







Los Osos
Habitat Conservation Plan

June 2022

Los Osos Habitat Conservation Plan



Prepared for

County of San Luis Obispo

Planning and Building Department

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List of Acronyms

Acronym	Definition
AMMP	adaptive management and monitoring plan
APN	assessor's parcel number
BLM	Bureau of Land Management
BO	Biological Opinion
CalIPC	California Invasive Pest Plant Council
CAL FIRE	California Department of Forestry and Fire Protection
CASH	California Academy of Sciences Herbaria
CCH	California Consortium of Herbaria
CDFW	California Department of Fish and Wildlife (formerly California Department of Fish and Game)
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CMCA	Crawford, Multari, and Clark Associates
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
COI	certificate of inclusion
DPS	Distinct Population Segment
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Federal Endangered Species Act
ESHA	Environmentally Sensitive Habitat Area
FC	Candidate to be Federally Listed
FD	Federally Delisted
FE	Federally Endangered
FGC	State Fish and Game Code
FP	State Fully Protected (CESA) and Fully Protected (CDFW)
FR	Federal Register
FT	Federally Threatened
GIS	Geographic Information System
GPS	Global Positioning System
GSW	Golden State Water Company
HCP	Habitat Conservation Plan
IAMMP	Interim Adaptive Management and Monitoring Plan
IBA	Important Bird Areas
IKM	Indian Knob mountainbalm
IPPC	Intergovernmental Panel on Climate Change
ITP	incidental take permit (federal)

Acronym	Definition
JSA	Jones and Stokes Associates
LOCSD	Los Osos Community Services District
LOHCP	Los Osos Habitat Conservation Plan
MBA	Michael Brandman Associates
MBKR	Morro Bay kangaroo rat
MCAS	Morro Coast Audubon Society
MDER	Morro Dunes Ecological Reserve
MM	Morro manzanita
MOU	Memorandum of Understanding
MSS	Morro shoulderband snail
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OHV	Off-Highway Vehicle Use
OSUH	Oregon State University Herbarium
PAR	Property Analysis Report
PCA	Priority Conservation Area
PRISM	PRISM Climate Group
PT	Proposed for Federally Threatened Listing
S&T	S & T Mutual Water Company
SD	state delisted
SE	state endangered
SOD	Sudden Oak Death
SRA	Sensitive Resource Area
SSC	Species of Special Concern
ST	state threatened
SWAP	Small Wilderness Area Preservation
SWCA	SWCA Environmental Consultants
TP	Threatened Phenomenon
URL	Urban Reserve Line
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USL	Urban Services Line
WL	Watch List
WRCC	Western Regional Climate Center

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Executive Summary

The County of San Luis Obispo is requesting a federal incidental take permit issued pursuant to Section 10(a)(1)(B) of the federal Endangered Species Act (ESA) to cover take/impacts[1] of four state and/or federally listed species:

Covered Species	**Federal Status/State Status**
Morro shoulderband snail (*Helminthoglypta walkeriana*)	Threatened[2]/None
Morro manzanita (*Arctostaphylos morroensis*)	Threatened/None
Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*)	Endangered/Endangered, Fully Protected
Indian Knob mountainbalm (*Eriodictyon altissimum*)	Endangered/Endangered

The take/impacts would result from private development activities as well as public agency and private utility projects conducted during the 25-year permit term within the 3,209-acre Permit Area, where the ITP issued based on the Los Osos Habitat Conservation Plan will authorize take of Morro shoulderband snail (Figure 1-2). The HCP also covers two federally listed plants and the Morro Bay kangaroo rat, a state and federally listed animal. There will be no impacts to occupied Morro Bay kangaroo rat habitat from the permitted activities through implementation of the conservation measures. The Permit Area covers 3,209 acres within the 3,644-acre Los Osos Habitat Conservation Plan Area (Figure 1-1). The Permit Area excludes State Park lands except the 12.0 acres proposed for creation and maintenance of a fuel break as part of the Community Wildfire Protection Plan (Figures 1-1 and 1-2; Sections 1.3 and 2.2.7).

The Los Osos Habitat Conservation Plan Area is centered on the unincorporated community of Los Osos, in central coastal California (Figures 1-1 and 1-2). The Los Osos Habitat Conservation Plan (LOHCP or Plan) Area features the Baywood Fine Sands ecosystem—a unique biological system found only on ancient sand dunes in the Los Osos region, which provides habitat for numerous rare and unique plants and animals, including the four covered species.

Naturally rare due to their limited geographic range and narrow habitat specificity, the covered species have been impacted by habitat loss due to historic development in the region. The central and northern portions of the Plan Area, which are inside the Urban Services Line (USL), feature dense residential and commercial development; the area outside of the USL features sparser residential development, limited agricultural use, and parks and reserves that contain important habitat areas.

Covered Activities

Since 1988, there has been a moratorium on new development throughout much of Los Osos as a result of water quality issues caused by the region's septic systems. However, completion of the Los Osos

[1] "Take" under the federal ESA does not apply to listed plant species. For purposes of the LOHCP and the federal permit, "take" when applied to the covered plant species refers to impacts to the species. The Plan features conservation measures to protect these species, which are included as covered species, so that the USFWS will extend "no surprises" assurances for them.

[2] In 2020, the USFWS proposed to reclassify Morro shoulderband snail from an endangered to a threatened species (USFWS 2020a). The downlisting occurred on February 3, 2022 (USFWS 2022).

wastewater facility in 2016, along with the update to the Los Osos Community Plan, will enable development to resume within the 1,584-acre wastewater facility service area, which features 579 vacant parcels totaling 260 acres. Outside the wastewater treatment area, there are 122 additional vacant private parcels (445 acres), which are designated for single-family residential development. These vacant parcels will likely be developed during the 25-year permit term, impacting an estimated 253.8 acres of habitat: 150.7 acres of residential land and 103.1 acres of commercial land (Table 2-6). Additionally, remodels, additions, and other redevelopment on 5,283 developed parcels, which total 1,476 acres, are estimated to impact 156 acres (Table 2-7).

The take permit issued for this Plan would also cover the impacts of capital improvement projects, facilities operations, and maintenance activities conducted by the County, the Los Osos Community Services District, and two private water purveyors, S&T Mutual and Golden State Water Company. These projects, which include road and trail creation and maintenance, park expansion and creation, and water system upgrades, and facility maintenance activities, are estimated to impact 122.1 acres (Table 2-8).

To conduct these otherwise lawful activities in compliance with ESA, the County is requesting a federal incidental take permit, which would permit the take of Morro shoulderband snail. Pre-project surveys conducted in suitable habitat for Morro Bay kangaroo rat and Indian Knob mountainbalm will be used to ensure projects avoid harm to individuals of these species, such that a take permit is not being requested for these state-listed endangered species under Section 2081 of the California Environmental Species Act (CESA). This HCP includes Morro manzanita and Indian Knob mountainbalm as covered species.

Proponents of covered activities, including private landowners, agencies, and organizations that choose to participate in this voluntary[3] program, will receive take coverage via Certificates of Inclusion (COI)—legal documents that confer the County's federal take coverage to others who agree to the permit terms (Appendix H).

Habitat Impacts

Implementation of the covered activities will impact up to 532 acres of habitat[4] within the 3,209-acre Permit Area, resulting in the loss, degradation, and fragmentation of habitat for the four covered species. Though the precise number, size, and location of the projects to be conducted in this

[3] Participation in the LOHCP is voluntary; landowners who are not conducting activities that cause ground disturbance or otherwise impact the covered species need not participate in this plan. Moreover, proponents of projects causing ground disturbance may have other options for compliance with the local, state, and federal permitting. However, impacts to habitats on Baywood fine sands soils that require a permit from the County will need to be mitigated as outlined in LOHCP Section 5.7, and consistent with the Los Osos Community Plan. The LOHCP was developed to reduce the timeline and costs for permitting, while also contributing to a more cohesive conservation strategy for the covered species. Moreover, the USFWS has indicated that the LOHCP is their preferred permitting mechanism for compliance with the federal Endangered Species Act.

[4] The 532 acres of take/impacts does not include that caused by implementation of the conservation program and the Community Wildfire Protection Plan, both of which will result in additional temporary habitat impacts.

programmatic[5] HCP are unknown, the acres of vegetation and other land cover types that are anticipated to be affected were estimated based on information from available projects (Table 4-1). This analysis estimated that the covered activities will impact 189 acres of coastal sage scrub, 18 acres of central maritime chaparral, and 33 acres of woodlands, including primarily coast live oak woodland (Table 4-3). Much of the remaining impacts (207 acres) will occur within existing developed areas, including the County rights-of-way, which may still support the covered species.

In addition to directly affecting habitat and individuals, the covered activities will also impact the covered species indirectly (Section 4.1.2). Increasing the human population through development is likely to intensify recreational use of parks and reserves, which can degrade protected habitat (Section D.2). The covered activities, in addition to greater human habitation in the region, can also promote the invasion and spread of exotic plants, many of which are adapted to disturbance (Section D.1). Finally, the proximity of greater human population to remaining habitat will further complicate efforts to effectively manage fire in order to promote populations of the fire-dependent covered plants and retain the structure and species composition to which the covered animals are adapted (Section D.3).

The LOHCP permits will also cover fire hazard abatement activities conducted to implement the Los Osos Community Wildfire Protection Plan (Section 2.2.7; SLOCCFSC 2009). Construction of fuel breaks at the wildlife urban interface is anticipated to impact 89.4 acres. Some of the treatments will promote the LOHCP biological goals and objectives by reducing exotic plants and creating early-successional habitat conditions. In order for the take/impacts of the CWPP to be covered under the permit issued for this Plan, the CWPP will be implemented using a suite of avoidance and minimization measures developed as part of the LOHCP to substantially reduce take of Morro shoulderband snail in the form of injury and mortality and reduce the severity of impacts to Morro manzanita (Table 5-4), which will be largely temporary.

Conservation Program

To mitigate the effects of the covered activities on the covered species, the County will be responsible for implementation of the LOHCP conservation program—a comprehensive program designed to avoid, minimize, and mitigate the impacts of the covered activities to a level that is commensurate with the impacts of the taking, as summarized in Table 5-11. This conservation plan is also intended to contribute to recovery of the listed species, by addressing threats to survival to promote long-term persistence.

The LOHCP conservation program includes the following elements:

- **Biological Goals and Objectives:** the desired future conditions of the ecosystem, communities, and covered species (goals), and 23 targets for achieving them (objectives; Table 5-1).
- **Avoidance and Minimization Measures:** the steps that will be taken during implementation of the covered activities to avoid or minimize their effects on covered species and the degradation of upland habitats (Table 5-2); a suite of measures to avoid impacts to other listed species not

[5] Unlike project- or land-specific HCPs, where all of the activities and/or affected areas are known, a programmatic HCP identifies a Permit Area and project eligibility criteria used to identify activities that can be covered by the ITP issued to the Plan's sponsor (in this case, the County). Activities meeting these criteria can be covered provided that project proponents implement the Plan's avoidance, minimization, and mitigation measures and adhere to the associated Plan conditions identified in the certificate of inclusion issued to confer take coverage under the sponsor (i.e., the County's) ITP.

covered by the permits, which primarily occur in the wetland and riparian systems as these areas are not covered by the Plan (Table 5-3); and additional avoidance and minimization measures designed to minimize impacts from the community wildfire protection plan (Table 5-4);

- **Habitat Protection**: the measures that will be taken to secure fee title or conservation easements from willing landowners to safeguard additional habitat, to expand and connect existing protected lands (Section 5.3.2);
- **Habitat Restoration:** the projects to re-establish habitat conditions, including native plant community structure and species composition, where it has been substantially degraded by anthropogenic factors, such as erosion, dense infestations of exotic plants, and fire exclusion (Section 5.3.3);
- **Habitat Management:** the ongoing efforts to maintain or enhance habitat conditions and promote the long-term population viability of the covered species, by addressing factors that negatively impact habitat, including incompatible recreational use, exotic plants, and fire outside of the natural disturbance regime (Section 5.3.3);
- **Monitoring:** the long-term studies to track the status and trends of the covered species populations, and the condition of their habitat (Table 5-6), as well as project-specific monitoring to document the effectiveness of restoration and management relative to the performance criteria that reflect their conservation value for the covered species; and
- **Adaptive Management:** the framework through which the six other elements will be implemented in order to enhance long-term effectiveness of the conservation program at achieving the biological goals and objectives (Section 5.5).

As the permittee, the County will be responsible for implementation of the LOHCP Conservation Program. It envisions contracting with an Implementing Entity— an existing or newly-created non-profit conservation organization (e.g., a land trust or conservancy), that will provide expertise in land conservation and management of threatened and endangered species to assist with implementation of the LOHCP conservation program (Section 6.1). The Implementing Entity will be identified by the County and approved by CDFW and the USFWS prior to issuance of the permit (Table 6-1).

The LOHCP conservation program includes establishment and management of the LOHCP Preserve System—a network of existing protected lands (i.e., parks, open space, reserves already protected extensive development), as well as land protected through Plan implementation, as part of a coordinated strategy designed to achieve the LOHCP biological goals and objectives. Incorporation of existing protected lands eligible for management as part of the LOHCP Preserve System (Table 5-5) will ensure that the habitat of greatest long-term conservation value is restored and enhanced to promote persistence of the covered species (Section 5.3.1).

The LOHCP Preserve System will be assembled during the 25-year permit period, through the acquisition, restoration, and management of native communities that provide habitat for the covered species to build upon the public and private conservation investments in the region over the past three decades. To provide the greatest long-term benefit for the covered species, these activities will primarily occur within the Priority Conservation Area (Section 5.3.1.2). Located on the perimeter of the LOHCP Area (Figure 5-1), this area features large blocks of relatively intact habitat identified as important for long-term viability of the covered species in their respective recovery plans (USFWS 1998a, 1999).

The LOHCP Preserve System will be managed, restored, and monitored as outlined in the LOHCP Preserve System Adaptive Management and Monitoring Plan (AMMP; Section 5.3.3.2). The AMMP will be developed during the first three years of Plan implementation based on initial surveys and monitoring studies that will be used to establish baseline information about habitat conditions and covered species populations and to inform the design of restoration and management strategies and projects (Section 5.3.3.2). The AMMP will be developed based on the framework and information provided in this plan, including: 1) biological goals and objectives (Section 5.1); 2) information about the covered species ecology and conservation needs (Appendix B); 3) scientific information about the three main threats to the covered species—exotic plants, incompatible recreation, and fire exclusion—and approaches to their management (Appendix D); and 4) monitoring protocols for the covered species, communities, and habitat conditions (e.g., exotic plants; Appendix E). The AMMP will build of the *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (IAMMP)—a plan that will guide initial restoration conducted as mitigation in order to jump start the conservation program (McGraw 2020; Appendix M). The AMMP, which will be subject to approval by the USFWS and CDFW, will establish performance criteria that habitat protection, restoration, and management actions must achieve to be credited as mitigation for the take of/impacts to the covered activities on the covered species through this Plan.

Mitigation Requirements

The conservation program elements will be implemented by the Implementing Entity in coordination with the County and others who conduct covered activities under the Plan (project proponents) through measures required to mitigate the take/impacts of their permitted activities on the covered species. To receive take coverage, project proponents who elect to participate in this program will be required to implement the applicable avoidance and minimization measures identified by the County during the application review process (Tables 5-2 to 5-4).

Project proponents will also be required to compensate for their project take/impacts by contributing to the protection, restoration, and long-term management of habitat within the LOHCP Preserve System. The type and level of compensatory mitigation reflects the amount and quality of habitat impacted, to ensure that the impacts to covered species are offset by the mitigation requirements (Table 5-7).

- **On-Site Habitat Protection:** Proponents of residential development projects inside the PCA will dedicate conservation easements to the Implementing Entity, which will protect habitat set-asides on-site at a ratio of 3:1 for the area of habitat impacts. This approach to on-site habitat protection reflects the generally high conservation value of habitat in these parcels.
- **Off-Site Habitat Protection Fee:** Proponents of activities located outside of the PCA will pay a fee that will be used to acquire additional privately held land from willing sellers that will be included in the LOHCP Preserve System. This fee, which was calculated on a per-square foot basis, was calculated to cover the costs of protecting habitat within the PCA (Section 7.2.1).
- **Habitat Restoration, Management, and Plan Administration:** All proponents of project types identified in Table 5-7 will pay a fee to fund restoration of habitat in the LOHCP Preserve System, as compensation for the loss of habitat caused by the covered activities. This fee will also fund ongoing habitat management and monitoring, to ensure that the protected and restored habitat does not degrade in ways that would reduce its value for the covered species. Calculated based on the area disturbed by the covered activity, so that mitigation offsets the project impacts, this Plan Restoration/Management/Administration Fee, will also fund long-

term monitoring of the Preserve System as well as Plan administration, so that the Plan implementation costs are completely funded by project proponents.

The mitigation fees were calculated based on both the anticipated land acquisition costs (Habitat Protection Fee), and the estimated costs to restore, manage, and monitor land within the LOHCP Preserve System, as well as administration of the Plan (Restoration/Management/Administration Fee; Section 7.2). The fees will be used, in part, to establish an endowment to fund ongoing management and monitoring of the LOHCP Preserve System after expiration of the permits. The endowment will ensure the condition of habitat protected and restored within the LOHCP Preserve System is maintained in perpetuity. Calculated on a per-square-foot basis, the initial Habitat Protection Fee is approximately $0.17 while the initial Restoration/Management/Administration Fee is approximately $1.03 (Table 7-1)[6].

The County will work with an Implementing Entity to administer the LOHCP over the 25-year period of the Plan, by permitting a suite of eligible covered activities, and assembling the LOHCP Preserve System by: 1) accepting conservation easements dedicated by landowners developing vacant land inside the PCA (i.e., on-site mitigation); 2) using Habitat Protection Fees collected from other project proponents identified in Table 5-7 to acquire fee title or conservation easements from willing sellers of land inside the PCA; 3) using restoration, management, and administration fees collected from all project proponents identified in Table 5-7, to manage and restore the newly acquired land; and 4) using the restoration, management, and administration fees to manage and restore existing protected lands enrolled into the LOHCP Preserve System, and to monitor the habitat and species populations to document achievement of the performance criteria established in the AMMP.

In this programmatic plan, the land protection, restoration, and management actions will be phased in over time and keep pace with the covered activities. At any time during plan implementation, the benefits of the Preserve System for the covered species, as documented through achievement of the performance criteria specified in the AMMP, will exceed, or at least match, the impacts of the covered activities, such that the mitigation is commensurate with the impacts on the covered activities.

To initiate the mitigation component of the conservation program, the County proposes to work with the Implementing Entity to restore habitat within the Morro Dunes Ecological Reserve, which the County and CDFW (the landowner) anticipate enrolling in the LOHCP Preserve System at the outset of Plan implementation as outlined in the Memorandum of Understanding (Appendix J). The *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (McGraw 2020; Appendix M) will guide this initial work, which will 'jump start' the mitigation and help ensure that it stays ahead of the project impacts (Section 6.2.5). Alternatively or additionally, the County will work with the Implementing Entity to protect new land or enroll existing unprotected County land into the LOHCP Preserve System to generate mitigation credits to offset impacts to covered species from covered activities early during implementation (Section 6.2.5).

Habitat Benefits

Mitigation costs in this Plan were estimated based on the LOHCP Preserve System configuration scenario (Section 5.8.1)—a scenario for the final preserve system design, which identifies the acres of land that

[6] The fees will be calculated to the nearest hundredth of a cent (Table 7-8). The fees listed here are rounded to the nearest cent for simplicity.

will be acquired, restored, and managed to mitigate the impacts of the covered activities. As noted above, the LOHCP Preserve System will be assembled over time by the County in coordination with the Implementing Entity, which will work with willing landowners to protect unprotected habitat as well as enroll existing protected lands of high conservation value to the covered species. The precise acreage of new and existing protected land that will ultimately comprise the LOHCP Preserve System is unknown. However, a reasonable scenario for the LOHCP Preserve System was developed in order to estimate the land protection, restoration, management, and monitoring costs, in order to estimate the mitigation fees.

In this scenario, the LOHCP Preserve System would consist of 386 acres and would (Table 5-9):

- **Protect 107.5 acres** of currently unprotected land, of which 10 acres will be restored and then managed (the other 97.5 acres will not require initial restoration and instead will be actively managed);
- **Restore 35 acres** of degraded habitat within existing parks or reserves that are already protected from development (e.g., the Morro Dunes Ecological Reserve) to increase its ability to support the covered species; and
- **Actively manage 243.7 acres** of additional habitat within existing parks and reserves, to meet the unmet management needs and that go above and beyond the existing management obligations of the landowner/land management agency and address factors that threaten long-term persistence of the covered species.

Mitigation crediting ratios were used to relate the value of habitat protection, restoration, and management to the impacts of the covered activities. The ratios are designed to express the relative value of the conservation actions for the long-term recovery of the covered species by assessing the effects of *not* implementing the typical covered activity (Section 5.7.2.3.1; Table 5-8). For example, the ratio of 1.5:1 is used to reflect the 50% higher benefit of restoring habitat that is degraded by dense infestations of exotic plants in an existing protected area (e.g., the Morro Dunes Ecological Reserve), for the conservation of the covered species, relative to *not* implementing a typical covered activity, such as residential development on a 3,000-sf lot within the urban services line.

The ratios are generally greater than 1:1, reflecting the fact that the long-term benefits for the covered species populations of the mitigation actions will exceed the take of/impacts to the covered species resulting from the covered activities. This is because the conservation actions will be largely implemented in the PCA (Figure 5-1), which features larger, more contiguous areas of relatively intact habitat that are of greater long-term conservation value for the covered species, whereas most of the covered activities will occur in areas not deemed essential for recovery of the species such as designated critical habitat or conservation planning units identified in a recovery plan. Instead, the covered activities will largely occur in areas of existing high-density residential and commercial development, that are of lower conservation value. While activities in these areas will impact the covered species and therefore require mitigation in order to meet the issuance criteria for an incidental take permit, the mitigation ratios reflect the greater value of the conservation actions for long-term conservation of the covered species (Section 5.7.2.3.1, Table 5-8).

These mitigation crediting ratios were used to assess the anticipated net benefits of the LOHCP Preserve System for the covered species by comparing the habitat impacts of the covered activities, which are analyzed in Section 4.2 based on the methods outlined in Section 4.1, to the anticipated benefits to habitat in the LOHCP Preserve System, which are described in Section 5.8 based on a similar

methodology. In the scenario used for the final configuration of the LOHCP Preserve System, the 386-acre LOHCP Preserve System will benefit 533.1[7] acres of habitat, thus mitigating the maximum impacts of the covered activities on habitat at a ratio of 1:1 (Table 5-10). The mitigation equivalencies were multiplied by the acres of vegetation and other land cover types anticipated to be within the LOHCP Preserve System to calculate the acre equivalents of each type that would benefit from the LOHCP conservation program (Table 5-10). These were compared to the acreages anticipated to be impacted by the covered activities (Table 4-3). For each, a cross walk between vegetation types and other land cover was used to calculate the area of habitat potentially occupied by Morro shoulderband snail and Morro manzanita (Tables 4-4 and 4-5).

- **Morro Manzanita:** The Preserve System is anticipated to benefit 354-acre equivalents of Morro manzanita habitat (central maritime chaparral and native woodlands; Table 4-4), whereas the covered activities are anticipated to impact just 41 acres of habitat. This 8.6:1 ratio of benefits to impacts reflects the far greater proportion of central maritime chaparral on the perimeter of the Plan Area, where the Preserve System will be located, compared to the center of the Plan Area where the covered activities will largely occur.
- **Indian Knob Mountainbalm:** The Preserve System is anticipated to benefit 156-acre equivalents of central maritime chaparral, while the covered activities will impact just 18 acres of these communities that can provide habitat for this endangered plant. This 8.5:1 ratio of habitat benefits to impacts for central maritime chaparral will greatly facilitate recovery of Indian Knob mountainbalm.
- **Morro Bay Kangaroo rat:** The covered activities are anticipated to impact 189 acres of coastal sage scrub and 18 acres of central maritime chaparral, which can be suitable for Morro Bay kangaroo rat if open habitat conditions are maintained. The Preserve System is anticipated to benefit 475-acre equivalents of these communities thus offsetting habitat impacts for this species at a ratio of more than 2:1.
- **Morro Shoulderband Snail:** The covered activities are anticipated to impact 189 acres of habitat, while the Preserve System will benefit 191-acre equivalents, resulting in a 1:1 ratio of benefits to impacts.

Based solely on habitat acreages, these ratios understate the anticipated net benefits of the Plan for the covered species. First, the habitat that will benefit from the Preserve System is of far greater long-term conservation value than the habitat that will be impacted by the covered activities (Section 4.2). Specifically, of the 207 acres of coastal sage scrub and central maritime chaparral anticipated to be impacted by the covered activities, 166 acres (80%) is anticipated to be inside the Urban Services Line (Table 4-3). Habitat within this already densely-developed portion of Los Osos is not included in designated critical habitat or identified as a conservation planning unit within a recovery plan for the covered species, and has lower long-term conservation value as it is more degraded and fragmented; as a result, it would be far more difficult to actively manage than the larger, more intact habitat within the Priority Conservation Area. As illustrated in Table 5-10, the 386-acre Preserve System is anticipated to result in 475-acre equivalents of habitat benefits from protection, restoration, and/or management of 350 total acres of relatively intact coastal sage scrub and central maritime chaparral communities that

[7] The LOHCP preserve system scenario includes 1.6 acre-credits more than needed to mitigate the 531.5 acres of impacts caused by the covered activities, to address estimation errors in this 25-year, programmatic plan.

occurs in larger, more contiguous habitat patches[8]. In addition, this Plan will result in net benefits for the covered species by funding, in perpetuity, the active habitat management of the upland habitat within the Baywood fine sands ecosystem. The funding is necessary to achieve the goals and objectives and can help promote recovery of the listed species.

Plan Implementation

The Plan will be implemented by the County with the assistance of an Implementing Entity, which is anticipated to primarily assist with implementation of the conservation program (Section 6.1). The USFWS will monitor County compliance with the incidental take permit including by reviewing annual reports (Section 5.6) and annual work plans for the LOHCP Preserve System AMMP. The following paragraphs outline their main roles and responsibilities:

1. **County:** As the sole permittee, the County will be responsible for implementation of the Plan and compliance with the permit terms. Specific roles include: review applications and issuing COIs, conducting implementation monitoring enforcing compliance with the terms of COIs, preparing annual reports, and overseeing work by the Implementing Entity to implement the conservation program.
2. **USFWS:** Pursuant to their regulatory roles under the ESA, the USFWS will primarily be responsible for monitoring Plan implementation and notifying the County if Plan implementation is not proceeding in compliance with the permit. The USFWS will also review and approve land acquisition and conservation easement proposals, review and approve the LOHCP Preserve System AMMP, and review annual reports and work plans documenting plan implementation and monitoring. The USFWS, as well as CDFW, will approve the selection of the Implementing Entity. The USFWS may also, in their discretion, assist the County in securing federal funding to enhance the conservation program (e.g., Section 6 funds).
3. **Implementing Entity:** Under contract with the County, this organization is anticipated to assist with implementation of the conservation program by: assembling, restoring, and managing the Preserve System; conducting all monitoring to evaluate its biological effectiveness including achievement of the success criteria; recommending updates to the AMMP and the Plan to increase its success; and assisting the County with development of the annual reports.

This programmatic Plan will be implemented through an adaptive management framework, which will ensure its long-term effectiveness at achieving the biological goals and objectives (Table 5-1). The Preserve System AMMP, which will be developed early during Plan implementation (Years 1-3) and guide restoration and management of the Preserve System, will be updated as part of annual review cycles based on:

1. **Biological effectiveness monitoring results**, which will document achievement of the performance criteria as well as refine management strategies and techniques to promote long-term effectiveness;
2. **Implementation monitoring results**, which will identify additional or different avoidance and minimization protection measures;

[8] The benefits to habitat exceed the acreages of habitat in the Preserve System, as a result of the mitigation equivalency ratios applied to each of the conservation actions to reflect their value for conservation of the covered species relative to the impacts of the typical covered activity, as described in detail in Section 5.7.2.3.1.

3. **New scientific information,** which will inform effective conservation and management of the covered species and the communities in which they occur; and
4. **Changes in habitat conditions,** relative to baseline conditions, including threats to the covered species, such as invasion and spread of exotic plants or animals, fire, drought, or global climate change, which may necessitate additional or different management treatments (Section 6.5).

The mitigation costs will be tracked to update the financial analysis and mitigation fee schedule (Section 7.4). This adaptive financial management will ensure that the Plan is adequately funded, so that mitigation is assured, and the Plan is implemented as intended, and can respond to changed circumstances including future impacts due to climate change (Section 6.5). In doing so, this coordinated conservation program will contribute to the recovery of the four covered species and help conserve other native plants and animals that comprise the endemic communities of the Baywood fine sands ecosystem.

1 Introduction and Background

1.1 Overview

Located in San Luis Obispo County in central coastal California, the unincorporated community of Los Osos is approximately ten miles northwest of the City of San Luis Obispo and five miles south of the City of Morro Bay (Figure 1-1). The community of Los Osos is situated on an ancient dune complex. The sandy soil, known as the Baywood fine sand, combine with the region's maritime climate to create a mosaic of natural communities including coastal sage scrub, central maritime chaparral, and coast live oak woodland, that support unique and diverse assemblages of plants and animals, including four narrowly endemic species:

- Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*);
- Morro shoulderband snail (*Helminthoglypta walkeriana*);
- Morro Manzanita (*Arctostaphylos morroensis*); and
- Indian Knob mountainbalm (*Eriodictyon altissimum*).

Due to their small geographic range, narrow habitat specificity, and small and declining populations, these four species have been listed as either threatened or endangered under the federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA; Section 1.4). In order to comply with these laws, landowners and others seeking to conduct projects that would impact these species including their habitats must receive state and federal incidental take permits. These permits cover the take/impacts to the listed species that result from ,otherwise lawful activities.

This habitat conservation plan for the Los Osos area (LOHCP or Plan) is part of an application by the County of San Luis Obispo (County) to obtain an incidental take permit (ITP) from the United States Fish and Wildlife Service (USFWS), which implements the federal Endangered Species Act. The County will avoid take, as defined under CESA, of the state-listed species; therefore, the County is not requesting an incidental take permit issued pursuant Section 2081 of CESA. As the permittee, the County can issue Certificates of Inclusion (COIs) to landowners and other project proponents to confer take coverage for projects that impact one or more of the listed species.

The LOHCP identifies the suite of activities that will be covered by the permit (covered activities; Section 2.2), their anticipated impacts to the listed species covered by the permit (covered species; Chapter 4), and the steps that the County and other plan participants will take to avoid, minimize, and mitigate the impacts of the covered activities on the covered species (the conservation program; Chapter 5).

Participation in the LOHCP is voluntary; landowners who are not conducting activities that cause ground disturbance need not participate in the Plan. Moreover, landowners and other proponents of projects causing ground disturbance have other options for compliance with the local, state, and federal permitting requirements that are addressed through this plan. However, the LOHCP is designed to streamline the permitting process, reducing both the timeline and costs for permitting, while also contributing to a more cohesive conservation strategy for the covered species. Moreover, the USFWS has indicated that the LOHCP and an issued ITP are the recommended permitting mechanism for compliance with the federal Endangered Species Act.

To mitigate the take of animals and impacts to plants from the covered activities, the County has developed a conservation program to: 1) avoid impacts of the projects on the covered species, where possible, and 2) minimize and compensate for the impacts on the covered species, in cases where take/impacts cannot be avoided. The conservation program also includes measures to avoid impacts to other listed species in the Plan area, that are not covered under the ITP. These elements of the LOHCP Conservation Program build upon the history of conservation work in the region, which has protected in state parks and ecological reserves habitat of high conservation value. To leverage these prior public and private investments in conservation in the region, the LOHCP Preserve System will feature a mix of existing protected lands as well as new habitat acquired through the LOHCP, which will be restored, managed, and monitored through a comprehensive strategy designed to maximize effectiveness of the habitat mitigation fees collected through the plan (Chapter 5).

The LOHCP also outlines the specific measures that the County will take to implement the LOHCP. The County envisions contracting with an Implementing Entity—a non-profit conservation organization approved by the USFWS and CDFW— to implement the conservation program (Chapter 6). Chapter 7 outlines the costs and funding approach to implement the elements of the Plan, while Chapter 8 identifies alternatives to the proposed taking and why they were not pursued by the County.

Implementation of this plan will help conserve the covered species and enhance the natural communities that support them as well as other native species, while allowing compatible growth and development consistent with applicable local, state, and federal laws.

1.2 Permit Holder/Permit Duration

The County is requesting to hold the incidental take permit issued pursuant to Section 10(a)(1)(B) of ESA. As the land use jurisdiction for the unincorporated area of Los Osos, the County can be responsible for implementing the Plan and ensuring compliance with the terms of the permit as it implements its general plan and associated land use policies and ordinances. As a landowner and provider of various services, including road and park maintenance, the County will also use the take authorization provided by the incidental take permit issued based on the Plan to cover impacts of its own capital improvement and facilities operations and maintenance projects.

The County will also coordinate plan implementation with other public entities, such as the Los Osos Community Services District (LOCSD), to cover take/impacts caused by covered activities that are outside of County jurisdiction. The County will confer take coverage to other proponents of projects that meet the Plan's eligibility criteria through its land use authority and through issuance of Certificates of Inclusion (Appendix H): legally binding contractual agreements between the County and the Plan participant, as allowed under Title 50 of the Code of Federal Regulations Section 13.25 (e).

The County will monitor the compliance of Plan participants to ensure compliance with the requisite conservation program measures. As the permittee, the County anticipates implementing the conservation program with the assistance of the Implementing Entity; however, the County remains legally responsible for implementing the plan and complying with the incidental take permit, including all actions, and any failure to act, by the Implementing Entity.

The County has requested a 25-year permit term. This duration will allow the County sufficient time to implement the conservation program designed to attain the Plan's biological goals and objectives (Section 5.1). It will also enable implementation of the Los Osos Community Plan, the general plan and

local coastal plan for the Los Osos Region (County of San Luis Obispo 2020b). Prior to expiration of the permit, the County may apply to renew the permit (Section 6.9).

1.3 Plan Area and Permit Boundary

The 3,644-acre plan area for the LOHCP (Plan Area; Figure 1-1) identifies the contiguous area of habitat of the Baywood fine sands ecosystem which was evaluated for covered activities (Section 2), the environmental setting and biological resources (Section 3), potential impacts and take (Section 4) and the Plan's conservation program (Section 5). The Plan Area was delineated to incorporate the upland Baywood fine sands ecosystem that is the focus of the Plan. It was based largely upon the Los Osos Urban Reserve Line—the boundary separating urban and rural land uses in the region—but was modified to primarily include habitat within the Baywood fine sands ecosystem. On the west, the Plan Area extends beyond the Los Osos Urban Reserve Line (URL) in order to incorporate the Baywood fine sands ecosystem located within the Morro Dunes Ecological Reserve and the Morro Dunes Natural Preserve (part of Montaña de Oro State Park) that is east of the Morro Sand Spit. The Plan Area was contracted on the northeast to exclude much of the wetland habitat within Morro Bay State Park. The Plan Area also excludes a small area inside the southern portion of the URL that is outside of the Baywood fine sands ecosystem (Figure 1-2).

The 3,209-acre permit area delineates the area in which the ITP issued by the United States Fish and Wildlife Service for the LOHCP will authorize take of the Morro shoulderband snail (Figure 1-2). The permit area includes all of the land in the Plan Area except the land within State Parks that is located outside of the fuel break for the Community Wildfire Protection Plan (Section 2.2.7). During planning to develop the LOHCP, State Parks did not identify any activities for permit coverage (Section 2.1.3.3) and also declined to have their lands managed as part of the Los Osos Preserve System (Section 5.3.3). However, the narrow strips of land on portions of the perimeter of the Los Osos Oaks State Natural Reserve, Montaña de Oro State Park, and Morro Bay State Park were included in the LOHCP Permit Area so that the ITP can authorize take of Morro shoulderband snails and avoid or minimize impacts to the other covered species that result from vegetation management activities to create and maintain a fuel break as part of the Community Wildfire Protection Plan (Section 2.2.7).

1.4 Species to be Covered by the Habitat Conservation Plan

The LOHCP features four covered species: federally-listed threatened or endangered species. The Morro shoulderband snail is the species for which the incidental take permit is being requested[9]. The covered species were identified through a detailed analysis of the habitat, status, anticipated impacts, and available information for 141 rare species that occur within or near the LOHCP Area (Section 3.2.1).

Covered Species	**Federal Status/State Status**
Morro shoulderband snail (*Helminthoglypta walkeriana*)	Threatened[10]/None

[9] "Take" under the federal ESA does not apply to listed plant species. For purposes of the LOHCP and the federal permit, "take" when applied to the covered plant species refers to impacts to the species. In recognition of the conservation measures in the plan to protect the covered plant species, the USFWS will extend "no surprises" assurances to those species.

[10] In 2020, the USFWS proposed to reclassify Morro shoulderband snail from an endangered to a threatened species (USFWS 2020a). The downlisting occurred on February 3, 2022 (USFWS 2022).

Morro manzanita (*Arctostaphylos morroensis*)	Threatened/None
Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*)	Endangered/Endangered, Fully Protected
Indian Knob mountainbalm (*Eriodictyon altissimum*)	Endangered/Endangered

Coverage for Morro Bay kangaroo rat and Indian Knob mountainbalm is requested only for implementation of the LOHCP conservation program; specifically, the permit for these species is requested to cover short-term impacts of management and restoration activities that are intended to promote population growth and restore the habitat of these species. Take/impacts of these species due to development and other covered activities will be avoided through implementation of a series of measures identified in the Plan (Section 5.2). Coverage for Morro Bay Kangaroo rat and Indian Knob mountainbalm is only requested for degradation or loss of unoccupied habitat; take of individuals of these two species will be avoided through the Plan's avoidance measures (Section 5.2).

Eight additional state and/or federally listed species (listed below) that occur within the LOHCP Area are discussed within the Plan but will not be covered by the incidental take permit. These 'additional listed species' did not meet the criteria that were used to identify the Plan's covered species (Section 3.2.3). Most occur within wetland or riparian habitats and will not be affected by the covered activities.

Species Not Covered by the Permit	**Federal Status/State Status**
California red-legged frog (*Rana draytonii*)	Threatened/None
California Black Rail (*Laterallus jamaicensis coturniculus*)	None/Threatened
California seablite (*Suaeda californica*)	Endangered/None
Salt marsh bird's beak (*Chloropyron maritimum* ssp*. maritimum*)	Endangered/Endangered
Marsh sandwort (*Arenaria paludicola*)	Endangered/Endangered
South Central CA Coast Steelhead (*Oncorhynchus mykiss irideus*)	Threatened/None
White-tailed kite (*Elanus leucurus*)	None/Fully Protected
Golden Eagle (*Aquila chrysaetos*)	None[11]/Fully Protected

As part of this plan, project proponents will implement measures to avoid impacting these species (Section 5.2.2). If a project will impact these or other listed species not covered by the LOHCP, the proponent of that project will be required to obtain permits for those species independently, through a separate process. The County will require They will proof of such separate permitting in order to issue a COI that will cover their take/impacts of the LOHCP covered species (Section 6.3.1).

1.5 Regulatory Framework

Though developed primarily to comply with ESA and CESA, the LOHCP was designed to be consistent with other local, state, and federal laws and regulations, in order to streamline permitting and meet the criteria for issuance of the incidental take permit. This section describes consistency of the Plan with the

[11] Though not listed under ESA, golden eagles receive federal protection through the Bald and Golden Eagle Protection Act.

following statutes:

Federal	State
Federal Endangered Species Act	California Endangered Species Act
National Environmental Policy Act	State Fish and Game Code
National Historic Preservation Act	California Environmental Quality Act
	California Coastal Act

1.5.1 Federal Regulations

1.5.1.1 Federal Endangered Species Act

1.5.1.1.1 Overview

Section 9 of the ESA and Federal regulation pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened animal species, respectively, without special exemption or authorization. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species by annoying them to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity.

Pursuant to Section 11(a) and (b) of the ESA, any person who knowingly violates Section 9 of the ESA or any permit, certificate, or regulation related to Section 9, may be subject to civil penalties of up to $25,000 for each violation or criminal penalties up to $50,000 and/or imprisonment of up to one year.

Individuals and State and local agencies proposing an action that is expected to result in the take of federally listed species are encouraged to apply for an incidental take permit under Section 10(a)(1)(B) of the ESA to be in compliance with the law. Such permits may be issued by the USFWS when take is not the intention of and is incidental to otherwise legal activities. An application for an incidental take permit must be accompanied by a habitat conservation plan, commonly referred to as an HCP. The regulatory standard under Section 10(a)(1)(B) of the ESA is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable. Under Section 10(a)(1)(B) of the ESA, a proposed project also must not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and adequate funding for a plan to minimize and mitigate impacts must be ensured. Section 1.6.1.2 outlines the process of obtaining a Section 10(a)(1)(B) permit.

Section 7 of the ESA requires federal agencies to ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify listed species' critical habitat. "Jeopardize the continued existence of…" pursuant to 50 CFR 402.2, means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers,

or distribution of that species. Issuance of an incidental take permit under Section 10(a)(1)(B) of the ESA by the USFWS is a Federal action subject to Section 7 of the ESA. As a federal agency issuing a discretionary permit, the USFWS is required to consult with itself (i.e., conduct an internal consultation). Delivery of the HCP and a Section 10(a)(1)(B) permit application initiates the Section 7 consultation process within the USFWS.

The requirements of Section 7 and Section 10 substantially overlap. Elements unique to Section 7 include analyses of impacts on designated critical habitat, and analyses of cumulative impacts on listed species. Cumulative effects are effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area, pursuant to Section 7(a)(2) of the ESA. The action area is defined by the influence of direct and indirect impacts of covered activities. The action area may or may not be solely contained within the HCP boundary, though in the case of the LOHCP, the action area is the HCP boundary. These additional analyses are included in this HCP to meet the requirements of Section 7 and to assist the USFWS with its internal consultation.

1.5.1.1.2 The Section 10(a)(1)(B) Process - Habitat Conservation Plan Requirements and Guidelines

The Section 10(a)(1)(B) process for obtaining an ITP has three primary phases: (1) the HCP development phase; (2) the formal permit processing phase; and (3) the post-permit-issuance phase.

During the HCP development phase, the project applicant works with the USFWS to prepare a plan that integrates the proposed project or activity with the protection of listed species. An HCP submitted in support of an ITP application must include the following information:

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested;
- Measures that will be implemented to monitor, minimize, and mitigate impacts; funding that will be made available to undertake such measures; and procedures to deal with unforeseen circumstances;
- Alternative actions considered that would avoid or reduce take; and
- Additional measures the USFWS may require as necessary or appropriate for purposes of the plan.

The HCP development phase concludes, and the permit processing phase begins, when a complete application package is submitted to the appropriate permit-issuing office. A complete application package consists of 1) an HCP, 2) an Implementing Agreement (IA), if applicable, 3) a permit application, and 4) a $100 fee from the applicant, unless exempted under 50 CFR13. The USFWS must also publish a Notice of Availability of the HCP package in the Federal Register to allow for public comment. The USFWS also prepares an Intra-Service Section 7 consultation and a Set of Findings and Recommendations to evaluate the Section 10(a)(1)(B) permit application in the context of permit issuance criteria, which are described below.

The issuance of an ITP is a federal action that triggers USFWS compliance with NEPA. For the LOHCP, the USFWS has prepared an EA (Section 1.5.1.2).

A Section 10(a)(1)(B) incidental take permit is granted upon a determination by the USFWS that all criteria for permit issuance have been met. Statutory criteria for issuance of the permit specify that:

- The taking will be incidental;
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking;
- The applicant will ensure that adequate funding for the HCP and procedures to deal with unforeseen circumstances will be provided;
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild; and
- The applicant will ensure that other measures that the USFWS may require as being necessary or appropriate will be provided; and
- The USFWS has received assurances, as may be required, that the HCP will be implemented.

During the post-issuance phase, the Permittee and any other responsible entities implement the HCP, and the USFWS monitors compliance with the HCP as well as the long-term progress and success of the HCP.

1.5.1.2 National Environmental Policy Act

The purpose of the National Environmental Policy Act (NEPA) is two-fold: to ensure that federal agencies examine the environmental impacts of their actions and assess possible alternatives, and to solicit public input on this analysis through circulation of the appropriate NEPA document, which could be an EAS, an EA or an EIS.

Issuance of an incidental take permit under section 10(a)(1)(B) of the ESA constitutes a federal action requiring compliance with the National Environmental Policy Act (NEPA). In order to ensure NEPA compliance, the USFWS prepared an Environmental Assessment (EA) to address issuance of an incidental take permit associated with the LOHCP.

1.5.1.3 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470 et seq.), requires federal agencies to take into account the effects of their actions proposed on properties eligible for inclusion in the National Register of Historic Places. Properties include prehistoric and historic sites, buildings, and structures that are listed on, or meet the criteria for listing on, the National Register of Historic Places.

The issuance of an incidental take permit by the USFWS is an undertaking subject to Section 106 of the NHPA. The NHPA and the potential effects of implementation of the Plan on resources subject to the NHPA are discussed in the EA prepared for the LOHCP.

1.5.2 Regulations of the State of California

1.5.2.1 California Endangered Species Act

The California Endangered Species Act prohibits take of species listed as threatened, endangered or candidate by the California Fish and Game Commission, including birds, mammals, fish, amphibians, reptiles, and plants; invertebrates cannot be designated as threatened or endangered (CESA Section 2080). In CESA, take is defined as any action or attempt to hunt, pursue, catch, capture, or kill a listed species; take does not include loss or degradation of habitat alone or the impacts of the taking.

Like ESA, CESA allows exceptions to the prohibition for take that occurs during otherwise lawful activities. As described in Section 2081 of the California Fish and Game Code, incidental take of state-listed species may be authorized if an applicant submits an approved plan that minimizes and fully mitigates the impacts of take.

Morro shoulderband snail and Morro manzanita are not listed under CESA; however, Morro Bay kangaroo rat and the Indian Knob mountainbalm are state-listed species. The HCP requires pre-project surveys and other measures to avoid take of Morro Bay kangaroo rat and Indian Knob mountainbalm individuals (Section 5.2.1, Section F.1) and thus take as defined under CESA, which is not as inclusive as the definition under ESA; therefore, the County is not requesting a 2081 permit.

Should any restoration and management actions implemented as part of the LOHCP conservation program to promote population growth of Indian Knob mountainbalm be determined to potentially cause take of individuals as defined under the state act, the County will first obtain a separate permit from the state, such as a state recovery permit issued pursuant Section 2081(a) of CESA. The USFWS would also need to reinitiate consultation on the ITP since the analysis based on the Plan would not have included these impacts. An amendment to the Plan might also be needed.

1.5.2.2 Other Regulations in the California Fish and Game Code

The California Fish and Game Code (FGC) contains additional regulations designed to protect native species.

1.5.2.2.1 California Fully Protected Species

Prior to the passage of CESA, the California legislature identified species to be protected under the FGC. These 37 fully protected species are given protection under four separate sections for birds (Section 3511), fish (Section 5515), mammals (Section 4700), and reptiles and amphibian (Section 5050). Fully protected species may not be taken or possessed at any time. Licenses or permits issued for their “take” are limited to collecting for necessary scientific research, including efforts to recover the species.

To comply with Section 4700 of the FGC, this Plan includes measures that must be implemented to avoid impacts to the Morro Bay kangaroo rat, a fully protected species (Section 5.2).

1.5.2.2.2 Bird Nests

Section 3503 of the FGC also makes it unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as permitted by the CDFW. This Plan contains measures to avoid take of bird nests (Section 5.2.3).

1.5.2.2.3 Birds of Prey

Section 3503.5 of the FGC prohibits take, possession, or destruction of birds of prey or their nests or eggs. The CDFW may issue permits authorizing such impacts. The Plan measures are designed to avoid take of birds of prey, including golden eagle and white-tailed kite, which are fully-protected species, as well as other birds of prey that occur in the region, including peregrine falcon (*Falco peregrinus anatum*) and Cooper's hawk (*Accipiter cooperii*).

1.5.2.3 California Environmental Quality Act

The California Environmental Quality Act (CEQA; Public Resources Code §21000 et seq.) requires State and local government agencies to complete an environmental review of most projects that could impact environmental resources. It also requires that the environmental impacts identified be reduced to a less-than-significant level through avoidance, minimization, and mitigation measures unless overriding considerations are identified that make it infeasible to mitigate the impacts or conduct an alternative project.

In adopting the Plan, the County is responsible for conducting the environmental review and ensuring compliance with CEQA. To comply with CEQA, the County acted as the lead agency and prepared an environmental impact report (EIR) and CDFW participated as the responsible agency (County of San Luis Obispo 2020a).

The draft EIR is designed to provide programmatic compliance with CEQA for Plan covered activities. However, each development application must be considered separately for compliance with CEQA. The receipt of an incidental take permit does not in itself ensure compliance with CEQA, as there may be the potential for other significant environmental impacts related to other resources, depending on the size, type, and location of the proposal. If a discretionary project needs to complete an environmental document, as defined under CEQA, appropriate mitigation will need to be determined. The LOHCP may provide appropriate mitigation, but this will be decided on a case-by-case basis.

1.5.2.4 California Coastal Act of 1976

One of the primary objectives of the California Coastal Act is to preserve, protect, and enhance environmentally sensitive habitat areas (ESHA). Section 30107.5 of the Coastal Act defines an "Environmentally Sensitive Area" as:

> Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

The following sections of the California Coastal Act provide guidance for resource protection:

- Section 30240 prohibits any significant disruption of habitat values, and limits development within ESHA to uses that are dependent on the resources. It also requires development adjacent to ESHA be sited and designed to prevent significant degradation and be compatible with the continuance of the habitat.

- Section 30250(a) directs new residential, commercial, or industrial development to existing developed areas. Where developed areas cannot accommodate new development, it is to be located in other areas where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.

The Los Osos Community Plan (LOCP) identified as ESHA the Los Osos Ecosystem (County of San Luis Obispo 2020b). The County designation included habitat of the Baywood fine sand soil ecosystem between the Los Osos Urban Services Line (USL) and the Urban Reserve Line (URL), but excluded the central urbanized area of Los Osos as ESHA (County of San Luis Obispo 2020b). Although the area within the USL may contain Baywood fine sand and may contain individual endangered species, it does not meet the key elements of the definition of ESHA: the area is generally disturbed and degraded (not pristine), remaining habitat is greatly fragmented, and thus the area is not especially valuable for species persistence (County of San Luis Obispo 2020b). In contrast, the area outside of the USL is largely intact, significantly less degraded, and it contains habitat that is especially valuable for long-term persistence.

The LOHCP goals and objectives are consistent with the Coastal Act and the San Luis Obispo County LCP, which implements the Coastal Act for Los Osos. The Plan contains avoidance, minimization, and mitigation measures that will protect the sensitive species and their habitats including ESHA (Section 5.2). Any updates to the LCP will ensure that it is consistent with the LOHCP.

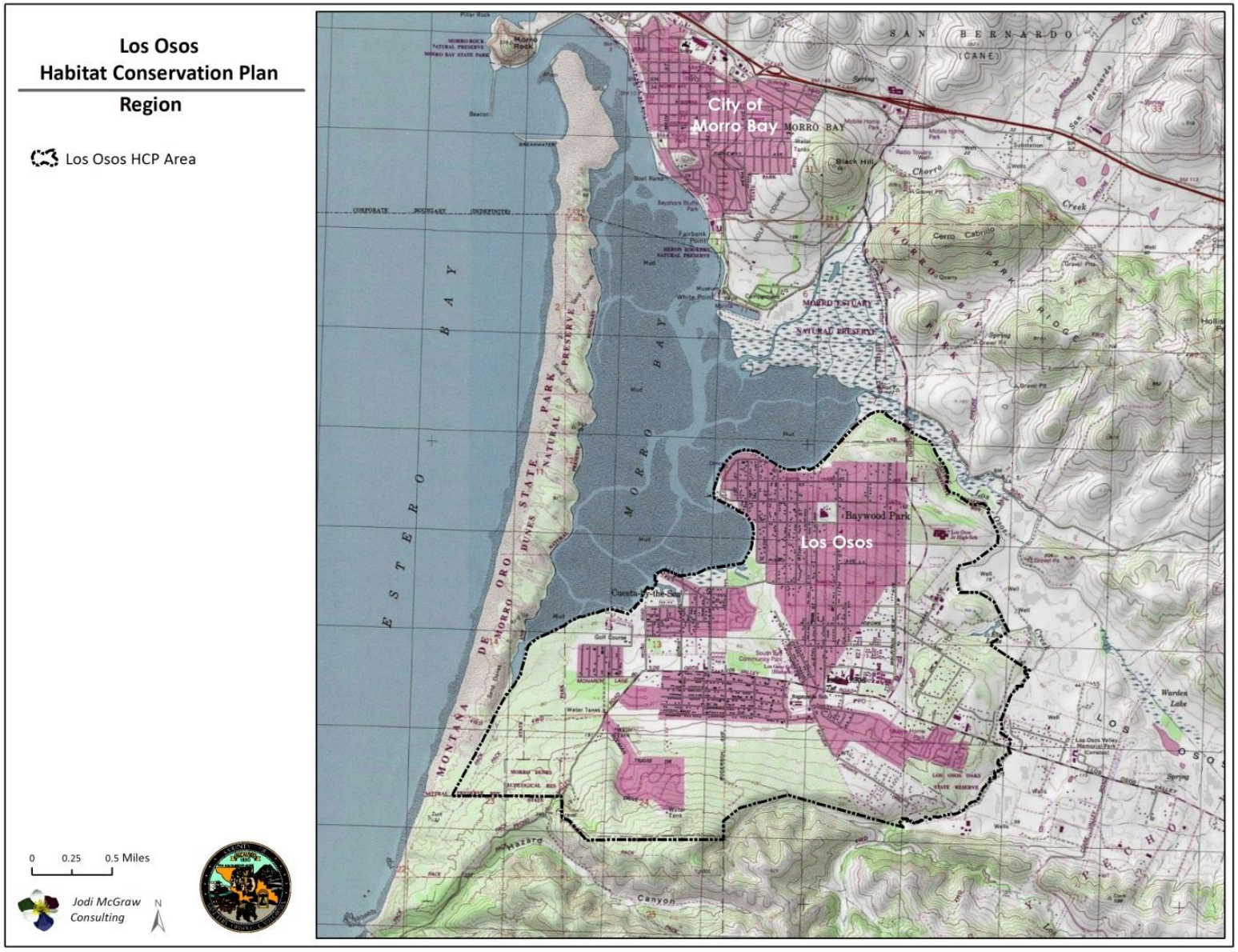


Figure 1-1: Plan Region

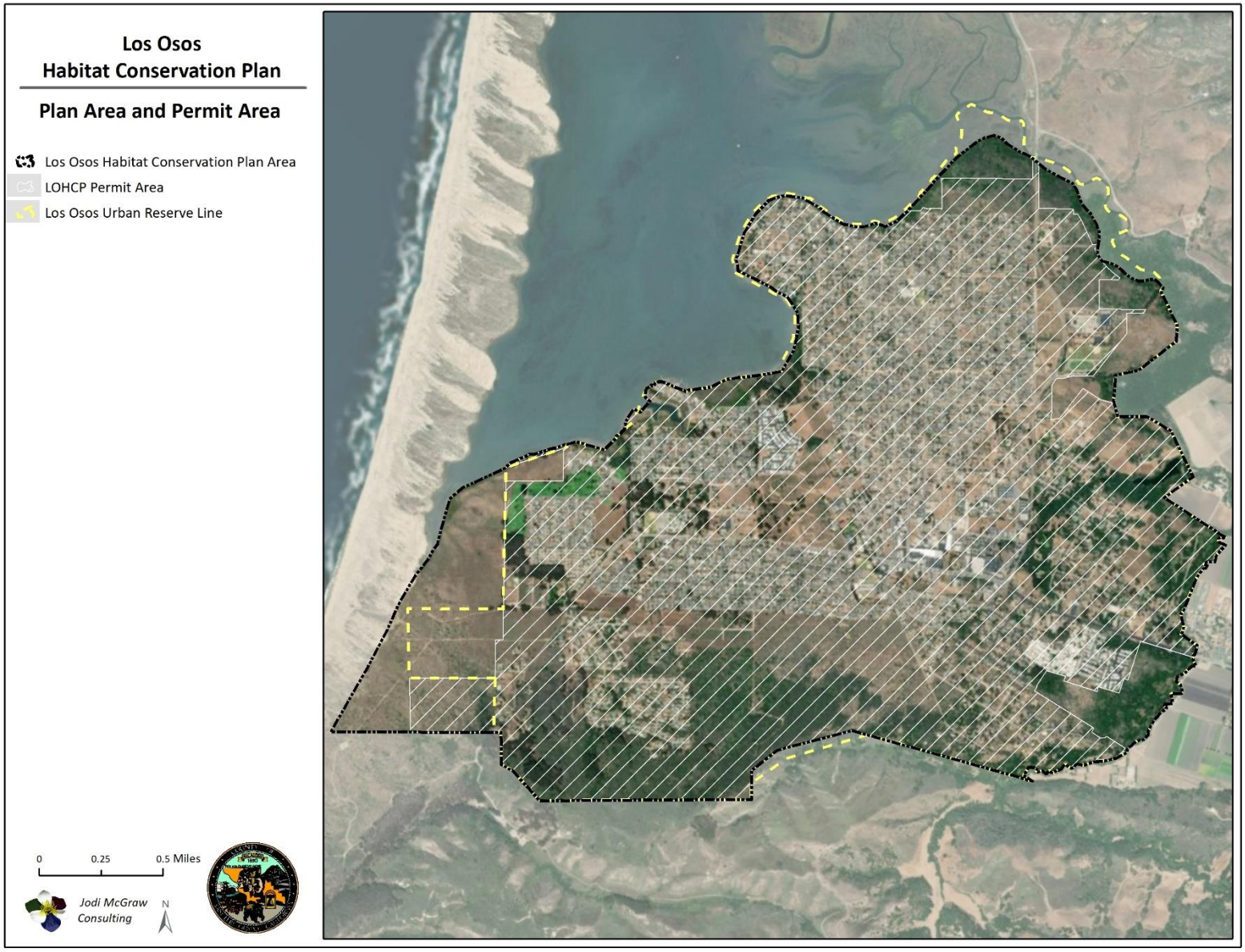


Figure 1-2: Los Osos HCP Plan Area and Permit Area

2 Land Use and Covered Activities

This chapter describes land use in the LOHCP area, including the existing development (Section 2.1.1) as well as current policies under the Estero Area Plan (Section 2.1.2). It then describes the conservation lands, including parks, reserves, and easements, and their current management (Section 2.1.3). This information provides the context for the activities that will be covered under the incidental take permit, which are described in Section 2.2. The impacts of these covered activities on the covered species are described in Chapter 4.

2.1 Land Use and Conservation

The LOHCP features a mix of land uses that include relatively dense residential and commercial development in the center and northern portion of the Plan Area, with generally sparse residential development, limited agricultural use, and conservation lands on the perimeter of the community. The existing and planned land use patterns informed development of the Plan's conservation program, specifically the design of the Preserve System (Section 5.3), and the Plan's covered activities.

2.1.1 Existing Land Use

Los Osos is an unincorporated community of nearly 15,000 people. It has been characterized as a 'bedroom community'' as 75% of those who live there are employed elsewhere (County of San Luis Obispo 2020b).

A large portion of Los Osos was subdivided into small lots in the early part of the twentieth century. The 3,644-acre LOHCP Area features 6,032 assessors' parcels. The following outlines the general parcel status (Table 2-1, Figure 2-1)[12]:

1. **Developed**: 1,525 acres (48.3%) of the Plan Area are held within 5,290 parcels that have been partially or entirely built up for residential and commercial uses and public facilities;
2. **Undeveloped:** 705 acres (22.3%) of the Plan Area are within 701 parcels that are undeveloped or largely undeveloped, in that they feature limited improvements. This category also includes parcels that are in cultivation.
3. **Protected:** 925 acres (29.3%) of the Plan Area are within parks, reserve, or other open space or conservation areas managed, at least in part, for natural resource protection. An additional 23.7 acres within the Plan Area are privately held but protected via open space easements: legal agreements that restrict development, though may not allow active management.

Within the Plan Area, the land use pattern varies, particularly with respect to the Urban Services Line (USL) which demarks the Urban-Rural boundary in the Local Coastal Plan (County of San Luis Obispo 2020b). The area inside of the USL contains more than 95% of the LOHCP Area parcels (5,744), though it represents just 48% (1,509 acres) of the area of land contained within parcels in the Plan Area (Table 2-1). Parcels within the USL are small (average is 0.26 acres; median is 0.14 acres) and the majority (88%) are already developed. Most are residential, though the USL contains all of the land in the LOHCP Area

[12] This analysis is based on 2014 parcel data. Due to the moratorium on development, few changes have occurred since that time; these limited changes are not anticipated to affect the HCP's analysis or implementation.

that is designated for commercial use and contains most of the existing commercial development including the central business district (Figure 2-2).

While the majority of the area within the USL is built up, this area also contains eight vacant parcels that are greater than five acres each and that total 104 acres (Figure 2-1). These parcels generally feature stands of exotic trees (e.g., eucalyptus) or coastal sage scrub habitat that has been degraded by land use including vegetation clearing (e.g., mowing); while such habitat can be restored (Section 3.1.5.1), its location with respect to development reduces its long-term conservation value (Section 5.3.1.2).

In contrast, 50% of the Plan Area located outside of the USL is permanently protected from development, with an additional 388 acres (12.3%) in 45 vacant, unprotected private parcels (Figure 2-1). Of these, 14 parcels greater than 5 acres total 343 acres, much of which is adjacent to existing protected land. Many of these undeveloped parcels support coastal sage scrub, central maritime chaparral, and coast live oak woodlands that are relatively intact and contiguous with similar native communities outside of the Plan Area, particularly to the west, south, and east. The notable exceptions include a few large parcels that are used for row crop agriculture, with the remaining development parcels outside of the USL zoned for residential use.

2.1.2 Land Use Policies, Designations, and Development Patterns

Land use within Los Osos Urban Reserve Line (including the USL) is governed by the County of San Luis Obispo through implementation of the Estero Area Plan, which is a component of the County General Plan and Local Coastal Program. Adopted in 1988, the Estero Area Plan was updated for the community of Cayucos and the rural portions (areas outside of the urban reserve lines) in 2009 (County of San Luis Obispo 2009). During the course of development of the LOHCP, the Los Osos Community Plan was updated to provide consistency with the LOHCP (County of San Luis Obispo 2020a).

A key objective of the Estero Area Plan is to protect agriculture, open space, and sensitive resources, including ground water supplies, in part by focusing future development within the Los Osos, Morro Bay, and Cayucos urban reserve lines (County of San Luis Obispo 2009). The Estero Area Plan identifies numerous sensitive resource areas (SRAs) within the Los Osos URL including: Los Osos Dune Sands Habitat, Morro Bay kangaroo rat habitat, Los Osos Oaks State Reserve, Hazard Canyon and Vicinity, and the pygmy oaks within the 86-acre Los Osos Oaks State Natural Reserve (County of San Luis Obispo 2009). The Sensitive Habitats program in the Estero Area Plan calls for protection and management of sensitive habitat, including: areas that support threatened and endangered species, include a range of vegetation types, are sufficiently large to support ecosystem processes, include buffer areas that separate habitat from incompatible uses, and include continuous wildlife corridors. Strategies for protecting land include encouraging acquisition of fee title or conservation easements by public agencies or conservation organizations and obtaining easements in connection with development projects (County of San Luis Obispo 2009).

Within the Los Osos URL, land use designations typically focus future commercial and residential development largely inside the USL; this infill development approach is designed to aid preservation of a green belt around Los Osos. Table 2-2 and Figure 2-2 illustrate the land use designations and acreage in each under the Estero Area Plan. Of the approximately 3,150 acres located in parcels within the LOHCP Area (the remainder of the Plan Area being in County rights of way), 229 acres (7.3 %) are designated for commercial and multifamily residential uses. These are focused within the center of the Plan Area. A total of 2,318 (73.6%) are designated for single-family residential development. The remaining 19.1% of

the Plan Area is designated for recreation (328 acres), open space (122 acres), and public facilities (66), while 87 acres (3%) were not certified as part of the Estero Area Plan (i.e., are 'white holed').

2.1.2.1 Changes Since the 1988 Plan Was Adopted

Since the Estero Area Plan land use designations were adopted in 1988, development within Los Osos has been limited. In January 1988, the Regional Water Quality Control Board established a discharge moratorium to protect water quality in the aquifer underlying the community and in the Morro Bay Estuary, which was being degraded by the thousands of individual septic systems in the Plan Area. This moratorium prohibited the County from issuing permits for new on-site sewage disposal (septic) systems within a 1,584-acre prohibition area in the center of Los Osos. It halted most new construction or major expansion of existing development until a new wastewater system (sewer) is operational. In 2016, the Los Osos Wastewater Treatment Plant was completed and existing development began to connect to the system

During the more than 30-year period in which the moratorium has been in effect, increasing recognition of the high biodiversity conservation value of intact habitat within the Los Osos area led local, state, and federal agencies and non-profit organizations to collaborate on several habitat protection projects. Working with willing sellers, the conservation agencies and organizations protected 451 acres of land designated for rural, suburban, or single-family residential development, 84 acres that were not designated (i.e., were 'white holed'), and an additional 12 acres designated for commercial or multifamily residential development (Table 2-3). Combined with other lands zoned for parks, recreation, and open space, the conservation lands in the Plan Area total 948 acres (Table 2-4, Figure 2-3).

2.1.2.2 Anticipated Future Development

In 2016, the County completed construction of a wastewater treatment facility that will service 5,147 parcels within a 1,584-acre wastewater service area in the center of Los Osos that contains the highest density of development (Figure 2-2). Most existing parcels are connected to the system. The Los Osos Community Plan, as adopted by the County Board of Supervisors and pending Coastal Commission certification, and associated amendments to the Growth Management Ordinance, would set a 1.3% annual growth rate for new residential development once Phase 1 Basin Plan programs are complete and require a 2:1 water offset for new development until Phase 2 Basin Plan programs are complete and verified to sufficiently increase sustainable basin yield. The Los Osos sewer service area includes 579 vacant, unprotected parcels totaling 260 acres; one of the larger parcels (Tract 1646) has a pre-existing approval to be subdivided. The 882 parcels located outside of the sewer service area will continue to utilize septic systems for on-site sewage treatment and disposal. This area features 122 vacant, unprotected parcels totaling 445 acres that are within one of three land-use categories intended for single-family development. These categories are collectively referred to in this plan as Single-Family Residential.

Future development in Los Osos may be constrained by water issues. As part of the adjudication process, the County and the water purveyors in the region, the LOCSD, Golden State Water, and S&T Mutual Water Company, developed a management plan for the Los Osos groundwater basin to address saltwater intrusion resulting from overdraft and thus develop a sustainable water supply (County et al. 2015). Adopted in October 2015, the basin management plan includes a series of measures to reduce water use and increase the sustainable yield of the basin as part of a coordinated strategy to provide a

sustainable water supply for existing and future users and reverse and halt seawater intrusion. At the time this plan was finalized in 2022, the County estimated that Phase I Basin Plan Programs will be implemented by July 2025 (Section 7.3.2.2).

2.1.3 Existing Protected Lands and Open Space Easements

Within the 3,644-acre LOHCP Area, 948 acres (26%) are protected from development (Table 2-4, Figure 2-3). These lands include 925 acres within a state ecological reserve, state parks, County parks and open space, and other land owned by other government agencies and nonprofit organizations. These lands are managed, at least in part, for natural resource conservation and biodiversity protection; they exclude small parks that are largely built-up, such as the 6.8-acre Los Osos Community Park.

An additional 24 acres within the Plan Area are protected by open space easements granted by landowners to the County pursuant the California Open Space Easement Act of 1974 (Government Code Sections 51070 through 51097; Table 2-4). These conservation measures restrict, in perpetuity, development and other uses including agricultural development, grading, vegetation removal, landscaping, hardscaping (i.e., paving).

Collectively, these public and private lands are referred to as 'protected' in this Plan. They will not be targeted for acquisition to protect habitat in the LOHCP Conservation Program. Selected existing protected parks and ecological reserves that contain intact habitat that is of the greatest long-term conservation value for the rare and endangered species in the Bayview fine sands ecosystem will be subject to restoration and enhanced habitat management to promote recovery of the endangered species (Section 5.3.1).

The LOHCP Area adjoins approximately 12,000 acres of protected land and water located outside of the Plan Area (Figure 2-3):

- **Montaña de Oro State Park:** an 8,396-acre park south and west of the LOHCP Area;
- **Morro Bay State Park**: approximately 2,300 acres of this state park, which is partially within the LOHCP area, is located north of the Plan Area;
- **Morro Bay Wildlife Area:** a 1,307-acre area containing most of the Morro Bay estuary, which is managed by CDFW and is located north of the LOHCP Area; and
- **Los Osos Creek Wetlands:** an approximately 120-acre conservation easement located northeast of the LOHCP Area, which is held by the United States Natural Resource Conservation Service.

Though these adjacent protected lands do not feature the Baywood fine sands ecosystem, effective conservation and management of their other upland and wetland ecosystems can promote effective conservation within the LOCHP Area. Specifically, they can buffer lands that are protected, managed, and restored as part of the LOHCP Conservation Program against the indirect effects of more intensive land uses (e.g., development or agriculture).

The following sections describe the protected lands that are within the LOHCP Area, according to their owner and managing agency, to provide information about land use in the area and as context for the LOHCP Conservation Program. The lands targeted for inclusion in the LOHCP Preserve System, which will be established to mitigate the impacts of the covered activities, are identified in Section 5.3.3.1.

Descriptions of the natural communities noted as occurring within these lands are provided in Section 3.1.5.

2.1.3.1 County of San Luis Obispo

Within the Plan Area, the County owns seven parcels totaling 142 acres that feature parks and open space (Table 2-4, Figure 2-3).

2.1.3.1.1 Division of Parks and Recreation

The County of San Luis Obispo Division of Parks and Recreation (County Parks) manages two properties: the 14-acre Monarch Grove Natural Area, which features a blue gum (*Eucalyptus globulus*) grove, and the 34-acre County-owned portion of the Elfin Forest Natural Preserve, which supports coastal sage scrub, central maritime chaparral, and pygmy coast live oak woodland plant communities.
The mission of County Parks is to ensure personal enrichment of the County's residents and visitors while protecting it's natural, cultural, and historical resources. The Elfin Forest is managed as part of a 93-acre natural area, which includes 59 acres of state-owned land. Currently, Small Wilderness Area Preservation (SWAP), a local non-profit conservation organization that helped protect the land, works with the landowners to manage the Natural Area as part of an "Adopt-A-Park" agreement. Through the 10-year, renewable agreement, that was last extended in 2014, the all-volunteer organization provides docent-led interpretive hikes on the trails, which include a raised boardwalk, and conducts habitat maintenance activities including: native plant revegetation, weed management, erosion control, and trail maintenance activities, such as vegetation trimming, boardwalk repair, and installing deterrents for non-designated trails.

The Monarch Grove Natural Area is managed by County Parks for passive recreational use, including hiking and equestrian use. It mostly serves as an access route to reach the adjacent Montaña de Oro State Park. Management includes trail and fence maintenance, litter removal, and twice-yearly vegetation management for fuel reduction.

The County also owns the 6.8-acre Los Osos Community Park, which is managed by County Parks. This largely developed park features tennis courts, a playground, a skate park, bathrooms, and picnic areas. The approximately 1.6 acres of open space north of the park is slated to be developed as part of a park expansion outlined in the County General Plan (Section 2.2.5.2). Therefore, this park was not included in the list of conservation lands (Table 2-4).

Of the County-owned lands, only a small portion of the Monarch Grove Natural Area was identified as suitable for inclusion in the LOHCP Preserve System, which will be used to mitigate the impacts of the covered activities on the covered species (Section 5.3.3.1). The LOHCP Implementing Entity will evaluate opportunities to coordinate management of other County lands within the LOHCP Preserve System and other protected lands, to maximize effectiveness of the conservation program for the covered species (Section 5.3.3.1).

2.1.3.1.2 Department of Public Works and Transportation

The Department of Public Works and Transportation (County Public Works) manages two open space properties: the 82-acre Broderson Site and the 12-acre Midtown site. These properties feature coastal

sage scrub, central maritime chaparral, and coast live oak woodland plant communities that have been degraded in places due to prior land use. They were partially developed as part of the Los Osos Wastewater Project and feature a leach field (Broderson) and pump station (Midtown).

The temporarily disturbed areas are being actively restored and are permanently protected via conservation easements or deed restrictions, revegetated to address the impacts caused by facilities development as well as the existing habitat degradation, and then actively managed to protect the rare species and natural communities of the LOHCP Area, including the covered species (SWCA 2012). The County currently holds the properties but intends to transfer the 73-acre portion of the Broderson property that is used for mitigation to a land conservation and management agency or organization (County of San Luis Obispo 2012). Because this site is already serving as mitigation for the LOWPP, it will not be considered for incorporation within the LOHCP Preserve System; however, the County and the LOHCP Implementing Entity will evaluate opportunities to coordinate management of the LOHCP Preserve System with other protected lands to maximize effectiveness of the conservation program (Section 5.3.3.1).

2.1.3.2 California Department of Fish and Wildlife Properties

2.1.3.2.1 Morro Dunes Ecological Reserve

The California Department of Fish and Wildlife (CDFW) owns and manages the 278.7-acre Morro Dunes Ecological Reserve (MDER). Located in the south-central portion of the LOHCP Area, the 230.9-acre Bayview Unit of MDER supports a mosaic of coastal sage scrub, central maritime chaparral, and coast live oak woodland, and features populations of, or habitat for, all four covered species. The remainder of MDER is in a disjunct 47.8-acre parcel located in the southwest portion of the Plan Area (Figure 2-3); it supports coastal sage scrub and central maritime chaparral that provides suitable habitat for the Morro Bay kangaroo rat and populations of Morro shoulderband snail and Morro manzanita.

Ecological reserves are established under California law to protect rare, threatened, or endangered native plants, wildlife, aquatic organisms and specialized terrestrial or aquatic habitat types (Fish and Game Code 1580). They are managed to conserve biodiversity, while providing opportunities for education, research, and compatible recreation, as outlined in the California Code of Regulations Title 14, Chapter 11, Section 630. A management plan was prepared for the MDER in 1982, when it featured only the 47.8-acre Pecho Unit located largely west of Pecho Valley Road (CDFW 1982). Appendix G lists the management recommendations identified in the plan.

2.1.3.2.2 Morro Bay Wildlife Area

The CDFW manages the Morro Bay Wildlife Area, a 1,307-acre estuarine (i.e., largely inundated) area. There is an approximate four acre-portion of this area that is mapped within the LOHCP Area. However, this sliver of land likely reflects mapping imprecision in the spatial data layers used to assess protected lands for the LOHCP, as the wildlife area is, by definition, below the median high tide line and therefore located north of the LOHCP Plan Area.

State wildlife areas are established primarily for wildlife conservation and providing opportunities for compatible recreation, including hunting and wildlife viewing (Fish and Game Code 1525-1530). The

wildlife area is managed pursuant the California Code of Regulations Title 14, Chapter 8, Sections 550, 551, and 553.

2.1.3.3 California Department of Parks and Recreation Properties

The California Department of Parks and Recreation (State Parks) is responsible for 21 parcels (447 acres) of land within the LOHCP Area. This land is managed by the San Luis Obispo Coast District as part of four parks or reserve units (Table 2-4, Figure 2-3). State Parks is governed under Sections 500-514 of the State Public Resources Code. Their natural resource mission is to acquire, protect, restore, maintain, and sustain outstanding and representative examples of California's natural and scenic values for the benefit of present and future generations. Management activities include habitat restoration, prescribed fire management, corrective and ongoing maintenance, and monitoring.

During LOHCP development, State Parks did not identify any activities for permit coverage. State Parks also declined to have its lands evaluated for inclusion in the LOHCP Preserve System (Barker 2015), which will be used to mitigate the impacts of the covered activities on the covered species (Section 5.3.3). As a result, State Park properties were excluded from the LOHCP Permit Area except for in the designated fuel break for the Community Wildfire Protection Plan (Sections 1.3 and 2.2.7). These narrow strips of land on portions of the perimeter of the Los Osos Oaks State Natural Reserve, Montaña de Oro State Park, and Morro Bay State Park were included in the LOHCP Permit Area so that the ITP can authorize take of the covered species that results from vegetation management activities to create and maintain the fuel break, if/when State Parks approvals implementation of such fire hazard abatement activities. The County and the LOHCP Implementing Entity will evaluate opportunities to coordinate management of the LOHCP Preserve System with other protected lands including State Parks, to maximize effectiveness of the conservation program for the covered species (Section 5.3.3.1).

2.1.3.3.1 Morro Bay State Park

The LOHCP Area includes part of Morro Bay State Park—an approximately 2,400-acre park located east of Morro Bay. The southernmost 90 acres of the park located within the northeastern corner of the LOHCP Area primarily support coastal sage scrub and coast live oak woodland, with areas of riparian and wetland vegetation occurring along Los Osos Creek. No existing, authorized trails or facilities occur within the portion of the park within the LOHCP Area.

2.1.3.3.2 Los Osos Oaks State Natural Reserve

Located in the southeastern portion of the LOHCP Area, the 86-acre Los Osos Oaks State Natural Reserve primarily supports a mosaic of coastal sage scrub (24 acres) and coast live oak woodland (60 acres), which features old-growth coast live oaks. The coast live oaks support diverse assemblage of lichens, including splitting yarn lichen (*Sulcaria isidifera*), which is endemic to the area.

2.1.3.3.3 Montaña de Oro State Park

The western portion of the LOHCP Area features five parcels totaling 236 acres that are managed as part of Montaña de Oro State Park: a nearly 8,400-acre park that wraps around the western and southern portions of the Plan Area. Within the LOHCP Area, the park incudes parcels managed as part of the Morro Dunes Nature Preserve. These parcels, which primarily support coastal sage scrub (185 acres) and

central maritime chaparral communities (47 acres),feature five hiking and equestrian trails totaling 3.5 miles that provide beach access from Pecho Valley Road. The park's main facilities including campground and picnic areas are located south of the LOHCP Area.

2.1.3.3.4 Elfin Forest Natural Preserve

Within the LOHCP Area, the State of California owns four parcels totaling 35 acres that are managed as part of the 90-acre Elfin Forest Natural Preserve, which also features County-owned parcels and is managed by SWAP (Section 2.1.3.1.1). This property primarily supports coast live oak woodland (32 acres) but also features a small area of central maritime chaparral communities (2.1 acres).

2.1.3.4 Bureau of Land Management Property

The Bureau of Land Management (BLM) owns and manages one five-acre parcel that supports coastal sage scrub and is contiguous with Morro Bay State Park in the northeast corner of the Plan Area (Figure 2-3). The parcel was designated as an Area of Critical Environmental Concern (ACEC) in the Resource Management Plan for the Bakersfield Office (BLM 2014).

The goal of management in this area is to protect and preserve important cultural resources, natural systems and processes, and habitat for listed species. The objectives are to:

1. Protect significant cultural resources from damage and degradation;
2. Maintain rare and endemic plant communities including coastal dune scrub, central maritime chaparral, and pygmy oak forest; and
3. Ensure no net loss of associated habitat for special-status plants and animals

This designation provides for the following special management:

- excludes rights-of-ways related to utility scale renewable energy projects;
- excludes livestock grazing;
- prohibits campfires and overnight camping;
- prohibits off-highway vehicles, mechanized use, equestrian use, and cross-country travel by pedestrians;
- requires pets to be leashed (maximum eight-foot length) at all times and removal of pet fecal matter by owners or handlers;
- prohibits air-soft and paintball activities, including organized games and casual use of these types of equipment; and
- prohibits the casual collection of plants or their parts without BLM authorization.

The BLM parcel is federal land and, as such, activities thereon cannot be included for take coverage as part of the LOHCP including the conservation program (Section 5.3.3.1). However, the County and the LOHCP Implementing Entity will evaluate opportunities to coordinate management of the LOHCP Preserve System with the BLM, where appropriate, to maximize effectiveness of the conservation program for the covered species (Section 5.3.3.1).

2.1.3.5 Morro Coast Audubon Society

The Morro Coast Audubon Society (MCAS) owns three parcels that comprise the Sweet Springs Nature Preserve (29.4 acres), which is located on Morro Bay in the north-central part of the Plan Area (Figure 2-3). Protected by an easement held by the State Coastal Conservancy, the preserve primarily supports wetlands (28 acres) and riparian areas (0.3 acres) along the estuary as well as upland habitat featuring a mosaic of exotic trees (0.6 acres) and degraded coastal sage scrub (0.1 acres). It features hiking trails and is used for bird watching, nature study, and community outreach efforts. In 2011, MCAS prepared a *Morro Shoulderband Snail Recovery Action Plan for the Sweet Springs Nature Preserve* (SWCA 2011) to guide restoration and management of the Preserve and promote recovery of the Morro shoulderband snail.

The MCAS has two additional conserved parcels totaling 1.15 acres: a 0.92-acre parcel near Cuesta Inlet, which are protected by an easement held by the State Coastal Conservancy, and a 0.23-acre parcel on the northern border of the Planning Area, which is protected from development via deed restrictions. These parcels primarily support disturbed wetlands (0.05 acres) and landscape trees (0.9 acres).

The mission of the MCAS, a volunteer-based organization that is a part of the non-profit network the National Audubon Society, is to promote the appreciation, conservation, and restoration of ecosystems, focusing on the biological diversity of birds, other wildlife, and their habitats, particularly in San Luis Obispo County.

The MCAS lands are being managed by the MCA and were not considered for inclusion in the LOHCP Preserve System. However, the County and the LOHCP Implementing Entity will evaluate opportunities to coordinate management of the LOHCP Preserve System with the MCAS, where appropriate, to maximize effectiveness of the conservation program for the covered species (Section 5.3.3.1).

2.1.3.6 Conservation and Open Space Easements

Within the LOHCP Area, 23.7 acres on 15 parcels are protected through conservation easements voluntarily granted by private landowners to the County. Located primarily in the outer portion of the Plan Area, these easements restrict development in areas ranging in size from less than 0.1 acres to nearly five acres. They occur on vacant parcels as well as undeveloped portions of residential parcels. Collectively, the easements protect a mosaic of riparian communities (7.7 acres) as well as upland communities including central maritime chaparral (6.4 acres), coastal sage scrub (6.3 acres), and coast live oak woodlands (1.1 acres). While most are not actively managed for habitat values, the easements may prohibit activities that can degrade habitat, such as planting exotic and ornamental plants, and vegetation clearing. While not considered for incorporation as part of the LOHCP Preserve System, these easement lands can help buffer and protect habitat in other protected lands and the County and the LOHCP Implementing Entity will evaluate opportunities to coordinate management with private landowners where doing so can promote the goals and objectives of the LOHCP

2.2 Activities Covered by Permit

Covered Activities are actions for which the County is seeking incidental take permit coverage, and for which the LOHCP identifies avoidance, minimization, and mitigation measures. The covered activities include one-time actions occurring in discrete locations, such as capital improvements (e.g., expanding

the library), as well as ongoing actions that occur broadly within the Plan Area, such as mowing road medians.

This section discusses the criteria and methods that were used to identify covered activities and the criteria for covering additional activities, and then outlines the LOHCP covered activities. The final section of this chapter lists activities that will not be covered by the permit requested as part of the LOHCP.

2.2.1 Covered Activity Selection Criteria and Methods

As described in the *Habitat Conservation Planning Handbook* (USFWS and NMFS 2016), covered activities are actions within the Plan Area that: (1) are likely to result in incidental take of Morro shoulderband snails and impacts to the covered species; (2) are reasonably certain to occur over the life of the permit; (3) are controlled by the applicant(s) to some extent, and (4) are otherwise lawful activities, including conducted with landowner permissions and all other required permits and approvals. Based on this guidance, and in consideration of the LOHCP goals, the following criteria were established for covered activities in the LOHCP:

1. **Location:** the activity will occur within the 3,209-acre LOHCP Permit Area (Figure 1-2);
2. **Timing:** the activity will or is likely to occur during the 25-year period of the take permit;
3. **Entity:** the activity is conducted by the County of San Luis Obispo, is subject to the County's jurisdiction as the local land use authority, or will otherwise be conducted under contract with the County;
4. **Impact:** the otherwise-lawful activity has the potential to result in incidental take or impacts to one or more of the covered species by causing ground disturbance, which includes any activity that removes vegetation or compacts or displaces soil not covered by existing impervious surfaces;
5. **Addressed:** the effects of the taking or impacts of the covered activity were evaluated and addressed as part of the plan (Chapter 4); and
6. **Goals:** the activity will not prevent achievement of the biological goals and objectives of the LOHCP (Section 5.1).

To determine activities meeting these criteria, the County worked internally, as well as with landowners, agencies, and organizations, to identify the general types of activities, as well as specific projects, that would occur in the LOHCP Area during the next 25 years and would benefit from take coverage. The County circulated to agencies and organizations a LOHCP fact sheet, which provided potential project proponents including landowners and land management entities with information about the HCP, and an activity worksheet designed to obtain information about anticipated covered activities, including their location, timing, frequency, and size. This information was synthesized to identify the covered activities outlined in this chapter, and to assess their potential impacts to covered species (Chapter 4).

The following sections describe the general activities as well as anticipated specific projects, that will be covered by the permit issued based on the LOHCP. Additional projects not listed here can be covered under the incidental take permit. All projects must meet the following requirements:

1. The project must be a lawful activity meet the plan's eligibility criteria listed above, as determined by the County through review of an application for take coverage (Section 6.3);

2. The project proponent must agree to the terms of the voluntary program, including implementation of the avoidance, minimization, and mitigation measures (Section 5.7); and
3. There must be adequate take coverage remaining under the permit at the time the project application is approved.

2.2.2 Anticipated Project Proponents

The following entities are anticipated to conduct activities that will be covered under the LOHCP incidental take permit.

Private property owners: Owners of private land within the LOHCP Area conducting residential and commercial development projects that are eligible for coverage under the LOHCP permit, and who choose to participate in this voluntary program; their projects will be permitted by the County through the local land use and building application procedures.

County of San Luis Obispo: three separate County departments are anticipated to conduct covered activities:

- Department of Public Works and Transportation (Public Works): This department is responsible for construction and maintenance of infrastructure including roads and drainage systems;
- Library Department: This department operates and manages the Los Osos Public Library.
- Parks Department: This department operates and manages parks, open space, and recreation facilities, develops and maintains trails, and conducts recreation programs.

Los Osos Community Services District: The LOHCP Area includes 3,127 acres under the jurisdiction of this local agency, which provides drainage systems, water, parks, recreation, street lighting, solid waste, and fire emergency and rescue response services, and as well as supplies water within an 826-acre service area.

Golden State Water Company: This private utility company maintains water facilities used to supply water within their approximately 1,569-acre service area in the LOHCP Area.

S & T Mutual Water Company: This private utility company provides water within an approximately 90-acre area near the Sea Pines Golf Course in Los Osos.

California Department of Fish and Wildlife: This state agency manages the 278.7-acre MDER which is within the LOHCP Area, as well as the 1,307-acre Morro Bay Wildlife Area located adjacent to the LOHCP Area.

Though the BLM owns and manages approximately 5 acres of land in the northeastern portion of the LOHCP Area, take resulting from any activities on this property should be covered through a Section 7 consultation with the USFWS, rather than under a Section 10 incidental take permit; therefore, no BLM activities were included as part of the LOHCP.

Though the California Department of Parks and Recreation (State Parks) manages land within the LOHCP area, State Parks did not identify any covered activities to be included in this plan. Additionally, they elected not to have their land considered for enrollment in the LOHCP Preserve System (Barker 2015).

Additional entities may also seek coverage under the LOHCP for projects that meet the covered activity criteria (Section 2.2.1). To receive take coverage, all project proponents must apply to the County Planning and Building Department which will process applications for all LOHCP covered activities (Section 6.3).

2.2.3 General Categories of Covered Activities

Four main categories of covered activity were identified through the outreach conducted by the County to prepare the LOHCP:

1. **Private development:** Commercial and residential development and redevelopment, including remodels or additions, on privately owned legal parcels, including creation and maintenance of defensible space;
2. **Capital Projects:** Public and private infrastructure development projects, such as building or expanding roads, libraries, parks, and water facilities;
3. **Facilities Operations and Maintenance:** Public and private activities to operate and maintain, including repair and replace, existing facilities, such as roads, drainage basins, water systems, and parks;
4. **Fire Hazard Abatement:** Vegetation modification and other related treatments to reduce the amount and contiguity of fuels to reduce the risk of wildfire in designated fuel breaks as part of the Community Wildfire Protection Plan (SLOCCFSC 2009); and
5. **Conservation Program Implementation**: Activities conducted to implement the LOHCP conservation program (Chapter 5), including restoration, management, maintenance, and monitoring of preserves used to mitigate the effects of the other covered activities.

For all covered activities, the project disturbance envelope includes all areas of ground disturbance and vegetation removal. It includes areas of temporary disturbance, such as a corridor in which underground utilities are installed, as well as areas that are permanently covered by impervious surfaces. The disturbance envelope also includes the area impacted through creation and maintenance of defensible space (CAL FIRE 2020). The maximum disturbance envelope applies to remodels and reconstruction, including additions and remodels that disturb additional ground, as well as new construction.

Plan participants must limit the disturbance envelope associated with their projects, including by siting development in areas that minimize the amount of vegetation management required to achieve defensible space, such as along roads or adjacent to existing development, in vegetation and terrain (i.e., slopes) that require less clearance. However, if defensible space requirements would result in more than 30,000 sf of disturbance, including due to the new requirement for 100 feet of defensible space (relative to 30 feet when the plan was written), the County can permit that additional impact area if they find that the project proponent has minimize the impacts of the project. Project proponents must mitigate for the actual total impact area, including by setting aside land or paying the habitat protection fee based on the actual area impacted including any amount in excess of the

maximum disturbance envelopes identified in this plan. Such potential expansion of the disturbance envelop for individual projects will not change the overall impacts of the covered activities in this plan, for which no additional take beyond the 531.5 acres is requested.

The following sections describe each of these types of activities in terms of their anticipated acres of impacts as summarized in Tables 2-5 to 2-9, and illustrated in Figures 2-4 to 2-7.

2.2.4 Private Development

The LOHCP incidental take permit will cover the impacts of private development activities permitted by the County through both ministerial and discretionary permit processes, as defined in CEQA Guidelines Sections 15369 and 15357. The general types of private activities that will be permitted include:

- **New Construction:** New commercial and residential construction including associated onsite improvements (e.g., driveways, utilities, and storm water control measures) that are part of the development project.
- **Remodels and Reconstruction:** Additions or adjustments to existing commercial and residential buildings and associated onsite infrastructure and facilities that add to the ground surface footprint of the existing development.
- **Defensible Space**: Selective vegetation removal in compliance with state law (PRC 4291), which requires property owners to maintain around structures defensible space: an area of reduced flammability materials that will slow the spread of fire and enable firefighters to safely access structures. The defensible space should extend 100 feet or to the property line, whichever is nearer. The first 30 feet should lack flammable vegetation and woodpiles; fuels should be reduced and spaced within the remaining 70 feet (CAL FIRE 2020).

To be eligible for coverage, activities on private property must:

1. Meet the general covered activities criteria (Section 2.2.1);
2. Occur on a legal parcel at the time the LOHCP is adopted and the ITP permit is issued, or on a parcel for which subdivision approval was granted by the County prior to issuance of the ITP and that remains valid (Section 2.1.2.2);
3. Conform with the current Estero Area Plan/Los Osos Community Plan standards; and
4. Meet specific eligibility criteria for private development under the LOHCP, which are described below.

2.2.4.1 Private Project Eligibility Criteria

The additional eligibility criteria for private development are based on three factors:

1. **Development Type:** commercial and multifamily residential development are included in one category, while various types of single-family residential development are included in another;
2. **Parcel size**: the size of the parcel in one of several size categories used for planning purposes**;** and
3. **Planning Zone**: location with respect to the Urban Services Line (Figure 2-1).

For single-family residential development, Table 2-5 outlines the eligibility criteria and identifies the number and total acreage of parcels to which they apply. Table 2-6 identifies the acres of habitat within undeveloped parcels that are estimated to be impacted by all new, residential development, while Table 2-7 estimates the acres of existing developed parcels that can be impacted through redevelopment of all residential parcels. These numbers and acreages were developed based on analyses conducted in 2014. While some changes have occurred since that time, they are limited due to the moratorium on development and will not affect the plan's analysis or implementation.

As noted above, project disturbance envelope includes all areas of ground disturbance and vegetation removal. It includes areas of temporary disturbance, such as a corridor in which underground utilities are installed, as well as areas that are permanently covered by impervious surfaces. The disturbance envelope also includes the area impacted through creation and maintenance of defensible space (CAL FIRE 2020). Depending on the defensible space requirements for the project and the size and configuration of the parcel, the disturbance envelopes for some projects, particularly those occurring on smaller parcels, may encompass the entire parcel.

The maximum disturbance envelopes apply to remodels and reconstruction, including additions and remodels that disturb additional ground, as well as new construction. The entire area featuring non-natural elements, including buildings and other facilities (e.g., septic systems) and infrastructure, hardscapes (e.g., driveways and patios), and non-native plantings including cultivated agriculture as well as ornamental plants or other species not native to the Baywood fine sand.

2.2.4.1.1 Single-Family Residential Development

On the 5,367 parcels totaling 2,362 acres in the Plan Area that are designated Residential Single-Family, Residential Rural, or Residential Suburban in the Estero Area Plan (Table 2-5, Figure 2-2), development can be permitted through the LOHCP. For parcels outside of the USL, development must be contained within maximum disturbance envelopes designed to protect habitat while allowing reasonable use of the land, as outlined in Table 2-5. These eligibility criteria also apply to 10 unprotected privately-owned parcels within the USL that are designated for Recreation and Open Space.

The maximum disturbance envelopes identified in Table 2-5 were determined based on the parcel size and location with respect to the Urban Services Line; these two factors reflect the general conservation value of the habitat within the parcels. Parcels cannot be subdivided unless they have received County approval prior to adoption and permitting of the LOHCP. Only a single parcel (Tract 1646) has received such approval (Section 2.1.2.2). Importantly, a single assessor's parcel may feature more than one legal lot, and in some cases, assessor's parcels do not constitute legal lots for purposes of development. On balance, the number of legal lots approximately equals the number of assessor's parcels.

2.2.4.1.2 Commercial and Multi-Family Residential Development

The LOHCP will also permit development on parcels designated for Commercial Retail, Commercial Service, Office Professional, and Residential Multifamily development. These 621 parcels total just 258 acres (7%) of the LOHCP Area; they are located within the center of the existing developed community (Figures 2-2 and 2-4). Located entirely within the USL, these parcels will not be subject to maximum disturbance envelopes. Instead, by focusing future development inside the existing developed area, the

LOHCP will minimize the negative effects of the permitted projects on the more intact and viable habitat concentrated on the perimeter of the Plan Area, outside of the USL.

2.2.5 Capital Projects

Infrastructure development projects conducted by public entities, private utility companies, and conservation organizations will be covered by the LOHCP. The following are specific capital projects that are slated to be implemented and will be covered. Figure 2-5 illustrates locations of projects for which there are available spatial data; the precise locations of several projects are unknown. As outlined above, other projects that meet the Plan eligibility criteria (Section 2.2.1) can also be covered by the LOHCP permit, following approval of an application to the County (Section 6.3).

2.2.5.1 County of San Luis Obispo Library Department

During the 25-year term of the requested incidental take permit, the San Luis Obispo County Library plans to expand or relocate the main library building (or demolish the existing library and build a larger library) and add paved parking on the 0.3-acre undeveloped south and west sides of the existing building (Table 2-8). Groundskeeping and other maintenance activities will continue on other portions of this parcel (Section 2.2.6.1).

2.2.5.2 County of San Luis Obispo Division of Parks

The Division of Parks operates and manages parks, open space, trails, and recreation facilities and conducts recreation programs. Parks activities anticipated to occur in the LOHCP Area during the permit term were identified based on the Parks and Recreation Element of the County General Plan (County of San Luis Obispo 2006) and the San Luis Obispo County Coastal Access Guide (County of San Luis Obispo 2007). Table 2-8 lists the anticipated capital projects, which are briefly described below.

Facility Creation or Expansion: The Division of Parks anticipates conducting the following projects to create or expand facilities during the permit term (Table 2-8):

- Los Osos Community Park Expansion: The next phase of the County-approved master plan to expand Los Osos Community Park includes addition of tennis courts, a sand volleyball court, and restrooms in an approximately three-acre undeveloped area north of the existing park facilities.
- New Park: The County anticipates building in Los Osos a new, approximately 10-acre park that would feature facilities including play equipment, courts, fields, buildings, paved parking, and other facilities. Though the precise location is unknown, it will likely occur within the USL, and may be located adjacent to existing parks to provide joint-use opportunities.
- New Aquatic Center: The County anticipates building a new aquatic park, which would feature swimming pools and associated facilities. Though the precise location is unknown, it will likely occur within the USL and is estimated to be three acres in size.
- New Boat Ramp: The County anticipates installing a boat ramp in the back bay to provide access the estuary. The facility is estimated to impact 1.5 acres, with the precise location

uncertain. Any impacts to wetland species associated with this project would not be covered by the LOHCP permit (Section 1.4).

Trails and Paths: County Parks plans to build 10 multi-use trails ranging in length between 0.1-1.7 miles and totaling 7.8 miles. Located within the road rights-of-way in Los Osos (Figure 2-5), the trails are within the USL, with the exception of the Coastal Trail and the Los Osos Perimeter Trail. Trail areas were estimated based a 15-foot anticipated width and were rounded to the nearest quarter acre (Table 2-8).

Elfin Forest Natural Preserve Projects: County Parks has an approved plan to expand the existing boardwalk between the loop and 13th Street. The County also anticipates erecting 5,000 lineal feet of symbolic fencing. These projects are designed to increase accessibility and reduce impacts to habitat by focusing visitor travel on well-defined paths.

Coastal Access: County Parks anticipates creating 14 coastal access points in Los Osos, as outlined in the Coastal Access Guide for San Luis Obispo County (County of San Luis Obispo 2007). These access points generally consist of approximately five-foot-wide trails featuring native soils. Their installation may entail minor vegetation clearing and occasionally, installation of fences and signage.

Of these projects planned by County Parks, only half are anticipated to be conducted during the 25-year permit term. Thus, while all constitute covered activities, the County Parks' projects totaling 65.6 acres were estimated to cause just 32.8 acres of disturbance in the take/impacts assessment (Section 4.1.1.2). Additional impacts from County Parks projects can be covered under the LOHCP provided that projects meet the eligibility criteria for the LOHCP, the impacts do not exceed the maximum permitted amount of 532 acres[13], and that the project impacts are mitigated as required in the conservation program (Section 5).

2.2.5.3 County of San Luis Obispo Department of Public Works and Transportation

Within the LOHCP Area, County Public Works is responsible for construction and maintenance of infrastructure including roads and drainage systems designed to limit soil run off onto roads, reduce pollutants that reach the estuary, and promote water infiltration. Drainage systems include ditches, detention basins, bioswales, and underground infiltrators.

Impacts of the Los Osos Wastewater System, including the treatment plant and pipelines that were constructed by Public Works, were addressed through a biological opinion (USFWS 2011a) issued under Section 7 of the federal Endangered Species Act. Impacts to state-listed species were avoided, such that a State 2081(b) permit was not required. The following new capital projects will be covered by the LOHCP permit (Table 2-8).

New Roads and Road Expansion: Public Works anticipates extending two roads located within the USL to adjacent arterials. A 1,015-foot extension of Ramona Avenue will connect South Bay Blvd and Fifteenth Street and cause approximately two acres of disturbance within the 85-foot right-of-

[13] The LOHCP maximum removal of 532 acres does not include impacts due to implementation of the conservation program or the Community Wildfire Protection Plan, which will result in additional temporary impacts to habitat.

way. A 686-foot extension of Doris Avenue between Rosina and South Court will cause an estimated 0.7 acres of disturbance within the 45-foot-wide right-of-way (Table 2-8).

During the term of the permit, County Public Works will also expand existing roads to create new lanes, including turn lanes and bike lanes, install signs, and realign the routes. These activities are anticipated to disturb an estimated 33 acres within the designated road right-of-way: 25 acres to build new roads and widen existing roads, and eight acres to install bicycle lanes.

Drainage Infrastructure Installation and Improvements: During the permit term, Public Works plans to create detention basins in seven sites located within the USL (Figure 2-5). The anticipated footprints of four sites are just under 10,000 square feet each, while one is 1.2 acres and another is 7.2 acres; bringing the total to 11.4 acres (Table 2-8). Installing these features entails removing existing vegetation, grading soil to achieve the desired topography, and excavating soil, in places, to install underground devices (e.g., infiltrators). In addition, Public Works will conduct drainage improvements within the County right-of-way and along road shoulders; these improvements are anticipated to impact seven acres.

2.2.5.4 Los Osos Water Purveyors

Water in Los Osos is largely provided by the Los Osos Community Services District (LOCSD), Golden State Water Company (GSW), and S & T Mutual Water Company (S&T); individual, private wells supply properties in rural areas outside of the service areas of the three purveyors (Figure 2-6). The following sections describe capital improvements that will be conducted by the water purveyors that will be covered by the LOHCP permit; facilities operations and maintenance activities of these entities are described in Section 2.2.6. The future infrastructure projects include projects recommended in the basin management plan (County et. al 2015), such as new and expanded water wells, groundwater blending projects, a community nitrate removal facility, pipeline construction, and water main upgrades. These and similar projects identified in the final plan will be covered by the LOHCP permit.

2.2.5.4.1 Los Osos Community Services District

The LOCSD operates water facilities within their approximately 826-acre service area located primarily within the USL (Figure 2-6). The following are capital projects anticipated to be completed during the LOHCP permit term and that were identified for coverage, based on review of the Los Osos Community Services District 2010 Water Master Plan Capital Improvements Update (Wallace Group 2011) and the Basin Management Plan (County et al. 2015), as well as discussions with the LOCSD staff.

Pipeline Projects: The LOCSD plans to install new pipelines and upgrade existing water pipes (two to 16-inch diameter). These pipelines projects are anticipated to affect an approximately 2.6-acre area within the County right-of-way.

Well Decommissioning and Construction: The LOCSD anticipates the following well projects:

- Disconnecting the decommissioned Ferrell Well from their water distribution system; this will likely include upgrading the existing pipeline in the one-acre site.
- Installing a new well, including appurtenances and possibly nitrate removal equipment, within the 0.5-acre 8th Street and El Moro Yard.

- Constructing a new water tank within the 0.11-acre LOCSD parcel at Highland Drive and Alexander Avenue.
- Installing a new expansion well (approximately 0.42-acres) at the north end of Sage Avenue as part of the Basin Management Plan (County et al. 2015).

Nitrate Removal and Blending Projects: The LOCSD anticipates installing a skid-mounted unit to remove high nitrates in the upper aquifer wells by blending with water from the lower aquifer; this facility will likely be located within a 0.01-acre area within the County right-of-way. As part of the Basin Management Plan, the LOCSD will implement a joint project with Golden State Water Company (GSW) to install a community nitrate removal facility within an estimated 0.023-acre area on a GSW-owned parcel (1,000 square feet).

2.2.5.4.2 Golden State Water Company

The Golden State Water Company (GSW) operates water facilities to supply water within its 1,569-acres service area in the LOHCP Area (Figure 2-6). Capital projects anticipated to occur during the permit term were provided by GSW staff and identified through review of the Basin Management Plan (County et al. 2015).

Pipeline and Blending Projects: To reactivate existing upper aquifer wells, GSW anticipates constructing a pipeline in the County right-of-way to connect their lower aquifer Rosina Well to the upper aquifer Skyline Well, which will occur in an approximate 0.261-acre area. Additionally, to accommodate additional water flow from three expansion wells, the segment of the Los Osos Valley Road water main within an approximately 0.14-acre area near Sea Oaks Drive and Tierra Drive will be upgraded to a 12-inch diameter pipe.

Well Construction: GSW anticipates constructing a new upper aquifer well and a new lower aquifer well, which along with the pipeline to connect them, are estimated to impact an approximately 0.254-acre area; the location of these wells is unknown. Additionally, GSW plans to install a new expansion well south of Los Osos Valley Road in an estimated 0.22-acre area located in the vicinity of the Sunny Oaks Mobile Home Park.

2.2.5.4.3 S & T Mutual Water Company

The S& T Mutual Water Company (S&T) is a corporation that provides water to an approximately 90-acre service area in the Sunset Terrace area around Sea Pines Golf Course in the western portion of the LOHCP Area (Figure 2-6). This private utility company recently installed new water meters for its 199 connections. As described in the Basin Management Plan (County et al. 2015), S&T owns three upper aquifer wells on a parcel that may be developed in the future; if so, S&T will need to construct replacement wells that will occur in an approximately 0.069-acre area (3,000 square feet). Alternatively, S&T could purchase water from either the LOCSD or GSW.

2.2.6 Facilities Operations and Maintenance

The LOHCP will also cover activities conducted by agencies and organizations to operate and maintain existing facilities. This includes the repair or replacement of existing infrastructure such as roads, drainage systems, and water systems, as well as the maintenance of parks and open space.

2.2.6.1 County of San Luis Obispo Library Department

Ongoing operations and maintenance of the Los Osos Library facilities and grounds (e.g., landscaping) within the library parcel and on the perimeter of the adjacent 12-acre parcel also owned by the County may cause impacts that would be covered under the requested permit.

2.2.6.2 County of San Luis Obispo Department of Public Works and Transportation

Road Maintenance: County Public Works maintains 54 miles of roads which are located within the County right-of-way. This 489-acre area is located between assessor's parcels and includes paved and unpaved roads as well as vegetation (Figure 2-5). Existing roads will be maintained by paving and mowing vegetation to maintain visibility and reduce fire risk, which will impact approximately five acres along the road shoulder (Table 2-8).

Drainage Infrastructure Maintenance: County Public Works maintains ten drainage basins inside the USL that total approximately 4.9 acres (Figure 2-5). During the permit term, County Public Works will maintain these as well as the newly installed drainage infrastructure (Section 2.2.2) by removing established vegetation, grading to remove deposited sediment, and excavation, as needed, to repair underground devices.

2.2.6.3 Los Osos Community Services District (LOCSD)

The LOCSD operates and maintains 24 properties, on which it anticipates conducting the following facilities maintenance activities that will be covered under the LOHCP.

Maintain Drainage Basins: The LOCSD maintains five drainage basins that total approximately four acres (Figure 2-5). During the permit term, the LOCSD will maintain these areas approximately annually, by removing established vegetation, grading deposited sediment, and conducting additional excavation to repair underground devices, as needed.

Vegetation Management: The LOCSD conducts fuel reduction and vegetation removal activities annually or as needed on eight LOCSD parcels totaling approximately 4.9 acres (Figure 2-5). This is in addition to the vegetation management on LOCSD parcels that will be conducted as part of the Community Wildfire Protection Plan (Section 2.2.7).

Facility Maintenance: The LOCSD operates seven water facility sites totaling approximately two acres, which feature tanks, wells, pump stations, water mains, fire hydrants, water meters, sample stations, and associated infrastructure. Operations and maintenance of these facilities includes: equipment removal and replacement, material storage, grounds keeping, weed abatement, rodent and pest control, painting, inspections, and other related activities.

2.2.6.4 Golden State Water Company

Golden State Water Company (GSW) maintains the water facilities including blending facilities, pump stations, wells, pipeline, and fire hydrants within their service area (Figure 2-6). The following operation and maintenance activities by GSW will be covered by the LOHCP (Table 2-8).

Water Facility Operations and Maintenance: On its ten sites in the LOHCP Area that total approximately five acres, GSW will repair water tanks, booster pumps, filtration units, and buildings, and conduct necessary maintenance of the grounds, including weeding. These activities are anticipated to impact 2.8 acres through the potential mobilization of heavy equipment including cranes, trucks, backhoes, and dump trucks; welding, painting, sandblasting, excavating, grading, and other construction and maintenance activities may also cause impacts.

Water Pipeline and Main Repair, Replacement, and Flush-Outs: As needed, water mains and other pipelines totaling approximately 25 miles will be excavated for repair or replacement and flushed until water within the pipeline runs clear. These pipelines are located primarily in the County right-of-way.

Meter Box Maintenance and Replacement: Approximately twice per year, GSW will clean out its 2,673 water meter boxes. They also replace meter boxes or water meters, as needed. These maintenance activities can affect immediately adjacent habitat.

Fire Hydrant Maintenance: GSW will maintain its 248 fire hydrants and wharf heads, which are generally located in the County right-of-way, by flushing them with water until they run clear; this activity can impact adjacent areas.

2.2.6.5 S&T Mutual Water Company

The S&T Mutual Water Company will likely conduct facilities maintenance activities similar to those conducted by GSW, to maintain their estimated two miles of pipeline and 199 meter boxes. Such activities, which are estimated to affect 0.85 acres, will be covered under the LOHCP permit (Table 2-8).

2.2.7 Community Wildfire Protection Plan

The incidental take permit issued based on the LOHCP will cover take associated with vegetation management and related fire hazard abatement work implemented as part of the Los Osos Community Wildfire Protection Plan (CWPP). The CWPP was developed by the San Luis Obispo County Community Fire Safe Council to identify areas that will receive a range of fuel reduction and fire hazard abatement treatments within and adjacent to the community (SLOCCFSC 2009). Implementation of the CWPP is anticipated to be conducted by CAL FIRE and cooperating entities (e.g., Fire Safe Council, contractors). Prior to implementing the CWPP, CAL FIRE will receive permission from the landowners and a Certificate of Inclusion conferring take coverage under the LOHCP ITP for the CWPP activities (Section 6.1.1.3, Appendix H). Anticipated treatments include removal of downed, dead, or diseased vegetation, the creation of shaded fuel breaks, and mowing of non-native grassland.

These activities are anticipated to occur in a total of 89.4 acres located at the wildland–urban interface (WUI)—the zone where human development meets wildland with vegetative fuels that can present risks to life, property, infrastructure, and habitat (Figure 2-7). Fuel management in these areas will help protect human lives and property as well as adjacent intact habitat from the impacts of wildfire. To cover this activity, the LOHCP Permit Area was delineated to include the area within the designated fuel break even where it occurs on State Park lands (12.0 acres), which were otherwise excluded from the LOHCP Permit Area (Sections 1.3 and 2.1.3.3).

Since completion of the CWPP, the California Department of Fire and Forestry (CAL FIRE) Station 15, under contract with the LOCSD, has been working with the USFWS, CDFW, and local landowners to implement the CWPP in three areas totaling 20.5 acres where no State or federally listed animal species

occur (Figure 2-7). The permit issued pursuant to the LOHCP will provide take authorization under ESA, enabling the activities to be initiated in the remaining 68.9 acres, as well as take of covered species throughout the 89.4-acre treatment area.

CAL FIRE estimates that approximately one-third of the total 89.4-acre treatment area would be retreated annually depending on site-specific conditions, the need for hazard abatement activities, and funding. A maximum distance of 50 feet from structures would be mowed in non-native grassland areas, with the shaded fuel breaks established to complete a total distance of 100 feet from structures. This 100-foot distance is considered the minimum strategically effective distance necessary for hazard abatement. Mowing would likely be done every two to three years, with maintenance of established shaded fuel breaks occurring every three to four years after they are created.

The USFWS and CDFW have worked closely with CAL FIRE to develop avoidance and minimization measures for the CWPP that will enable the fuel modification activities to be covered under this HCP (Section 5.2.4; Table 5-4). The CWPP will avoid take of Morro Bay kangaroo rat and Indian Knob mountainbalm, and is anticipated to have negligible effects on Morro shoulderband snail and Morro manzanita (Section 4.1.1.2) as a result of implementation of avoidance and minimization measures (Section 5.2.4). Accordingly, the CWPP acreages are not included in the total calculation of take/impacts used to identify the compensatory mitigation, as the take/impacts of the CWPP will not be compensated for in the manner used to mitigate the take/impacts of the other covered activities in this plan.

2.2.8 Conservation Program Implementation

The LOHCP conservation program includes measures designed to avoid, minimize, and mitigate the take/impacts of the covered activities on the covered species and impacts to their habitat (Chapter 5). These activities, which are essential to achieving the biological goals and objectives of the LOHCP (Section 5.1) include:

- Avoidance and minimization measures, including surveys (Section 5.2, Section F);
- Habitat restoration and management within the LOHCP Preserve System—the network of protected lands that will be managed and monitored in perpetuity to mitigate the impacts of the covered activities on the covered species (Section 5.3); and
- Monitoring to track the status and trends of the covered species populations (Section 5.4).

The County will implement the LOHCP conservation program through contracts within an Implementing Entity (Section 6.2).

Avoidance and minimization measures for the covered activities will be conducted at project sites throughout the LOHCP Area. They will be implemented by USFWS-approved biologists during the permit term, as well as part of management of the LOHCP Preserve System in perpetuity.

Other aspects of the conservation program will take place primarily within the LOHCP Preserve System, which will include eligible existing protected lands (e.g., the Morro Dunes Ecological Reserve) that will be managed and restored as part of the LOHCP, as well as new preserves established through plan implementation (Section 5.3.1). The detailed management and restoration activities will be identified in the LOHCP Preserve System AMMP, which will be developed and must be approved by the USFWS during the first three years of plan implementation (Section 5.3.3.2).

Though the elements of the conservation program will benefit the covered species by contributing to their recovery, some measures or treatments may cause short-term effects that may result in take of the species. For example, exotic plant removal projects will promote long-term viability of Morro shoulderband snail by restoring the natural community structure and species composition of the habitat; however, they can also have short-term negative impacts on individuals that may occupy infested areas. Similarly, construction of fuel breaks to reduce the risk of wildfire spreading into the, from adjacent developed areas will cause short-term negative effects to covered species in the treatment areas, which will be outweighed by the protection of habitat from fire and fire suppression activities. The consequences of the potential take/impacts caused by the covered activities caused by the conservation program are limited and will be outweighed by their long-term benefits (Chapter 4).

All measures to implement the conservation program that are consistent with the goals and objectives of the plan will be covered. The following outlines anticipated activities.

2.2.8.1 Species Protection Measures

A series of measures will be used to minimize the amount or severity of take of or impacts to the covered species during the course of implementing covered activities (Section 5.2). These include pre-project surveys to evaluate whether a species is present, installation of fences and other barriers to limit project disturbance areas, and capture and relocation of individuals to intact, suitable habitat that is permanently protected and located away from covered activity footprints and adjacent areas that can be indirectly impacted. These measures, which are designed to reduce impacts of the covered activities, may have some limited negative effects themselves; for example, Morro shoulderband snails could be injured or killed inadvertently during efforts to install fences or capture and relocate them out of harm's way (Section 4.2.1.2). Take or impacts caused by these measures will be covered by the Plan incidental take permit.

Prior to engaging in any activity that could result in take in any form, which includes capture of the covered species, qualified personnel must obtain written approval from the USFWS and, if required, CDFW.

2.2.8.2 Species Population Enhancement Measures

Some elements of the conservation program designed to increase or otherwise enhance the viability of the covered species populations in order to promote their recovery may cause short-term negative impacts or take. Activities that will be covered include:

- Collection of seeds or cuttings of the covered plants, for salvage, storage in a seed bank, genetic analysis, direct seeding, and/or propagation for revegetation of the LOHCP Preserves as part of restoration and enhancement projects; and
- Capture and relocation of Morro shoulderband snail individuals in order to establish or enhance populations following successful restoration to address the factors that eliminated or suppressed their populations.

Prior to conducting these activities, qualified personnel must obtain written approval from the USFWS and, if required, CDFW. Notably, an incidental take permit issued under Section 2081(a) of CESA would be obtained prior to any propagation or other activities involving collecting Indian Knob mountainbalm, which is a state-listed plant.

2.2.8.3 Habitat Management and Restoration

The LOHCP Preserve System will be actively managed to maintain and enhance the natural structure and species composition of the communities, and the size and persistence of the covered species populations. Habitat management and restoration will be designed to address anthropogenic factors that are negatively impacting the populations and communities, which include exotic species, fire exclusion, erosion, and incompatible recreation. In some cases, management will utilize treatments that have been proven effective, while in other cases, management will be experimental; that is, the prescriptions will be developed based upon ecological models for the biological systems that are informed by the best available science, and will be conducted in a manner that is designed to limit deleterious effects and allow examination of effectiveness (Section 5.5.2).

Specific habitat restoration and management treatments will be identified in the LOHCP Preserve System AMMP, which will be developed during the first three years of plan implementation (Section 5.3.3.2). While the AMMP is being developed, the *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (McGraw 2020, Appendix M) will guide initial restoration activities within the Morro Dunes Ecological Reserve, which the County proposes to enroll into the LOHCP Preserve System as part of initial work to implement the LOHCP conservation program (Section 6.2.5). The following are techniques that are included in the IAMMP and/or are anticipated to be included in the LOHCP Preserve System AMMP, and that will be covered by the LOHCP permit:

- Management of vegetation using manual, mechanical, and chemical techniques, as well as fire, to promote natural community structure and native species composition or habitat conditions for the covered species;
- Eradication and control or exotic plants using the most appropriate techniques, which may include manual, mechanical, chemical, and biological means;
- Eradication and control of non-native animals including techniques to address non-native snails and other invertebrates, as well as, amphibians and reptiles, birds, and mammals, if any such activities negatively affect the covered species;
- Erosion control in unnaturally denuded areas that would otherwise result in excessive or accelerated soil movement caused by water, wind, and gravity;
- Demolition and removal of structures and other infrastructure;
- Removal of debris and hazardous material, including soil remediation, closure of underground storage tanks, and removal of dumped materials; and
- Active revegetation techniques including the collection of seed and cuttings, off-site plant propagation, seeding, and outplanting of container stock

Additional habitat restoration and management treatments causing similar take or impacts and that are determined in the LOHCP Preserve System AMMP to also advance the biological goals and objectives will also be covered by the permit.

2.2.8.4 General Land Stewardship Management

The LOHCP will also cover general activities required to maintain the LOHCP Preserves. The following activities are covered by this plan.

- **Facilities:** Installation and maintenance of facilities to:
  - Protect the land, including fences and gates;
  - Patrol properties, including roads and trails; and
  - Enable restoration, including water systems (wells, tanks, and pipelines) for temporary irrigation.
- **Recreation:** Provide limited opportunities for passive recreation where doing so is compatible with the LOHCP goals and objectives, by:
  - Installing and maintaining trails and providing opportunities for trail use, including boardwalks that facilitate accessibility while limiting habitat degradation in the sand soil, as well as deterring use of non-designated trail routes;
  - Developing and maintaining limited interpretation facilities, including signage, kiosks, and wildlife observation platforms; and
  - Creating and maintaining parking lots, staging areas, picnic areas, and restrooms.

2.2.8.5 Monitoring

Effective long-term management of the LOHCP Preserve System will require implementation of monitoring studies (Section 5.4), which are generally designed to:

- fill gaps in the scientific understanding of the biology of the covered species, including their distribution and abundance within the Preserve System, and the factors that influence their occurrence and demographic performance;
- track the status and trends in the distribution, abundance, and performance of the covered species populations; and
- evaluate the effects of restoration and management, including responses of the covered species populations to specific restoration projects.

Monitoring activities that can cause take include trapping, handling, and marking individuals, and collecting individuals for *ex situ* (e.g., laboratory) studies or analyses. The adverse effects of such activities that are determined to be essential to long-term effectiveness of the conservation program at attaining the goals and objectives will be covered as part of this plan. Appendix E outlines the draft monitoring protocols, which will be revised, as needed, in the LOHCP Preserve System AMMP, which will be reviewed and approved by the USFWS during the first three years of plan implementation (Section 6.2.3.2).

2.3 Activities Not Covered by Permit

In developing the LOHCP, the County attempted to identify activities that would require take coverage during the 25-year permit term. Some activities identified did not meet the other criteria needed to

qualify for coverage (Section 2.2.1). Specifically, these activities were:

- Not compatible with the LOHCP biological goals and objectives; and/or
- Not sufficiently well-described to enable evaluation of their impacts.

The following activities will not be covered under the LOHCP.

- **Parcel Subdivisions**: Development on parcels that are newly created (i.e., through subdivision) after adoption of the LOHCP will not be covered by the LOHCP permit. Instead, the ITP will only cover development on existing legal lots at the time the LOHCP is adopted by the County and that the ITP permit is issued by the USFWS, or on lots where the County previously granted an approved subdivision that remains valid (Section 2.1.2.2).
- **Agricultural Land Conversion:** Conversion of habitat to agricultural uses will not be covered by the LOHCP permit.
- **Construction Activities that Do Not Cause Soil Disturbance:** Not all land use activities permitted by the County will cause soil disturbance, which is defined as any activity that removes vegetation or compacts or disturbs soil, and thus potential impacts to the covered species. For example, interior remodels or vertical construction in which disturbance is confined to the existing disturbance footprint on a parcel would not require coverage under the LOHCP. If such projects cannot avoid ground disturbance, then they will require a take permit and will be covered under this plan.
- **Projects Impacting Riparian or Wetland Communities, unless a separate permit is provided:** Most of the covered activities described in this section are not anticipated to cause take/impacts to species and habitats in wetland and riparian areas. If any project proposed for coverage occurs within or near, or otherwise is anticipated to adversely affect, wetlands and riparian areas or species, the project proponents must obtain separate permits to cover those impacts, in order to be eligible for coverage of their impacts to the LOHCP covered species through this Plan (Section 6.3.1).

The County will refer proponents of activities not covered by the LOHCP permit to the USFWS and CDFW for permitting and also notify the agencies of such referrals. The County will not issue permits to those projects that cause take or impacts unless proponents provide proof of compliance with CESA and ESA (Section 6.3).

Table 2-1: Parcel Status

	Inside Urban Services Line				Outside Urban Services Line				Total			
	Parcels		Acres		Parcels		Acres		Parcels[2]		Acres[3]	
Status[1]	N	%	Total	%	N	%	Total	%	N	%	Total	%
Developed	5,082	84.3%	1,149	36.4%	208	3.4%	376	11.9%	5,290	87.7%	1,525	48.3%
Undeveloped	656	10.9%	317	10.1%	45	0.7%	388	12.3%	701	11.6%	705	22.3%
Protected	6	0.1%	43	1.4%	32	0.5%	882	28.0%	41	0.7%	925	29.3%
Total	**5,744**	**95.2%**	**1,509**	**47.8%**	**285**	**4.7%**	**1,646**	**52.2%**	**6,032**	**100%**	**3,155**	**100%**

[1] Number and percentage of total parcels and area (acres) that are developed, undeveloped, or permanently protected inside and outside the Los Osos Urban Services Line from the 2009 Estero Area Plan, which is the current community plan. The USL was modified slightly to reflect actual development intensity. The parcel analysis was conducted in 2014; while some numbers have changed, these changes are limited due to the moratorium on development and are not anticipated to affect the plan's impact analysis or implementation.

[2] Number of mapped parcels in assessor's parcel database

[3] Acres based on GIS and County of San Luis Obispo Official Maps of 2016. Approximately 490 acres in Plan Area are located outside assessor's parcels in the County right-of-way.

Table 2-2: Land Use Designations in the Plan Area

	Urban Services Line[1]					
	Inside		Outside		Total	
Status	Acres[2]	%	Acres[2]	%	Acres[2]	%
Commercial and Multifamily Residential						
Commercial Retail	70	4.6%	0	0.0%	70	2.2%
Commercial Services	24	1.6%	0	0.0%	24	0.7%
Office and Professional	25	1.6%	0	0.0%	25	0.8%
Residential Multifamily	111	7.3%	0	0.0%	111	3.5%
Subtotal: Commercial/Multifamily	**229**	**15.1%**	**0**	**0.0%**	**229**	**7.3%**
Single-Family Residential						
Residential Rural	0	0.0%	107	6.5%	107	3.4%
Residential Suburban	62	4.1%	851	52.2%	913	29.0%
Residential Single Family	1,113	73.3%	184	11.3%	1,298	41.2%
Subtotal: Single-Family Residential	**1,175**	**77.4%**	**1,143**	**70.0%**	**2,318**	**73.6%**
Other						
Open Space	13	0.9%	109	6.7%	122	3.9%
Recreation	38	2.5%	290	17.8%	328	10.4%
Public Facilities	40	2.6%	26	1.6%	66	2.1%
White Holed[3]	23	1.5%	64	3.9%	87	2.8%
Subtotal: Other	**114**	**7.5%**	**489**	**30.0%**	**603**	**19.1%**
Grand Total	**1,518**	**100.0%**	**1,632**	**100.0%**	**3,150**	**100.0%**

[1] Acres and percentage of land inside and outside of the Los Osos Urban Services Line within the land use categories within the Los Osos Community Plan. For planning purposes in the LOHCP, the USL was modified slightly to reflect the actual development intensity (Figure 2-2). Acres based on GIS and the County of San Luis Obispo Official Maps of 2016. Remaining acreage results from small gaps in land use category map and land area located in the County right-of-way.

[2] Not all acres are within the Permit Area (Figure 1-2).

[3] No land use category designation

Table 2-3: Land Use Designation of Existing Protected Lands in the Plan Area

Land Use Category	Acres of Protected Land[1]		
	Fee Title	Easements	Total[2]
Commercial and Multifamily Residential			
Commercial Retail	8.4		8.4
Commercial Services	0		0
Office Professional	3.2		3.2
Residential Multifamily	0.2		0.2
Subtotal: Commercial/Multifamily	**11.8**	**0**	**11.8**
Single-Family Residential			
Residential Single Family	173.7	2.5	176.2
Residential Suburban	213.6	21.0	234.7
Residential Rural	39.6	0.0	39.6
Subtotal: Single-Family Residential	**426.9**	**23.6**	**450.5**
Other			
Open Space	114.1	0.1	114.1
Recreation	279.4		279.4
Public Facilities	0.3		0.3
White Holed	84.4		84.4
Agriculture	1.6		1.6
Subtotal: Other	**479.7**	**0.1**	**479.8**
Grand Total	**918.4**	**23.6**	**942.0**

[1] Acres of existing parks (excluding highly built-up parks), reserves, conservation easements, or open space easements in the LOHCP Plan Area according the 1988 Estero Area Plan land use categories. Not all acres are within the Permit Area, which excludes all State Parks lands except 12 acres within the Community Wildfire Protection Plan Area (Figure 1-2).

[2] The total is less than overall protected lands (948.5 ac.; Table 2-4) due to offsets in the land use category map

Table 2-4: Existing Protected Lands [1]

Management Agency	Acres[2]	% of Total
County of San Luis Obispo		
Elfin Forest Natural Preserve (County Parks)	31.8	3.3%
Monarch Grove Natural Area (County Parks)	16.8	1.8%
Broderson Site (County Public Works)	81.5	8.6%
Midtown Site (County Public Works)	12.2	1.3%
Subtotal: County of San Luis Obispo	**142.3**	**15.0%**
California Department of Fish and Wildlife		
Morro Dunes Ecological Reserve	278.7	29.4%
Morro Bay Wildlife Area [3]	4.2	0.4%
Subtotal: Department of Fish and Wildlife	**283.0**	**29.8%**
California Department of Parks and Recreation[4]		
Elfin Forest Natural Preserve (State Parks portion)	34.8	3.7%
Los Osos Oaks State Natural Reserve	85.7	9.0%
Montaña de Oro State Park (a portion of)	236.2	24.9%
Morro Bay State Park (a portion of)	107.4	11.3%
Subtotal: State Parks	**447.0**	**47.1%**
U.S. Bureau of Land Management		
Unnamed (APN: 038-711-016)	4.8	0.5%
Morro Coast Audubon Society		
Sweet Springs Nature Preserve	29.4	3.1%
Other Unnamed Properties	1.2	0.1%
Subtotal: Morro Coast Audubon Society	**30.5**	**3.2%**
Conservation Easements on Private Land	23.7	2.5%
Total	**948.4**	**100.0%**

[1] This table lists existing protected lands in the LOHCP Area. Table 5-5 evaluates their suitability for inclusion in the LOHCP Preserve System managed as mitigation for the covered activities.

[2] Acres within the LOHCP Plan Area

[3] This area likely reflects mapping imprecision and does not occur in the LOHCP Area

[4] Though State Parks are located within the LOHCP Plan Area, they are excluded from the LOHCP Permit Area except for 12 acres within the Community Wildfire Protection Plan Area (Figure 1-2).

Table 2-5: Single-Family Residential Development Eligibility Criteria[1]

Planning Zone	Parcel Size	Number of Parcels[2]	Total Acres[2]	Maximum Disturbance Envelope (sf)
Inside the USL	<20,000 sf	4,799	747	None
	20,000 sf – 1 ac.	185	119	None
	>1 acre	111	299	None
Outside the USL	<=5 acres	230	327	30,000
	> 5 acres	42	870	30,000
All Single Family-Residential Parcels		**5,367**	**2,362**	

[1] Criteria for development on parcels in Single-Family Residential Development Categories based on parcel size and location with respect to the Urban Services Line.

[2] Includes 10 privately held, unprotected parcels totaling 16.5 ac. that were designated for 'Recreation' or 'Open Space' that will be eligible for single-family residential land use.

Table 2-6: Undeveloped Parcel Land Eligible for Private Development[1]

Parcel Locate and Size Category	Single-Family Residential Development					Commercial and Multifamily Development				Total Undeveloped Land	
	Max. Disturbance Envelope[3]	Undeveloped Land		Max. Developed [4]		Undeveloped Land		Max. Developed [4]			
		Parcels	Acres	Assumption	Acres	Parcels	Acres	Assumption	Acres	Parcels	Acres
Inside the USL											
<20,000 sf	None	469	77.8	All Developed	77.8	81	16.1	All Developed	16.1	550	93.9
20,000 sf - 1 ac.	None	30	18	20,000 sf/parcel	13.8	6	4.2	All Developed	4.2	36	22.2
>1 ac.	None	35	95.6	1 ac./parcel	35	18	82.8	All Developed	82.8	53	178.4
Subtotal: Inside the USL		**534**	**191.4**		**126.6**	**105**	**103.1**		**103.1**	**639**	**294.5**
Outside the USL											
<= 5 acres											
<30,000 sf[5]	entire parcel	8	2.8	total parcel	2.8	0	0		0	8	2.8
>30,000 sf but ≤ 5 acres	30,000	24	53.6	30,000 sf/parcel	16.5	0	0		0	24	53.6
Parcels Acquired for Protection[6]	0	4	13.0	Fee Title Acquisition	2.8					4	13.0
Subtotal: Parcels ≤ 5 acres		28.0	43.4		16.5	0	0		0	28.0	43.4
>5 acres	30,000	13	331.2	30,000 sf/parcel	9	0	0		0	13	331.2
Parcels Acquired for Protection[6]	0	2	63.5	Fee Title Acquisition	1.4	0	0		0	2	63.5
Subtotal: Outside the USL		**39**	**311.1**		**24.1**	**0**	**0**		**0**	**39**	**311.1**
Grand Total		**573**	**502.5**		**150.7**	**105**	**103.1**		**103**	**678**	**605.6**

[1] Parcels designated for private development. Single family includes the Residential Rural, Residential Suburban, and Residential Single Family land use categories, as well as 12 privately owned lots designated "Recreation" and "Open Space", which can be developed as the other designations listed here. Analysis conducted in 2014; while some numbers have changed, these changes are limited due to the moratorium on development and are not anticipated to affect the plan's impact analysis or implementation.

[2] Location of the parcel with respect to the Urban Services Line (USL)

[3] Maximum area within the parcel to be disturbed permanently or temporarily during development, in the eligibility criteria for private development under the LOHCP

[4] Maximum acres that will be developed at build out, based on the maximum disturbance envelop and amount of vacant land

[5] Of the 32 total parcels ≤ 5 acres outside the USL, 8 are smaller than 30,000 sf; these parcels are assumed here to be entirely developed.

[6] Six vacant parcels outside of the USL (and inside the PCA) totaling 76.5 acres are assumed to be protected through fee-title acquisition as part of the LOHCP Conservation Strategy (Section 5.7.2.3.2); four of these parcels are anticipated to be less than 5 acres and the other two are anticipated to be greater than five areas. These parcels and associated acreages were subtracted from the calculations of total developed land.

Table 2-7: Redevelopment of Private Land

Land Use Category	Parcels	Acres	Assumption	Acres to Be Impacted[1]
Commercial	518	162	15% of acres to be further impacted	24
Other	7	49	No additional impacts (schools and parks covered elsewhere)	0
Residential Inside the USL	4,558	964	10% of area to be further impacted	96
Residential Outside the USL	207	350	10% of area to be further impacted	35
Residential Subtotal	4,765	1,314	10% of the area to be further impacted	131
Grand Total	**5,290**	**1,525**		**156**

[1] Estimated acres to be impacted by redevelopment of developed, privately held parcels, based on County Planning Department estimates of redevelopment.

Table 2-8: Anticipated Public and Private Utility Covered Activities

Entity	Proposed Project	Estimated Acres
County Parks and Recreation Department	**Parks and Aquatic Center**	
	New Park in Los Osos	10
	Aquatic Center	3
	Los Osos Community Park Expansion	1.6
	Boat Ramp	1.5
	Coastal Access	0.45
	Subtotal: Parks and Facilities	**16.55**
	Creation of New Paths and Trails	
	Elfin Forest Boardwalk 13th St.to loop	0.25
	Elfin Forest Symbolic fencing (5000 ft.)	0.05
	Los Osos to San Luis Obispo Trail (Los Osos URL)	2
	Pismo Ave. to South Bay Blvd. Trail	1.5
	South Bay Blvd to LOVR Trail	3
	Mountain View Dr. Trail	1.5
	Nipomo Street to Buckskin Street Trail	0.75
	2nd/3rd St. to Los Osos Valley Road Trail	2.5
	Pismo Ave. 3rd Street to 18th Street Trail	1.75
	Sweet Springs Preserve Trail	1
	Sea Pines to LOVR through Midtown Site Trail	2
	Highland/Monarch Grove School/Sea Pines/Los Osos Valley Road Trail	2.75
	Highland Drive to Nipomo Ave. via Los Osos Community Park	3.25
	Los Osos Valley Road to Los Osos Community Park to Montaña De Oro	3.5
	Coastal Trail in Los Osos	8.25
	Los Osos Perimeter Trail	15
	Subtotal: Trails	**49.05**
	County Division of Parks: Total Planned Projects	**65.6**
	County Division of Parks: Total Anticipated Projects	**32.8[1]**
County Public Works Department	**Capital Projects**	
	Road Expansion	22
	New Roads	2.7
	Bike Lanes	8
	New Drainage Basins	11.4
	New Bioswales	6.6
	Drainage Improvements	7
	Subtotal: Capital Projects	**57.7**
	Facilities Operations and Maintenance	
	Road Maintenance	5
	Maintain Drainage Basins	4.9
	Subtotal: Facilities Operations and Maintenance	**9.9**
	County Public Works Department Total	**67.6**
County Library	Expansion or relocation of Los Osos Public Library	0.33

Table 2-8: Anticipated Public and Private Utility Covered Activities

Entity	Proposed Project	Estimated Acres
	Los Osos Public Library Grounds Maintenance	0.45
	County Library Department Total	**0.78**
Los Osos Community Services District	**Capital Projects**	
	Pipeline Projects	2.60
	Ferrell Well Loop Upgrade	1
	Upper Aquifer Well at 8th & El Moro Yard	0.50
	New Water Tank at Highland Drive and Alexander	0.11
	South Bay Upper Aquifer Well Nitrate Removal/Blending Project	0.01
	New Expansion Well	0.42
	New Community Nitrate Removal Facility[2]	0.02
	Subtotal: Capital Projects	**4.67**
	Facilities Operations and Maintenance	
	Vegetation Management	4.9
	Maintain Drainage Basins	4
	Facilities Maintenance	2
	Subtotal: Facilities Operations and Maintenance	**13.1**
	Los Osos Community Services District Total	**17.77**
Golden State Water Company	**Capital Projects**	
	Blending Project	0.26
	Well Construction	0.25
	Expansion Well	0.22
	Los Osos Valley Road Main Upgrade	0.14
	Subtotal: Capital Projects	**0.87**
	Facilities Operations and Maintenance	
	Major Plant Site Maintenance	2.8
	Meter Box Maintenance	0.55
	Flush Water Mains	0.07
	Water Main Repair and Replacement	0.05
	Fire Hydrant Maintenance	0.05
	Subtotal: Facilities Operations and Maintenance	**3.52**
	Golden State Water Company Total	**4.39**
S & T Mutual Water Company	Well Construction	0.07
	Water Main and Pipeline Maintenance	0.85
	S & T Mutual Water Company Total	**0.92**
	Anticipated Public and Utility Covered Activities Total	**122.1**

[1] This table does not include the acreage of temporary impacts that will result from the Community Wildfire Protection Plan or implementation of the LOHCP conservation program.

[2] Though County Parks projects could cause up to 65.6 acres of soil disturbance, the County anticipates that only half of the projects will be conducted during the term of the permit.

[3] Joint project of the Los Osos Community Services District and Golden State Water Company under the Basin Plan for the Los Osos Groundwater Basin (County et al. 2015)

Table 2-9: Summary of Anticipated Covered Activity Impacts in the Permit Area[1]

			Acres	
General Category	**Sub-Category**	**Type**	**Total**	**To Be Impacted**
Private Land Development and Improvements	New Development on Vacant Parcels	Single Family	573	150.7
		Multifamily-Commercial	105	103.1
		Subtotal: New Development	**678**	**253.8**
	Improvements to Existing Developed Parcels	Private Redevelopment	1,314	131.4
		Commercial Redevelopment	162	24.3
		Subtotal: Redevelopment	**1,476**	**155.7**
Public and Private Utility Projects	County Division of Parks			32.8
	County Public Works			67.6
	County Library Department			0.8
	Los Osos Community Services District			15.6
	Golden State Water Company			4.4
	S & T Mutual Water Company			0.9
		Subtotal: Public/Utility Projects		**122.1**
		Grand Total		**531.5**

[1] Does not include impacts due to implementation of the conservation program and the Community Wildfire Protection Plan, which will result in additional temporary impacts to habitat.

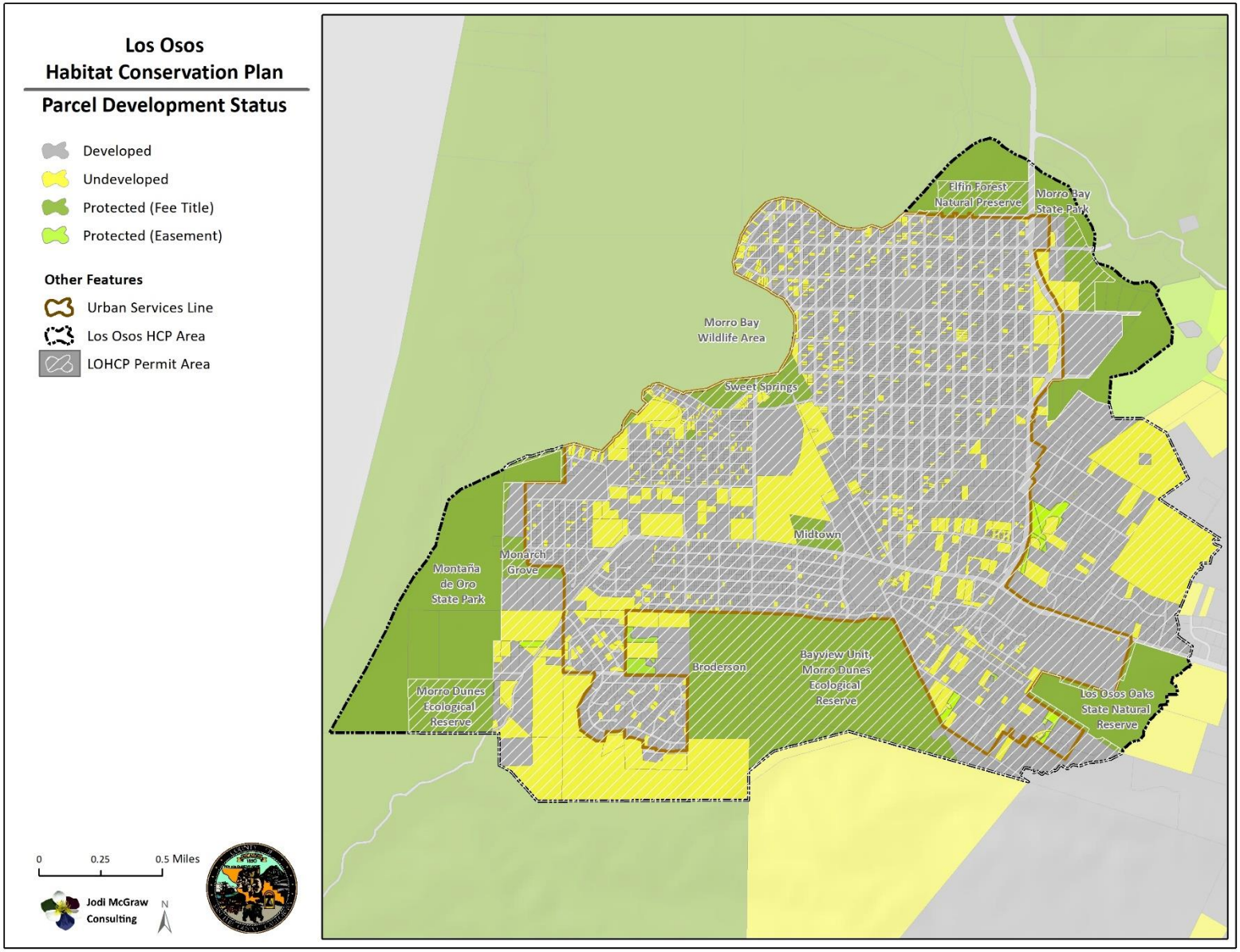


Figure 2-1: Parcel Status

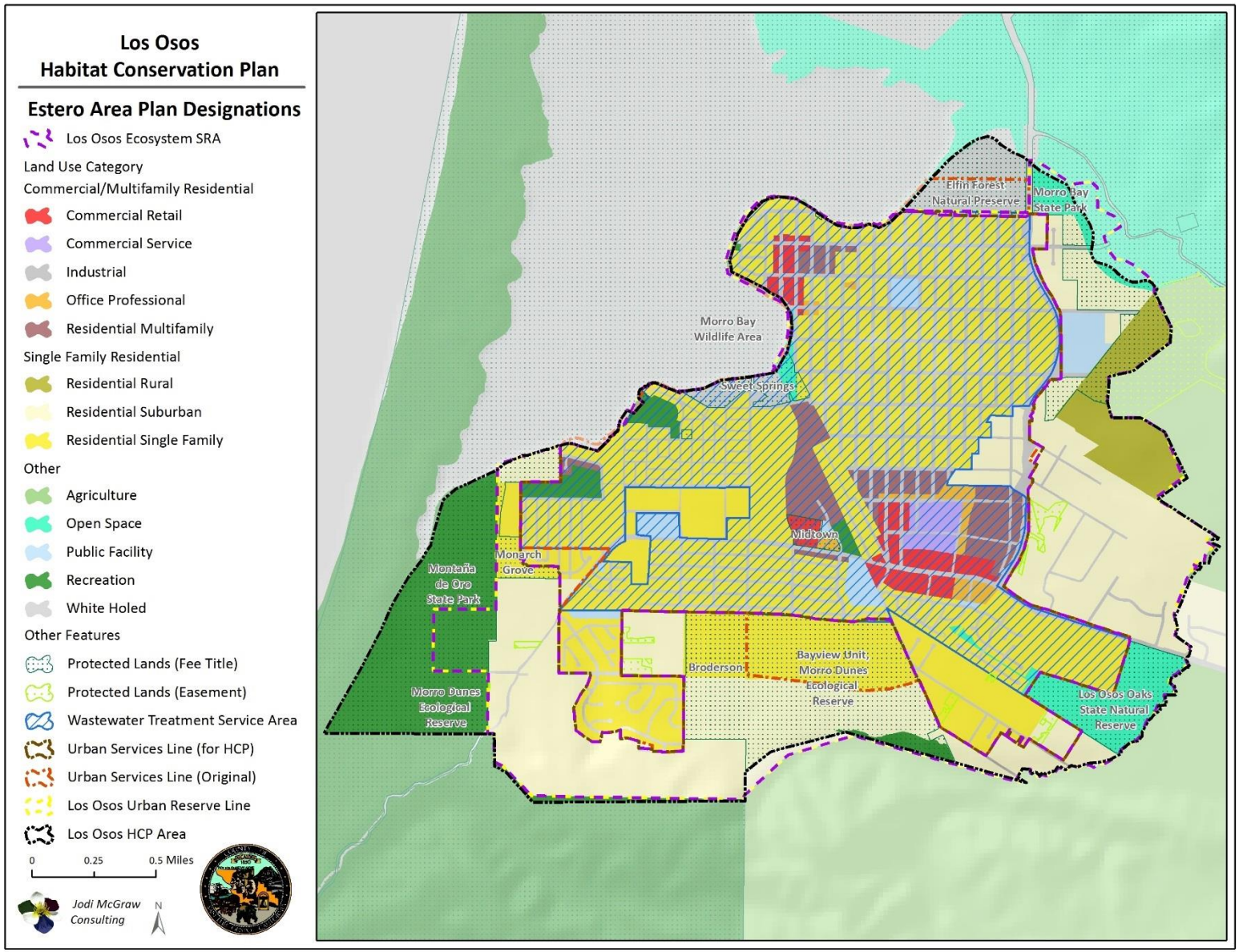


Figure 2-2: Land Use

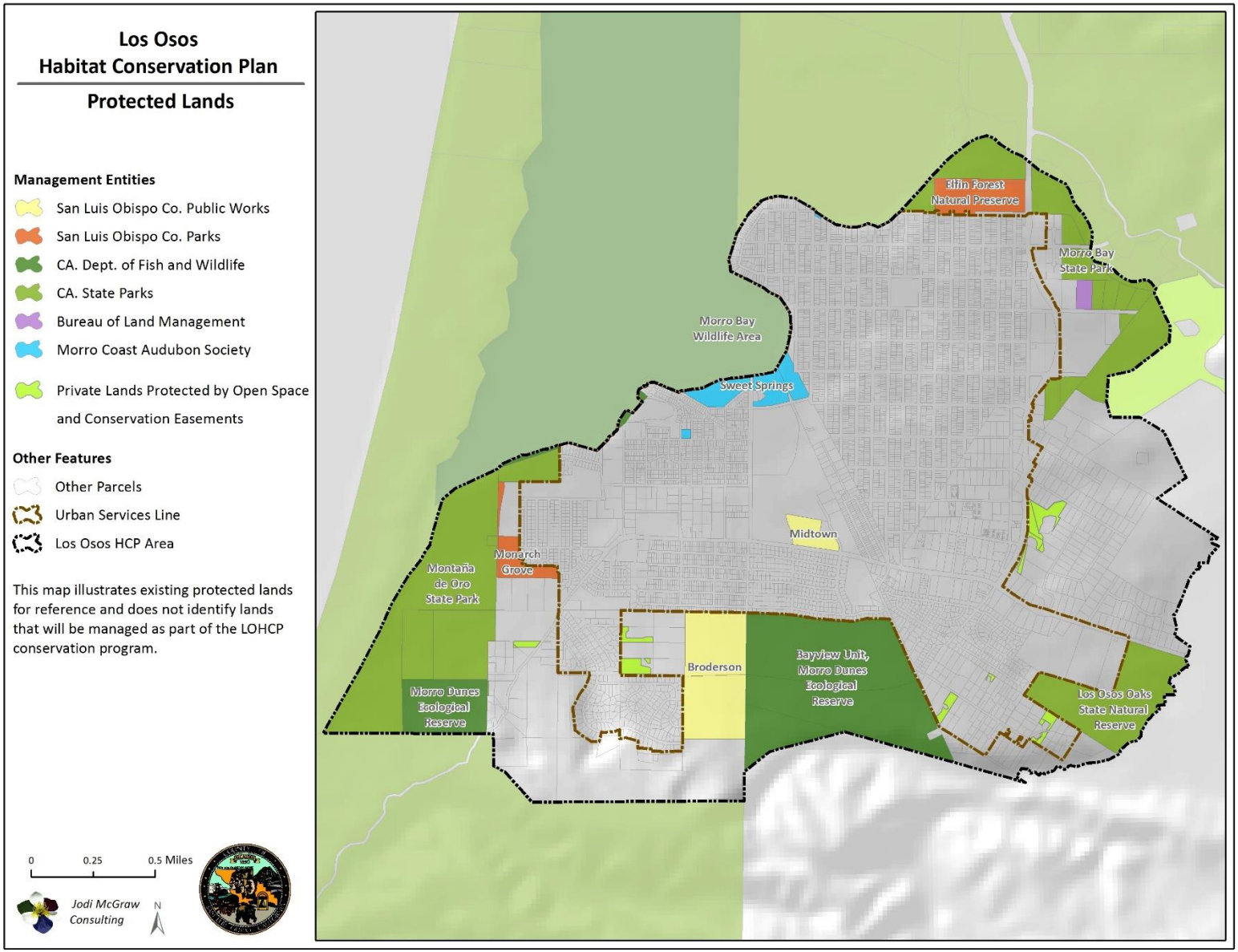


Figure 2-3: Existing Protected Lands in the Plan Area

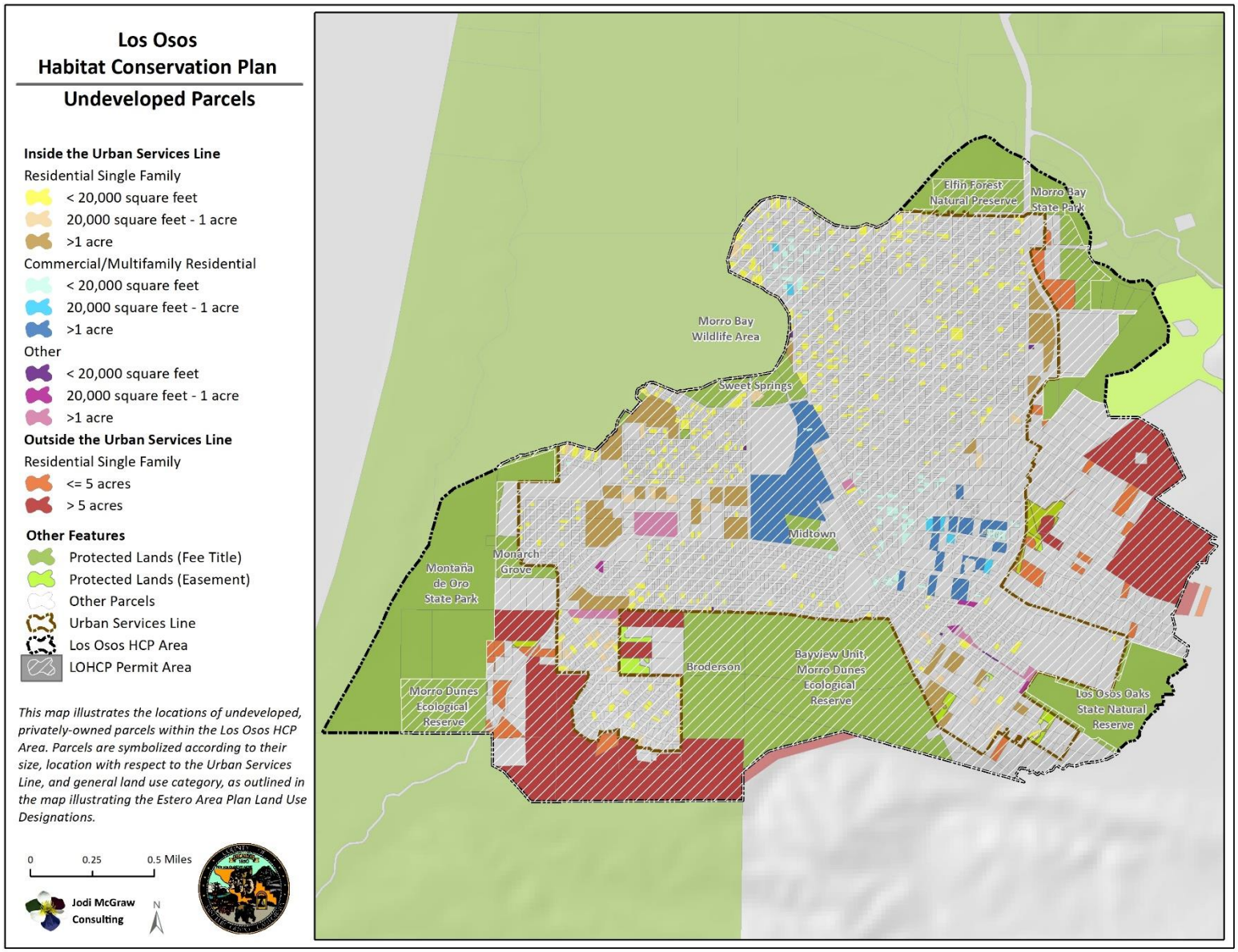


Figure 2-4: Undeveloped Parcels According to their Size and Location with Respect to the Urban Services Line

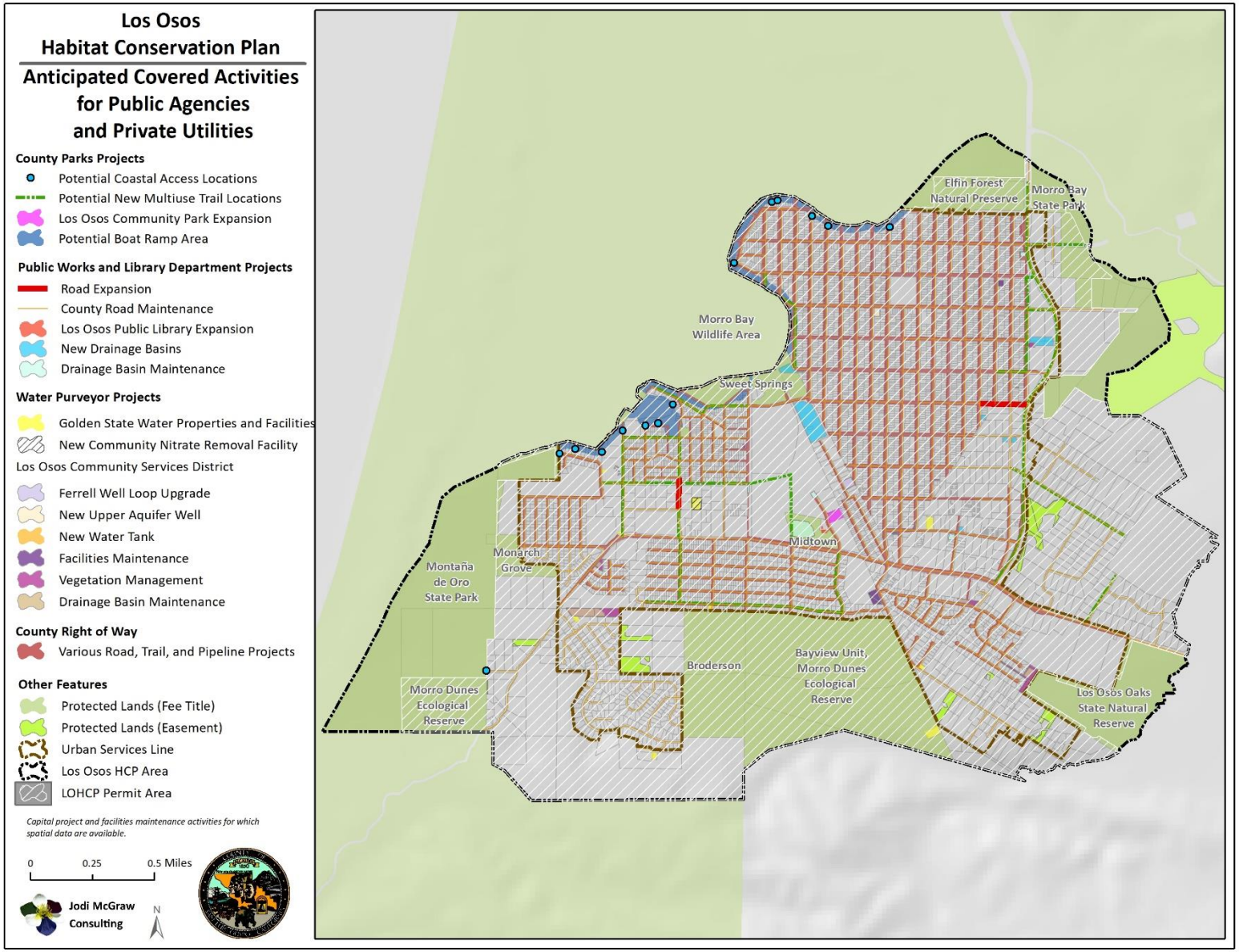


Figure 2-5: Public Agency and Private Utility Projects

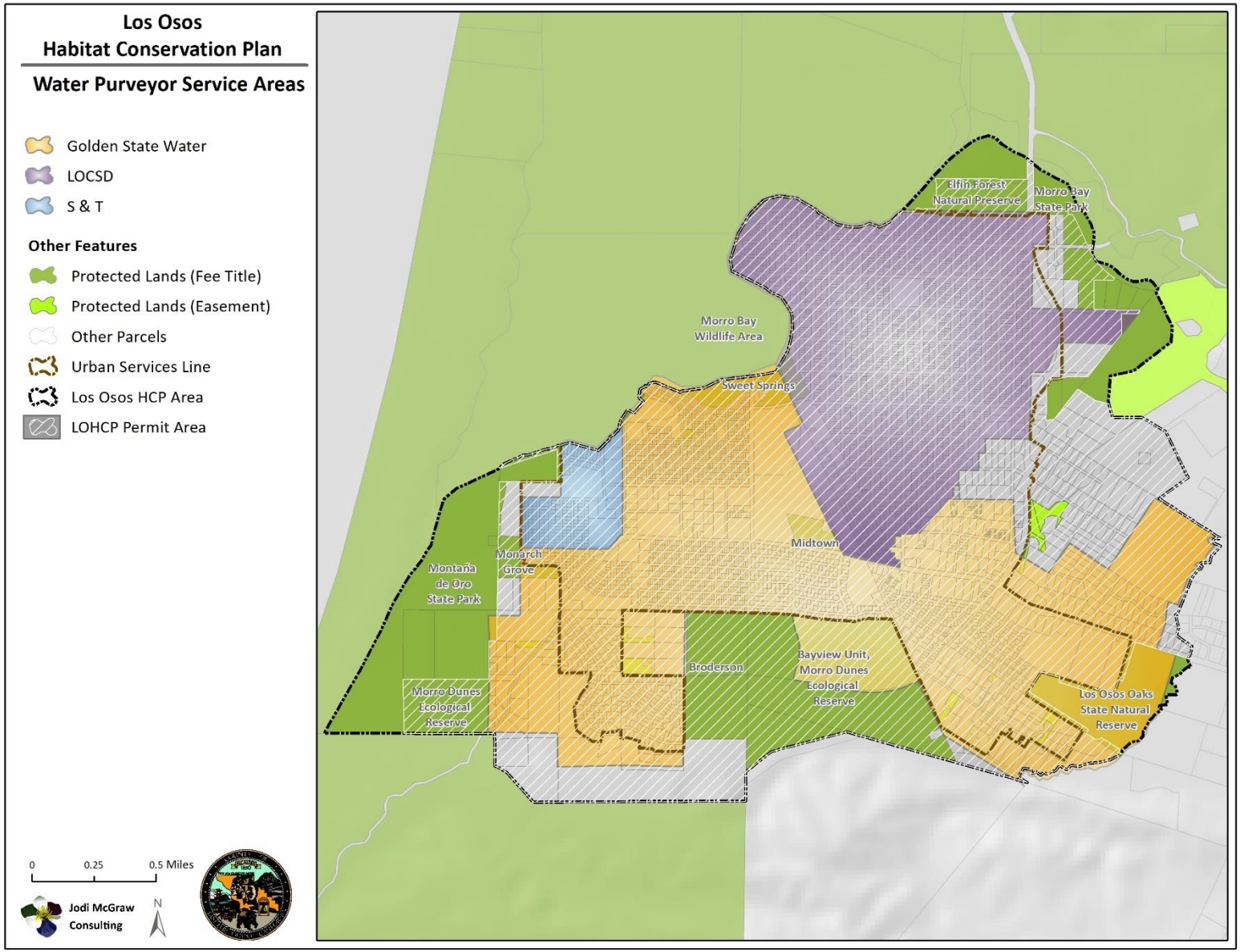


Figure 2-6: Water Purveyor Service Areas

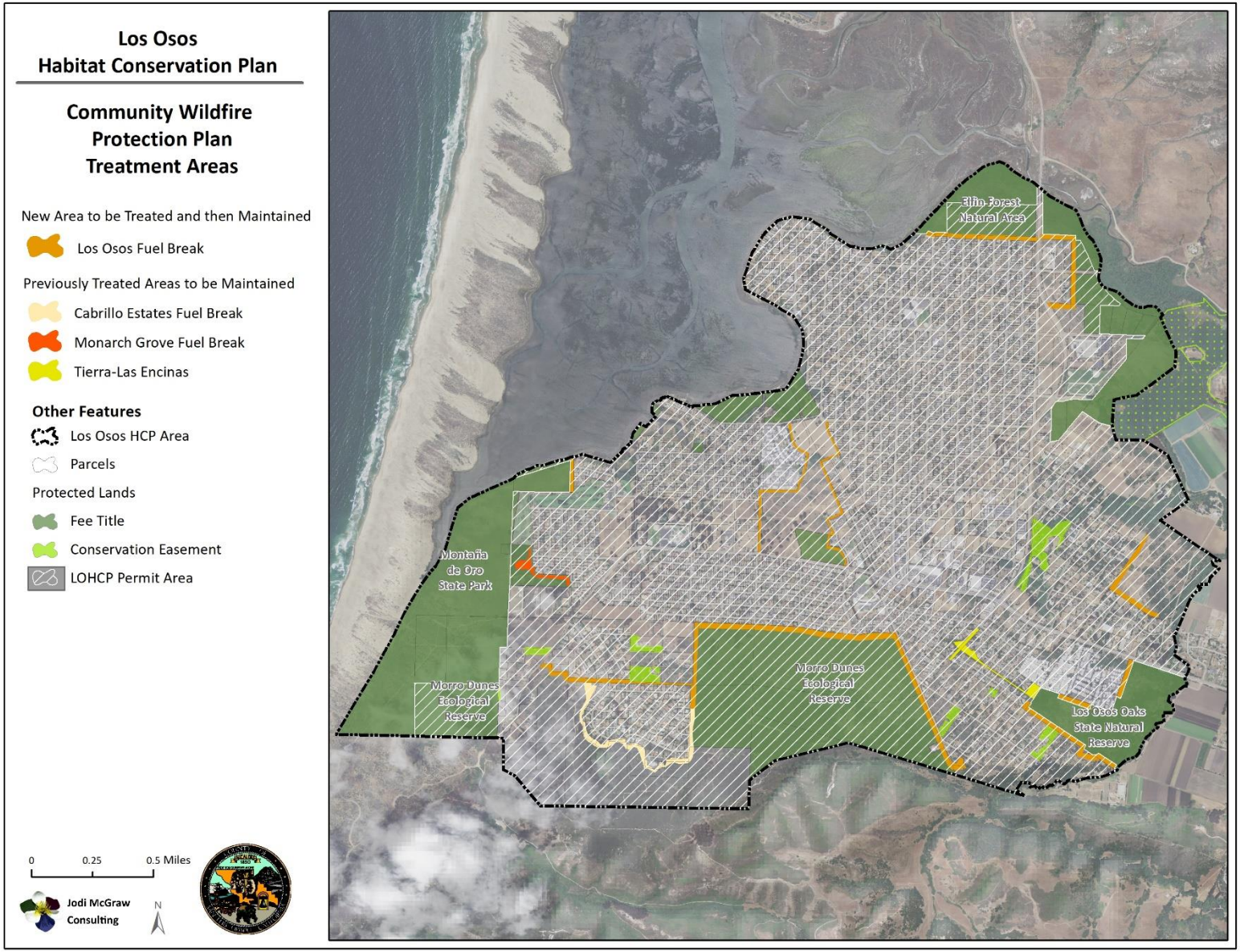


Figure 2-7: Community Wildfire Protection Plan Fire Hazard Abatement Treatment Areas

3 Environmental Setting and Biological Resources

The Los Osos HCP Area features a unique combination of soils and climate that give rise to a suite of endemic communities within the Baywood fine sands ecosystem (Section 3.1). The ecosystem and broader region support numerous rare species, including several narrowly endemic species (Section 3.2.1). These communities and species have the potential to be negatively impacted by the covered activities (Section 2.2). To identify the species to be covered by the LOHCP, 140 species (70 plants and 70 animals) occurring within the region were evaluated according to their range, status, potential impacts, and available information (Section 3.2.1). This analysis resulted in the identification of four covered species: two animals (Morro shoulderband snail and Morro Bay kangaroo rat) and two plants (Morro manzanita and Indian Knob mountainbalm) for which the incidental take permit issued based on the LOHCP will authorize take, at least for some covered activities (Section 3.2.2). These species will also be the subject of the LOHCP conservation program, while will avoid, minimize, and mitigate the impacts of the covered activities on the covered species (Chapter 5).

3.1 Environmental Setting

Centered on the Los Osos community in coastal San Luis Obispo County, the 3,644-acre Los Osos HCP Area (Plan Area) is bounded on the west and north by Morro Bay, on the northeast and east by Los Osos Creek, and on the south by Montaña de Oro State Park (Figure 1-1).

Despite its small size, the Plan Area features a diverse and unique flora and fauna due to two main factors:

- **Biogeography:** Los Osos is located near the center of the California Floristic Province, which has been identified as one of the world's global biodiversity hotspots owing to the richness of its flora (Myers et al. 2000). Located in the center along the Pacific Coast, the area is a mixing zone for species with northern and southern ranges.
- **Unique Soil Conditions:** The Plan Area is located on an ancient dune complex that has given rise to sandy soils of varying degrees of development, and thus fertility. The sandy soils combine with the maritime climate to create a mosaic of conditions that support unique assemblages of plants and animals, include several narrowly endemic species that occur in this region and nowhere else (JSA 1997).

This section describes the Plan Area, with an emphasis on the factors that influence the species and the communities, or habitats, in which they occur. It was developed based on the best available scientific and technical information including:

- Field surveys conducted for the LOHCP and other local projects;
- Prior conservation plans (JSA 1997);
- Environmental review documents (i.e., EIRs/EISs and EAs, previously approved parcel specific HCPs for properties in the LOHCP Area);
- The California Department of Fish and Wildlife's Natural Diversity Database (CNDDB 2016);
- US Fish and Wildlife Service's (USFWS) Critical Habitat Designations and Recovery Plans;
- California Native Plant Society's (CNPS) inventory of rare plants (CNPS 2016); and,

- Information from local biological reports and experts.

3.1.1 Climate

Los Osos features a Mediterranean climate characterized by relatively warm, dry summers and cool, wet winters. Due to its proximity to the coast, Los Osos experiences moderate temperatures; mean high temperatures in July are just 66 ◦F while mean low temperatures in January are 41◦F (PRISM 2011). Dense morning fog is frequent during the summer and helps moderate temperatures and reduce plant desiccation stress. Los Osos receives an average of 18 inches of precipitation, which occurs as rain that falls primarily between November and March. There is a slight precipitation gradient within the LOHCP Area, with the coast receiving an average of 17 inches of rainfall and the higher elevation areas further inland receiving 19 inches (PRISM 2011).

Interannual variability in weather, particularly precipitation, is high and can have important implications for biological systems. Over the 53-year period of record for which daily rainfall was measured at the Morro Bay Fire Station Coop weather station north of the Plan Area (WRCC 2013), mean rainfall was 16.6 inches; the standard deviation of the mean was 7.7, reflecting the high variability. In 21 of the years, precipitation was less than 75% of normal, and there were four periods of two or more years of such low rainfall, which constitute a drought: 1960 - 1961, 1984 - 1985, 1989 - 1990, and 2007 - 2009. Given the low water-holding capacity of the Baywood fine sand soil, drought can have important implications for plant and animal populations and habitat conditions (Section 6.5.6).

3.1.2 Topography and Geology

The LOHCP Area occurs on a broad coastal terrace that is deeply buried by ancient sand dunes. Topography is flat to gently sloping throughout much of the Plan Area, with steep terrain limited to the south where the ancient dunes abut the Irish Hills—a portion of the Coast Range Mountains (Figure 3-1). Elevations within the Plan Area range from just above mean sea level adjacent to the Morro Estuary, to 275 feet above mean sea level at the base of the Irish Hills.

Los Osos is within a seismically active region that includes several active earthquake faults including the Los Osos fault zone, which cuts through the Los Osos Valley area in an east-west fashion. The Plan Area is underlain primarily by Jurassic-age to Cretaceous-age (approximately 120 to 180 million years old) rocks of the Franciscan complex: a mixture of igneous, metamorphic, and sedimentary rocks. This complex is overlain by Cretaceous-age (65 to 140 million years old) and Tertiary-age (2 to 65 million years old) sedimentary rocks, including an unnamed Cretaceous sandstone, and the Lospe, Vaqueros, Rincon, Monterey, and Pismo formations. These formations are, in turn, overlain by a late Pleistocene and Holocene Dune Complex and Lower Pleistocene sediments of the Paso Robles Formation. The upper Paso Robles beds can be distinguished from the dune sands by their higher proportion of clay and silt particles (Chipping 1987).

3.1.3 Soils

The unique geology and climate have combined with other factors including slope, microclimate, and vegetation, to result in the development of seven classified and mapped soil types within the region (USDA 1984, Figure 3-2). The Plan Area itself, however, predominantly features Baywood fine sand soil; with other types occurring on less than 3% of the Plan Area along its perimeter. The relatively coarse

texture of the predominantly sand soils in the Plan Area contrasts with the mix of sandy loam, and clay soils developed on a mix of parent material further inland (Figure 3-2).

Covering 3,550 acres (98%) of the LOHCP Area, the Baywood soil is a deep, somewhat excessively drained fine sand that is derived from the aeolian sand deposits (i.e., dunes; USDA 1984). The surface layer of Baywood soils is slightly acidic, with soils having medium acidic or strongly acidic with increasing depth. Within the Plan Area, Baywood soils primarily occur on slopes between nine and 15 percent (3,225 acres or 89%); 256 acres (7%) in the southwestern portion of the Plan Area are on 15 to 30 percent slopes, and the remaining 69 acres (2%) in the northeast portion of the Plan Area are on slopes of just 2 to 9% (Figure 3-2; USDA 1984).

The Baywood soils vary in their degree of development, which increases with the age of the ancient dunes from which they are derived. Soils on the older and middle-aged dunes farther inland and at higher elevation are more developed than soils closer to the coast (JSA 1997). Soil formation processes have led to a gradient of soil development; these processes include accumulation of organic matter, clay synthesis, clay migration to lower profile position, and iron mineral transformation (JSA 1997). Generally speaking, soil development results in greater organic matter and smaller soil particles (i.e., finer texture). These factors increase soil water-holding capacity and nutrient availability: two properties have important implications for plant growth and thus influence the vegetation and other habitat conditions within the Plan Area (Section 3.1.5).

Located on the perimeter of the LOHCP Area, the other soil types feature characteristics that reflect their occurrence within or near the wetlands and along Los Osos Creek, as well as the different parent material (e.g., sandstone and siltstone) found adjacent to the ancient dunes. When compared with the Baywood fine sand, the other soils have finer texture and are more developed.

- **Santa Lucia shaly clay loam** occurs on 44 acres (1.2%) of the Plan Area on a steep (30-75%) slope in the headwaters of Los Osos Creek;
- **Concepcion fine sandy loam** and **Corralitos loamy sand** occur on 12 acres (0.3%) and two acres (<0.1%), respectively, on the eastern portion of the Plan Area where they support coast live oak woodland;
- **Salinas silty clay loam** occurs on 12 acres (0.3%) along Los Osos Creek in the southeastern portion of the Plan Area;
- **Marimel silty clay loam** occurs on seven acres (0.2%) in the eastern portion of the Plan Area along Los Osos Creek;
- **Dunes** occur on 3.2 acres (0.1%) on the western portion of the Plan Area; and
- **Aquolls saline soils** cover 0.9 acres (<0.1%) of the Plan Area and primarily support wetlands located on the northern portion of the LOHCP Area.

3.1.4 Hydrology

3.1.4.1 Streams, Rivers, Drainages

The LOHCP Area is within the Los Osos Creek Watershed: an approximately 28-square-mile area east and southeast of Morro Bay. Los Osos Creek is one of streams that drain to Morro Bay, the other being the Chorro Creek Watershed to the north (Figure 3-1).

Los Osos Creek is a perennial stream, though it features numerous dry reaches during the summer. It has an unconsolidated streambed substrate composed of sand, gravel, and silt. Los Osos Creek features two named tributaries: Eto Creek and Warden Creek.

The mainstem of Los Osos Creek flows through the Clark Valley, a narrow valley at the base of the Irish Hills. There, the stream's upper reaches have been extensively channeled and diked as part of agricultural activity. After Clark Valley, Los Osos Creek flows along a 2.5-mile portion of the eastern perimeter of the LOHCP Area to its confluence Eto Creek—an approximately one-mile-long tributary that flows from Los Osos Valley Road just east of South Bay Boulevard northeasterly to Eto Lake, a small lake formed at the confluence with Los Osos Creek. From there, the stream flows another 1.5 miles along the perimeter of the LOHCP Area to the confluence with Warden Creek located 0.75 miles upstream of Morro Bay (Figure 3-2).

Located outside of the Plan Area, Warden Creek drains the western portion of Los Osos Valley. The creek flows through an area known as Warden Lake and then northwesterly along the edge of the valley until it joins Los Osos Creek just above the abandoned crossing of Santa Ysabel Avenue. Like Los Osos Creek, Warden Creek's hydrology has been altered as part of agricultural activities in the valley.

Los Osos Creek has an approximately 0.75-mile-long estuary that extends from its confluence with Warden Creek until it enters Morro Bay. The estuary is bordered on the northwest by the delta and tributary system of Chorro Creek, which along with Los Osos Creek provides most of the fresh water that flows to Morro Bay.

3.1.4.2 Lakes and Ponds

The Plan Area includes three mapped ponds: a 0.8-acre pond in the upper headwaters of Eto Creek, a 4.5-acre pond on Eto Creek just upstream of its confluence with Los Osos Creek, and a freshwater pond in the Sweet Springs Preserve (Figure 3-2). No other mapped ponds or lakes occur in the LOHCP Area, though small, unmapped, created ponds may be on some private parcels.

3.1.5 Vegetation

The soils and climate within the LOHCP Area create a unique ecosystem that is found only within Los Osos. As in other areas of Central Coastal California that feature soils derived from ancient dune systems, including Fort Ord to the north (Monterey County) and Burton Mesa to the south (Santa Barbara County), the Baywood fine sand soil in Los Osos combines with the maritime climate to create unique conditions for plants and animals. These unique environmental conditions support a mosaic of native plant communities (vegetation), including one endemic type: Morro manzanita chaparral, a form of central maritime chaparral that is dominated by the endemic Morro manzanita (*Arctostaphylos morroensis*). This and the other communities that occur on Baywood fine sand support three additional endemic species adapted to the ecosystem: Morro shoulderband snail (*Helminthoglypta walkeriana*), Morro kangaroo rat (*Dipodomys heermanni morroensis*), and splitting yarn lichen (*Sulcaria isidifera*). They also support rich assemblages of more widespread plants and animals, including species with northern and southern ranges that overlap in central coastal California.

3.1.5.1 Overview

The LOHCP Area features assemblages of plants adapted to the relatively low-nutrient, well-drained soil Baywood fine sand soil (Section 3.1.3). Within the LOHCP Area, the distributions of plant species and communities reflect several factors including:

- **Soil development**, which is correlated with dune age, with inland areas having more fertile soils derived from older dunes than areas closer to the coast, which feature less-developed soils on younger dunes;
- **Microclimate**, which can result from variation in topography (e.g., cooler north-facing slopes) and also subtle temperature, precipitation, and fog gradients that occur with distance from the coast;
- **Hydrology**, including streams, lakes, and seasonally inundated areas including Morro Bay and Los Osos Creek;
- **Natural disturbances such as fire and erosion,** which remove established vegetation and initiate a process of succession (i.e., changes in plant community composition over time); and
- **Historic land use,** including agriculture, grazing, land clearing, and other human activities such as recreational use, which remove or alter native vegetation.

These and other factors interact in complex ways to create a mosaic of plant assemblages (or communities) within the LOHCP Area, which have been classified and mapped (JSA 1997).

Plant community conditions vary in terms of the cover of exotic plants, which are species that do not naturally occur within the communities; instead, these species were planted, accidentally introduced to the area, or spread from other areas where they were introduced. As outlined below and described in greater detail in Section D.1, several exotic plant species including primarily trees, grasses, and ice plants, have become abundant and have degraded habitat for native plants and animals in the LOHCP Area. The distribution and abundance of many exotic plants has been facilitated by natural disturbance and historic land uses.

Much of the LOHCP Area has been modified by human land use. Vegetation can reestablish after disturbances including agriculture, grazing, and other clearing, through natural succession or regeneration. Many native plants are adapted to natural disturbances and recolonize cleared areas from seed or vegetative materials (e.g., roots, rhizomes, and tubers). For example, cultivated land on the south end of the Plan Area in 1949 returned to coastal sage scrub and Morro manzanita chaparral by 1987. Following dry crop bean cultivation in the 1980s on another site, known as Powell II, dune lupine (*Lupinus chamissonis*), California croton (*Croton californicus*), and other native herbaceous plants became established and created a sparse, coastal sage scrub habitat. Following subsequent bean production on the property in 1997, coastal sage scrub vegetation again re-established within five years. The property has since been permanently protected.

3.1.5.2 Vegetation and Other Land Cover

As a result of the diverse microsite conditions, the 3,644-acre LOHCP Area supports a fine-scale mosaic of plant communities (or vegetation) and other land cover types (Table 3-1, Figure 3-3). An estimated 1,894 acres (52%) supports native and exotic vegetation that can be classified into six main types based

primarily on structure: coastal sage scrub (866 acres or 24%), central maritime chaparral (503 acres or 14%), woodland (367 acres or 10%), grassland (39 acres or 1.1%), wetlands (43 acres or 1.2%), and riparian (77 acres or 2.1%). These general types were further divided into 20 communities that differ in plant species composition due to variability in soil conditions, time since disturbance, microclimate, and other factors (Table 3-1, Figure 3-4, CMCA 2004). The remaining 1,750 acres (48%) of the Plan Area features other land cover, including primarily development, but also agricultural land (Table 3-1).

The following sections describe each general vegetation and land cover type, according to factors influencing its distribution, the dominant species, and important habitat conditions, including prevalence of exotic plants. Distinctions between the subtypes within each general category are also outlined.

3.1.5.2.1 Coastal Sage Scrub

Approximately 866 acres (24%) of the LOHCP Area features coastal sage scrub: a shrubland dominated by short to medium height, soft-woody shrubs. When compared to the shrubs dominating central maritime chaparral, the other shrubland in the LOHCP Area, coastal sage scrub features shrubs that are shorter-statured, less woody, and form a discontinuous canopy.

Coastal sage scrub occurs primarily on relatively flat terraces adjacent to the Pacific Ocean. Within the LOHCP Area, coastal sage scrub dominates the middle-aged dunes; it also occurs as a mosaic with central maritime chaparral and woodlands found on the older dunes.

Coastal sage scrub is dominated by several shrubs including California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), California goldenbush (*Ericameria ericoides*), silver lupine *(Lupinus albifrons*), dune (or sand) almond (*Prunus fasciculata* var. *punctata)*, dune lupine (*Lupinus chamissonis*), deer weed (*Acmispon glaber*), and black sage (*Salvia mellifera*). Herbaceous plants occur between shrubs, with common species including California croton (*Croton californicus*), wedgeleaf horkelia (*Horkelia cuneata*), rush rose (*Crocanthemum scoparium*), and common sandaster (*Corethrogyne filaginifolia*).

In the Los Osos region, many areas of coastal sage scrub have been highly modified by prior land use, including agriculture and grazing. These activities remove shrub cover and facilitate the invasion and spread of exotic plant species such as perennial veldt grass (*Ehrharta calycina*), freeway iceplant (*Carpobrotus edulis*), narrow leaved ice plant (*Conicosia pugioniformis*), wild oats (*Avena* spp.), rip-gut brome (*Bromus diandrus*), and red brome (*Bromus madritensis* ssp. *rubens*).

Within the LOHCP Area, four coastal sage scrub community types have been mapped; they are distinguished by their dominant shrubs and level of invasion by exotic plants (Table 3-1, Figure 3-4, CMAC 2004).

California Sagebrush – Black Sage: An estimated 482 acres, or 13% of the LOHCP Area, supports this community, which features a 2- to 5-foot-tall, continuous or intermittent canopy of California sagebrush and black sage with California buckwheat (*Eriogonum fasciculatum*), deer weed, and white sage (*Salvia apiana*) often present.

California Sagebrush – Black Sage Disturbed: Located on 373 acres in areas that have been relatively recently graded or cleared, including fallowed agricultural fields, this community consists of a relatively low cover of California sagebrush and black sage that are 1 to 4 feet tall. Herbaceous exotic plants are widespread and patchily abundant in these areas.

California Sagebrush – Black Sage Heavily Disturbed: An estimated 11 acres (0.3%) of the LOHCP Area supports small patches of California Sagebrush-Black Sage that have been heavily or more recently disturbed. These areas feature a relatively low abundance of native shrubs and high cover of veldt grass and other exotic plants.

Coyote Brush: Found on just 0.7 acres (<0.1%), this community features a continuous or intermittent shrub canopy dominated by coyote brush that is 3 to 6 feet tall. California sagebrush, California buckwheat, poison oak, and black sage may also be present. It occurs as small patches within disturbed portions of the LOHCP Area.

3.1.5.2.2 Central Maritime Chaparral

Central maritime chaparral occurs on approximately 503 acres (14 %) of the LOHCP Area. It is dominated by sclerophyllous (hard-leaved) shrubs and features scattered trees. Due to the low light and deep leaf litter in the understory, herbaceous plant cover is primarily limited to gaps in the shrub canopy.

Central maritime chaparral occurs in coastal areas of central California that are within reach of the summer fog. Within the LOHCP Area, central maritime chaparral occurs primarily on the older dunes (i.e., farther inland), on the southern hillsides and on the north-facing slopes of the marine terraces just south of Los Osos Creek in the southern portion of the Plan Area (Figure 3-3).

In the LOHCP Area, central maritime chaparral is dominated by Morro manzanita: a species endemic to Los Osos ecosystem. Other common species include chamise (*Adenostoma fasciculatum*) coast live oak, wedge-leaf ceanothus (*Ceanothus cuneatus*), and sticky monkeyflower (*Diplacus aurantiacus*). Canopy gaps support a variety of subshrubs including California goldenbush and deer weed, as well as herbs such as wedgeleaf horkelia, seacliff buckwheat (*Eriogonum parvifolium*), California croton, and golden yarrow (*Eriophyllum confertiflorum*).

Central maritime chaparral forms a mosaic with coastal sage scrub and woodland communities. Though it occurs primarily on the Baywood fine sand, which dominate the Plan Area (Section 3.1.3), central maritime chaparral is also supported by the Santa Lucia shaly clay loam. When compared with the coastal sage scrub, central maritime chaparral occurs on the steeper slopes and predominates the portions of the Plan Area that feature slopes that exceed 30%. This may reflect the dominant shrubs' requirements for more developed soils that occur on the older dunes farther inland. Alternatively, it may result because the gentler slopes (2-9%) have been more recently cleared (Tyler and Odion 1996).

Central maritime chaparral is a fire-adapted community. Though precise aspects of the fire regime are unknown, long fire-free periods (i.e., 100 years) are thought to be necessary for the dominant Morro manzanita to accumulate a sufficient seed bank to regenerate (Odion and Tyler 2002; Section B.2).

Based on their variability in dominant species, four types of central maritime chaparral have been mapped within the LOHCP Area (Table 3-1, Figure 3-4).

Morro Manzanita: Found on 321 acres (9% of the Plan Area), the Morro manzanita community is characterized by dense cover of Morro manzanita, with coast live oak, wedgeleaf ceanothus, sticky monkey flower, and black sage also present in a canopy, which is 4-12 feet tall. It occurs primarily on the older dunes and on steeper slopes in the southern portion of the Plan Area (Figure 3-4).

Morro Manzanita - Wedgeleaf Ceanothus: This community occurs on 113 acres (3.1% of the Plan Area) and features Morro manzanita and wedgeleaf ceanothus as co-dominant species creating a dense shrub canopy that is 3 to 6 feet tall. California sagebrush, black sage, and sticky monkey flower may be present in this community, which appears transitional between coastal sage scrub and Morro Manzanita in the southern portion of the Plan Area.

Morro Manzanita - California Sagebrush: This community consists of Morro manzanita and California sagebrush as co-dominant species creating a sparse canopy that is approximately 3 to 6 feet tall. California buckwheat (*Eriogonum fasciculatum*), deer weed, wedgeleaf ceanothus, sticky monkeyflower, and black sage may also be present. It occurs on 38 acres (1% of the Plan Area) at the transition between middle-aged dunes and older dunes and in areas that have been cleared relatively recently.

Wedgeleaf Ceanothus - California Sagebrush: This community features a dense, 3- to-6-foot-tall canopy of wedgeleaf ceanothus and California sagebrush, with black sage and sticky monkey flower often present. It occurs in one, 31-acre patch in the northern portion of the Plan Area.

3.1.5.2.3 Woodland

Approximately 367 acres (10%) of the Plan Area supports woodlands: upland communities characterized by a largely continuous canopy of trees, with a variable understory featuring primarily shade-tolerant herbs, vines, and shrubs.

Within the LOHCP Area, there are two native woodlands, coast live oak and bishop pine (*Pinus muricata*) woodland, as well as stands of the exotic eucalyptus (*Eucalyptus* spp.). The native woodlands occur primarily on the older dunes on the perimeter of the Plan Area, presumably reflecting their requirement for the higher nutrient availability and water-holding capacity of the more developed soils found there (Figure 3-4). The exotic eucalyptus woodland occurs patchily throughout the Plan Area, reflecting its establishment through deliberate plantings (e.g., as wind rows), from which the species subsequently spread into adjacent areas.

Coast Live Oak: Approximately 291 acres (8%) of the LOHCP Area features an intermittent or continuous canopy dominated by coast live oak, which typically range from 20 to 45 feet in height. The understory can feature Morro manzanita, wedgeleaf ceanothus, coffee berry, poison oak, and herbaceous species dominated by exotic annual grasses.

Within the LOHCP Area, coast live oak woodlands occur as two distinct phases. The area south of Morro Bay and west of Los Osos Creek support stunted, wind-pruned coast live oaks featuring with multiple trunks. These ‘pygmy oaks’ are well-represented within the Elfin Forest Natural Preserve and the Los Osos Oaks State Reserve. North-facing slopes and canyons, particularly those featuring sandstone or shale-derived soils, support more typical coast live oak woodlands.

Bishop Pine: The LOHCP Area features two stands of bishop pine mapped as occurring on 3.4 acres (0.1% of the Plan Area). This community features a continuous tree canopy of bishop pine 20 to 35 feet in height, and a shrub understory. Located on soils derived from older dunes in the southern portion of the Plan Area, the bishop pine woodland occurs as pockets within Morro manzanita chaparral. Recent examination of the stands indicates that they occupy a much smaller area (~0.5 acres total) and feature just a few living trees (< 10 trees), with several snags (dead standing trees; McGraw 2020). More widespread in the Irish Hills, the isolated stands of bishop pine, which are visible in aerial photographs from 1949, may be restricted by unique soil conditions or lack of fire; like other closed-cone conifers, bishop pine establishes primarily following fire, which releases seeds from their serotinous cones and creates an open canopy and bare-mineral soil conditions that facilitate seedling establishment.

Eucalyptus: The LOHCP Area features numerous, scattered patches of eucalyptus woodland, which total 72 acres (2% of the Plan Area). These non-native woodlands feature a continuous canopy of 20 to 75-foot-tall eucalyptus (*Eucalyptus* spp.), including primarily blue gum (*E. globulus*), with a sparse understory of shrubs and herbs. Eucalyptus create dense canopy and litter (barks and leaves) that often prevent native plant species from growing in the understory. Eucalyptus woodlands in the LOHCP Area provide overwintering habitat for Monarch butterflies (*Danaus plexippus*), a California Special Resource. They are also often used by raptors for nesting and wintering habitat.

3.1.5.2.4 Grassland

Approximately 39 acres (1.1%) of the Plan Area supports grasslands—communities that lack appreciable shrub or tree cover and instead are dominated by herbaceous plants, including primarily grasses but also other graminoids (grass-like plants) such as sedges and rushes, as well as forbs (broad-leaf herbs).

Within the LOHCP Area, grasslands occur primarily in areas where shrublands (coastal sage scrub or central maritime chaparral) and woodlands have been cleared for use in agriculture, grazing, or development. As a result, the grasslands occur primarily as small patches scattered throughout the LOHCP Area (Figure 3-3), and are dominated by exotic species including common velvet grass (*Holcus lanatus*), slender wild oats (*Avena barbata*), common wild oats (*Avena fatua*), rip-gut brome, soft chess (*Bromus hordeaceus*), red brome, Italian ryegrass (*Festuca perennis*), foxtail barley (*Hordeum murinum*), and rat-tail fescue (*Festuca myuros*). Though dominated by exotic plant species, grasslands can provide foraging habitat for raptors. In addition, in the absence of ongoing disturbance (i.e., grazing, cultivation, mowing, etc.), native shrubs and trees can re-establish in these areas, converting them to shrublands and woodlands over time.

Two grassland communities have been mapped within the LOHCP Area, based on their differences in plant species composition (Table 3-1, Figure 3-4, CMCA 2004).

California Annual Grassland*:* Approximately 4 acres (0.1%) of the LOHCP Area supports a mix of native and exotic annual grasses and herbs, including purple needle-grass (*Stipa pulchra*) and wildflowers such as California buttercup (*Ranunculus californicus*), blue-eyed grass (*Sisyrinchium bellum*), blue dicks (*Dichelostemma capitatum*), owl's clover (*Castilleja* spp.), larkspur (*Delphinium* spp.), and annual lupine (*Lupinus* spp.).

Non-Native Grassland: Approximately 35 acres (1%) of the LOHCP Area supports annual grasses and herbs dominated by introduced species and genera such as veldt grass, bromes, wild oats, ryegrass, and Harding grass (*Phalaris aquatica*). Shrubs are absent or occur only very sparsely.

3.1.5.2.5 Wetlands

The LOHCP Area includes 43 acres (1.2%) of vegetation growing in permanently or seasonally saturated soils. This wetland vegetation occurs almost exclusively on the northern perimeter of the Plan Area on Morro Bay and the Los Osos Creek estuary (Figure 3-3). These communities are an important link between the upland ecosystem and the Morro Bay estuary.

Three types of wetlands have been mapped within the LOHCP Plan Area (Table 3-1, Figure 3-4).

Cattail: Approximately 0.2 acres (<0.1%) of the Plan Area supports a continuous, intermittent, or open, 4- to 8-foot-tall community dominated by common cattail (*Typha latifolia*). Associated with permanently or seasonally flooded fresh and brackish water wetlands near the Los Osos Creek estuary, the cattail wetland community contains bulrush (*Schoenoplectus* spp.), sedges (*Carex* spp.), rushes (*Juncus* spp.), mugwort (*Artemisia douglasiana*) and arroyo willow (*Salix lasiolepis*).

Pickleweed: Approximately 1.3 acres (<0.1%) of the LOHCP Area features a continuous or intermittent canopy dominated by 0.5-to-1-foot-tall pickleweed (*Salicornia* spp.). This community occurs in areas permanently or seasonally flooded by saltwater or brackish water along the Los Osos Creek estuary. Associated species include common brass buttons (*Cotula coronopifolia*), marsh jaumea (*Jaumea carnosa*), and saltgrass (*Distichlis spicata*).

Disturbed Wetlands: The LOHCP Area features 41.7 acres (1.1%) of wetlands that have been degraded by human activities. Most occur along Morro Bay near Cuesta-by-the-Sea, where salt and alkali marsh have been impacted by the invasion of exotic species including fig marigold and eucalyptus. A small patch of degraded freshwater wetland occurs south of the intersection of South Bay Boulevard and Los Osos Valley Road (Figure 3-4). This may contain a mixture of riparian and wetland plants including arroyo willow, cattail, rushes, and sedges.

3.1.5.2.6 Riparian

The LOHCP Area includes 77 acres (2.1%) of vegetation associated with waterways, particularly Los Osos and Eto creeks. This riparian vegetation also includes small areas that support arroyo willow along Morro Bay near Cuesta-by-the-Sea.

Riparian vegetation stabilizes stream banks, traps sediment before it reaches the stream, moderates stream temperature, and provides nesting, feeding, and cover habitat for a number of birds, mammals, and other species. Riparian areas also provide corridors that facilitate animal movement through otherwise fragmented landscapes.

Three types of riparian vegetation occur in the LOHCP Area (Table 3-1, Figure 3-4).

Arroyo Willow: Approximately 12 acres (0.3%) of the LOHCP Area features a continuous canopy of arroyo willow, which occurs as a shrub or tree that is 8 to 30 feet in height. Located in seasonally-

flooded areas, including along Los Osos Creek, Eto Creek, and adjacent to Morro Bay near Cuesta-by-the-Sea, this community may also feature California sycamore (*Platanus racemosa*), black cottonwood (*Populus trichocarpa*), and coyote brush, as well as a sparse or abundant herbaceous understory layer that can include common cattail.

Arroyo Willow - Black Cottonwood: Approximately 0.8 acres (<0.1%) of the LOHCP Area features black cottonwood, a large tree (30-75 feet) that is co-dominant with arroyo willow. This community occurs in a single patch located along Los Osos Creek on the northeast corner of the LOHCP Area, within Morro Bay State Park (Figure 3-4). It features California sycamore in the overstory, with coyote brush and herbaceous species in the understory.

Coast Live Oak - Arroyo Willow: Arroyo willow and coast live oak are co-dominant within woodland comprised of 20 to 50-foot-tall trees that occurs on 62 acres (1.7%) of the LOHCP Area. Located along Los Osos and Eto creeks, where it forms a fairly continuous corridor in the eastern portion of the Plan Area, this riparian community may contain wetland plants in the understory and California bay (*Umbellularia californica*) in the stand.

Black Cottonwood: Located on less than two acres in the southeastern portion of the LOHCP Area along Los Osos Creek just downstream of Clark Valley, this community features a nearly continuous canopy of 50- to-100- foot-tall black cottonwood with an understory of shrubs. Arroyo willow is also present.

3.1.5.2.7 Other Land Cover

The following other land cover types cover a total of 234 acres (6.4%) within the LOHCP Area (Table 3-1, Figure 3-4).

Ruderal Disturbed: Approximately 50 acres (1.4%) of the Plan Area supports vegetation that has been significantly disturbed by agriculture, development, land clearing, or other human activities. This vegetation primarily supports exotic plant species that are adapted to colonizing disturbed areas, including wild mustard (*Brassica* spp.), wild radish (*Raphanus sativus*), Russian thistle (*Salsola tragus*), castor bean (*Ricinus communis*), sweet fennel (*Foeniculum vulgare*), Bermuda grass (*Cynodon dactylon*), and red stem filaree (*Erodium cicutarium*). Ruderal vegetation also contains exotic annual grasses common in the grasslands, such as wild oat, red brome, and ripgut brome; however, unlike in the grassland, native species occur at very low diversity and abundance in these areas. The only native plant species that occurs commonly within ruderal habitat is coyote brush.

Landscaped Trees Series: Approximately 131 acres (3.6%) of the Plan Area features dense canopy of native and exotic trees that were planted as for landscaping or as wind blocks. The dominant species include Monterey pine (*Pinus radiata*), Monterey cypress (*Hesperocyparis macrocarpa*), and eucalyptus, which range from 40 to 60 feet in height.

Agriculture: Approximately 49 acres (1.3%) of the Plan Area is used for agricultural crops. Located primarily in areas of flat terrain with fertile soils, agricultural lands have been altered by tillage, irrigation, fertilization, and the use of pesticides and herbicides. Crops vary in terms of their sizes and growing patterns, creating various canopy cover.

Open Water: Covering a total of approximately 4 acres (0.1%) of the LOHCP Area, open water occurs within Eto Lake, Eto Creek, and Los Osos Creek. Eto Lake occurs at the confluence of Los Osos Creek and its tributary, Eto Creek, which is located east of the intersection of Los Osos Valley Road and South Bay Boulevard (Figure 3-1). Los Osos Creek flows from the Irish Hills northerly to Morro Bay, and features a small estuary extending from its confluence with Warden Creek (outside of the LOHCP Area), to where it flows into Morro Bay (Section 3.1.4).

3.2 Covered Species

The LOHCP Area supports diverse assemblages of plant and animal species that are adapted to the unique conditions created by the soil, climate, and vegetation. While some species inhabit a broad geographic area (e.g., the California Coast), others have a more limited geographic range (e.g., central coastal California). Among these species, some exhibit narrow habitat specificity, being found solely within communities on the Baywood sand soils. For these narrow endemic species, which are naturally rare, the loss and degradation of habitat in and around the LOHCP Area has reduced populations, rendering them vulnerable to extinction. In recognition of their peril, these species have been listed as threatened or endangered under the state and federal endangered species acts. The LOHCP is designed to conserve these listed species by protecting, restoring, and managing habitat that can also support the diverse array of native species in the LOHCP Area.

This section describes the analysis conducted to identify the species within the LOHCP Area that should be covered by the take permit issued pursuant to the state and federal endangered species acts and be the focus of the LOHCP conservation program (Chapter 5).

3.2.1 Covered Species Analysis

To determine the species to be covered by the incidental take permit issued based on the LOHCP (covered species), available distribution information for the species and communities (vegetation) within the project area was reviewed, in consideration of the anticipated impacts of the covered activities (Section 2.2).

Four primary criteria were used to evaluate species for coverage:

1. **Range:** The species is known to occur within the coastal San Luis Obispo County based on several sources including:
    - California National Diversity Database (CNDDB 2016): The database of rare species updated July 2016 was queried in GIS to identify plants and animals occurring within the USGS 7.5-minute quad centered on the LOHCP Area, Morro Bay South;
    - California Native Plant Society Rare Plant Inventory (CNPS 2016): The on-line database of rare plant occurrences was queried using the nine-quad search based on the Morro Bay South quadrangle;
    - Existing Literature: Documented occurrences in the literature including reports; and,
    - Expert information: Observations of scientists and other experts in the region, including agency representatives.

2. **Status:** The species is state- or federally- listed as threatened or endangered or is likely to become listed during the 25-year permit term. The following factors were considered to evaluate species' status:
    - Federal Endangered Species Act: listed or proposed for listing;
    - California Endangered Species Act: listed or candidates for listing;
    - Fully Protected Species: listed under California Fish and Game Code;
    - Species of Special Concern on the special animals list (CDFW 2016);
    - California Native Plant Society Rare Plan Inventory: plants that are rare, threatened or endangered in California (Lists 1B and 2); and,
    - CEQA: other species that meet the definition of rare or endangered under CEQA, including those are not listed but known to be very rare or declining.

3. **Impact:** The species will, or is likely to be, negatively affected by the LOHCP covered activities (Section 2.2). This was evaluated based primarily on whether the species is known or likely to inhabit, or utilize for a significant part of their life history (including breeding, foraging, etc.), the following vegetation or land cover types that will be impacted by the covered activities:
    - grassland;
    - coastal sage scrub;
    - central maritime chaparral;
    - woodland; and
    - other upland, including agricultural, ruderal disturbed, and landscape trees.

    Species inhabiting wetlands, riparian, and riverine communities within LOHCP Area, as well as adjacent beach and dune communities outside of the Plan Area, were not considered for coverage though were identified (Section 3.2.3) to facilitate development of appropriate measures to avoid indirect impacts (Section 5.2.2).

4. **Information:** There is sufficient information about the species life history, habitat requirements, and occurrence in the Plan Area to adequately evaluate impacts of the covered activities on the species, and to develop elements of a conservation program to mitigate these activities. Because comprehensive focal species surveys of the Plan Area have not been conducted, distribution information is limited for some species. Such information is necessary to conduct the take/impacts assessment, and to develop elements of the conservation program, including ensuring adequate representation of the populations or suitable habitat within the preserves established to mitigate the project impacts.

Table 3-2 lists the species evaluated and the criteria met by each. Appendix A summarizes key aspects of the distribution and habitat of species known to occur within the Plan Area, or for which suitable habitat is present in the Plan Area.

3.2.2 Covered Species

Take coverage is requested for Morro shoulderband snail. Additionally, impacts to three state and/or federally listed threatened or endangered species are included for which the covered activities, including implementation of the LOHCP conservation program, were deemed to potentially cause impacts. As described above, this is based on the species' listing status and documented current or historical occurrence within the upland habitats of the LOHCP Area where the covered activities will take place (Table 3-2, Appendix A).

Covered Species	**Federal Status/State Status**
Morro shoulderband snail (*Helminthoglypta walkeriana*)	Threatened[14]/None
Morro manzanita (*Arctostaphylos morroensis*)	Threatened/None
Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*)	Endangered/Endangered, Fully Protected
Indian Knob mountainbalm (*Eriodictyon altissimum*)	Endangered/Endangered

Morro Bay kangaroo rat and Indian Knob mountainbalm are covered species to minimize or avoid impacts from management and restoration activities during implementation of the conservation program. Coverage for these species is only requested for impacts to suitable but unoccupied habitat, take of individuals is not requested. Take in the form of harm to individuals of these species associated with development and facilities operations and maintenance activities covered by the permit will be avoided.

Conservation, restoration, and management of the mosaic of natural communities as part of the LOHCP conservation program designed to promote recovery of the covered species will benefit many other species including several other sensitive species in the Plan Area (Table 3-2).

The covered species' distributions, life histories, and ecologies, are described in detail in species profiles that synthesize the best available scientific information and identify important gaps in information that will be addressed through implementation of the conservation program (Appendix B). This information, along with the vegetation distribution information (Section 3.1.5) and description of the covered activities (Section 2.2) is the basis for the LOHCP impact analysis (Chapter 4) and conservation strategy (Chapter 5).

The following sections provide a brief summary of the more-detailed species profiles which are provided in Appendix B.

3.2.2.1 Morro Shoulderband Snail

The Morro shoulderband snail (*Helminthoglypta walkeriana* Helminthoglyptidae), is a federally listed threatened terrestrial mollusk endemic to the area immediately north and south of Morro Bay in coastal San Luis Obispo County (Roth and Tupen 2004). When listed by the USFWS in 1994, the taxon, which was also known as the banded dune snail, was comprised of two subspecies, *H. w. walkeriana,* and *H. w. morroensis* (USFWS 1994). These taxa have since been recognized as two separate species: Morro

[14] In 2020, the USFWS proposed to reclassify Morro shoulderband snail from an endangered to a threatened species (USFWS 2020a). The downlisting occurred on February 3, 2022 (USFWS 2022).

shoulderband snail (*H. walkeriana*) and Chorro shoulderband snail (*H. morroensis*; Roth and Tupen 2004).

The current known range of Morro shoulderband snail is estimated to encompass approximately 7,700 acres (Roth and Tupen 2004). Most of the area is centered on Los Osos north of Hazard Canyon, west of Los Osos Creek, and south of Morro Bay; however, it also includes a narrow strip of coastal dunes north of Morro Bay in Morro Strand State Park (Roth and Tupen 2004, USFWS 2006). Within this geographic area, native habitat occupied by the species includes coastal dune scrub along the immediate coast, and coastal sage scrub and open central maritime chaparral communities on stabilized dunes further inland. Within these areas, Morro shoulderband snail is often found in areas featuring dense plant cover comprised of shrubs or mat-forming species (e.g., iceplant) where plant cover including branches is in contact with the ground (USFWS 1998). Individuals are typically patchily dispersed and observed in clumps of coastal sage scrub shrubs or clumps of veldt grass (SWCA 2014).

Though intact habitat includes primarily coastal sage scrub, and open central maritime chaparral, Morro shoulderband snail can also occur, sometimes in high abundance, in areas of degraded habitat, including areas invaded by dense exotic plants, such as veldt grass, fennel (*Foeniculum vulgare*), and iceplant (SWCA 2013). However, the species distribution was negatively associated with exotic eucalyptus (Walgren and Andreano 2012). Morro shoulderband snails also found in association with a variety of anthropogenically disturbed habitat areas, including areas where coastal sage scrub has been converted to non-native grassland due to vegetation clearing and mowing, areas covered by veldt grass and iceplant, landscaping and ornamental plantings, woodpiles, and other habitats within developed areas and rights-of-way (SWCA 2013, 2014, 2015, 2016, and 2017). Indeed, frequent observation of Morro shoulderband snails within a range of habitat conditions found within existing developed parcels areas as well as remaining vacant parcels indicate that the species has the potential to occur throughout the urban services line and Los Osos Wastewater Treatment Plant Area (Figure 2-2), as well as intact habitat on the perimeter of the Plan Area.

Morro shoulderband snail is also often found in litter that accumulates on the soil surface, and under piles of rock, downed wood, or other debris (SWCA 2013). These microsites provide moist, sheltered environments of reduced desiccation stress that are required by the terrestrial mollusk (Roth 1985). The species is occasionally observed in shallow (less than ½ inch) depressions within the soil (Belt 2016). Morro shoulderband snails can be attracted to and found in water puddles, where they can be drowned (SWCA 2013).

Morro shoulderband snails feed on decaying matter and fungal mycelia that grow on decaying matter and plant roots. The species is most active during periods of moist conditions, including during and after rain, as well as when there is heavy fog or morning dew. Feeding, reproduction, and growth occur primarily during the rainy season (i.e., October to April; Roth 1985). During periods of drought, Morro shoulderband snails are typically inactive, and may aestivate (Roth 1985).

Morro shoulderband snail is threated by loss of habitat due to development, and degradation of habitat as a result of exotic plants, recreational activities, and senescence of dune vegetation (USFWS 2001). When originally listed as federally-endangered in 1994, additional threats to Morro shoulderband snail included competition from non-native snails such as the European garden snail (*Helix aspersa*) and parasitism by sarcophagid flies (USFWS 1994); however, the most recent five-year review of the status of the species found no evidence for the effects of the former, and the latter threat was deemed unlikely to threaten the species' persistence (USFWS 2006).

The recommendation from the five-year review was that the species be down listed to 'threatened' (USFWS 2006) and in July 2020, the USFWS officially proposed the species for down listing (USFWS 2020a). The downlisting, which occurred on February 3, 2022 (USFWS 2022), signifies that Morro shoulderband snail is at risk of becoming endangered, rather than risk of becoming extinct.

3.2.2.2 Morro Bay Kangaroo Rat

The Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*) is a small, nocturnal, fossorial rodent endemic to the Baywood fine sands ecosystem centered on the community of Los Osos in coastal San Luis Obispo County. Within its range, which was estimated at less than five square miles, habitat for the species includes compacted sandy soils with slopes of less than 15 degrees, supporting a range of vegetation types (Gambs and Holland 1988).

Optimal habitat for Morro Bay kangaroo rat appears to be early-successional stages of coastal sage scrub, which are characterized by scattered subshrubs and shrubs less than three feet tall, interspersed with herbaceous plants and bare ground. Characteristic plant species of Morro Bay kangaroo rat habitat include sandcarpet (*Cardionema ramosissimum*), wedgeleaf ceanothus, western thistle (*Cirsium occidentale*), California croton (*Croton californicus*), seacliff buckwheat, wedgeleaf horkelia, deer weed, and grasses (Roest 1973, Gambs and Holland 1988).

Morro Bay kangaroo rats are solitary, and inhabit burrow systems that they use for nesting, escape, and caching seeds, which constitute their primary food source. Predators likely include snakes, owls, bobcat (*Lynx rufus*), coyote (*Canis latrans*), domestic cat (*Felis catus*) and domestic dog (*Canis lupus*); the domestic animals enter habitat from adjacent residential areas (USFWS 2011b).

Morro Bay kangaroo rat is listed as endangered under the CESA and the ESA; the species is also fully protected under the California Fish and Game Code. Listed as federally endangered in 1970 (USFWS 1970), Morro bay kangaroo rat has not been observed in the wild since 1986 despite several surveys (Section B.4.8). The last observed occurrence was within habitat currently within the Bayview Unit of the Morro Dunes Ecological Reserve (USFWS 2011b). The species may still be present in the Plan Area below detectable levels; alternatively, it may have gone extinct (USFWS 2011b). However, observations of potential signs that may be evidence of the species (e.g., burrow entrance shaped like an upside down "U" with a runway, tail drag mark, surface seed pit cache) from 2008 to 2011 suggest that some isolated colonies may persist in pockets of suitable habitat (USFWS 2011b). The species may persist on several large, privately owned parcels featuring potentially suitable habitat, including two where the species previously occurred, where surveys could not be conducted (USFWS 2011b).

Declines in the population of this species are attributed to habitat loss, degradation, and fragmentation caused primarily by development within the Los Osos and Baywood Park communities; habitat has also been degraded and fragmented by fire exclusion, which converts early-successional coastal sage scrub habitat to later successional communities that lack the preferred food plants and perhaps other important structural components of their habitat. Declines may have also resulted from predation by domestic cats and use of rodenticides (USFWS 1999, USFWS 2011b).

3.2.2.3 Morro Manzanita

Morro manzanita (*Arctostaphylos morroensis*) is a large, evergreen shrub in the heath family (Ericaceae) that is federally listed as a threatened species (USFWS 1994). Though not state listed under CESA, Morro manzanita has a California Rare Plant Rank of 1B.1, which is used for plants that are rare, threatened, or endangered in California and elsewhere (CNPS 2016).

Morro manzanita is endemic to the Los Osos region in coastal San Luis Obispo County where it occurs primarily on Baywood fine sand soils. Based on the likely historic distribution of these soils, Morro manzanita may have covered between 2,000 and 2,700 acres (McGuire and Morey 1992). The current range of Morro manzanita is approximately 890 acres (LSA Associates 1992). Within that area, Morro manzanita covers approximately 350 acres (Tyler and Odion 1996).

Within the LOHCP Area, Morro manzanita primarily occurs within central maritime chaparral communities; it is the dominant species (i.e., in terms of canopy cover) within the Morro manzanita chaparral and co-dominates with wedgeleaf ceanothus and California sagebrush (Section 3.1.5.2.2). Morro manzanita also occurs at low abundance in the coast live oak woodland, in the understory or canopy gaps of coast live oak. Scattered Morro manzanita may also be found in other communities including within the developed areas (Section 3.1.5).

A long-lived shrub (>50-year life span), Morro manzanita is adapted to recurring fire, which is an important component of the disturbance regime within the Baywood fine sands ecosystem. Fire kills adult Morro manzanita, which lack a burl from which to resprout; however, it also promotes seed germination and establishment, and therefore regeneration (Tyler et al. 2000). Effective fire management will likely be essential to the species' long-term persistence. Too-frequent fire may decrease populations by killing adults prior to accumulation of sufficient viable seed to replace them (Odion and Tyler 2002). At the same time, fire exclusion may cause 'senescence risk.' As adult shrubs senesce and die, seed production decreases; at some point, seed availability could be reduced to a level below which seedling establishment following an eventual fire is insufficient to replace the stand (Odion and Tyler 2002).

As a narrowly endemic species, Morro manzanita persistence is also threatened by habitat loss, including land conversion; habitat degradation, including exotic plants and incompatible recreational uses, which can cause erosion, can further impact persistence (USFWS 2008). Morro manzanita may also be impacted by vegetation management, including fire hazard abatement on private lands; the Community Wildfire Protection Plan avoids removing this species; Section 5.2.4. Although individual Morro manzanita are typically trimmed rather than removed in most hazard abatement activities, as noted above, the species does not resprout from a burl when cut, and in the absence of fire, seedling establishment is very limited (Tyler et al. 1998).

3.2.2.4 Indian Knob Mountainbalm

Indian Knob mountainbalm (*Eriodictyon altissimum*) is a shrub in the borage family (Boraginaceae) that is both state and federally listed as an endangered (USFWS 1994); it is also has a California Rare Plant Rank of 1B.1, which signifies that it is rare, threatened, or endangered in California and elsewhere (CNPS 2016).

Indian Knob mountainbalm is known from just seven occurrences in western San Luis Obispo County (CNDDB 2016). Two occurrences are on Indian Knob, a rock outcrop area south of San Luis Obispo and north of Pismo Beach. Two additional occurrences represented by a total of four, disjunct stands are in Hazard Canyon within Montaña del Oro State Park south of the LOHCP Area (USFWS 2013a). Of the three occurrences within the LOHCP Area, one is located in the Broderson site and the other two are within the Bayview Unit the Morro Dunes Ecological Reserve. A census of the three sites within the LOHCP in April 2016 found 22 individual plants (Occurrence 6) and 23 individual plants (Occurrence 4) in the two occurrences within the Bayview Unit; however, no Indian Knob mountainbalm plants were observed in the Broderson Unit (Occurrence 1; USFWS 2016).

Though the populations have not been comprehensively censused throughout the species' range, they are estimated to total fewer than 600 plants, with most of those (~500) occurring within the Indian Knob occurrence approximately 13 miles east of Los Osos (USFWS 2013a).

Indian Knob mountainbalm occurs on sandy soils derived from marine sandstone at Indian Knob, and Pleistocene older and partly cemented aeolian deposits (i.e., the Baywood fine sand soils) in Los Osos. In both areas, the species occurs in a mosaic of chaparral and oak woodland vegetation. Within these communities, the species' distribution is very limited. While the microhabitat characteristics of the endangered shrub have not yet been examined, the stands are thought to be remnants of once larger occurrences that have contracted over time as a result of succession, which creates less favorable conditions for this early successional species that is promoted by fire (USFWS 2013a).

Indian Knob mountainbalm can reproduce vegetatively by establishing clones from rhizomes (Wells 1962). Individuals may survive fire by resprouting from belowground tissues. Fire may be required to stimulate seed germination and create open canopy, bare soil conditions conducive to seedling establishment and survival (USFWS 2013a).

As part of the most recent five-year review, persistence of Indian Knob mountainbalm was deemed threatened by fire exclusion, exotic plants, climate change, and demographic and environmental stochasticity (randomness; USFWS 2013a). Most land supporting Indian Knob mountainbalm, including all stands within the Los Osos region, is now protected; however, development still threatens a portion of one of the Indian Knob occurrences, which is within unprotected, private land (USFWS 2013a).

3.2.3 Additional Listed Species

The LOHCP Area contains populations of eight additional state and/or federally listed threatened, endangered, or fully protected species for which take will be avoided. These species primarily or exclusively utilize habitats where the covered activities will not occur, including wetlands and riparian areas. Impacts to these species can be avoided by the covered activities through implementation of a series of avoidance measures (Section 5.2.2).

These additional listed species will continue to be protected under ESA, CESA, and CEQA under separate permitting processes. If available information indicates that a future project proposed for coverage under the LOHCP has the potential to impact these species, the project must demonstrate compliance with the state and federal regulations for these species in order to receive a Certificate of Inclusion conferring take coverage for Morro shoulderband snail under the LOHCP (Section 6.3.1).

Appendix C provides detailed species accounts that were used to develop the avoidance measures outlined in Section 5.2.2.

Species Not Covered by the Permit	**Federal Status/State Status**
California red-legged frog (*Rana draytonii*)	Threatened/None
California Black Rail (*Laterallus jamaicensis coturniculus*)	None/Threatened
California seablite (*Suaeda californica*)	Endangered/None
Salt marsh bird's beak (*Chloropyron maritimum ssp. maritimum*)	Endangered/Endangered
Marsh sandwort (*Arenaria paludicola*)	Endangered/Endangered
South Central CA Coast Steelhead (*Oncorhynchus mykiss irideus*)	Threatened/None
White-tailed kite (*Elanus leucurus*)	None/Fully Protected
Golden Eagle (*Aquila chrysaetos*)	None[15]/Fully Protected

[15] Though not listed under ESA, golden eagles receive federal protection through the Bald and Golden Eagle Protection Act.

Table 3-1: Vegetation and other Land Cover in the Plan Area

Vegetation/Land Cover	Acres	Percent of Plan Area
COASTAL SAGE SCRUB		
California Sagebrush – Black Sage	481.6	13.2%
California Sagebrush – Black Sage Disturbed	373.0	10.2%
California Sagebrush – Black Sage Heavily Disturbed	10.8	0.3%
Coyote Brush	0.7	<0.1%
Subtotal: Coastal Sage Scrub	**866.0**	**23.8%**
CENTRAL MARITIME CHAPARRAL		
Morro Manzanita California Sagebrush	38.0	1.0%
Morro Manzanita	321.2	8.8%
Morro Manzanita Wedgeleaf Ceanothus	113.4	3.1%
Wedgeleaf Ceanothus - California Sagebrush	30.6	0.8%
Subtotal: Central Maritime Chaparral	**503.3**	**13.8%**
WOODLAND		
Bishop Pine	3.4	0.1%
Coast Live Oak	291.2	8.0%
Eucalyptus	72.0	2.0%
Subtotal: Woodland	**366.6**	**10.1%**
GRASSLAND		
California Annual Grassland	3.5	0.1%
Non-Native Grassland	35.0	1.0%
Subtotal: Grassland	**38.5**	**1.1%**
WETLAND		
Cattail	0.2	<0.1%
Pickleweed	1.3	<0.1%
Disturbed Wetlands	41.7	1.1%
Subtotal: Wetland	**43.1**	**1.2%**
RIPARIAN		
Arroyo Willow Black Cottonwood	0.8	<0.1%
Arroyo Willow	11.6	0.3%
Black Cottonwood	1.8	<0.1%
Coast Live Oak - Arroyo Willow	62.3	1.7%
Subtotal: Riparian	**76.6**	**2.1%**
OTHER LAND COVER		
Agricultural Land	48.5	1.3%
Developed	1,515.8	41.6%
Landscaped Trees	131.4	3.6%
Open Water	4.2	0.1%
Ruderal Disturbed	49.9	1.4%
Subtotal: Other Land Cover	**1,750.0**	**48.0%**
Total	**3,643.8**	**100%**

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]						LOHCP	
Common Name	**Scientific Name**	**ESA**	**CESA**	**Other State**	**Range**	**Status**	**Habitat**	**Data**	**Impact**	**Listed**	**Treatment**	**Information**
ANIMALS												
Invertebrates												
obscure bumble bee	*Bombus caliginosus*	-	-	-	Y	N	Y	N	N	N	-	Table A-1
vernal pool fairy shrimp	*Branchinecta lynchi*	FT	-	-	Y	Y	N	Y	N	Y	-	
sandy beach tiger beetle	*Cicindela hirticollis gravida*	-	-	-	Y	N	N	Y	N	N	-	
globose dune beetle	*Coelus globosus*	-	-	-	Y	Y	N	Y	N	N	-	
monarch butterfly	*Danaus plexippus*	-	-	-	Y	Y	Y	Y	Y	N	-	Table A-1
Morro shoulderband snail	*Helminthoglypta walkeriana*	FT	-	-	Y	Y	Y	Y	Y	Y	C	Table A-1, App. B
California linderiella	*Linderiella occidentalis*	-	-	-	Y	N	N	Y	N	N	-	
Morro Bay blue butterfly	*Plebejus icarioides moroensis*	-	-	-	Y	N	Y	N	N	N	-	Table A-1
Atascadero June beetle	*Polyphylla nubila*	-	-	-	Y	Y	N	N	N	N	-	
San Luis Obispo pyrg	*Pyrgulopsis taylori*	-	-	-	Y	N	N	Y	N	N	-	
mimic tryonia	*Tryonia imitator*	-	-	-	Y	N	N	Y	N	N	-	Table A-1
Fish												
tidewater goby	*Eucyclogobius newberryi*	FE	-	SSC	Y	Y	N	Y	N	Y	-	Table A-1
steelhead - SCC DPS	*Oncorhynchus mykiss irideus*	FT	-	SSC	Y	Y	N	Y	N*	Y	AL	Table A-1, App. C
Amphibians												
foothill yellow-legged frog	*Rana boylii*	-	-	SSC	Y	Y	N	Y	N	N	-	
California red-legged frog	*Rana draytonii*	FT	-	SCC	Y	Y	N	Y	N*	Y	AL	Table A-1, App. C
western spadefoot	*Spea hammondii*	-	-	SSC	Y	Y	N	Y	N	N	-	
Coast Range newt	*Taricha torosa*	-	-	SSC	Y	Y	N	Y	N	N	-	
Reptiles												
black/silvery legless lizard	*Anniella pulchra nigra/pulchra*	-	-	SSC	Y	Y	Y	Y	Y	N	-	Table A-1
western pond turtle	*Emys marmorata*	-	-	SSC	Y	Y	N	Y	N	N	-	Table A-1
coast horned lizard	*Phrynosoma blainvillii*	-	-	SSC	Y	Y	Y	Y	Y	N	-	Table A-1
Two-striped garter snake	*Thamnophis hammondii*	-	-	SSC	Y	Y	N	Y	N	N	-	

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]						LOHCP	
Common Name	Scientific Name	ESA	CESA	Other State	Range	Status	Habitat	Data	Impact	Listed	Treatment	Information
				Birds								
Cooper's hawk	*Accipiter cooperii*	-	-	WL	Y	Y	Y	Y	N	N	-	Table A-1
sharp-shinned hawk	*Accipiter striatus*	-	-	WL	Y (w)	N	N	Y	N	N	-	Table A-1
tricolored blackbird	*Agelaius tricolor*	-	SE	SSC	Y	Y	N	Y	N	N	-	
grasshopper sparrow	*Ammodramus savannarum*	-	-	SSC	Y	Y	N	Y	N	N	-	
golden eagle	*Aquila chrysaetos*	-	-	FP, WL	Y	Y	Y	Y	N*	N	AL	Table A-1, App. C
black turnstone	*Arenaria melanocephala*	-	-	-	Y	N	N	Y	N	N	-	
burrowing owl	*Athene cunicularia*	-	-	SSC	Y	Y	N	Y	N	N	-	Table A-1
ferruginous hawk	*Buteo regalis*	-	-	WL	Y	N	N	Y	N	N	-	
western snowy plover	*Charadrius alexandrinus nivosus*	FT	-	SSC	Y	Y	N	Y	N	Y	-	Table A-1
northern harrier	*Circus cyaneus*	-	-	SSC	Y	Y	Y	Y	N	N	-	Table A-1
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FT	SE	-	Y	N	N	Y	N	Y	-	
olive sided flycatcher	*Contopus cooperi*	-	-	SSC	Y	N	N	Y	N	N	-	
white-tailed kite	*Elanus leucurus*	-	-	FP	Y	Y	N	Y	N*	N	AL	Table A-1, App. C
southwestern willow flycatcher	*Empidonax traillii* ssp. *extimus*	FE	SE	-	N	Y	N	Y	N	Y	-	
California horned lark	*Eremophila alpestris actia*	-	-	WL	Y	N	N	Y	N	N	-	
merlin	*Falco columbarius*	-	-	WL	Y (w)	Y	Y	Y	Y	N	-	Table A-1
prairie falcon	*Falco mexicanus*	-	-	WL	Y	N	Y	Y	N	N	-	Table A-1
peregrine falcon	*Falco peregrinus anatum*	DE	DE	FP	Y	Y	Y	Y	Y	Y	AL	Table A-1
black oystercatcher	*Haematopus bachmani*	-	-	-	Y	N	N	Y	N	N	-	
loggerhead shrike	*Lanius ludovicianus*	-	-	SSC	Y	Y	Y	Y	N	N	-	Table A-1
California black rail	*Laterallus jamaicensis coturniculus*	-	ST	FP	Y	Y	N	Y	N*	Y	AL	Table A-1, App. C
marbled godwit	*Limosa fedoa*	-	-	-	Y (w)	N	N	Y	N	N	-	Table A-1
long billed curlew	*Numenius americanus*	-	-	WL	Y (w)	N	N	Y	N	N	-	Table A-1
whimbrel	*Numenius phaeopus*	-	-	-	Y (w)	N	N	Y	N	N	-	Table A-1

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]						LOHCP	
Common Name	**Scientific Name**	**ESA**	**CESA**	**Other State**	**Range**	**Status**	**Habitat**	**Data**	**Impact**	**Listed**	**Treatment**	**Information**
large-billed savannah sparrow	*Passerculus sandwichensis rostratus*	-	-	SSC	Y (w)	Y	N	Y	N	N	-	Table A-1
California brown pelican	*Pelecanus occidentalis californicus*	DE	DE	FP	Y	Y	N	Y	N	N	-	Table A-1
purple martin	*Progne subis*	-	-	SSC	Y	Y	N	Y	N	N	-	
California clapper rail	*Rallus longirostris obsoletus*	FE	SE	FP	Y	Y	N	Y	N	Y	-	Table A-1
Allen's hummingbird	*Selasphorus sasin*	-	-	-	Y (b)	N	Y	Y	Y	N	-	Table A-1
yellow warbler	*Setophaga petechia*	-	-	SSC	Y	Y	N	Y	N	N	-	Table A-1
California spotted owl	*Strix occidentalis*	-	CT	SSC	Y	Y	Y	Y	N	N	-	Table A-1
elegant tern	*Thalasseus elegans*	-	-	WL	Y(w)	N	N	Y	N	N	-	Table A-1
California thrasher	*Toxostoma redivivum*	-	-	-	Y	N	Y	Y	Y	N	-	Table A-1
Mammals												
pallid bat	*Antrozous pallidus*	-	-	SSC	Y	Y	Y	N	N	N	-	Table A-1
Townsend's big-eared bat	*Corynorhinus townsendii*	-	CT	SSC	Y	Y	N	N	N	N	-	
Morro Bay kangaroo rat	*Dipodomys heermanni morroensis*	FE	SE	FP	Y	Y	Y	Y	N*	Y	C[1]	Table A-1, App. B
southern sea otter [4]	*Enhydra lutris nereis*	FT	-	FP	Y	Y	N	Y	N	Y	-	Table A-1
western mastiff bat	*Eumops perotis californicus*	-	-	SSC	Y	Y	N	N	N	N	-	
long-eared myotis	*Myotis evotis*	-	-	-	Y	N	Y	N	N	N	-	Table A-1
fringed myotis	*Myotis thysanodes*	-	-	-	Y	N	N	N	N	N	-	
Long-legged myotis	*Myotis volans*	-	-	-	Y	N	N	Y	N	N	-	
Yuma myotis	*Myotis yumanensis*	-	-	-	Y	Y	N	Y	N	N	-	
San Diego desert woodrat	*Neotoma lepida intermedia*	-	-	SSC	Y	Y	Y	Y	Y	N	-	Table A-1
big free-tailed bat	*Nyctinomops macrotis*	-	-	SSC	Y	Y	Y	N	Y	N	-	
harbor seal	*Phoca vitulina*	-	-	-	Y	N	N	Y	N	N	-	Table A-1
Mexican free-tailed bat	*Tadarida brasiliensis*	-	-	-	Y	N	Y	N	N	N		Table A-1
American badger	*Taxidea taxus*	-	-	SSC	Y	Y	N	N	N	N	-	Table A-1

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]						LOHCP	
Common Name	**Scientific Name**	**ESA**	**CESA**	**Other State**	**Range**	**Status**	**Habitat**	**Data**	**Impact**	**Listed**	**Treatment**	**Information**
VASCULAR PLANTS AND LICHENS												
Vascular Plants												
Hoover's bent grass	*Agrostis hooveri*	-	-	1B.2	Y	Y	Y	N	Y	N	-	Table A-2
Arroyo de la Cruz manzanita	*Arctostaphylos cruzensis*	-	-	1B.2	Y	Y	N	Y	N	N	-	Table A-2
Santa Lucia manzanita	*Arctostaphylos luciana*	-	-	1B.2	Y	Y	N	Y	N	N	-	Table A-2
Morro manzanita	*Arctostaphylos morroensis*	FT	-	1B.1	Y	Y	Y	Y	Y	Y	C	Table A-2, App. B
Santa Margarita manzanita	*Arctostaphylos pilosula*	-	-	1B.2	Y	Y	N	Y	N	N		
Oso manzanita	*Arctostaphylos osoensis*	-	-	1B.2	Y	Y	N	Y	N	N	-	Table A-2
Pecho manzanita	*Arctostaphylos pechoensis*	-	-	1B.2	Y	Y	N	Y	N	N	-	Table A-2
dacite manzanita	*Arctostaphylos tomentosa* ssp. *daciticola*	-	-	1B.1	Y	Y	N	Y	N	N	-	Table A-2
marsh sandwort	*Arenaria paludicola*	FE	SE	1B.1	Y	Y	N	Y	N*	Y	AL	Table A-2, App. C
Miles' milk-vetch	*Astragalus didymocarpus* var. *milesianus*	-	-	1B.2	Y	Y	N	N	N	N	-	
Coulter's saltbush	*Atriplex coulteri*	-	-	1B.2	Y	Y	Y	N	N	N	-	Table A-2
round-leaved filaree	*California macrophylla*	-	-	1B.2	Y	Y	N	Y	N	N	-	
San Luis Obispo mariposa-lily	*Calochortus obispoensis*	-	-	1B.2	Y	Y	N	Y	N	N	-	
La Panza mariposa-lily	*Calochortus simulans*	-	-	1B.3	Y	Y	N	Y	N	N	-	
Cambria morning-glory	*Calystegia subacaulis* ssp. *episcopalis*	-	-	4.2	Y	Y	Y	N	N	N	-	Table A-2
Hardham's evening-primrose	*Camissoniopsis hardhamiae*	-	-	1B.2	Y	Y	Y	N	Y	N	-	Table A-2
San Luis Obispo sedge	*Carex obispoensis*	-	-	1B.2	Y	Y	N	Y	N	N	-	
San Luis Obispo owl's-clover	*Castilleja densiflora* var. *obispoensis*	-	-	1B.2	Y	Y	N	Y	N	N	-	
Congdon's tarplant	*Centromadia parryi* ssp. *congdonii*	-	-	1B.1	Y	Y	N	Y	N	N	-	
pappose tarplant	*Centromadia parryi* ssp. *parryi*	-	-	1B.2	Y	Y	N	Y	N	N		
coastal goosefoot	*Chenopodium littoreum*	-	-	1B.2	Y	Y	Y	Y	Y	N		Table A-2

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]						LOHCP	
Common Name	Scientific Name	ESA	CESA	Other State	Range	Status	Habitat	Data	Impact	Listed	Treatment	Information
dwarf soaproot	*Chlorogalum pomeridianum* var. *minus*	-	-	1B.2	Y	Y	N	Y	N	N	-	
salt marsh bird's-beak	*Chloropyron maritimum* ssp. *maritimum*	FE	SE	1B.2	Y	Y	N	Y	N*	Y	AL	Table A-2, App. C
Brewer's spineflower	*Chorizanthe breweri*	-	-	1B.3	Y	Y	N	Y	N	N	-	
Chorro Creek bog thistle	*Cirsium fontinale* var. *obispoense*	FE	SE	1B.2	Y	Y	N	Y	N	Y	-	
compact cobwebby thistle	*Cirsium occidentale* var. *compactum*	-	-	1B.2	Y	Y	Y	Y	N	N	-	Table A-2
Cuesta Ridge thistle	*Cirsium occidentale* var. *lucianum*	-	-	1B.2	Y	Y	N	Y	N	N		
surf thistle	*Cirsium rhothophilum*		ST	1B.2	Y	Y	Y	Y	N	Y	-	Table A-2
leafy tarplant	*Deinandra paniculata*	-	CBR	4.2	Y	Y	N	Y	N	N	-	
Eastwood's larkspur	*Delphinium parryi* ssp. *eastwoodiae*	-	-	1B.2	Y	Y	N	Y	N	N		
beach spectaclepod	*Dithyrea maritima*	-	ST	1B.1	Y	Y	N	Y	N	N	-	
Betty's dudleya	*Dudleya abramsii* ssp. *bettinae*	-	-	1B.2	Y	Y	N	Y	N	N	-	
mouse-gray dudleya	*Dudleya abramsii* ssp. *murina*	-	-	1B.3	Y	Y	N	Y	N	N	-	
Blochman's dudleya	*Dudleya blochmaniae* ssp. *blochmaniae*	-	-	1B.1	Y	Y	N	Y	N	N	-	
yellow-flowered eriastrum	*Eriastrum luteum*	-	-	1B.2	Y	Y	N	Y	N	N	-	
Blochman's leafy daisy	*Erigeron blochmaniae*	-	-	1B.2	Y	Y	N	Y	N	N	-	Table A-2
saint's daisy	*Erigeron sanctarum*	-	-	4.2	Y	N	Y	N	Y	N	-	Table A-2
Indian Knob mountainbalm	*Eriodictyon altissimum*	FE	SE	1B.1	Y	Y	Y	Y	N*	Y	C[2]	Table A-2, App. B
Hoover's button-celery	*Eryngium aristulatum* var. *hooveri*	-	-	1B.1	Y	Y	N	Y	N	N	-	
suffrutescent wallflower	*Erysimum suffrutescens*	-	-	4.2	Y	N	Y	Y	Y	N	-	Table A-2
San Benito fritillary	*Fritillaria viridea*	-	-	1B.2	Y	Y	N	Y	N	N	-	
San Francisco gumplant	*Grindelia hirsutula* var. *maritima*	-	-	3.2	Y	Y	Y	N	Y	N	-	Table A-2
mesa horkelia	*Horkelia cuneata* var. *puberula*	-	-	1B.1	Y	Y	Y	Y	N	N	-	Table A-2
Kellogg's horkelia	*Horkelia cuneata* var. *sericea*	-	-	1B.1	Y	Y	Y	Y	Y	N	-	Table A-2
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*	-	-	1B.1	Y	Y	N	Y	Y	N	-	Table A-2

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]						LOHCP	
Common Name	Scientific Name	ESA	CESA	Other State	Range	Status	Habitat	Data	Impact	Listed	Treatment	Information
pale-yellow layia	*Layia heterotricha*	-	-	1B.1	Y	Y	N	Y	N	N	-	
Jones' layia	*Layia jonesii*	-	-	1B.2	Y	Y	N	Y	N	N	-	
San Luis Obispo County lupine	*Lupinus ludovicianus*	-	-	1B.2	Y	Y	N	Y	N	N	-	
Carmel Valley bush-mallow	*Malacothamnus palmeri* var. *involucratus*	-	-	1B.2	Y	Y	N	Y	N	N	-	Table A-2
Santa Lucia bush-mallow	*Malacothamnus palmeri* var. *palmeri*	-	-	1B.2	Y	Y	N	Y	N	N	-	
Palmer's monardella	*Monardella palmeri*	-	-	1B.2	Y	Y	N	Y	N	N	-	
southern curly-leaved monardella	*Monardella sinuata* ssp. *sinuata*	-	-	1B.2	Y	Y	Y	Y	Y	N	-	
crisp monardella	*Monardella undulata* ssp. *crispa*	-	-	1B.2	Y	Y	Y	N	Y	N	-	Table A-2
San Luis Obispo monardella	*Monardella undulata* ssp. *undulata*	-	-	1B.2	Y	Y	Y	N	Y	N	-	Table A-2
woodland woollythreads	*Monolopia gracilens*	-	-	1B.2	Y	Y	N	Y	N	N	-	
shining navarretia	*Navarretia nigelliformis* ssp. *radians*	-	-	1B.2	Y	Y	N	Y	N	N	-	
coast woolly-head	*Nemacaulis denudata* var. *denudata*	-	-	1B.2	Y	Y	Y	Y	N	N		Table A-2
short-lobed broomrape	*Orobanche parishii* ssp. *brachyloba*	-	-	4.2	Y	N	Y	Y	Y	N	-	Table A-2
hooked popcorn-flower	*Plagiobothrys uncinatus*	-	-	1B.2	Y	Y	N	Y	N	N	-	
Diablo Canyon blue grass	*Poa diaboli*	-	-	1B.2	Y	Y	N	Y	N	N	-	
sand almond	*Prunus fasciculata* var. *punctata*	-	-	4.3	Y	N	Y	Y	Y	N	-	Table A-2
adobe sanicle	*Sanicula maritima*	-	-	1B.1, SR	Y	Y	N	Y	N	N	-	
chaparral ragwort	*Senecio aphanactis*	-	-	2B.2	Y	Y	N	Y	N	N	-	Table A-2
Cuesta Pass checkerbloom	*Sidalcea hickmanii* ssp. *anomala*	-	-	1B.2, SR	N	Y	N	Y	N	N	-	
most beautiful jewel-flower	*Streptanthus albidus* ssp. *peramoenus*	-	-	1B.2	Y	Y	N	Y	N	N	-	

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]						LOHCP	
Common Name	Scientific Name	ESA	CESA	Other State	Range	Status	Habitat	Data	Impact	Listed	Treatment	Information
California seablite	*Suaeda californica*	FE	-	1B.1	Y	Y	N	Y	N*	Y	AL	Table A-2, App. C
saline clover	*Trifolium hydrophilum*	-	-	1B.2	Y	Y	N	Y	Y	N	-	
caper-fruited tropidocarpum	*Tropidocarpum capparideum*	-	-	1B.1	Y	Y	N	Y	N	N	-	
Lichens												
Spiraled old man's beard	*Bryoria spiralifera*	-	-	1B.1	Y	?	Y	N	Y	N	-	Table A-2
firm cup lichen	*Cladonia firma*	-	-	2B.1	Y	N	Y	N	Y	N	-	Table A-2
Los Osos black and white lichen	*Hypogymnia mollis*	-	-	-	Y	?	Y	N	Y	N	-	Table A-2
long fringed parmotrema	*Parotrema hypolecinum*	-	-	-	Y	?	Y	N	Y	N	-	Table A-2
splitting yarn lichen	*Sulcaria isidiifera*	-	-	1B.1	Y	N	Y	Y	Y	N	-	Table A-2

[1] Status

Federal Endangered Species Act:

FE: Federal Endangered

FT: Federal Threatened

DE: Delisted species

California Endangered Species Act

SE: State Endangered

ST: State Threatened

CT: State candidate for listing

DE: Delisted species

CBR: Considered but Rejected for state listing

Other State Designations:

California Rare Plant Rank Designations:

List 1B: Plants rare, threatened, or endangered in California and elsewhere

List 2B: Plants rare, threatened, or endangered in California, but more common elsewhere

List 3: Plants about which more information is needed — a review list

List 4: Plants of limited distribution or infrequent presence throughout California —a watch list

California Rare Plant Threat Ranks, represented as decimals after status categories (e.g., "List 1B.1"):

Table 3-2: Evaluation of rare and special status species in the Los Osos Region

		Status[1]			Criteria[2]					LOHCP
Common Name	Scientific Name	ESA	CESA	Other State	Range	Status	Habitat	Data	Impact Listed	Treatment Information

0.1: Seriously threatened populations

0.2: Marginally threatened populations

0.3: Populations with limited threats

FP: Fully Protected - may not be taken or possessed at any time without a permit for necessary scientific research or relocation

SR: State Rare-Although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens (California Native Plant Protection Act)

SSC: Species of Special Concern

WL: Watch List - previously SSCs but no longer merit SSC status

[2] Criteria: Detailed description of criteria is provided in the text.

Range: Y= occurs within; Y(w)= wintering, and Y(b)= breeding within the LOHCP Area; N=outside of range

Habitat: Y = Species occurs within the upland habitat found in the LOHCP Area; N=species does not occur in LOHCP Area upland habitats

Impacts: Y=potential for impacts from covered activities and N= impacts unlikely; * Indicates that impacts can be avoided through measures outlined in the Conservation Strategy of the LOHCP.

Listed: Y= species is listed federal and/or state as endangered or threatened, N=species is not listed under CESA and ESA

[3] LOHCP Treatment:

AL= Additional listed species for which impacts can be avoided.

C= Species recommended for coverage in the LOHCP.

C^1= Take coverage only requested for habitat impacts (not impacts to individuals) for management and restoration as part of the LOHCP Conservation Strategy.

C^2= Take coverage only requested for management and restoration as part of the LOHCP Conservation Strategy.

LOHCP Information: Section of document where additional species information is provided.

[4] The southern sea otter is designated as a Special Species of Concern by the Marine Mammal Commission

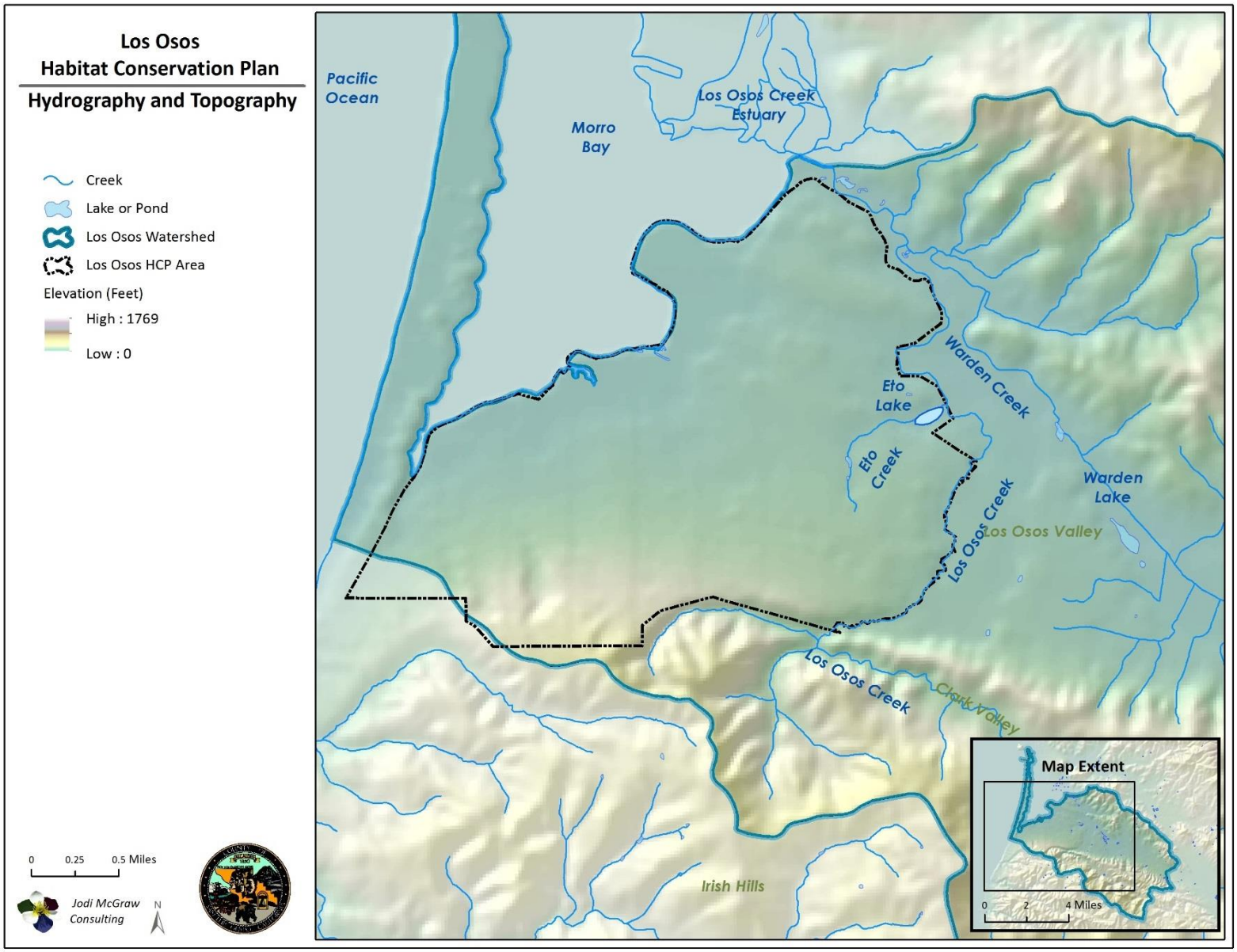


Figure 3-1: Hydrography and Topography

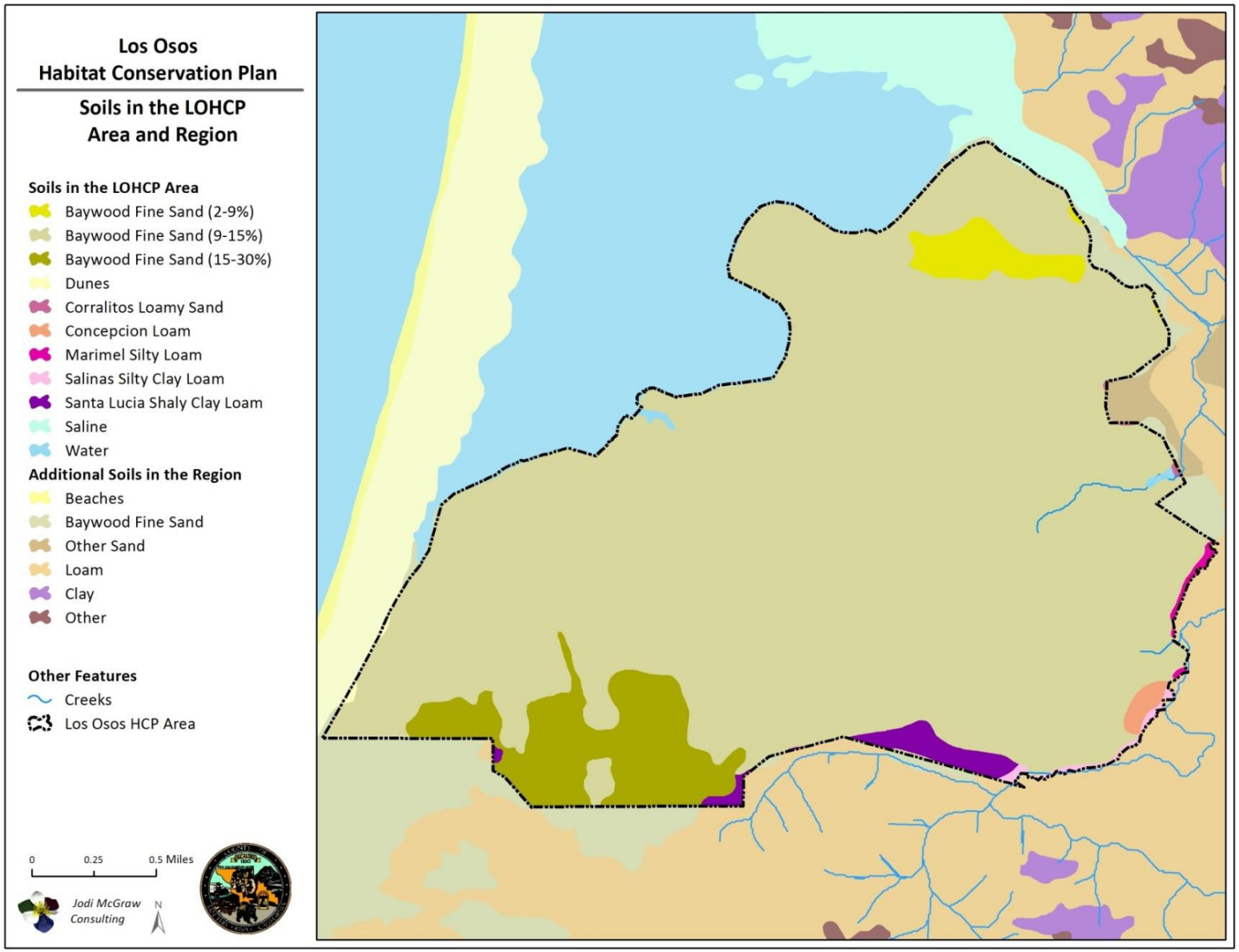


Figure 3-2: Soils

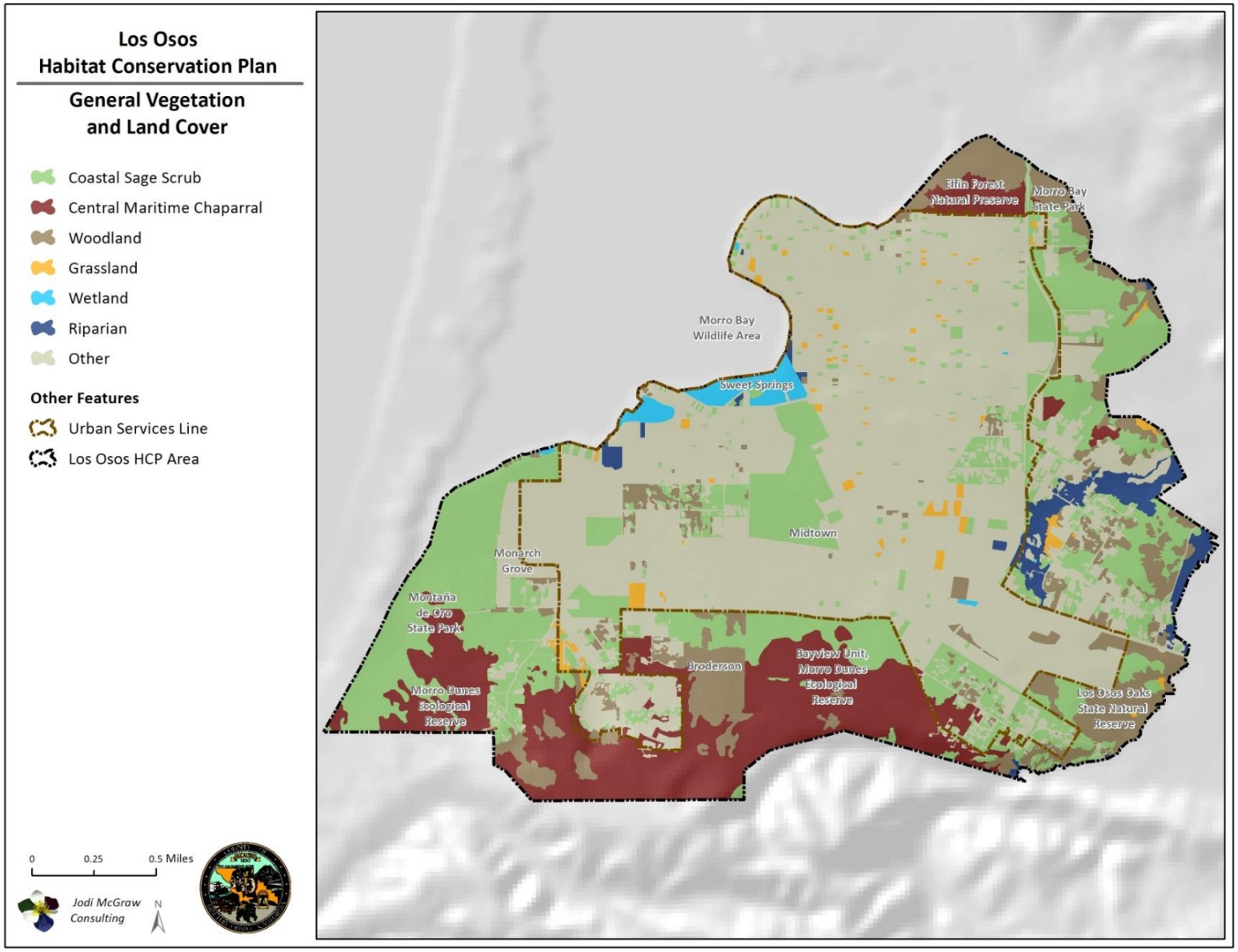


Figure 3-3: General Vegetation and Land Cover

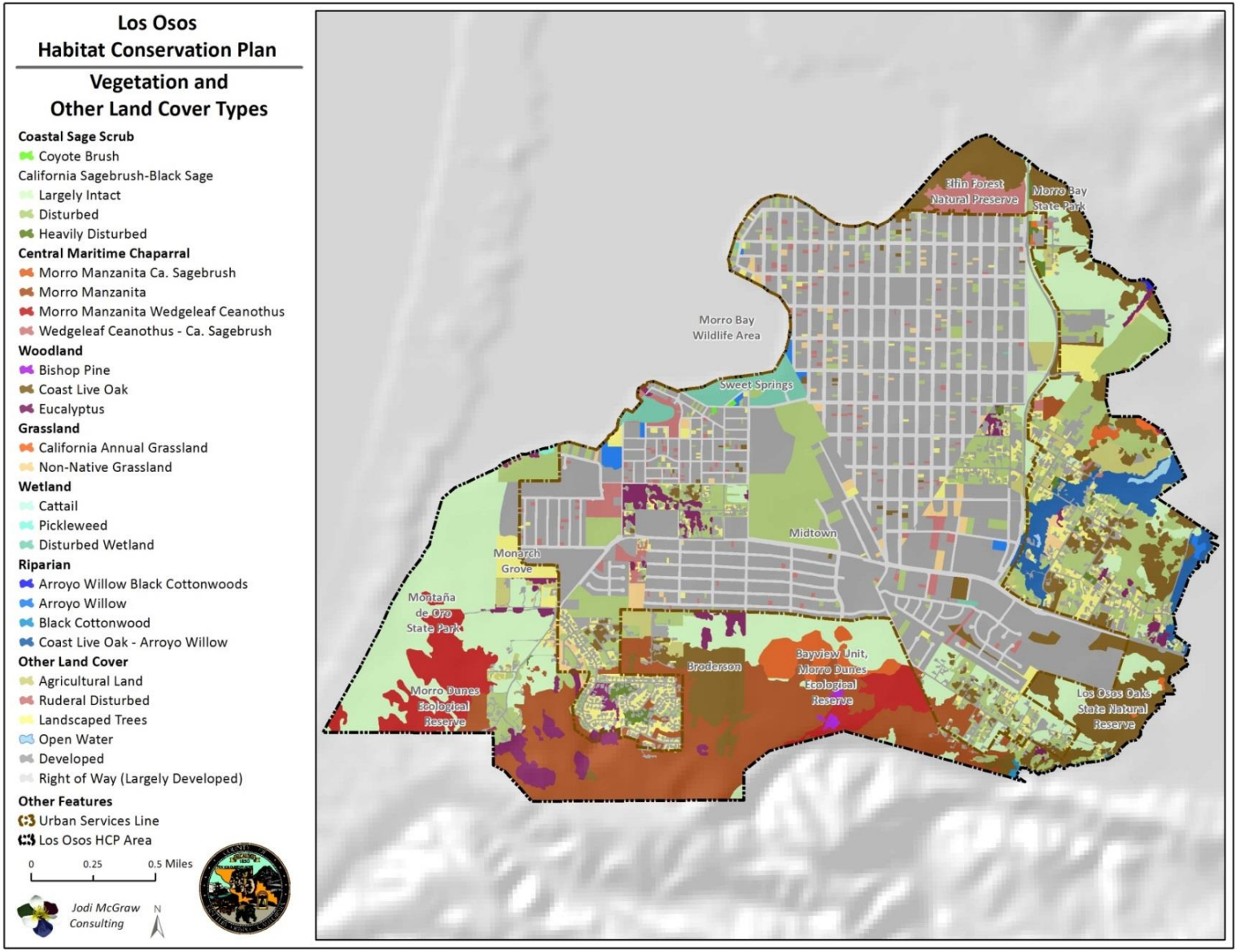


Figure 3-4: Specific Vegetation and Other Land Cover Types

4 Potential Biological Impacts/Take Assessment

The activities that will be covered by the LOHCP have the potential to negatively impact the covered species and their habitats. This chapter assesses the take/impacts both qualitatively, based on the various ways or mechanisms in which they affect species, and quantitatively, based on their direct effects on potentially occupied habitat. This assessment of impacts and take was based on the anticipated covered activities (Section 2.2), and available information about the habitats (Section 3.1.5) and occurrences (Section 3.2.2, Appendix B). It informed development of the conservation program (Chapter 5) and the financial analyses used to determine how it will be funded (Chapter 7).

After first describing both the general effects of the covered activities and the approach used to quantify the habitat impacts, this section evaluates the anticipated effects of the covered activities on each of the covered species. It ends with an assessment of the cumulative effects of the covered activities, which considers their effects in light of past, present, and reasonably foreseeable future actions.

During plan implementation, a database will be created and used to track each project covered by the LOHCP permit and document their actual take/impacts on the covered species and the impacts to their habitats (Section 5.4.1.1). This database will be used to prepare the annual reports (Section 5.6) and enable the County, the Implementing Entity, and the USFWS to evaluate whether the benefits of the conservation program are keeping pace with, or exceeding, the impacts of the covered activities, as part of the Plan's 'stay-ahead provision' (Section 6.2.4).

4.1 General Effects and their Mechanisms

The covered activities will impact the covered species through a variety of mechanisms, which can generally be categorized as:

- **direct effects:** impacts that occur where and when the covered activity occurs; and
- **indirect effects:** impacts that occur at a different place, and/or at a later time, than the covered activity, but are still reasonably certain to occur as a result of the activity.

4.1.1 Direct Effects

The covered activities will directly affect the covered species, potentially causing take of Morro shoulderband snails or impacts to covered animals and plants, by causing:

- **direct mortality** or injury that leads to mortality to individuals (excludes Morro Bay kangaroo rat and Indian Knob mountainbalm, for which no take/impacts in the form of injury or mortality will be permitted);
- **permanent loss of habitat suitable for, or occupied by, covered species**, resulting from areas of open soil (including vegetated areas) with impermeable surfaces (e.g., pavement or buildings); and/or
- **temporary loss of habitat suitable for, or occupied by, covered species**, such as by disturbing soil and removing vegetation in an area that will otherwise be restored. For example, temporary habitat loss will result from soil and vegetation disturbance to install a below-ground pipeline, after which habitat recovers naturally or as part of an active revegetation effort.

4.1.1.1 General Consequences of Direct Effects

Habitat loss and mortality can decrease the long-term viability of the covered species, by reducing the size of their populations. Loss of habitat is the leading threat to endangered species persistence (Wilcove et al. 1998), and can be especially problematical for narrowly endemic species such as the covered species, given their natural rarity (Skinner and Pavlik 1994). Habitat loss was identified as a leading threat to the covered species when they were originally listed (USFWS 1994); accordingly, protecting remaining habitat was identified as essential to their recovery (USFWS 1998a and 1999).

As part of more recent evaluations of the species' status, which has been documented in their five-year reviews (USFWS 2006, 2008, 2011b, 2013, and 2020a), habitat loss has been characterized as having lower threat, relative to when the species were listed, due to successful efforts during the past twenty years to protect large tracts of high-quality habitat in the LOHCP Area (Section 2.1.2.1). Nonetheless, given their extremely small geographic ranges and narrow habitat specificity, habitat loss remains a significant factor contributing to the declines; as a result, loss of additional habitat has potential to impact their long-term viability, in the absence of efforts to offset its effects.

Even if habitat loss and direct mortality do not directly lead to the loss of populations, known as a local extinction or extirpation, they can cause a genetic bottleneck—the process through which genetic diversity is lost when populations go through a large decline (Primack 2002). These losses of genetic diversity can influence individual fitness, population growth, and thus species persistence.

4.1.1.2 Methods used to Estimate Direct Effects

Direct effects on the covered species were quantified by estimating the acres of habitat that will be affected by the covered activities. Direct effects were quantified in terms of habitat, rather than the number of individuals, for a variety of reasons including:

- this regional conservation plan is focused on protecting and improving the quality of habitat within which the covered species can persist;
- there is no systematic information about the distribution and abundance of the covered species, which would be needed to estimate impacts to individuals; and
- this programmatic plan covers a suite of activities over 25 years, and finite project footprints are not yet known for many of the activities, such that surveys of cannot be used in advance to evaluate their effects.

The direct effects on habitat were estimated for the anticipated private development, facilities maintenance, and capital improvement projects that will be covered by the LOHCP permit (Section 2.2). The direct effects on habitat caused by the activities covered to implement the conservation program, including avoidance and minimization measures, habitat management, restoration, and monitoring, are generally anticipated to be temporary and are discussed in Section 4.2.

Because only the conservation program activities are anticipated to affect Morro Bay kangaroo rat and Indian knob mountainbalm, both of which occur within extremely limited distribution in the Plan Area, impacts to these species were also qualitatively described.

To estimate impacts to potentially occupied habitat for Morro shoulderband snail and Morro manzanita, available information about the species' ecology (Appendix B) was used to characterize the vegetation and land cover types as habitat if it is more likely than not to be occupied by the species. This analysis was designed to approximate the acres of suitable habitat that will be affected by the covered activities. This cross walk was also used to calculate the acres of potentially occupied habitat that will be benefited by conservation and management of the Los Osos Preserve System (Section 5.8.1).

Importantly, additional occurrences of the covered species may occur outside of the areas mapped as suitable; conversely, some of the mapped area may not be occupied. Additional habitat may become suitable in the future, as a result of succession, alterations in land use, and/or restoration. Moreover, new information about covered species distribution and ecology may indicate that additional areas are suitable. For these and perhaps other reasons, this landscape-scale analysis of potentially occupied habitat is not designed to be used to determine the appropriate measures that must be implemented to avoid and minimize impacts the covered species. Instead, Section 5.2.1 describes how project-specific site evaluations will be used to identify the avoidance and minimization measures that must be implemented, which are outlined in Section 5.2 and Tables 5-2 through 5-4.

The direct effects of the covered activities were quantified using a spatial analysis of the LOHCP Plan Area, based on a series of assumptions about the size, location, and in some cases, frequency of the anticipated private development, facilities maintenance, and capital improvement projects. Table 4-1 lists the assumptions for each of these anticipated covered activities identified in Section 2.2. The following outlines the approach used to quantify the impacts of the covered activities on vegetation and land cover types, and thus the covered species' habitat.

Step 1: Estimate the size of the disturbance envelope. The disturbance envelope (or project footprint) is the entire area that will be disturbed during the course of implementing the covered activity. For construction projects, this includes the area that will be covered by the structures or other improvements, including hard surfaces, as well as the adjacent area that will be disturbed but later restored. For purposes of this analysis, the disturbance envelopes include areas of existing impervious surfaces and areas of existing fire hazard abatement, as they could not be estimated based on available information; such areas will be excluded from the take or impact calculations conducted during implementation of the plan (Section 5.7.2). Therefore, the disturbance envelopes used in this analysis likely overestimate the actual habitat impacts and thus take or impacts to the covered species. This overestimate may be large for projects occurring in or near existing developed areas, such as developed parcels or the County right-of-way.

The disturbance envelopes correspond to the sizes outlined in Section 2.2, and Tables 2-6 through 2-8. Tables 2-6 and 2-7 outline the assumptions for the private development and redevelopment, respectively. These estimates were based on the patterns of existing development within Los Osos.

For capital projects (Table 2-8), the disturbance envelopes were largely estimated by the project proponents; where size estimates were not provided, the envelopes were estimated based on the dimensions of typical projects, and assumptions about the adjacent area that would be disturbed. As noted, although County Parks has numerous projects planned, only half of these projects are likely to be implemented during the course of the 25-year permit term; therefore, the estimated total disturbance envelope of County Parks Projects (65.6 acres) was cut in half (32.8 acres) for purposes of conducting this take or impact assessment.

Step 2: Determine the vegetation or other land cover types that are likely to be impacted. The vegetation or other land cover types that will be impacted by each covered activity were quantified using geographic information system (GIS) featuring the best available vegetation map for the region (Section 3.1.5, CMCA 2004). Impacts were assessed using one of two main methods, depending on whether the location of the covered activity was known.

a. **Projects with Known Locations:** For activities with a known location, such as mapped project footprint (e.g., drainage basin) or specific parcels that will be entirely impacted (e.g., the Los Osos Community library parcel), the vegetation and other land cover mapped that occur within the anticipated project area were characterized as being impacted in this analysis. Similarly, the impacts of projects known to occur within the County right-of-way, such as road and major pipeline projects, were allocated to this largely developed portion of the Plan Area.

b. **Projects with Unspecified Locations:** For activities without known locations, the impacts to vegetation and other land cover types were extrapolated based on their proportional occurrence within the broader geographic area in which the activity is anticipated to occur. For example, development of a 5-acre facility on a 10-acre parcel featuring 2 acres of coastal sage scrub and 8 acres of central maritime chaparral is presumed to result in the loss of 1 acre of coastal sage scrub and 4 acres of central maritime chaparral.

   When conducting such extrapolations to estimate vegetation and other land cover impacts, available information was used to attribute the habitat impacts to the most accurate area possible, given the available information (Table 4-1). Extrapolations were conducted for a variety of different geographic areas, including:

   i. **Parcels:** For activities anticipated to impact a given parcel, the acres of impact were allocated proportionally to the vegetation and other land cover types mapped within the parcel;

   ii. **Service Areas:** For activities anticipated to occur within the service area of a specific water purveyor (e.g., Golden State Water), the impacts were allocated proportionally to the vegetation and other land cover types within the service area; and

   iii. **Inside the Urban Services Line:** For projects anticipated to occur within the largely developed portion of the LOHCP Area, such as development of a new County park, impacts were allocated proportionally to the vegetation and land cover types occurring within the Urban Services Line (USL).

When extrapolating impacts, vegetation and other land cover types were excluded from the proportional allocation if they were assumed unlikely to be impacted by the activity. Most notably, impacts to wetland and riparian vegetation, as well as open water, were excluded from most development projects, as impacts to these habitats will not be covered by the LOHCP; therefore, it is assumed in this analysis that such covered activities will be sited in other habitats.

Where actual mapped project footprints contained riparian and wetland vegetation, or open water habitat, these habitat impacts were tabulated so that the total anticipated disturbance envelope would equal to the total vegetation and other land cover type impacts (Tables 4-2 and 4-3). However, take of other listed species that occur in these habitats is not covered by the permit issued by the LOHCP; therefore, proponents of projects in these areas must either avoid

such habitats, or demonstrate that they have complied with state and federal regulations for these non-covered listed species before they can receive take coverage under the LOHCP take permit (Section 6.3.1).

Step 3: Characterize the Activity Location with Respect to the Urban Services Line. The urban services line largely circumscribes the area of greater existing development density within the LOHCP Area (Section 2.1.1). Habitat within this area is generally considered to have lower long-term conservation value for the covered species. In order to assess the relative impacts of habitat loss on the covered species, the impacts of covered activities were assessed based on their location with respect to the USL.

As with the assessment of impacts to vegetation and other land cover, this assessment was conducted using GIS following one of two approaches:

- **Specified Project Location**: In many cases, the location of covered activity was known and thus could be attributed as occurring inside or outside of the USL; and
- **Extrapolate by Area:** Where the precise location of the activity was unknown, its impacts were allocated to habitats inside or outside of the USL based on assumptions about where it might occur. For example, if a Golden State Water capital improvement project lacked a specific location, its impacts were allocated as 65% inside and 35% outside the USL (35%), as these are the percentages of the utility's service area located inside and outside of the USL.

Step 4: Estimate the Permanent and Temporary Impacts. The impacts of each covered activity were broken down into the percentages of permanent and temporary impacts, based on available information about the nature of the activity and its impacts on habitat. As defined above, permanent impacts remove habitat; therefore, the percentage of the disturbance envelope to be covered with impervious surfaces or other non-habitat land cover (e.g., mulch) was characterized as permanently impacted.

Temporary impacts occur when vegetation and perhaps soil are disturbed but not permanently covered, such that habitat within the affected area is revegetated and otherwise restored to the conditions pre-project or to an improved condition. Temporary impacts commonly result during project construction, when habitat is impacted to install infrastructure or access the building site and is later restored. The area of temporary impacts for each project was estimated as a percentage of the total disturbance envelope based on available information about the project including its construction methods and dimensions.

Importantly, areas that will be chronically disturbed by covered activities were characterized as permanently impacted for purposes of this take/impacts assessment, as these areas are unlikely to be restored or otherwise contribute to the viability of the covered species populations. For example, drainage basin maintenance, which requires annual removal of accreted soil and established vegetation, was characterized as having 100% permanent impacts even though the area could be revegetated between treatments. Areas of fuel modification to create and maintain defensible space, as required by state and local fire departments (i.e., under Public Resources Code 4291; CAL FIRE 2020) is similarly regarded as permanently impacted since ongoing vegetation removal is needed to maintain the fuel reduction standards. This ongoing

vegetation removal will significantly impair the ability of the area to support the covered species, such that it will be regarded as permanently impacted.

Step 5: Estimate Impacts to Morro Shoulderband Snail and Morro Manzanita Habitat. To assess impacts to Morro manzanita and Morro shoulderband snail habitat, the vegetation and land cover types were categorized as follows:

1. **Habitat:** For Morro manzanita, this designation was applied to vegetation types that are suitable and has a high potential to be occupied;
2. **Primary Habitat:** for Morro shoulderband snail, this designation refers to native vegetation types where the species is preferentially found;
3. **Secondary Habitat**: for Morro shoulderband snail, these areas are either native vegetation types in which the species is found at lower frequency and/or abundance, or anthropogenic land cover types (e.g., Ruderal Disturbed) where the species may occur at higher frequency and/or density than in native vegetation types as described in Sections 3.2.2.1 and B.1.6.
4. **Non-habitat:** vegetation or land cover types that are generally not suitable and unlikely to be occupied.

Table 4-4 identifies the vegetation and land cover types within each habitat category for each species, while Table 4-5 illustrates the permanent and temporary impacts to their habitats, which are illustrated in Figure 4-1 (Morro shoulderband snail) and Figure 4-2 (Morro manzanita).

Due to their extreme rarity within the Plan Area, the impacts of the covered activities on Indian Knob mountainbalm and Morro Bay kangaroo rat were evaluated based on the likely impacts to individuals, rather than habitat. To quantify the habitat benefits that will result from implementation of the conservation program, Morro Bay kangaroo rat was assumed to benefit from protection, restoration, and management of coastal sage scrub and central maritime chaparral communities, as the species can occur in the latter when they are managed for open conditions (Section 3.2.2.2). Habitat benefits for Indian Knob mountainbalm were assessed based on protection, restoration, and management of central maritime chaparral communities.

Implementation of avoidance and minimization measures developed for the fire hazard abatement measures as part of the Community Wildfire Protection Plan (Section 5.2.4, Table 5-4) will avoid impacts to Morro Bay kangaroo rat and Indian Knob mountainbalm. These measures will also reduce take of Morro shoulderband snail in the form of injury or mortality and reduce the severity of impacts to Morro manzanita caused by trimming of individual shrubs. As a result, the CWPP will result in only short-term negative impacts to the covered species and their habitat, which are anticipated to benefit from the vegetation modifications including invasive plant removal in the long term.

Given the limited scope of the CWPP and the requisite avoidance and minimization measures that will be implemented to protect the covered species during fire hazard abatement (Table 5-4), implementation of the CWPP is expected to have a negligible effect on the covered species. Habitat impacts are anticipated to be temporary: they do not convert the land to hardscape or other impermeable surface. Instead, the treated areas will support native plants and intact soils that can support the covered species. Additionally, certain aspects of the CWPP fire hazard abatement treatments have the potential to improve habitat conditions for covered species in the long term, by removing invasive plant species and creating early-successional conditions required by Morro Bay

kangaroo rat. Accordingly, this covered activity was not subject to the quantitative analysis of direct effects that is outlined above, and that was used to tabulate habitat impacts in this chapter. Nonetheless, the take and impacts of CWPP treatments on the covered species are assessed qualitatively in Sections 4.2 and 4.3.

4.1.2 Indirect Effects

The covered activities can also indirectly, negatively affect the covered species, by degrading adjacent habitat, fragmenting habitat, and increasing human activity in the area.

4.1.2.1 Habitat Degradation

Through a variety of mechanisms, the covered activities can lead to the degradation of habitat in adjacent areas, including existing protected lands as well as habitat that will be protected through implementation of the LOHCP conservation program (Section 5.3). Generally speaking, habitat degradation is the reduction in the quality of the habitat due to anthropogenic factors, including those outlined below, which can reduce or eliminate the ability of the covered species to inhabit these areas. Resulting population reductions can reduce their long-term viability, as smaller populations are more susceptible to demographic and environmental stochasticity—chance events in population demography and environmental conditions, respectively, which can reduce populations and result in extirpations (localized extinctions), to which small populations are more vulnerable (Gilpin and Soulé 1986, Land 1993, Matthies et al. 2004). Habitat degradation causes population bottlenecks that can reduce genetic diversity, which can reduce individual fitness and thus population growth (Keller et al. 1994, Young et al. 1996). Small populations can ultimately suffer from inbreeding depression—the reduced fitness (performance) of a population as a result of breeding of related individuals (Hedrick and Kalinowski 2000, Keller and Waller 2002).

The following sections describe specific mechanisms by which the covered activities could indirectly degrade habitat for the covered species. These and other factors will be the focus of habitat restoration and management conducted within the LOHCP Preserve System to mitigate the impacts of the covered activities (Section 5.3).

4.1.2.1.1 Promote the Invasion or Spread of Exotic Species

Some covered activities can indirectly degrade habitat for the covered species by promoting the invasion and spread of exotic plants and animals, which threaten the persistence of many endangered species (Wilcove et al. 1998), including the covered species (USFWS 1994, 1998, 1999, 2006, 2008, 2011b, 2013, and 2020a). When abundant, exotic plants reduce the ability of habitat to support populations of native species both directly, through competition (Carlsen et al. 2000), and indirectly, by altering habitat conditions so that they are no longer suitable (D'Antonio and Vitousek 1992, Levine et al. 2003). Exotic animals may similarly affect the covered species. For example, the brown snail (*Helix aspersa*) is hypothesized to compete with the Morro shoulderband snail (USFWS 1994), while domestic cats (*Felis catus*) and European red foxes (*Vulpes vulpes*) may date predate upon native mammals including the Morro Bay kangaroo rat (USFWS 2011b).

Human activities can promote the invasion and spread of exotic species through a variety of mechanisms. For plants, these include:

1. Planting exotic plant species into landscapes, from which they spread into adjacent habitat;
2. Removing vegetation or disturbing soil, which can promote establishment and growth of disturbance-adapted exotic plants;
3. Vectoring seed of exotic plants into intact habitat areas on their clothes, pets, stock (e.g., horses), or equipment.

The occurrence of exotic animals in habitat areas can similarly be promoted by the covered activities. Development can increase the density of dogs and cats and their proximity to habitat areas. Non-native snails can similarly spread from nearby gardens and landscapes where they are introduced, and their populations are promoted by watering and other horticultural activities.

4.1.2.1.2 Promote Incompatible Fire Management

Some of the covered activities can indirectly negatively impact the covered species by further altering the fire regime of the Baywood fine sand communities. Fire is a natural component of the disturbance regime in the ecosystem, and the covered species exhibit many adaptations to fire and the conditions it creates. Fire promotes Morro manzanita seed germination and creates conditions appropriate for seedling establishment (Tyler et al. 2000). Fire similarly is thought to promote establishment of Indian Knob mountainbalm from seed as well as vegetatively (Wells 1962, USFWS 1998a). Fire is thought to have played an important role in maintaining early successional conditions characterized by a low density of subshrubs and perennial herbs (e.g., *Croton californicus, Horkelia cuneata,* and *Acmispon glaber*), which is the preferred habitat of Morro Bay kangaroo rat (USFWS 1999). Fire may similarly create and maintain habitat for Morro shoulderband snail, which occurs in coastal sage scrub but is not typically observed in later-successional central maritime chaparral; however, the species is itself vulnerable to mortality due to fire (Roth 1985, Walgren 2003a).

Within the LOHCP Area, fires are suppressed in order to protect lives and property. Removing fire from the ecosystem may threaten persistence of the fire-adapted covered species. For Morro manzanita and Indian Knob mountainbalm, an excessively long fire return interval (time between fire) can lead to senescence of the adult population without regeneration of a cohort (group) of seedlings of sufficient density to replace them (Tyler et al. 2000). Likewise, a long fire-free period may result in canopy closure in coastal sage scrub and ultimately succession to central maritime chaparral or coast live oak woodland, thus degrading habitat for Morro Bay kangaroo rat and Morro shoulderband snail (USFWS 1998a, 1999).

Although unlikely to alter the current policy of fire suppression, implementation of the covered activities may exacerbate fire exclusion by further impeding the use of fire as a management tool (e.g., prescribed fire) in protected lands, where it can be used to promote the natural community structure and species composition of the Baywood fine sand communities and the populations of the covered species. Increased density of human development in proximity to parks and ecological reserves could increase the concern about the threat to public health and safety posed by fire management.

The covered activities may also indirectly impact the covered species by facilitating human-caused fires. The covered activities will increase the population density and the proximity of development to protected lands, both of which will increase the probability of a wildfire occurring in the protected habitat areas. Such wildfires can cause mortality of the covered species and could lead to the extirpation of Morro Bay kangaroo rat and Indian Knob mountainbalm which occur at extremely low density. Fires

could similarly eliminate occurrences of Morro shoulderband snail (Walgren 2003a). Due to the fragmented nature of the remaining habitat, recolonization of habitat following fire may be inhibited.

In addition to killing individuals and potentially extirpating occurrences or populations, fire may negatively impact the covered species populations by causing soil erosion, which can preclude native plant re-establishment, and by promoting the invasion and spread of exotic plant species. Many exotic plants are adapted to establishing within the low-litter, open-canopy conditions created by fire (Hobbs and Huenneke 1992, Haidinger and Keeley 1993).

The risk of wildfire in the region, which results from high-density development occurring immediately adjacent to fire-prone vegetation, has promoted vegetation management projects designed to reduce the risk of wildfire, such as the CWPP (Section 2.2.7). Such vegetation management projects, which are often conducted by fire safe councils and fire prevention agencies, can include establishment of shaded fuel breaks at the wildland-urban interface, which are designed to reduce the risk of wildfire and slow its rate of spread. Efforts to conduct vegetation management may be intensified as a result of implementation of the covered activities, due to the increased development and thus risk of lives and property. Such vegetation management projects have the potential to negatively impact the covered species directly, by killing Morro manzanita and Morro shoulderband snail, which can be trampled during vegetation removal, and also by removing suitable habitat, including downed woody debris used by Morro shoulderband snail. Vegetation management projects can also impact the covered species indirectly, by promoting the invasion and spread of exotic plants, which are often promoted by disturbance and thrive in the open-canopy conditions of shaded fuel breaks.

Vegetation management projects also have the potential to promote populations of the covered species, by simulating the beneficial effects of fire in this fire-adapted system; for example, vegetation management can possible be used to re-create early successional conditions in coastal sage scrub that are required by Morro Bay Kangaroo rat. Likewise, vegetation management projects can also potentially promote regeneration of Morro manzanita populations facing 'senescence risk' (Odion and Tyler 2002), where prescribed fire is not feasible. Research and monitoring will be needed to fully evaluate the positive and negative, short-term and long-term, effects of vegetation management and other fire management in the LOHCP Area.

4.1.2.1.3 Promote Incompatible Recreation Activities

Some of the covered activities can indirectly negatively impact the covered species by increasing the frequency of recreation within remaining habitat areas. New development will increase the human population overall, as well as increase the proximity of development adjacent to parks, reserves, and other open spaces. The covered activities include creation of new trails within Los Osos, some of which will connect developed areas to parks and reserves on the perimeter of the Plan Area (Table 2-8, Figure 2-5). As a result, these areas will likely receive more frequent use, including both allowed use of trails for passive recreation, as well as unauthorized uses.

Like all disturbances, recreation impacts plant communities and species in various ways, which depend on the type, areal extent, and frequency of the use; these factors can interact with conditions of the habitat in which they occur, including the topography (e.g., slope), soil conditions, and vegetation, to determine the ultimate effects of the use (Section D.2.1). Generally speaking, recreational use will have greater impacts if it occurs on steep slopes with loose, sand soil, or other erosive soil, where vegetation removal renders slopes vulnerable to erosion, which further degrades habitat through soil loss. Negative

impacts of recreation can be reduced by siting trails appropriately and implementing measures to facilitate compliance with the trail use provisions, including installing signage and symbolic fences, and conducting trail patrols.

4.1.2.1.4 Increase Pollution including Nitrogen Deposition

The covered activities have the potential to indirectly impact the covered species by increasing pollution. Greater human development and associated activities including automobile use in the region can increase concentrations of nitrogen in the atmosphere, the deposition from which can fertilize the otherwise low-nutrient Baywood fine sand soil. This could promote the invasion and spread of exotic plants, particularly annual grasses, and can be promoted by increased nitrogen (Weiss 1999, Brooks 2003, James et al. 2011). These and other exotic plants can complete with the covered plant species, degrade habitat conditions for the covered animal species, and create fine fuels that can increase the risk of wildfire, which can further degrade habitat (Section 4.1.2.1.2).

4.1.2.2 Habitat Fragmentation

The covered activities can indirectly, negatively impact the covered species by fragmenting their habitat. Private development and capital public and private utility projects including roads and trails can fragment habitat for less mobile species, including Morro shoulderband snail and plants that are lack long-range seed dispersal mechanisms, such as wind or dispersal by wide-ranging animals (e.g., medium and large mammals or birds).

Like habitat loss, habitat degradation can fragment remaining covered species habitat. For example, fire suppression that converts coastal sage scrub and central maritime chaparral communities to coast live oak woodland also fragments remaining habitat for the covered species, which preferentially occur in the shrublands.

Fragmentation can effectively isolate groups of individuals, thus creating multiple smaller populations where from one large population (Primack 2002, Fahrig 2003). By eliminating or greatly reducing the likelihood of immigration into newly separated habitat patches, fragmentation reduces population size and therefore the likelihood of population persistence amidst demographic and environmental stochasticity (Gilpin and Soulé 1996, Hanski 1998). Fragmentation also limits opportunities for a “rescue effect”, whereby immigration from an adjacent patch can boost population growth (Brown and Kodrick-Brown 1997, Hanski et al. 1995). In doing so, fragmentation can decrease genetic diversity by reducing population size and causing genetic bottlenecks. Small, fragmented populations can ultimately suffer from inbreeding depression, which can further imperil the covered species populations. This scenario is likely for Indian knob mountainbalm, given its exceptionally population small size.

To mitigate these potential effects, the LOHCP conservation program includes habitat protection, restoration, and management measures, including efforts to maintain habitat connectivity and protect large contiguous blocks of habitat that can promote long-term viability of the covered species (Chapter 5).

4.2 Anticipated Take of Covered Animals

The following sections integrate the qualitative assessment of indirect effects and quantitative and qualitative assessments of direct effects to characterize the anticipated take of the covered animal species. The assessment of net impacts compares the anticipated negative effects of the covered activities, to the positive benefits anticipated from implementation of the LOHCP conservation program, based on the LOHCP Preserve System configuration scenario (Section 5.8.1).

4.2.1 Morro Shoulderband Snail

The covered activities will impact Morro shoulderband snail individuals and habitat both directly and indirectly, causing take as defined under ESA. The effects of these impacts will be offset by the protection, restoration, and management of habitat in the LOHCP Preserve System (Section 5.3) and are not anticipated to affect the long-term persistence of the species within the LOHCP Area or throughout its range.

4.2.1.1 Impacts to Habitat

The covered activities (other than the conservation program and CWPP) are anticipated to impact approximately 189 acres of primary habitat for Morro shoulderband snail (Table 4-5) which is defined as including all types of coastal sage scrub and open communities within maritime chaparral in the Plan area (Table 4-4, Figure 4-1). This represents 20 percent of the species primary habitat (935 acres) within the Plan Area; 48 percent (445 acres) is within existing protected lands, and an additional 37 acres (4 percent) is anticipated to be protected through habitat protection efforts conducted as part of the LOHCP conservation program (Section 4.2.1.3).

The covered activities are anticipated to impact an additional 289 acres (15%) of the 1,898 acres of secondary habitat Morro shoulderband snail (Table 4-5). This secondary habitat largely consists of existing developed areas and County rights-of-way, where prior surveys have detected the species (Table 4-4, Figure 4-1). Ongoing monitoring for Morro shoulderband snail as part of the conservation program for the Los Osos Wastewater Treatment Project has revealed that Morro shoulderband snail frequently inhabit, and are often found at high abundance, in such ruderal and disturbed areas (SWCA 2013, 2014, 2015, 2016, and 2017), hence their inclusion in the analysis of take and habitat impacts.

The estimated area of primary and secondary habitat to be impacted by the covered activities is likely greater than the actual acres supporting Morro shoulderband snail that will be impacted, as the species is unlikely to occupy the entire area of mapped as primary and secondary habitat. Moreover, many projects can avoid or reduce the direct impacts to habitat or individuals, by implementing the required protection measures, including by siting the project disturbance envelope away from occupied habitat (Section 5.2).

Of the total 478 acres of habitat for Morro shoulderband snail anticipated to be impacted, 429 acres (90%) is located inside the urban services line (Table 4-5, Figure 4-1)—the portion of the Plan Area that is already densely developed (Section 2.1.1), and where the Estero Area Plan will focus remaining development (Section 2.1.2.2). When compared with habitat outside of the USL, habitat within the USL is generally more degraded, in that it features higher cover by exotic plants and lower native plant cover due to vegetation management (e.g., frequently mowing), intense recreational use, and other historic

and current land uses. Habitat within the USL also occurs primarily on small parcels, which are highly fragmented by roads and other development. While surveys document the occurrence of Morro shoulderband snail in fragmented and degraded habitat, such areas provide lower long-term conservation value for the species. Due to the small size and degraded nature of the habitat patches, in the USL, the Morro shoulderband snail population there is likely smaller and more vulnerable to extirpation due to environmental or demographic stochasticity (than habitat of the same size outside of the USL). If Morro shoulderband snail becomes extirpated from habitat patches in this area, the probability of recolonization is lower due to habitat fragmentation, which will constrain dispersal of this species.

An estimated 30 acres of habitat and 20 acres of secondary habitat for Morro shoulderband snail habitat located outside of the USL will be impacted by the covered activities (Table 4-5, Figure 4-1). This will primarily be due to low-density residential development and redevelopment on primarily larger parcels, though some public and private utility projects will also impact small areas of habitat in this area.

The LOHCP caps the disturbance envelopes for private development outside of the USL (30,000 square feet; Table 2-6), and requires on-site habitat set-asides for new development on parcels in the within the Priority Conservation Area (Section 5.7.2.1.1), which includes much of the area outside of the USL. These Plan requirements are collectively designed to promote persistence of Morro shoulderband snail on even developed parcels in order to support populations in protected habitat and habitat connectivity and landscape permeability in this area.

Of the total 478 acres of suitable and potentially suitable habitat for Morro shoulderband snail impacted by the covered activities, 59 acres (12%) is anticipated to be temporarily impacted (Table 4-5). This represents the area adjacent to, or in the access path of, the improvement area, which will be degraded as a result of construction. These habitat areas will be restored to the pre-project or better habitat condition as part of the measures to minimize impacts to the covered species (Section 5.2).

Fuel hazard abatement treatments implemented as part of the CWPP are anticipated to impact 45.6 acres of Morro shoulderband snail primary habitat, as well as 15.7 acres of secondary habitat for this species in addition to the acreages identified in Table 4-5. These treatments, as well as other fuel breaks created on lands within the Preserve System to protect habitat from wildfire, can include removal of dead plants, thinning and selective removal of shrubs and trees, as well as mowing of non-native grasslands. They are anticipated to have temporary impacts on Morro shoulderband snail habitat, by removing plants used by the species for cover and food. By targeting invasive plants, such as eucalyptus, veldt grass, and exotic annual grasses, fuel hazard abatement projects have the potential to promote growth of native plant species and enhance habitat conditions in the long-term[16]. Nonetheless, these treatments have the potential to negatively impact Morro shoulderband snail habitat in the short term, and cause take in the form of capture, to move individuals within the treatment areas out of harm's way (Section 5.2.4, Table 5-4).

[16] The *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (McGraw 2020; Appendix M) outlines a prescription for the fuel break within the Bayview Unit of the Morro Dunes Ecological Reserve, that is designed to maximize beneficial effects of fuel reduction for the covered species.

4.2.1.2 Impacts to Individuals

The covered activities will impact Morro shoulderband snails occurring within their disturbance envelopes, where vegetation removal and soil disturbance can cause individuals to be trampled, crushed, buried, or otherwise injured or killed. These impacts will be reduced through implementation of the LOHCP avoidance and minimization measures, which for certain projects including the CWPP will include pre-project surveys to capture and relocate the species out of harm's way (Sections 5.2.1, 5.2.4, and F.2; Table 5-4).

Habitat modifications caused by the covered activities, whether permanent or temporary, can also increase Morro shoulderband snail vulnerability to exposure, including predation and desiccation. Similarly, vegetation removal can also reduce food availability by removing plant biomass. As a result, habitat impacts have the potential to impact individuals of this species.

The number Morro shoulderband snail individuals subject to take by the covered activities is impossible to predict for this programmatic plan and will likely vary for each covered activity depending on the nature of activity and the condition of the habitat that it affects. Notably, even non-native dominated habitat, including ruderal disturbed vegetation, and landscaping along County rights-of-way, can support relatively high concentrations of this species, as were observed during construction monitoring for the Los Osos Wastewater Plant (SWCA 2013, 2014, 2015, 2016, and 2017).

Impacts to individual Morro shoulderband snails may also result from implementation of the LOHCP conservation program. Pre-construction surveys and construction monitoring to capture and move individuals out of harm's way will greatly reduce take in the form of injury or mortality. Although such handling has some potential to cause take of Morro shoulderband snail in the form of injury or mortality, the incidence of this is low if the handling is done correctly (J. Vanderwier, pers. comm. 2017). Monitoring studies to track the status and trends of populations can similarly result in negative impacts to individuals handled and relocated during monitoring.

Morro shoulderband snail can also be impacted by habitat restoration and management activities, including erosion stabilization and revegetation, exotic plant control projects, and fire hazard abatement activities. Notably, Morro shoulderband snails may be impacted by the use of herbicides to control exotic plants as part of work to implement the LOHCP conservation strategy; specifically, to restore and manage habitat that has been degraded by veldt grass, exotic annual grasses, and iceplants. Morro shoulderband snails could be exposed to herbicides by ingestion and absorption while living in, or migrating through, a recently treated area. Direct herbicide spray or drift from spray could contaminate soil; leaves, stems, and branches of shrubs and other live plants; leaves, mold, and fungi in plant litter; and potential shelter sites for Morro shoulderband snails, including downed wood, rocks, or debris piles.

The potential effects of herbicide exposure for Morro shoulderband snail are unknown as most standard toxicology analyses do not test effects of pesticides on snails (USFWS 2018). A study found that the herbicide glyphosate caused genotoxicity to *Bulinus truncates*, an air-breathing, freshwater snail (Bakry et al. 2015). Aquatic snails exposed to glyphosate exhibited abnormalities in development and reproduction (Tate et al. 1997). However, atrazine was concluded to have no effects on four species of freshwater snails (Gustafson et al. 2015).

Exotic plant control and other restoration and management projects, which will be designed to improve habitat conditions and promote long-term population viability, will be implemented following methods to avoid or minimize impacts to Morro shoulderband snail (Section 5.2). For example, pre-project surveys and project monitoring will be used to capture and move out of harm's way any individuals observed. Treatments will be conducted in small-scale areas, where feasible, to avoid impacting large numbers of individuals; in addition, refugia will be maintained in or near treatment areas to facilitate recolonization of the affected habitat area.

Despite these measures, some impacts to individual snails may occur as a result of even well-designed and carefully implemented habitat management and restoration treatments. For example, in the Los Osos Wastewater Plant construction projects, Morro shoulderband snails were drowned after being attracted to puddles created in tarps used to cover equipment in a construction area (SWCA 2013). Implementation of the conservation program through an adaptive management framework, in which new information, including monitoring results, is used to enhance effectiveness of the program elements, will reduce the likelihood of such inadvertent take and related impacts.

Finally, Morro shoulderband snail individuals may be killed, injured, or otherwise harmed during implementation of the biological effectiveness monitoring protocols (Section E.2) and also pre-project surveys conducted to minimize impacts of the covered activities by moving individuals from harm's way (Section F.2). Long-term monitoring to examine the effectiveness of the conservation program at achieving the Plan biological goals and objectives (Section 5.1) will entail surveys for Morro shoulderband snail, to evaluate their distribution and abundance within the LOHCP Preserve System (Sections 5.4.2.1 and E.2). Surveys and counts for Morro shoulderband snail might also be used to evaluate the effectiveness of specific habitat restoration projects as part of project-specific monitoring (Section 5.4.2.2). Covered activities on selected parcels will also need to be preceeded by pre-project surveys in which biologists search for Morro shoulderband snails and then move them to suitable habitat that will not be impacted by the project (Section F.2) While these monitoring protocols and pre-project surveys will be conducted by highly-qualified, USFWS-approved biologists following procedures designed to avoid harming individuals, individuals will likely be taken in the form of harming and harassing, and a small number will even be inadvertently injured or killed.

4.2.1.3 Assessment of Net Impacts

The negative effects of the covered activities on Morro shoulderband snail populations will be offset by the beneficial effects that will result from efforts to protect, restore, and manage habitat within the LOHCP Preserve System—the network of protected lands that will be managed and monitored in perpetuity to promote populations of, and habitat conditions for, the covered species (Section 5.3).

In the scenario used for this analysis (Section 5.7.2.3.2), the LOHCP Preserve System will benefit 231 acres of habitat suitable for Morro shoulderband snail (Section 5.8.1; Table 5-10). Specifically, it is anticipated to protect and manage, in perpetuity, 49 acres of habitat suitable for Morro shoulderband snail that is currently unprotected and thus subject to development and other land uses that could degrade it. An estimated six acres of this newly protected habitat will be restored, to re-create habitat conditions where they have been severely degraded by erosion and dense exotic plant infestations (Section 5.7.2.3.2, Table 5-10).

The 386-acre Preserve System will also restore 26 acres of habitat suitable for Morro shoulderband snail and provide additional management for another 193 acres of suitable habitat within existing protected

lands; these parks and reserves feature some of the largest areas of remaining habitat, where additional restoration and management can promote species population sizes and viability. When these existing protected land acreages are multiplied by the mitigation equivalency or crediting ratios that relate the conservation value of acquiring, restoring, and managing new habitat to the value of not implementing the typical covered activity (Section 5.7.2.3.1), a total of 301-acre equivalents of Morro shoulderband snail habitat will benefit from the LOHCP Preserve System (Table 5-10). This reflects the greater quality and long-term viability of the habitat in the Preserve System compared to that which will be impacted by the covered activities. Therefore, protecting, restoring, and managing an equivalent of 139 acres of habitat in the LOHCP Preserve System will more than compensate, for the anticipated loss of 189 acres of habitat for the species due to the covered activities (Table 4-5). For these and other reasons outlined in Section 5.8, implementing the Plan is anticipated to have a large, positive effect for persistence of Morro shoulderband snail including by contributing to recovery.

4.2.2 Morro Bay Kangaroo rat

4.2.2.1 Impacts to Habitat

Covered activities permitted under the LOHCP are not anticipated to permanently impact habitat occupied by Morro Bay kangaroo rat. Suitable habitat for this species is primarily located outside of the USL. In areas of suitable habitat for the species, private development and public and private utility projects will only be permitted under the LOHCP pending a negative visual assessment, or as needed, a negative presence/absence survey (species not found; Sections 5.2.1 and F.1). Moreover, as part of the compensatory mitigation component of the LOHCP conservation program, the Implementing Entity will work with willing landowners to protect remaining private land featuring suitable habitat for Morro Bay kangaroo rat as part of the LOHCP Preserve System (Section 5.3); as a result, fewer covered activities (e.g., private residential development projects) are likely to be conducted than were included in the covered activities and thus take/impacts assessment (Table 2-8).

Suitable habitat for Morro Bay kangaroo rat may be temporarily impacted by fire hazard abatement treatments as part of the CWPP (Section 2.2.7), as well as other fuel breaks created on lands within the Preserve System to protect them from wildfire. Specifically, the creation of the Los Osos fuel break will require thinning plants on the perimeter of the County's Broderson Property and adjacent the Bayview Unit of the Morro Dunes Ecological Reserve, which is owned by the state and managed by CDFW (Figure 2-7). These treatments have the potential to enhance habitat for the endangered species, by removing invasive plants and dead or senescent vegetation, which can create more open habitat conditions preferred by this species.

Habitat suitable for Morro Bay kangaroo rat may be temporarily impacted by habitat management and restoration activities implemented within the LOHCP Preserve System as part of the Plan's conservation program (Section 5.3). Activities that will take place on existing protected lands, as well as new lands protected as part of the LOHCP, will include restoration of eroded areas such as old roads and trails, exotic plant control, and fire management including vegetation management to simulate the beneficial effects of fire (Section 5.3.3). These and other treatments designed to enhance habitat for Morro Bay kangaroo rat in the long term, may have short-term, negative impacts on habitat. These temporary effects can include soil disturbance and removal of native plants, which can temporarily reduce food availability for this herbivorous small mammal.

4.2.2.2 Impacts to Individuals

The covered activities will avoid take of Morro Bay kangaroo rat individuals, which will not be hunted, harmed, harassed, or captured, other than as part of surveys conducted to evaluate presence (Sections 5.2.1 and F.1) and to conduct long-term monitoring (Sections 5.4 and E.5). Prior to implementation of activities within potentially occupied habitat for the species, pre-project visual assessments and then surveys, if warranted, will be conducted to evaluate whether the species is present (Section 5.2.1). If the species is detected, all work will stop immediately, and the project proponents will contact CDFW and the USFWS to discuss project permitting. Take of individuals, in the form of hunting, pursuing, or killing, of this species will not be permitted under this plan (Section 1.4).

4.2.2.3 Assessment of Net Impacts

The short-term, negative effects of the covered activities on Morro Bay kangaroo rat habitat due to implementation of the covered activities will be offset by the long-term benefits that will result from protection, restoration, and management of suitable habitat for this species within the LOHCP Preserve System. Under the LOHCP Preserve Configuration scenario developed for this assessment (Section 5.7.2.3.2), the Preserve System will benefit 240 acres of coastal sage scrub, the preferred habitat for this species, and 110 acres of central maritime chaparral communities, which Morro Bay kangaroo rat can utilize when in an early-successional state. These habitat benefits will be accomplished through the following (Table 5-10):

- protecting and managing an estimated 33 acres of coastal sage scrub and 42 acres of central maritime chaparral communities that are currently unprotected;
- restoring 26 acres of coastal sage scrub and 9 acres of central maritime chaparral in existing protected lands, including through vegetation management projects to promote early successional habitat conditions; and
- actively managing an additional 226 acres of coastal sage scrub and 67 acres of central maritime chaparral communities within parks and reserves where habitat conditions can be improved through enhanced management to meet unmet needs (Section 5.3.3.1).

The covered activities are anticipated to impact just 189 acres of coastal sage scrub, and 18 acres of central maritime chaparral (Table 4-3). Therefore, the 475-acre equivalents of benefits to these communities that are anticipated to occur through implementation of the conservation program will offset the effects of the covered activities at a more than 2:1 ratio (Section 5.8.1 ; Table 5-10).
This ratio reflects the anticipated net benefits of the Plan for Morro Bay Kangaroo rat, as the habitat benefited by the conservation program has much higher viability than that which will be impacted by the covered activities. Specifically, of the 207 acres of coastal sage scrub and central maritime chaparral anticipated to be impacted by the covered activities, 166 acres (80%) is anticipated to be inside the Urban Services Line (Table 4-3). Habitat within this already densely developed portion of Los Osos has very little long-term conservation value for Morro Bay kangaroo rat, as the species is highly-sensitive to the effects of habitat fragmentation, including predation by domestic cats and dogs. In contrast, the 475-acre equivalents of habitat benefits resulting from protection, restoration, and/or management of 350 total acres of coastal sage scrub and central maritime chaparral communities in the 386-acre Preserve System (Table 5-10), will all occur in larger, contiguous habitat areas largely outside of the USL, including the Morro Dunes Ecological Reserve where the species was last observed. Restoration and

active management of this and other high-quality habitat areas are necessary to recover Morro Bay kangaroo rat (USFWS 1999, Section 5.8).

4.3 Anticipated Impacts on Covered Plants

The following sections integrate the qualitative assessment of indirect effects and quantitative and qualitative assessments of direct effects to characterize the anticipated impacts of the covered plant species.

4.3.1 Morro Manzanita

4.3.1.1 Impacts to Habitat

The covered activities will impact an estimated 40 acres of habitat suitable for Morro manzanita (Tables 4-4 and 4-5, Figure 4-2). This is the area of central maritime chaparral, as well as coast live oak woodland—the mapped vegetation types that can support the species—that are anticipated to be impacted by the covered activities, excluding the conservation program and CWPP (Tables 4-3 and 4-4). This represents just over five percent of the species total habitat (798 acres) within the Plan Area; 491 acres (62%) is within existing protected lands, and an additional 98 acres (12%) is anticipated to be protected through implementation of the Plan's conservation program (Table 5-10).

Implementation of the CWPP is anticipated to impact an additional 29.0 acres of Morro manzanita habitat, 19.1 acres of which are anticipated to be modified under the Plan for the first time; the remaining 9.8 acres have been previously modified and will just be treated to maintain the desired conditions (Section 2.2.7). In these areas, fuel reduction treatments may actually benefit Morro manzanita by stimulating seed germination and creating open canopy, bare mineral soil conditions that can promote seedling establishment. Conversely, these treatments may degrade habitat for Morro manzanita if they promote the invasion and spread of exotic plants, though these indirect negative effects can be prevented through follow-up invasive plant removal.

The estimated area of suitable habitat that will be impacted by the covered activities is greater than the actual acres covered by the Morro manzanita, as the species does not occupy the entire area of suitable habitat; most notably, the species likely occurs at only limited abundance within the 22.5 acres of coast live oak woodland that are anticipated to be impacted (Table 4-3). Coast live oak woodland was included as 'habitat' (Table 4-4) for purposes of this analysis, as the Morro manzanita occurs at low frequency and abundance in this community (Section 3.1.5.2.3). Moreover, some projects occurring on parcels supporting the Morro manzanita habitat can be sited so the project disturbance envelope avoids suitable habitat.

The impacts to suitable habitat for Morro manzanita are anticipated to occur nearly evenly inside (20.6 acres) and outside (19.5 acres) of the USL (Table 4-5, Figure 4-2). This results from inclusion of coast live oak woodland as Morro manzanita habitat; 67% of total impacts the central maritime chaparral communities, where the species occurs at greatest frequency and abundance, will occur outside the USL (Table 4-3). There, the impacts primary impacts will result from single-family residential development. Shrubs within the building footprint will be removed, as might some Morro manzanita individuals within the 100-foot area around structures in which woody vegetation must be well-spaced in order to maintain defensible space for fire safety (Section 2.2.4).

Of the 41 acres of habitat to be impacted, 5 acres (12%) is anticipated to be temporarily impacted. This represents the area adjacent to, or in the access path of, the improvement area, which will be degraded as a result of construction but will be restored to the pre-project or better habitat condition in order to minimize effects on the covered species (Section 5.2).

4.3.1.2 Impacts to Individuals

The covered activities will impact Morro manzanita individuals that occur within the disturbance envelopes of projects that are sited in areas where the species cannot be avoided. Established individuals will be killed as will viable dormant seed in the areas permanently covered by development, other impervious surfaces, and landscaping elements that are not conductive to the species (e.g., turf grass, weed matting etc.). Implementation of the CWPP minimization measure, which precludes removal of Morro manzanita and requires that canopy thinning and limbing be minimized (Table 5-4), will limit impacts to individuals associated the fire hazard abatement treatments within the CWPP (Section 5.2.4); however, some mortality may result from this covered activity. Overall, the number of individuals is impossible to predict for this programmatic plan and will likely vary for each covered activity depending on the nature of activity and the condition of the habitat that it affects.

Individual Morro manzanita may also be impacted during implementation of the conservation program. Individuals could experience die back (loss of biomass) or mortality due to use of herbicides to control invasive plants. The potential for this will be reduced through implementation of elements of an integrated pest management approach to exotic plant control, in which: 1) non-chemical treatments are used in areas supporting Morro manzanita, wherever possible, and 2) chemical treatments deemed necessary to achieve the management objectives are conducted using techniques that will prevent chemical contact with Morro manzanita, such as cut stump treatment or wicking, and foliar spray only away from Morro manzanita and when winds are calm.

Adult Morro manzanita shrubs are also anticipated to be killed by fire or fire surrogates—treatments that simulate the beneficial effects of fire, including mechanical vegetation removal. These treatments will be used to maintain the mosaic of natural communities of the Baywood fine sands ecosystem and promote regeneration of Morro manzanita and Indian Knob mountainbalm, among other fire-dependent species (Section D.3). These direct, negative, short-term impacts to the individuals are anticipated to promote long-term persistence of the populations by facilitating regeneration through germination of seeds of this obligate seeding plant from the soil seed bank (Section B.2.3). Fire and fire surrogates have the potential to facilitate the invasion and spread of exotic plants that are adapted to such disturbance and the conditions it creates (Section D.3.1.2). Accordingly, fire and fire surrogate treatments will be monitored to evaluate the establishment of exotic plants, and remedial treatments employed to limit exotic plant competition with Morro manzanita seedlings and other native plants. Other habitat management and restoration treatments, including revegetation of denuded areas, and control of exotic plants such as eucalyptus, will similarly enhance habitat for this covered species (McGraw 2020; Appendix M).

4.3.1.3 Assessment of Net Impacts

The negative impacts of the covered activities on Morro manzanita are anticipated to be greatly outweighed by the positive effects of implementation of the conservation program. The ratio of habitat

benefits to impacts for Morro manzanita is more than 8 to 1 (Section 5.8.1, Table 5-10). While the covered activities are anticipated to impact just 41 acres of habitat (Table 4-4), the Preserve System, which will contain 263 acres of Morro manzanita habitat, is anticipated to benefit 354-acre equivalents of Morro manzanita habitat (Chapter 8, Table 8-1). These benefits are anticipated to be accrued by the following aspects of the LOHCP conservation strategy (Table 5-10):

- Protecting 51.7 acres of habitat, of which approximately 5 acres will be restored and managed, and the remainder will be actively managed to address threats;
- Restoring 22.3 acres of habitat for this species within existing protected lands, including by conducting fire management to promote regeneration of the populations, as needed; and
- Actively managing an additional 189 acres of suitable habitat, to address factors that can degrade it including exotic plants.

The skewed ratio for Morro manzanita habitat benefits to impacts reflects the far greater proportion of central maritime chaparral habitat and to a lesser extent, coast live oak woodland, located in the Priority Conservation Area, where the Preserve System will be assembled, compared to the anticipated disturbance envelopes of the covered activities, which are largely within the USL (Table 5-10). The ratio of habitat benefits to impacts for central maritime chaparral is 8.5 to 1; for every acre of these communities that will be impacted, 8.5-acre equivalents will be benefited in the LOHCP Preserve System (Chapter 8, Table 8-1).

In addition, implementation of the LOHCP will have a strong net positive effect on Morro manzanita by funding long-term, active habitat management in an adaptive management framework, which is essential to ensure long-term persistence and recovery of this narrowly endemic, fire-adapted species. Fire or fire surrogates will be needed to maintain persisting populations of Morro manzanita; however, funds necessary to implement such intensive treatments are often not available. Moreover, the LOHCP provides a mechanism for coordination among landowners and agencies that is necessary to carry out such projects, which can have deleterious impacts on some species, at least in the short term. As a result, implementing the Plan is anticipated to have a large, positive effect for persistence of Morro manzanita including by contributing to recovery (Section 5.8).

4.3.2 Indian Knob Mountainbalm

4.3.2.1 Impacts to Habitat

The covered activities will impact an estimated 18 acres of habitat that is suitable for Indian Knob mountainbalm. This is the area of central maritime chaparral communities that is anticipated to be impacted by the covered activities other than the conservation program and CWPP (Table 4-3). Fire hazard abatement projects conducted to implement the CWPP are anticipated to impact an additional 20.9 acres of central maritime chaparral habitat which may be suitable for Indian Knob mountainbalm. The vegetation removal projects are anticipated to largely improve habitat conditions for this early-successional species, by mimicking the beneficial effects of a fire and creating more open canopy, bare mineral soil conditions which may promote plant establishment. However, the fuel reduction treatments may degrade habitat for Indian Knob mountainbalm if they promote the invasion and spread of exotic plants, though these indirect negative effects can be prevented through follow-up exotic plant control treatments.

4.3.2.2 Impacts to Individuals

The covered activities will not directly impact Indian Knob mountainbalm individuals, which will be avoided in this Plan. A 2016 survey in Los Osos found Indian Knob mountainbalm individuals occur in only two patches within the Plan Area, in the southeastern corner of the Bayview Unit of the Morro Dunes Ecological Reserve, which is owned by the state and managed by CDFW (Section 2.1.3.2.1); the species was not observed in the historic occurrence mapped within the County's Broderson Property (USFWS 2016).

The only covered activities anticipated to occur on the Morro Dunes Ecological Reserve are construction of the Los Osos fuel break as part of the CWPP (Figure 2-7), establishment of other fuel breaks needed to protect the Preserve lands from wildfire, and implementation of habitat restoration and management as part of conservation strategy for the Plan. To prevent impacts to individual Indian Knob mountain balm, which would constitute take under CESA and is not covered in this Plan or the ITP (Section 1.4), pre-project surveys for Indian Knob mountainbalm will be conducted prior to implementation of the CWPP, the conservation program, and any other projects within suitable habitat for the species (Section 5.2). If the species is present, the project proponent must take steps to avoid direct effects to individual plants as the County is not requesting a state incidental take permit for this species and therefore will avoid all direct impacts to individuals (Section 1.4).

To prevent die back (loss of biomass) or mortality due to use of herbicides to control invasive plants, herbicides will be applied using techniques that will prevent their contact with Indian Knob mountainbalm, such as cut stump treatment or wicking; foliar spray will only be permitted when winds are calm and will not be allowed within 50 feet of Indian Knob mountainbalm individuals.

If take of Indian Knob mountainbalm individuals cannot be avoided during implementation of the LOHCP conservation program, the County will contact the USFWS and CDFW to discuss project permitting requirements. Should the agencies determine that implementation of the conservation program may cause mortality to Indian Knob mountainbalm individuals, the County will first obtain a separate permit from the state, such as a state scientific, educational, or management permit issued pursuant Section 2081(a) of CESA. Such permits can be issued to cover restoration treatments designed to increase the size and thus viability of the population within the Plan Area and that would involve take of individuals, including the collection of seeds or cuttings to propagate plants that will be outplanted into suitable habitat. A state scientific, educational, or management permit would also be needed to cover any take of individuals resulting from the use of fire or fire surrogates to stimulate reproduction and create open habitat conditions that may promote regeneration. Such direct, negative, short-term impacts to individual Indian Knob mountainbalm plants, which are anticipated to be outweighed by the long-term benefits of the treatments and increase the population size and promote its viability, would need to be permitted through a separate state permits. Implementation of activities that result in take of individual Indian Knob mountainbalm (as defined under CESA) would also require reinitiating consultation with the USFWS for the LOHCP and ITP and may require a major amendment to the Plan (Section 6.7.3).

4.3.2.3 Assessment of Net Impacts

Like Morro manzanita, Indian Knob mountainbalm will benefit in the long-term from the protection of the central maritime chaparral habitat, which provides suitable habitat. The LOHCP Preserve System is anticipated to protect an additional 42.2 acres supporting central maritime chaparral communities.

When combined with the restoration of 8.5 acres and the management of 58.9 acres of central maritime chaparral within existing protected lands, the conservation program will benefit 155.5-acre equivalents of this endemic community which provides habitat that is potentially suitable for Indian Knob mountainbalm (Table 5-10). The covered activities will impact an estimated 18 acres of habitat, of which six acres are expected to be inside the densely developed Urban Services Line are (Table 4-3) where the active habitat management required to recover this species will be more difficult.

In addition to the anticipated more than 8-to-1 ratio of habitat benefits to impacts for central maritime chaparral, the LOHCP will promote recovery of Indian Knob mountainbalm by implementing management required to promote population growth, including fire management, that could increase the species distribution and abundance and thus promote long-term persistence. As a result, implementing the Plan is anticipated to have a positive effect for persistence of Indian Knob mountainbalm including by contributing to recovery (Section 5.8).

4.4 Effects on Critical Habitat

Under the federal Endangered Species Act, critical habitat is defined as "the specific areas within the geographic area occupied by a species on which are found those physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species."

The LOHCP features critical habitat that has been designated for Morro shoulderband snail and Morro Bay kangaroo rat. In addition, the Plan Area features a 1.5-acre strip of area designated as critical habitat for the Western snowy plover (*Charadrius alexandrinus nivosus*). This area is at the toe of the inland slope of the Morro Sand Spit on the extreme western boundary of the Plan Area within the Morro Dunes Natural Preserve in Montaña de Oro State Park. This area located outside of the LOHCP Permit Area (Section 1.3, Figure 1-2) and consequently will not be affected by the Plan's covered activities; therefore, it is not discussed further.

4.4.1 Morro Shoulderband Snail

Critical habitat was designated for Morro shoulderband snail on February 7, 2001 (USFWS 2001). Located entirely south of the City of Morro Bay, the area designated consists of land contained within three disjunct units that total 2,576 acres[17] (Figure 4-3; USFWS 2001):

- **Unit 1-Morro Spit and West Pecho:** This 1,831-acre unit includes the Morro Bay sand spit and foredune south toward Hazard Canyon in Montaña de Oro State Park, as well as the coterminous area west of Pecho Valley Road. The protection and recovery of this unit is essential to maintain the genetic diversity of the Morro shoulderband snail.
- **Unit 2-South Los Osos:** This 330-acre unit features critical habitat south of the residential area along Highlands Drive and north of the lower slopes of the Irish Hills. At the time of

[17] This is the acreage in a geographic information system shapefile produced by the USFWS, which was used in the spatial analysis for this Plan. The acreage differs slightly from the 2,556 acres listed in the critical habitat designation (USFWS 2001).

designation, this area contained what was considered to be a core population that could be expanded, and threats to the species reduced, with appropriate management.

- **Unit 3-Northeast Los Osos:** This 414-acre unit includes undeveloped areas between Los Osos Creek on the east and development on the west. The protection and recovery of this unit is essential to maintain the genetic diversity within the species and conserve the full range of ecological settings within which it occurs.

Of the total 2,575 acres of Morro shoulderband snail designated critical habitat:

- 2,192 acres (85%) is within existing protected lands, including Montaña de Oro State Park and Morro Dunes Ecological Reserve (Unit 1), the Broderson Parcel and the Bayview Unit of the Morro Dunes Ecological Reserve (Unit 2), and Morro Bay State Park and the Elfin Forest Natural Preserve (Unit 3; Figure 4-3); and
- 1,594 acres (62%) is located outside of the Plan Area.

Of the 981 acres (38%) inside the LOHCP Area, 695 acres (71%) is within existing protected lands. Of the 286 acres (29%) of designated critical habitat that is within the LOHCP Area and is not protected, approximately 87% is within the 412 already developed parcels; the remaining 13% lies within just 60 undeveloped parcels that feature land that is all or partially designated as critical habitat for Morro shoulderband snail. While private parcels of relatively high conservation value will be targeted for protection as part of the LOHCP conservation program (sections 5.3.2 and 6.2.2), the LOHCP will also cover private development and other public and private infrastructure projects in these areas. Based on the maximum disturbance envelope and parcel size distribution, development of vacant parcels could remove up to 37.5 acres of additional designated critical habitat for Morro shoulderband snail. Residential redevelopment projects, which are assumed to affect 10% of the residentially developed parcels, could impact another 14.2 acres. Finally, small public and private utility projects (e.g., road or pipeline work along South Bay Boulevard), as well as perhaps construction of the Los Osos Perimeter trail, and as some facilities maintenance projects have the potential to impact an estimated 2 acres of MSS critical habitat. In total, the covered activities are estimated to impact up to 53.7 acres of MSS critical habitat within the LOHCP Area.

Importantly, some of the land within the unprotected parcels lacks the physical and biological features that are essential to conservation of the species. These primary constituent elements are "sand or sandy soils needed for reproduction, a land slope not greater than ten percent to facilitate movement of individuals, and the presence of native coastal sage scrub vegetation, which was defined as typically but not exclusively represented by "California goldenbush, buckwheat, *Eriastrum,* chamisso lupine and *Dudleya*; and in more inland locations by California sagebrush, coyote brush and black sage" (USFWS 2001).

Implementation of the LOHCP conservation program will enhance critical habitat for Morro shoulderband snail in all three units, by contributing to the restoration and management of the existing protected lands with the exception of the Broderson property, which the County is managing as part of a separate habitat management plan (SWCA 2012). In doing so, the LOHCP will help achieve the objectives for designating the three units (USFWS 2001). The LOHCP conservation program may also protect additional designated critical habitat, through fee title acquisition or through on-site habitat set-asides dedicated as part of partial residential development of the remaining private parcels described above.

4.4.2 Morro Bay Kangaroo Rat

Critical habitat was designated for Morro Bay kangaroo rat in April 1977 (USFWS 1977). The single 689-acre unit includes the southern portion of the Morro Bay sand spit and adjacent habitat west of Pecho Valley Road (Figure 4-3); specifically, the southern half of section 14 and portions of Sections 23 and 24 that are west of Pecho Valley Road in T30S R10E of the Mount Diablo Base and Meridian.

The critical habitat is largely contained within the Morro Dunes Ecological Reserve and the northern portion of Montaña de Oro State Park, much of which is designated as part of the Morro Dunes Natural Preserve (Figure 4-3). Of the 672 acres contained within parcels (the remainder is outside of the parcel GIS database), 629 acres (94%) of the critical habitat area is already protected. An estimated 43 acres is within adjacent private land located west of Pecho Valley Road. Of this, 27 acres is contained in a total of eight vacant parcels, one of which is greater than five acres. Zoned for single-family residential land use, development of these parcels as part of the LOHCP could result in a loss of 3.9 acres of critical habitat. An estimated 1.6 acres of additional impacts to critical habitat for Morro Bay kangaroo rat could result from redevelopment on the 18 already-developed parcels, which total 16 acres, based on the estimate of 10% of the area to be further impacted by redevelopment (Table 2-1). Finally, construction of the Los Osos Perimeter Trail (Table 2-8) could impact a small area (i.e., 1.2 acres assuming the trail is one mile long and ten feet wide) though the alignment of this trail has not been determined. In total, the covered activities are estimated to impact 6.7 acres of critical habitat for Morro Bay kangaroo rat.

Implementation of the LOHCP conservation program will enhance critical habitat for Morro Bay kangaroo rat by contributing to the restoration and management of the Morro Dunes Ecological Reserve, which is proposed for inclusion in the LOHCP Preserve System (Table 5-5). The LOHCP conservation program may also protect additional designated critical habitat, through fee title acquisition or through on-site habitat set-asides dedicated as part of partial residential development of the remaining private parcels described above.

4.5 Cumulative Impacts

4.5.1 Analysis

The cumulative impacts are the incremental effects of the LOHCP taken together with the impacts of past, present, and reasonably foreseeable future actions, as required under NEPA (40 CFR 1508.7). In contrast with the analysis of cumulative impacts under Section 7 of the ESA, NEPA analysis of cumulative impacts accounts for incremental impacts of the action on the environment when added to other past, present, and reasonably-foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. The geographic area for analysis may be defined by the manifestation of direct or indirect impacts as a result of covered activities.

Under ESA Section 7 regulations, cumulative impacts are limited to the effects of future state or private actions that are reasonably certain to occur within the action area (50 CFR 402.02); the cumulative effects of federal projects, including projects that require federal permits or are federally funded, will be considered in future Section 7 consultations. In addition, the EIR/EA for the LOHCP presents a thorough analysis of the cumulative effects of all projects, federal and non-federal, when combined with the effects of the Plan. The internal consultation by the USFWS for the LOHCP will also address the Plan's cumulative effects.

4.5.2 Current Projects Not Covered by the LOHCP

The cumulative impacts of the LOHCP include the effects of prior projects causing take of Morro shoulderband snail permitted under individual low-effect HCPs. Eighteen HCPs affecting a total of 42.3 acres have been permitted by the USFWS and are in various stages of implementation in the Plan Area. In addition, California State Parks prepared an HCP in support of an incidental take permit for 0.41 acres of impacts to Morro shoulderband snail within Morro Bay State Park outside of the LOHCP Area (California State Parks 2008).

These projects are similar to the activities covered in this Plan, and therefore will likely have similar direct and indirect, permanent and temporary effects on Morro shoulderband snail (Section 4.2.1). The impacts of these projects will be mitigated through implementation of their respective conservation programs, which include habitat protection, restoration, and contributions to an in-lieu fee program which will fund projects to promote recovery of this species. Given their moderate size, and the occurrence of some in existing developed parcels that feature degraded habitat (e.g., Tenera 2010), the impacts of these projects, when considered with those of the LOHCP covered activities, are not anticipated to negatively influence recovery of Morro shoulderband snail or the other covered species.

Three prior HCPs are within designated critical habitat for Morro shoulderband snail, where they will impact up to 4.65 acres within the three units of critical habitat, with one project occurring in each unit.

Overall, the loss of 4.65-acres of critical habitat through the low-effect HCPs, when combined with the anticipated impacts of the LOHCP covered activities of approximately 53.7 acres of critical habitat, is not anticipated to degrade the overall function of the critical habitat for Morro Shoulderband snail, as 85% of critical habitat is protected within existing protected lands (Section 4.4.1) and the LOHCP will restore and manage critical habitat within the Morro Dunes Ecological Reserve, and help protect additional critical habitat in the Priority Conservation Area as part of the LOHCP Preserve System (Section 5.3).

4.5.3 Future Activities Not Covered by the LOHCP

Cumulative impacts also include the effects of future activities not covered by the Plan. The County does not anticipate any additional projects that will impact the covered species in the Plan Area, other than the covered activities (Section 2.2) and those activities that are specifically not covered by the Plan (Section 2.3). As part of work to develop this regional plan, the County contacted local and state agencies and private organizations that manage land within the Plan Area, to ascertain whether they anticipate conducting activities, including ongoing maintenance and operations and capital projects, that would impact the covered species. The activities identified by these entities were all included in the covered activities (Section 2.2). Take or impacts caused by activities on Bureau of Land Management Lands cannot be covered by an incidental take permit issued pursuant Section 10 of ESA and must instead be covered through the Section 7 consultation with the USFWS. The USFWS does not expect any take to occur on the 5-acre BLM parcel, which was also excluded from the potential LOHCP Preserve System (Section 5.3.3.1.2).

Soil-disturbing activities not covered by the LOHCP, including agricultural activities and activities for which the County does not issue permits, such as landscaping, have the potential to further impact the covered species directly and indirectly, causing both permanent and temporary impacts. Such projects

are anticipated to primarily impact Morro shoulderband snail, by causing direct mortality to individuals as well as temporary and permanent loss of habitat, as this species inhabits existing developed parcels and other degraded habitat areas. These activities will generally impact a small number of isolated individuals of Morro manzanita, which remain within existing developed areas. Non-covered activities may also affect suitable habitat for these and other covered species.

The magnitude of these effects is unknown though in general, they are anticipated to affect a small amount of habitat, most of which is highly degraded and lacks long-term conservation value due to its poor landscape context (i.e., fragmented nature and location within existing developed areas). The cumulative impacts of these activities, when considered along with the LOHCP covered activities and the impacts of other projects permitted through low-effect HCPs, are not anticipated to influence recovery of the covered species. Instead, implementation of the LOHCP conservation program as outlined in the next section of the Plan, is anticipated to have a net benefit for the covered species.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
County Parks and Recreation Department		
New Park in Los Osos	County Parks plans to build an approximately 10-acre park in a yet to be determined location likely within the Urban Services Line (USL).	Impacts were distributed proportionally to vegetation and other land cover types mapped within unprotected land within the USL. Because the project was anticipated to affect only undeveloped, upland vegetation types; impacts to developed areas and the County right-of-way (right-of-way), as well as wetland and riparian vegetation types and water were excluded. Within the project footprint, the habitat impacts from this construction project are anticipated to be 90% permanent, as this portion will be converted or lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.
Aquatic Center	County Parks plans to build 3.5-acre aquatic center in an undetermined location likely within the USL	Impacts were distributed proportionally to vegetation and other land cover types mapped within unprotected land within the USL. Because the project was anticipated to affect only undeveloped, upland vegetation types; impacts to developed areas and the right-of-way, as well as wetland and riparian vegetation types and water were excluded. Within the project footprint, the habitat impacts from this construction project are anticipated to be 90% permanent, as this portion will be converted or lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.
Los Osos Community Park Expansion	Count Parks plans to expand the Los Osos Community Park, which is estimated to impact the remaining undeveloped 1.6 acres on the parcel.	Impacts were allocated to the vegetation and other land cover types mapped within the project footprint. Habitat impacts from this construction project are anticipated to be 90% permanent, as this portion will be converted or lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Boat Ramp	County Parks plans to build a boat ramp, which is estimated to impact 1.5 acres of habitat near the Morro Bay shoreline.	Impacts were distributed proportionally to vegetation and other land cover types mapped within unprotected land located within 150 feet of the shoreline inside the USL. Impacts from this activity excluded developed areas and the right-of-way, as well as open water, where this project is unlikely to occur. Potential impacts to riparian and wetland habitat within these areas will not be covered by the LOHCP. Within the project footprint, the habitat impacts from this construction project are anticipated to be 90% permanent, as this portion will be converted or lost, and 10% temporary, as this area will be restored.
Coastal Access	County Parks plans to build 14 coastal access routes (i.e., trails to the coast), which would require some vegetation clearing and sign installation. Each route was estimated to be 200 feet long and 7-feet wide creating a cumulative 0.45-acre footprint.	Impacts of 13 routes located inside the USL were distributed proportionally to the vegetation and other land cover types mapped within 150 feet of the shoreline between Montaña de Oro State Park and Elfin Forest Natural Preserve. Impacts for the other route, which is in the vicinity of Costa Azul Drive outside the USL, were assigned to the vegetation mapped within the anticipated access area. This activity was not anticipated to affect developed areas, rights-of-way or open water. Potential impacts to riparian and wetland vegetation within these areas will not be covered by the LOHCP. Within the project footprints, the habitat impacts from these activities are anticipated to be 90% permanent, as this portion will be converted or chronically disturbed, and 10% temporary, as the adjacent area disturbed during construction will be restored.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
New Paths and Trails	County Parks plans to create sixteen new trails in the LOHCP Area. Of these, two are anticipated to be entirely within intact open space, five are expected to occur near existing streets, and nine are likely to be near existing streets but affect adjacent open space. To estimate the total area affected, each trail's approximate length was multiplied by 15 feet and rounded to the nearest quarter acre, resulting in a total 49.05-acre project footprint.	Impacts were assessed separately for trails occurring near existing streets and trails occurring within open space. Impacts within the 19.3-acre total footprint of trails anticipated to be constructed within open space were distributed proportionally to vegetation and other land cover types mapped outside the USL, excluding the following types in which trails are not likely to be built: wetland and riparian vegetation, open water, and developed areas and rights of way. The 29.75-acre total footprint of trails near existing streets was estimated to be comprised of 25% developed areas and 25% right-of-way. The remaining 50% of the impacts were distributed proportionally to the vegetation and other land cover types mapped within the USL, excluding wetland and riparian vegetation and open water which presumably will be avoided. Within the project footprints, the habitat impacts from trail construction are anticipated to be 90% permanent, as this portion will be converted or chronically disturbed, and 10% temporary, as the adjacent area disturbed during construction will be restored.
County Public Works Department		
Road Expansion	County Public Works plans to expand existing roads, to install turn lanes, and widen and realign roads in a 22-acre footprint of the existing right-of-way.	Impacts of road expansion were allocated to the right-of-way. Within the project footprints, the habitat impacts from road expansion are anticipated to be 90% permanent, as this portion will be converted or chronically disturbed, and 10% temporary, as the adjacent area disturbed during construction will be restored.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
New Roads	County Public works plans to extend Ramona and Doris avenues by 1,013 feet and 686 feet, respectively. They estimate Ramona Avenue would impact an 85-foot-wide area, and Doris Avenue would affect a 45-foot-wide area, resulting in a total 2.7-acre footprint for new roads.	Impacts to vegetation and other land cover types were based on the acres of each that are mapped within the project footprint. The habitat impacts from road construction are anticipated to be 90% permanent, as this portion will be converted or chronically disturbed, and 10% temporary, as the adjacent area disturbed during construction will be restored.
Bike Lanes	Public Works plans to install bike lanes in an 8-acre portion of the existing right-of-way.	Impacts of bike land construction were allocated to the right-of-way. Within the project footprints, the habitat impacts are assumed to be 60% permanent, as this is the portion of the outer roadway that will be converted or chronically disturbed, and 40% temporary as this area will be restored.
New Drainage Basins	Public Works plans to create 7 new drainage basins totaling 11.4 acres.	Impacts to vegetation and other land cover types were based on the acres of each that are mapped within the anticipated project footprints, which were mapped by County Public Works. Any impacts to riparian and wetland vegetation located within these areas will not be covered by the LOHCP. The habitat impacts from drainage basin construction are anticipated to be 90% permanent, as this portion will be chronically disturbed through basin maintenance activities, and 10% temporary, as the adjacent area disturbed during construction will be restored.
New Bioswales	Public Works plans to install new bioswales in the existing right-of-way that would impact approximately 6.6 acres.	Impacts of this activity were allocated to the right-of-way. As the bioswales can be revegetated, their construction was assumed to result in just 20% permanent impacts and 80% temporary impacts to the affected habitat.
Drainage Improvements	Public Works plans to implement drainage improvements throughout the right-of-way, which are estimated to affect a 7-acre area.	Impacts of drainage improvements were allocated to the right-of-way. The habitat impacts are anticipated to be 90% permanent, as this portion will be lost or chronically disturbed through ongoing maintenance, and 10% temporary, as the adjacent area disturbed during construction will be restored.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Road Maintenance	Public Works anticipates conducting annual road maintenance, including resurfacing roadways and vegetation management along roadsides, which would impact 5 acres.	Impacts of road maintenance were allocated to the right-of-way, where habitat impacts were assumed to be 100% permanent, due to the regular, chronic disturbance required to maintain roadways.
Maintain Drainage Basins	Public Works will annually maintain 10 sediment basins that total 4.9 acres, through removal of soil and vegetation management to maintain capacity.	Impacts to vegetation and other land cover types were based on the acres of each that are mapped within the footprints of the drainage basins. Potential impacts to riparian and wetland vegetation within these areas will not be covered by the LOHCP. Habitat impacts associated with maintenance of drainage basins were assumed to be 100% permanent, as the affected area will be disturbed annually (rather than affected then restored).
County Library Department		
Expansion of Los Osos Public Library	The County Library Department plans to expand the Los Osos Public Library, which is estimated to affect the 0.57-acre undeveloped area around the existing facility.	Impacts to vegetation were based on the acres of each type mapped within the project footprint. The habitat impacts from library expansion are anticipated to be 90% permanent, as this portion will be lost or chronically disturbed through maintenance activities, and 10% temporary, as the adjacent area disturbed during construction will be restored.
Los Osos Public Library Grounds Maintenance	The County conducts monthly vegetation management and associated activities to maintain approximately 0.4 acres of the grounds around the existing library.	Impacts were distributed proportionally to vegetation and other land cover types mapped within the library parcel that are outside of the library expansion project footprint. Habitat impacts associated with grounds maintenance were assumed to be 100% permanent, as the affected area will be disturbed chronically.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Los Osos Community Services District (LOCSD)		
Pipeline Projects	The LOCSD plans to build and maintain pipelines within the right-of-way. Installation and maintenance of the 2 to 16-inch-wide pipes were estimated to impact a 3.5-foot-wide area; based on their cumulative length, the projects are estimated to impact 2.6-acres.	Impacts from pipeline projects were allocated to the right-of-way, where this activity will be located. Within the project footprint, 40% of the habitat will be permanently impacted by an estimated 16-inch diameter pipe; the 60% temporary impacts reflect the adjacent area disturbed during construction that will be restored.
Ferrell Well Loop Upgrade	The LOCSD plans to disconnect a decommissioned well from the distribution system, which will impact a 1-acre area within the project parcel.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within the parcel boundary. The habitat impacts are anticipated to be 90% permanent, as this portion will be lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.
New Upper Aquifer Well at 8th & El Moro Yard	The LOCSD plans to drill a new upper aquifer well and install appurtenances, such as a skid-mounted nitrate removal equipment with a brine tank. The LOCSD estimates the project will impact the entire 0.5-acre parcel where it will occur.	Impacts to vegetation and other land cover types were based on the acres of each that are mapped within the project parcel. The habitat impacts are anticipated to be 90% permanent, as this portion will be lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.
New Water Tank at Highland Drive and Alexander	The LOCSD plans to install a new water tank that would impact the entire 0.11-acre target parcel.	Impacts were allocated to the vegetation and other land cover type mapped within the project parcel. The habitat impacts are anticipated to be 90% permanent, as this portion will be lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.
South Bay Upper Aquifer Well Nitrate Removal/Blending Project	The LOCSD plans to construct a 0.01-acre brine storage tank on a skid mounted unit within the right-of-way.	Impacts of the new facility were allocated to the right-of-way, where the habitat impacts are anticipated to be 90% permanent, as this portion will be lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
New Expansion Well	The LOCSD will install an expansion well on the north end of Sage Avenue as part of the Basin Management Plan. The project footprint was assumed to include a 0.023-acre area for the well and an additional 0.4-acre area for the pipeline (5,000 lineal feet x 3.5-foot-wide area of impact).	Impacts were allocated to the vegetation and other land cover types mapped within the intended project area. The habitat impacts are anticipated to be 33% permanent impacts (well footprint and 12" pipeline) and 67% temporary (disturbed area adjacent to the well and pipeline).
New Community Nitrate Removal Facility	The LOCSD and Golden State Water (GSW) intend to install a facility to remove nitrates from upper aquifer water supplies in a location identified in the Basin Plan for the Los Osos Groundwater Basin (2015).	The project was assumed to impact a 0.023-acre area. Within this area, impacts were distributed proportionally to the vegetation and other land cover types mapped within the anticipated project parcel. The habitat impacts are anticipated to be 90% permanent, as this portion will be lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.
Vegetation Management	The LOCSD plans vegetation maintenance including fuel reduction and tree trimming on 8 parcels totaling 4.9 acres.	Impacts were distributed proportionally to vegetation and other land cover types mapped within the parcels where the LOCSD conducts vegetation management, excluding the area that will be affected by sediment basins, facilities maintenance, or capital projects, for which impacts were estimated separately. Potential impacts to riparian and wetland vegetation within these areas will not be covered by the LOHCP. Due to the chronic disturbance they cause, vegetation management impacts were characterized as permanent.
Maintain Drainage Basins	The LOCSD plans to annually remove soil and vegetation to maintain the capacity of its 5 drainage basins which total 4 acres.	Impacts were allocated to the vegetation and other land cover types mapped within the basin footprints, three of which were supplied by County Public Works; the other two were digitized based on recent aerial images. Potential impacts to riparian and wetland habitat within these areas will not be covered by the LOHCP. Due to the chronic disturbance required to maintain them, sediment basin impacts to habitat were identified as permanent.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Facilities Maintenance	The LOCSD plans to conduct facilities maintenance including repairing storage tanks, booster pumps, generators, and other types of equipment and buildings on 7 of parcels totaling 2 acres.	Impacts were distributed proportionally to vegetation and other land cover types mapped within parcels in which the LOCSD maintains facilities. Potential impacts to riparian and wetland habitat within these areas will not be covered by the LOHCP. Due to the chronic disturbance they cause, facilities maintenance impacts were characterized as permanent.
CAL FIRE/Los Osos Community Services District		
Los Osos Community Wildfire Protection Plan	CalFire plans to conduct fuel hazard abatement projects in an 89.4-acre area at the wildlife-urban interface.	Impacts were assessed using the shapefile for the proposed project area (Figure 2-7). The area was assumed to be temporarily impacted. It was not included in the overall calculation of acres of habitat to be impacted, which was used to calculate the compensatory mitigation need, because the CWPP projects are assumed to have negligible impacts after implementation of project-specific avoidance and minimization measures (Table 5-4).
Golden State Water Company (GSW)		
Blending Project	As described in the Basin Plan for the Los Osos Groundwater Basin (2015), GSW plans to install pipelines to connect its lower aquifer Rosina and upper aquifer Skyline wells to the community nitrate removal facility. The total 3,254-foot-long pipelines are estimated to affect a 3.5-foot-wide area, and thus impact 0.261 acres.	Impacts of the pipelines were allocated to the right-of-way, where they are expected to be installed. Of the project footprint, 30% is anticipated to be permanently impacted by the approximately 12” diameter pipe; the remaining 30% of the area will be restored and therefore was assumed to be temporarily impacted.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Well Construction	The Basin Plan for the Los Osos Groundwater Basin (2015) states that GSW plans to construct a new upper aquifer and a new lower aquifer well within its service area, which would also require installation of a pipeline to connect the well to the water system	The well footprints were estimated to be 1,000 square feet (0.023 acres) each. The pipeline footprints were estimated to be 0.104 acres each based on the dimensions provided for the pipeline of the new aquifer well (1,300 lineal feet x 3.5-foot-wide area of impact). Impacts within the cumulative 0.254-acre footprint were distributed proportionally to vegetation and other land cover types mapped within the GSW service area, excluding wetland and riparian vegetation and open water which presumably will be avoided. The vegetation impacts were distributed according to the percentages of the GSW service area located inside the USL (65%) and outside the USL (35%). Within the project footprint, habitat impacts were assumed to result in 41% permanent impacts from the well and pipe footprints; the remaining 59% will be restored and assumed to be temporary.
New Expansion Well	As described in the Basin Plan for the Los Osos Groundwater Basin (2015), GSW plans to install an expansion well located in the vicinity of Sunny Oaks Mobile Home Park south of Los Osos Valley Road. The project footprint was assumed to include a 0.023-acre area for the well and an additional 0.2-acre area for the pipeline (2,400 lineal feet x 3.5-foot-wide area of impact).	Impacts within the cumulative 0.22-acre footprint were distributed proportionally to vegetation and other land cover types mapped within the GSW service area, excluding wetland and riparian vegetation and open water which presumably will be avoided. The vegetation impacts were allocated to within the USL, where the well is anticipated to be located. Within the project footprint, habitat impacts were assumed to be 36% permanent due to the well and pipe footprints; the remaining 64% will be restored and was assumed to be temporary.
Los Osos Valley Road Main Upgrade	To accommodate increased flows from new wells and well expansion, GSW plans to replace a 1,757-foot-long segment of the Los Osos Valley Road water main between Sea Oaks Drive and Tierra Drive with a larger, 12-inch diameter pipe.	Impacts of the water main were allocated to the right-of-way, where it is located. The project footprint is estimated to be 0.14 acres (1,757 lineal feet x 3.5-foot-wide area of impact). Of this, 30% is anticipated to be permanently impacted by the approximately 12” diameter pipe; the remaining 30% of the area will be restored and therefore was assumed to be temporarily impacted.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Major Plant Site Maintenance	Golden State Water anticipates 2.8 acres of impacts within their 10 facilities, which total 4.6 acres, will be further impacted through major plant site maintenance, including repairing water tanks, booster pumps, and filtration units, as well as building maintenance.	Impacts were distributed proportionally to vegetation and other land cover types mapped within the GSW's seven parcels and three additional facilities. Impacts to riparian and wetland vegetation and open water within the project footprints will not be covered by the HCP. Of the 4.6 acres impacted, 65% are anticipated to occur within the USL (3 acres) and 35% (1.6 acres) outside the USL. The habitat impacts were estimated to be 90% permanent due to major site and facility repair, and 10% temporary due to disturbance of adjacent habitat which will be restored.
Meter Box Maintenance	Golden State Water plans to maintain 2,673 meter boxes approximately twice per year by cleaning them out, maintaining the surrounding area, and replacing the meters and boxes as needed. This activity is estimated to impact 9 square feet per meter box or 0.552 acres total.	Because meter boxes are located on private development near the right-of-way, 40% of impacts were allocated to developed areas and another 40% of impacts were allocated to the right-of-way. To estimate the impacts to adjacent habitat, the remaining 20% of impacts were distributed to upland vegetation types to reflect potential impacts to adjacent habitat. The vegetation impacts were distributed according to the percentages of the GSW service area located inside the USL (65%) and outside the USL (35%). The impacts of this activity were characterized as permanent, as ongoing maintenance of meter boxes will result in chronic disturbance of the habitat.
Flush Water Mains	On an ongoing basis, GSW plans to flush pipelines, hydrants, and wharf heads. These activities are estimated to impact a total of 3,000 square feet (0.07 ac.), with each event affecting 100 square feet.	Impacts from flushing water mains were allocated to the right-of-way where water mains occur. There, habitat impacts were assumed to be 100% permanent, due to the regular, chronic disturbance required to maintain roadways.
Water Main Repair and Replacement	Based on its historic records, GSW anticipates 2,000 square feet (0.046 ac.) of vegetation will be impacted by the maintenance of water mains within their service area.	Impacts from repairing and replacing water mains were allocated to the right-of-way where water mains occur. There, habitat impacts were assumed to be 100% permanent, due to the regular, chronic disturbance required to maintain the pipelines.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Fire Hydrant Maintenance	Golden State Water indicated they would maintain 248 fire hydrants approximately once per year, through cleaning, painting, and testing. Occurring approximately once per year, this activity will impact approximately 9 square feet per fire hydrant for a total of 2,232 square feet (0.051 ac.).	Impacts from maintaining fire hydrants were allocated to the right-of-way where they primarily occur. There, habitat impacts were assumed to be 100% permanent, due to the regular, chronic disturbance required to maintain roadways.
S & T Mutual Water Company (S&T)		
Well Construction	The Basin Plan for the Los Osos Groundwater Basin (2015) indicates that S&T may construct three wells to replace their existing upper aquifer wells.	Each well footprint was estimated to be 1,000 square feet, for a total of 3,000 square feet (0.069 acres). Impacts were distributed proportionally to vegetation and other land cover types mapped within unprotected land located inside the USL, exclusive of wetland and riparian vegetation and open water which presumably will be avoided. Within the project footprint, the habitat impacts from this construction project are anticipated to be 90% permanent, as this portion will be converted or lost, and 10% temporary, as the adjacent area disturbed during construction will be restored.
Water Main and Pipeline Maintenance	S&T will likely maintain pipelines within their service area, which could impact 0.85 acres (approximately 10,560 feet of pipeline x 3.5-foot-wide area of impact). To estimate the lineal feet of pipeline, the number of S&T meter boxes (199), was multiplied by the ratio of meter boxes to pipeline in the GSW service area (2,673 meter boxes and 25 miles of pipeline) and rounded up to the nearest mile.	Impacts from pipeline projects were allocated to the right-of-way, where the pipelines occur. Of this area, 30% is anticipated to be permanently impacted by the approximately 12” diameter pipe; the remaining 30% of the area will be restored and therefore was assumed to be temporarily impacted.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
New Development on Privately-Owned Vacant Parcels: Inside the Urban Services Line		
Single-Family Residential parcels <20,000 sf	The County anticipates that 469 vacant parcels that are less than 20,000 square feet in size will be completely developed, thus impacting their total 77.8 acres inside the USL.	Impacts to vegetation and other land cover types were based on the acres of each type mapped within the parcels. Potential impacts to riparian and wetland habitat within these areas will not be covered by the LOHCP. Habitat impacts from development of these small parcels were characterized as permanent, as the entire parcel will be impacted by development and/or ongoing land use activities which will chronically impact habitat.
Single-Family Residential parcels between 20,000 sf and 1 acre	The County anticipates that 30 vacant parcels between 20,000 square feet and one acre will be developed inside the USL. The total 13.8 acres of impacts were based on an assumption that 20,000 sf would be impacted per parcel.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within these parcels, excluding riparian and wetland vegetation, and open water which will not be permitted through the LOHCP. Habitat impacts from development of these larger parcels were characterized as 80% permanent, to reflect the area that will be developed or chronically disturbed by ongoing land use, and 20% temporary, to reflect the adjacent area disturbed during development that will be restored.
Single-Family Residential parcels greater than 1 acre	The County anticipates that 35 vacant parcels greater than one acre will be developed inside the USL. The total 35 acres of impacts were based on an assumption that one acre would be impacted per parcel.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within these parcels, excluding riparian and wetland vegetation, and open water, which will not be permitted through the LOHCP. Habitat impacts from development of these larger parcels were characterized as 80% permanent, to reflect the area that will be developed or chronically disturbed by ongoing land use, and 20% temporary, to reflect the adjacent area disturbed during development that will be restored.
Multifamily-Commercial	The County anticipates that 105 vacant parcels designed for commercial, industrial, multifamily, and professional land use, will be completely developed, impacting their total 103 acres inside the USL.	Impacts to vegetation and other land cover types were based on the acres of each type mapped within the parcels. Potential impacts to riparian and wetland vegetation and open water will not be covered by the LOHCP. Habitat impacts from the development of these parcels were characterized as permanent, as the entire parcel will be impacted by development and/or ongoing land use activities which will chronically impact habitat.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
New Development on Privately-Owned Vacant Parcels: Outside the Urban Services Line		
Single-Family Residential parcels less than or equal to 5 acres	The County anticipates that 32 vacant parcels less than or equal to 5 acres will be developed outside the USL. The total 14.7 acres of impacts were based on the assumption that development within each will impact the maximum per-parcel disturbance envelope of 20,000 sf.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within these parcels, excluding riparian and wetland vegetation, and open water, which will not be permitted through the LOHCP. Habitat impacts from development of these larger parcels were characterized as 80% permanent, to reflect the area that will be developed or chronically disturbed by ongoing land use, and 20% temporary, to reflect the adjacent area disturbed during development will be restored.
Single-Family Residential parcels greater than 5 acres	The County anticipates that 13 vacant parcels greater than 5 acres will be developed outside the USL. The total 9 acres of impacts were based on the assumption that development within each will impact maximum per-parcel disturbance footprint of 30,000 sf.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within these parcels, excluding riparian and wetland vegetation, and open water, which will not be permitted through the LOHCP. Habitat impacts from development of these larger parcels were characterized as 80% permanent, to reflect the area that will be developed or chronically disturbed by ongoing land use, and 20% temporary, to reflect the adjacent area disturbed during development will be restored.
Improvements to Developed, Privately-Owned Parcels		
Commercial Redevelopment	The County anticipates that 15% of the area within the existing developed commercial parcels located in the USL will be further impacted by expansion and redevelopment activities (e.g., remodeling, renovation, and reconstruction), thus impacting a total of 24.3 acres.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within these parcels, excluding riparian and wetland vegetation, and open water, which will not be permitted through the LOHCP. Habitat impacts from redevelopment were characterized as 80% permanent, to reflect the area that will be developed or chronically disturbed by ongoing land use, and 20% temporary, to reflect the adjacent area disturbed during construction that will be restored.

Table 4-1: Take/impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area[1]

Activity	Description	Take/Impacts Assessment Methods
Residential Redevelopment within the USL	The County anticipates that 10% of the area within developed single-family parcels located inside the USL will be further impacted by expansion and redevelopment, thus impacting a total of 96.4 acres.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within these parcels, excluding riparian and wetland vegetation, and open water, which will not be permitted through the LOHCP. Habitat impacts from redevelopment were characterized as 80% permanent, to reflect the area that will be developed or chronically disturbed by ongoing land use, and 20% temporary, to reflect the adjacent area disturbed during construction that will be restored.
Residential Redevelopment outside the USL	The County anticipates that 10% of the area within developed single-family parcels outside the USL will be further impacted by expansion and redevelopment, thus impacting a total of 35 acres.	Impacts were distributed proportionally to the vegetation and other land cover types mapped within these parcels, excluding riparian and wetland vegetation, and open water, which will not be permitted through the LOHCP. Habitat impacts from redevelopment were characterized as 80% permanent, to reflect the area that will be developed or chronically disturbed by ongoing land use, and 20% temporary, to reflect the adjacent area disturbed during construction that will be restored.

[1] This analysis excludes the LOHCP conservation program, the take/impacts of which are qualitatively evaluated in the text.

Table 4-2: General Activities and their Habitat Impacts in Acres[1]

	Inside the Urban Services Line				Outside the Urban Services Line				Entire LOHCP Area[5]			
General Activity Type	**Upland Habitats[2]**	**Wet Areas[3]**	**Developed Areas[4]**	**Total**	**Upland Habitats**	**Wet Areas**	**Developed Areas**	**Total**	**Upland Habitats**	**Wet Areas**	**Developed Areas**	**Total**
New Private Single-Family Residential	109.6	2.0	15.0	126.6	23.1	<0.1	1.0	24.1	132.7	2.0	16.0	150.7
New Commercial and Multifamily	87.6	1.3	14.3	103.2	0.0	0.0	0.0	0.0	87.6	1.3	14.3	103.2
Redevelop/Remodel/Rebuild	20.2	<0.1	100.5	120.0	27.2	<0.1	7.8	35.0	47.5	<0.1	108.2	155.7
Public and Private Utility Projects	40.7	2.6	67.6	110.9	10.9	<0.1	0.4	11.4	51.6	2.6	68.0	122.2
Total	**258.2**	**5.8**	**197.3**	**460.6**	**61.2**	**0.0**	**9.2**	**70.5**	**319.4**	**5.8**	**206.5**	**531.8**

[1] Acres of upland vegetation, riparian and wetland vegetation, and developed areas and right-of-ways, to be impacted by the covered activities, showing the location with respect to the Los Osos Urban Services Line in the 2009 Estero Area Plan

[2] Upland habitats include all vegetation and land cover *except* wet areas and developed areas, each of which are defined below.

[3] Wet areas include riparian and wetland communities, as well as open water. Impacts to species in these habitats will not be covered by the LOHCP ITP.

[4] Developed areas include existing developed lands lacking vegetation, and County right-of-ways.

[5] Impacts will be limited to the 3,209-acre permit area.

Table 4-3: Impacts by Vegetation and Land Cover Type, Location, and Duration[1]

	Total in LOHCP Area		Existing Protected		To be Impacted by Covered Activities[2]					
Vegetation/Land Cover	Acres	Percent	Acres	Percent Protected	Inside USL	Outside USL	Permanently Impacted	Temporarily Impacted	Total	Percent of LOHCP Area
COASTAL SAGE SCRUB										
California Sagebrush – Black Sage										
Largely Intact	481.6	13.2%	327.5	68.0%	18.7	14.7	27.3	6.1	33.4	6.9%
Disturbed	373.0	10.2%	54.9	14.7%	138.7	13.4	143.1	9.0	152.1	40.8%
Heavily Disturbed	10.8	0.3%	0.1	0.9%	1.6	0.8	2.1	0.3	2.4	22.2%
Coyote Brush[3]	0.7	<0.1%	0	0	0.7	0.0	0.7	<0.1	0.7	100.0%
Subtotal: Coastal Sage Scrub	**866.0**	**23.8%**	**382.4**	**44.2%**	**159.7**	**28.9**	**173.2**	**15.4**	**188.6**	**21.8%**
CENTRAL MARITIME CHAPARRAL										
Morro Manzanita California Sagebrush	38.0	1.0%	34.4	90.5%	<0.1	0.6	0.5	0.1	0.6	1.6%
Morro Manzanita	321.2	8.8%	135.1	42.0%	6.1	10.1	13.6	2.7	16.2	5.0%
Morro Manzanita Wedgeleaf Ceanothus	113.4	3.1%	111.3	98.1%	0.1	1.2	1.1	0.2	1.3	1.1%
Wedgeleaf Ceanothus - California Sagebrush	30.6	0.8%	28.4	92.9%	<0.1	0.2	0.2	<0.1	0.2	0.7%
Subtotal: Central Maritime Chaparral	**503.3**	**13.8%**	**309.2**	**61.4%**	**6.2**	**12.1**	**15.4**	**2.9**	**18.3**	**3.6%**
WOODLAND										
Bishop Pine[4]	3.4	0.1%	3.4	100.0%	0.0	<0.1	<0.1	<0.1	<0.1	0.6%
Coast Live Oak	291.2	8.0%	178.3	61.2%	14.4	7.4	19.7	2.1	21.8	7.5%
Eucalyptus	72.0	2.0%	10.7	14.8%	7.1	3.6	8.8	1.8	10.7	14.9%
Subtotal: Woodland	**366.6**	**10.1%**	**192.4**	**52.5%**	**21.5**	**11.0**	**28.5**	**3.9**	**32.5**	8.9%
GRASSLAND										
California Annual Grassland	3.5	0.1%	1.2	34.4%	0.1	0.1	0.1	<0.1	0.2	4.4%
Non-Native Grassland	35.0	1.0%	1.0	2.9%	20.7	0.4	20.5	0.7	21.1	60.4%
Subtotal: Grassland	**38.5**	**1.1%**	**2.2**	**5.8%**	**20.8**	**0.5**	**20.6**	**0.7**	**21.3**	**55.3%**
WETLAND[5]										
Cattail	0.2	<0.1%	0.1	47.3%	<0.1	0	<0.1	<0.1	<0.1	<0.1%

Table 4-3: Impacts by Vegetation and Land Cover Type, Location, and Duration[1]

	Total in LOHCP Area		Existing Protected		To be Impacted by Covered Activities[2]					
Vegetation/Land Cover	Acres	Percent	Acres	Percent Protected	Inside USL	Outside USL	Permanently Impacted	Temporarily Impacted	Total	Percent of LOHCP Area
Pickleweed	1.3	<0.1%	1.2	90.5%	<0.1	0	<0.1	<0.1	<0.1	1.5%
Disturbed Wetlands	41.7	1.1%	29.5	70.8%	2.6	0	2.5	0.1	2.9	6.8%
Subtotal: Wetland	**43.1**	**1.2%**	**30.7**	**71.3%**	**2.6**	**0.0**	**2.5**	**0.1**	**2.9**	**6.7%**
RIPARIAN										
Arroyo Willow Black Cottonwood	0.8	<0.1%	0.8	100%	<0.1	0	<0.1	<0.1	<0.1	<0.1%
Arroyo Willow	11.6	0.3%	0.4	3.6%	3.1	0	3.1	<0.1	3.1	26.7%
Black Cottonwood	1.8	<0.1%	0	0%	<0.1	0	<0.1	<0.1	<0.1	<0.1%
Coast Live Oak - Arroyo Willow	62.3	1.7%	7.7	12.3%	<0.1	0	<0.1	<0.1	<0.1	<0.1%
Subtotal: Riparian	**76.6**	**2.1%**	**9.0**	**11.7%**	**3.1**	**0**	**3.1**	**<0.1**	**3.1**	**4.1%**
OTHER LAND COVER										
Agricultural Land	48.5	1.3%	0.1	0.1%	2.8	3.0	4.8	1.0	5.8	12.0%
Developed	1,515.8	41.6%	4.5	0.6%	197.4	9.2	169.0	37.6	206.5	13.6%
Landscaped Trees	131.4	3.6%	16.8	12.8%	16.3	5.3	19.2	2.4	21.6	16.4%
Open Water	4.2	0.1%	0.6	15.0%	0.0	0	0.0	0.0	0.0	0.0%
Ruderal Disturbed	49.9	1.4%	0.5	1.1%	30.9	0.6	30.1	1.4	31.5	63.0%
Subtotal: Other Land Cover	**1,750.0**	**48.0%**	**22.5**	**1.3%**	**247.4**	**18.0**	**223.1**	**42.3**	**265.4**	15.2%
Total	**3,643.8**	**100%**	**948.4**	**26.0%**	**461.3**	**70.5**	**466.3**	**65.4**	**532.0**	**14.6%**

[1] Areas of each mapped vegetation and other land cover type to be impacted temporarily and permanently by the covered activities. The amount of each type within existing protected lands is provided for reference. Does not include take due to implementation of the conservation program and the Community Wildfire Protection Plan, which will result in temporary impacts to habitat.

[2] Impacts will be limited to the 3,209-acre permit area.

[3] Impacts to coyote brush were overestimated as a result of this community primarily occurring in single family residential parcels, which as presumed to be completely impacted, as well as the community being included in the extrapolation used to estimate community-level impacts of activities without specified project footprints.

[4] Impacts to bishop pine community, which is only within existing protected lands, are overestimated as a result of the process of estimating impacts of activities without specified project footprints using extrapolation.

[5] Impacts to species in wetland and riparian communities will not be covered by the LOHCP ITP.

Table 4-4: Morro shoulderband snail and Morro manzanita Habitat Types in the Plan Area

Vegetation/Land Cover	Acres	Percent of Plan Area	Morro Shoulderband Snail[1]	Morro Manzanita
COASTAL SAGE SCRUB				
California Sagebrush – Black Sage				
Largely Intact	481.6	13.2%	Primary Habitat	
Disturbed	373.0	10.2%	Primary Habitat	
Heavily Disturbed	10.8	0.3%	Primary Habitat	
Coyote Brush	0.7	<0.1%	Primary Habitat	
Subtotal: Coastal Sage Scrub	**866.0**	**23.8%**		
CENTRAL MARITIME CHAPARRAL				
Morro Manzanita California Sagebrush	38.0	1.0%	Primary Habitat	Habitat
Morro Manzanita	321.2	8.8%		Habitat
Morro Manzanita Wedgeleaf Ceanothus	113.4	3.1%	Secondary Habitat	Habitat
Wedgeleaf Ceanothus - California Sagebrush	30.6	0.8%	Primary Habitat	Habitat
Subtotal: Central Maritime Chaparral	**503.3**	**13.8%**		
WOODLAND				
Bishop Pine	3.4	0.1%		Habitat
Coast Live Oak	291.2	8.0%		Habitat
Eucalyptus	72.0	2.0%		
Subtotal: Woodland	**366.6**	**10.1%**		
GRASSLAND				
California Annual Grassland	3.5	0.1%	Secondary Habitat	
Non-Native Grassland	35.0	1.0%	Secondary Habitat	
Subtotal: Grassland	**38.5**	**1.1%**		
WETLAND[3]				
Cattail	0.2	<0.1%		
Pickleweed	1.3	<0.1%		
Disturbed Wetlands	41.7	1.1%		
Subtotal: Wetland	**43.1**	**1.2%**		
RIPARIAN				
Arroyo Willow Black Cottonwood	0.8	<0.1%		
Arroyo Willow	11.6	0.3%		
Black Cottonwood	1.8	<0.1%		
Coast Live Oak - Arroyo Willow	62.3	1.7%		
Subtotal: Riparian	**76.6**	**2.1%**		
OTHER LAND COVER				
Agricultural Land	48.5	1.3%	Secondary Habitat	
Developed	1,515.8	41.6%	Secondary Habitat	
Landscaped Trees	131.4	3.6%	Secondary Habitat	
Open Water	4.2	0.1%		
Ruderal Disturbed	49.9	1.4%	Secondary Habitat	
Subtotal: Other Land Cover	**1,750.0**	**48.0%**		
Total	**3,643.8**	**100%**		

[1] MSS Primary Habitat: native vegetation where the species is more likely to occur than not; and

MSS Secondary Habitat: native vegetation where the species occurs at lower frequency and/or abundance than in primary habitat, as well as anthropogenically altered that often support MSS.

Table 4-5: Areas of Morro shoulderband snail and Morro manzanita habitat to be temporarily and permanently impacted by the covered activities[1]

Habitat[2]	Total Acres[3]	Existing Protected		To be Impacted (Acres)[4]					Percent to be impacted[3]
		Acres[3]	%[3]	Inside USL	Outside USL	Permanently Impacted	Temporarily Impacted	Total	
Morro Manzanita Habitat	797.9	490.9	61.5%	20.6	19.5	35.0	5.1	40.1	5.0%
Morro Shoulderband Snail									
Primary Habitat	934.6	445.2	47.6%	159.7	29.6	173.9	15.4	189.3	20.3%
Secondary Habitat	1,897.5	135.4	7.1%	269.1	19.6	245.5	43.2	288.7	15.2%
Total Morro shoulderband Snail	**2,832.1**	**580.7**	**20.5%**	**428.8**	**49.2**	**419.4**	**58.6**	**478.0**	**16.9%**

[1] Areas of Morro shoulderband snail and Morro manzanita habitat to be temporarily and permanently impacted by the covered activities. This quantitative analysis excludes the impacts of the CWPP and the conservation program, which will have additional impacts to temporary habitat as discussed in the text.

[2] Habitat impacts were determined based on the acres of impacts to vegetation and other land cover types (Table 4-3) using the cross walk presented in Table 4-4.

[3] These acres and percentages are for the total LOHCP Area.

[4] Impacts will be limited to the 3,209-acre permit area.

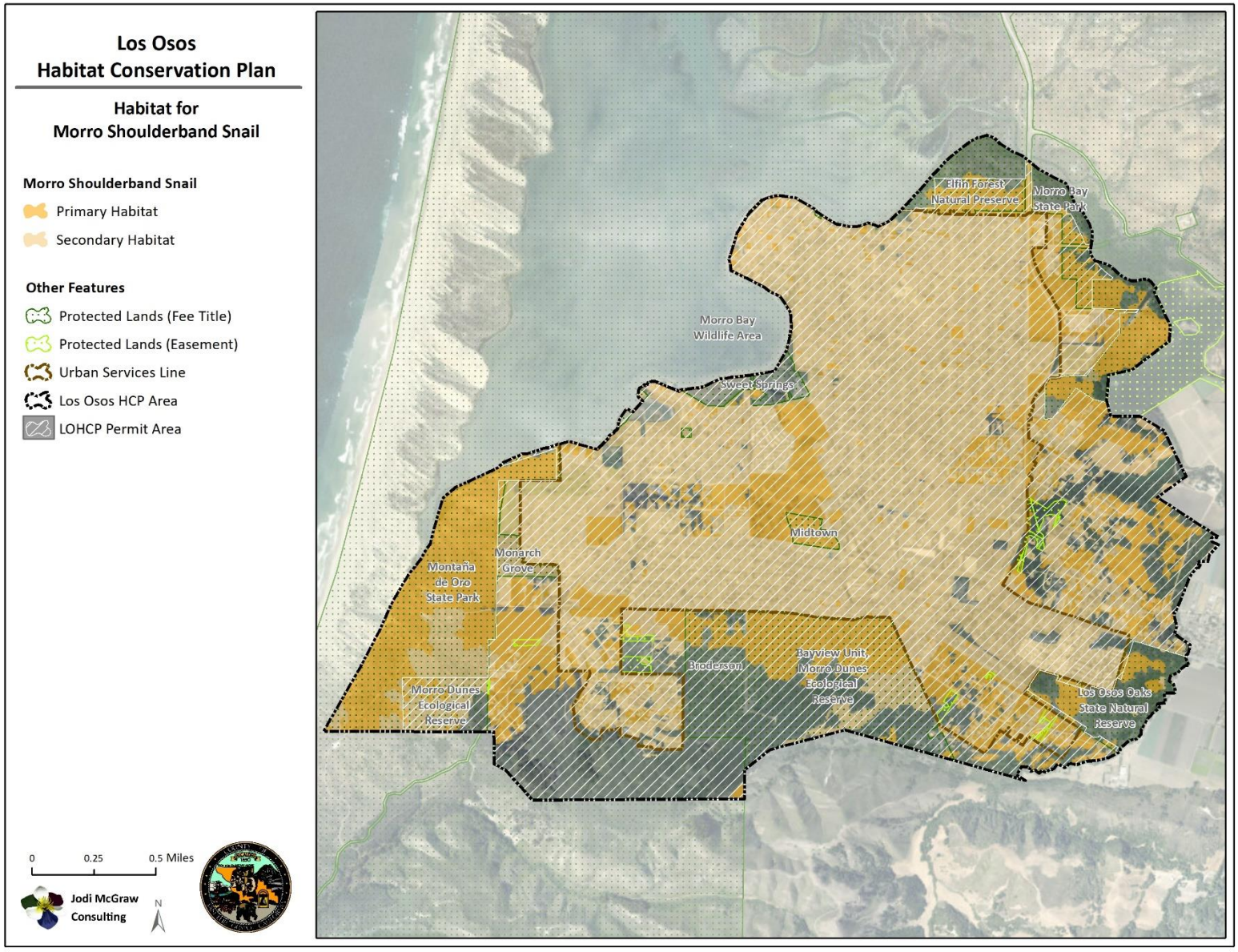


Figure 4-1: Morro Shoulderband Snail Habitat

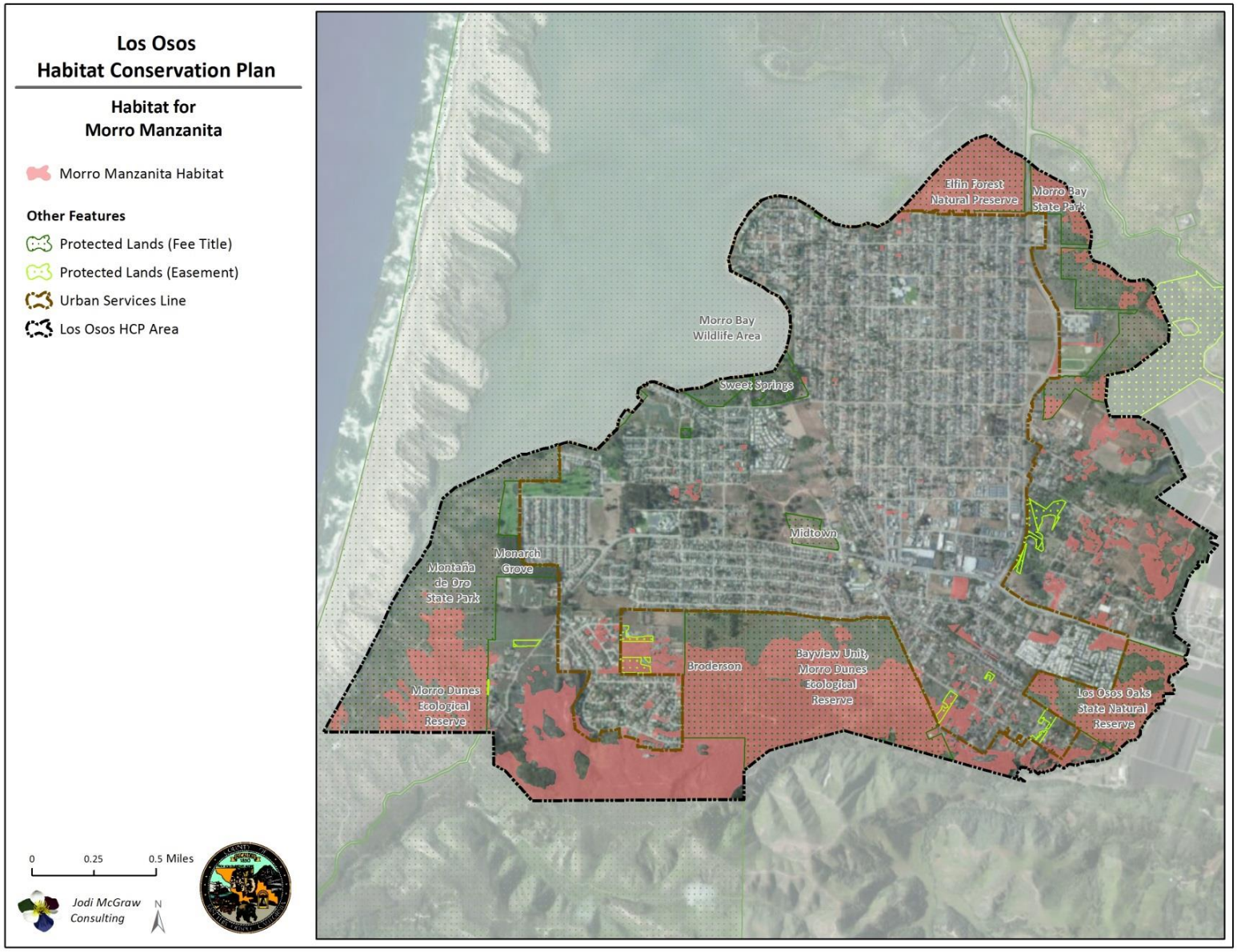


Figure 4-2: Morro Manzanita Habitat

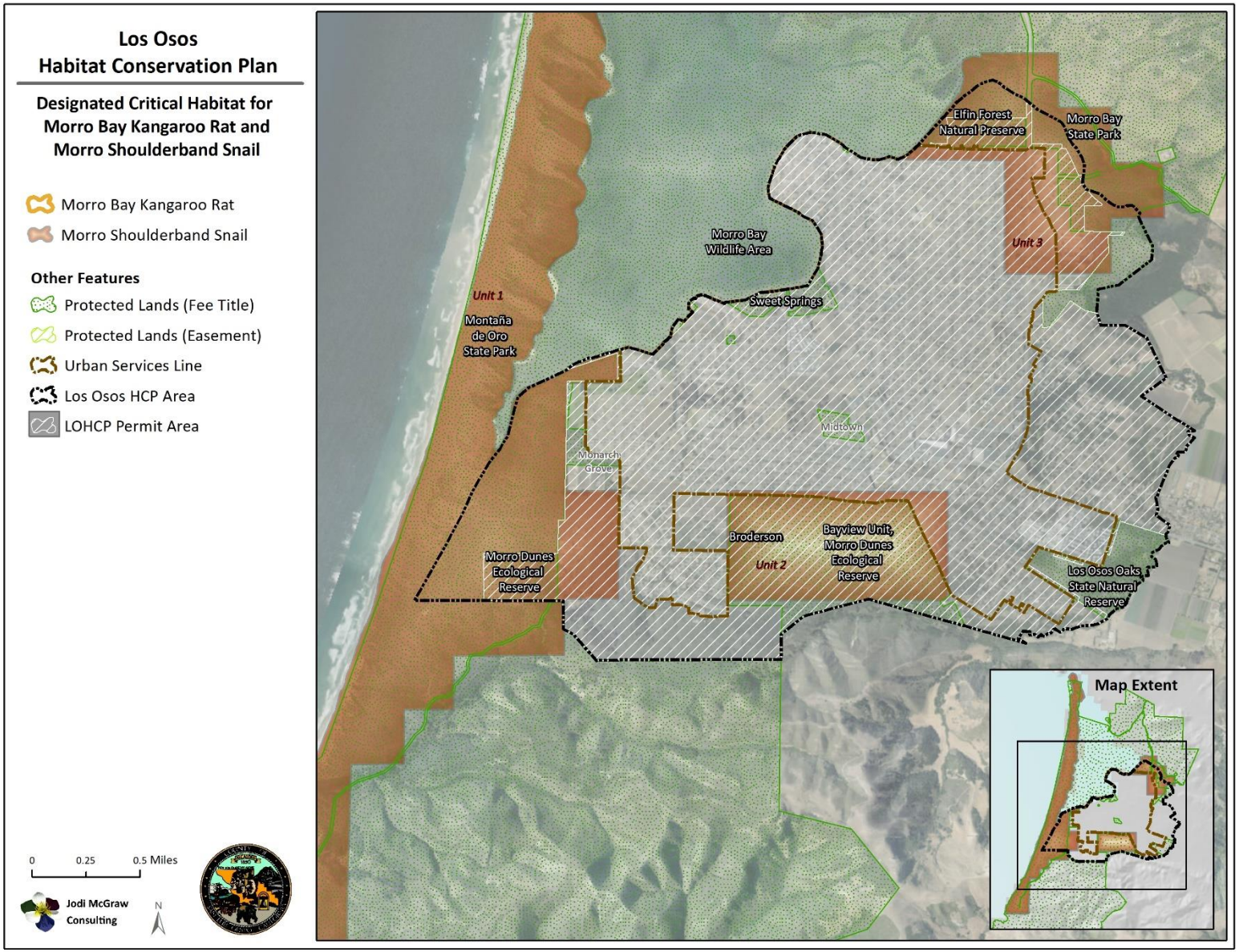


Figure 4-3: Designated Critical Habitat

5 Conservation Program

This chapter describes the LOHCP conservation program, which is designed to avoid, minimize, and mitigate the impacts of covered activities on the covered species such that the benefits of the mitigation will be, in aggregate, commensurate with the take /impacts of the covered activities on the covered species. The program features seven primary elements:

1. **Biological Goals and Objectives:** goals identify the desired outcome or future condition of the covered species, communities, and ecosystem in which they occur (collectively, "biological systems"), and the objectives identify specific targets for attaining the goals through implementation of the conservation program (Section 5.1);
2. **Avoidance and Minimization:** measures that will be taken during implementation of the covered activities, in order to avoid or minimize their effects on covered species and the degradation of habitat, as well as measures to avoid take of other listed species not covered by the permit (Section 5.2);
3. **Habitat Protection**: efforts to safeguard habitat by preventing its development or other uses that would result in its degradation, in order to expand and connect existing protected habitat that is managed at least in part for the covered species (Section 5.3.2);
4. **Habitat Restoration:** projects to re-create habitat conditions suitable for the covered species, and re-establish native plant community structure and species composition, where it has been substantially degraded by anthropogenic factors, such as erosion or dense infestations of exotic plants, and fire exclusion (Section 5.3.3);
5. **Habitat Management:** ongoing efforts to maintain or enhance habitat conditions and promote the long-term population viability of the covered species, by addressing factors that negatively impact habitat, including (but not limited to) incompatible recreational use and invasion by exotic plant species (Section 5.3.3);
6. **Monitoring:** studies to tract the status and trends of the covered species populations and the condition of their respective habitats, as well as the effects of restoration and management projects (Section 5.4); and
7. **Adaptive Management:** the framework through which the six other elements will be implemented in order to enhance long-term effectiveness of the conservation program at achieving the biological goals and objectives (Section 5.5).

These conservation program elements are intended to fulfill the habitat conservation plan requirements for issuance of a take permit; specifically, plans must identify goals and objectives, and steps that will be taken to avoid and minimize (protection measures) impacts of the covered species, as well as compensate for them (habitat protection, restoration, and management). Habitat conservation plans must also include monitoring to evaluate plan effectiveness toward achieving the goals and objectives, as well as adaptive management framework to enhance effectiveness over time (USFWS and NMFS 2016).

This section describes the elements of the conservation program. Appendix D provides details of the approaches that will be used to manage three primary factors that impact the covered species within protected habitat: exotic plants, incompatible recreation, and fire, including wildfires and fire exclusion. Appendix E provides initial monitoring protocols for the communities, the covered species, and their

habitats. Appendix F provides details for pre-project surveys to avoid take of Morro Bay kangaroo rat and minimize take in the form of injury or mortality for Morro shoulderband snail. These elements of the Plan will be combined with results of surveys and other information obtained early during implementation, to develop the LOHCP Preserve System Adaptive Management and Monitoring Plan (AMMP), which will detail how habitat restoration, management, and monitoring will be implemented based on the framework developed in this plan (Section 5.3.3.2).

The conservation program will be implemented by the County with the assistance of an Implementing Entity (Section 6.2). The conservation program will be funded through fees paid by plan participants (Chapter 7).

5.1 Biological Goals and Objectives

The biological goals identify the desired outcome, condition, or state of the biological systems. The objectives identify targets for attaining the goals related directly to the three primary elements of the conservation strategy: habitat protection, restoration, and management (Table 5-1). Goals and objectives reflect the ecological hierarchy: ecosystems, communities, and covered species. Although the primary purpose of the conservation program is to mitigate the impacts of the covered activities on covered species, goals were also developed for ecosystems and communities in order to:

1. create a unified, coordinated strategy for habitat-based management for the covered species, which co-occur within the various plant communities and their successional stages within the Baywood fine sands ecosystem; and
2. avoid negative impacts associated with single-species management, including cost inefficiencies, competing objectives, and unintended negative consequences for sensitive species and communities, as well as other natural resources in the Plan Area.

The LOHCP biological goals and objectives, which are listed in Table 5-1, are centered on promoting long-term persistence of the species, communities, and broader ecosystem. As such, the objectives emphasize the important role of maintaining connectivity and promoting natural processes, such as natural disturbance regimes, and other ecosystem functions. Recognizing the critical role of natural disturbances in creating and maintaining the habitat conditions to which the covered species are adapted, the objectives emphasize the importance of restoring and managing existing protected habitat as well as protecting and managing habitat in currently unprotected land.

The objectives also reflect the importance of maintaining and enhancing connectivity of habitat within the Plan Area, in order to promote long-term viability of the species populations, including by enabling movements in response to climate change.

For each biological objective, Table 5-1 identifies the following:

1. **Conservation measures:** the general habitat protection, restoration, and management measures that will be implemented to achieve the objective;
2. **Implementation monitoring**: the approach that will be used to track implementation of measures to achieve the objective (e.g., tracking the acres of habitat managed to control exotic plants); and

3. **Effectiveness monitoring**: the studies that will be used to evaluate the effectiveness of the conservation program at achieving the objective (e.g., monitoring the distribution and abundance of the Morro shoulderband snail population).

As part of efforts to develop and implement the LOHCP Preserve System AMMP, the goals and objectives will be updated to provide quantitative targets that will enable success to be measured (Section 5.3.3.2). Likewise, the monitoring protocols (Appendix E) will be revised to feature quantitative thresholds based on results of the initial baseline surveys.

5.2 Avoidance and Minimization Measures

During implementation of Plan covered activities, Plan participants will be required to implement a series of measures to avoid and/or minimize take of the covered animal species and impacts to the covered plant species (Section 5.2.1), avoid take of other listed species in the Plan Area that are not covered by the LOHCP permit (Section 5.2.2), avoid impacts to active bird nests (i.e., with eggs, nestlings), migratory birds, including birds of prey (Section 5.2.3), and avoid and minimize impacts to covered species and nesting birds during implementation of the CWPP (Section 5.2.4). The County will work with the Implementing Entity, which will assist the County with implementation of the conservation program, to facilitate successful implementation of the AMMs, evaluate their effectiveness, and recommend adjustments to ensure species protection as part of the adaptive management framework (Section 6.2.1).

5.2.1 Avoidance and Minimization Measures for Covered Species

Section 10 (a)(2)(B) of the Endangered Species Act stipulates that the impacts of covered activities must be minimized and mitigated to the maximum extent practicable. Table 5-2 lists the measures that will be implemented as part of the LOHCP to avoid or minimize take of/impacts to the covered species during implementation of the covered activities. These measures are designed to reduce the take of/impacts to individuals and the degradation of remaining habitat to the maximum extent practicable, in compliance with federal and state endangered species laws. The measures are outlined in accordance with the LOHCP conservation hierarchy, where attaining goals and objectives for ecosystems and communities will promote conservation of the covered species, as well as other species within the Baywood fine sands ecosystem of Los Osos (Table 5-2).

5.2.2 Avoidance Measures for Other Listed Species Not Covered by the LOHCP

The Plan Area and the area immediately adjacent supports habitat for eight state and/or federally listed species that will not be covered by the LOHCP permit (Section 3.2.3, Appendix C). Six of these species primarily inhabit riverine, riparian, and wetland communities, rather than the upland communities within the Baywood fine sands ecosystem, which are the focus of this HCP. Constraints to development within these aquatic systems are such that take coverage for these species is not necessary to implement the covered activities of the LOHCP. However, certain activities occurring in proximity to these habitat areas may have potential to cause take of these species; proponents of these projects will be required to implement measures to avoid such impacts in order to participate in the LOHCP.

To ensure that activities proposed for coverage under the LOHCP avoid wetland and riparian listed species, proponents of projects in parcels bordering the estuary, lake, stream or another water body, as

well as parcels featuring mapped wetland and/or riparian habitat, will be required to implement pre-project habitat assessments. Figure 5-4 illustrates the map of parcels that will be subject to a prep-project habitat assessment for wetland and riparian species; the map will be updated, as needed, as part of the adaptive management process.

The purpose of the assessment will be to evaluate whether the project has the potential to result in take of state or federally listed species not covered by the LOHCP permit. Assessments will be conducted by qualified biologists approved by the USFWS and CDFW. Where the County determines that potentially suitable habitat is known or likely to occur on the project site, focal species surveys will be required to ensure that no take of/impacts to non-covered wetland and riparian species occurs. Those that cannot avoid impacts will be required to obtain a separate take permit or otherwise demonstrate compliance with ESA and CESA, or they will be deemed ineligible for coverage under the LOHCP (Section 6.3.1).

The other two species, white-tailed kite and golden eagle, occur at low density and frequency but forage broadly within the LOHCP Area; they may infrequently nest in discrete locations in the Plan Area. These birds of prey are California Fully Protected Species therefore CDFW cannot issue permits for take of individuals; golden eagle is also protected by the Bald and Golden Eagle Protection Act.

Table 5-3 lists measures that will be implemented to avoid impacts to the other state or federally listed species and take of the California Fully Protected Species. They include ecosystem and community-level avoidance measures, which will protect aquatic, wetland, and riparian habitats more broadly, as well as species-specific avoidance measures.

5.2.3 Other Protection Measures

The Plan Area features populations of nesting birds and additional birds of prey. In compliance with Section 3503 of the California Fish and Game Code (Section 1.5.2.2), project proponents will implement measures to avoid and minimize impacts to bird nests and birds of prey. Specifically,

- Projects that remove vegetation and other nesting habitat will be conducted outside of the nesting season (September 1 - January 31), whenever feasible; and
- If it is not feasible, then they will use pre-project surveys for nesting birds to identify measures that will be implemented to avoid impacts to nests of birds of prey and any other nesting birds.

The seasonal prohibition period will be adjusted, as needed, to reflect changes in the breeding bird season due to climate change or other factors. These and other measures will be identified based upon the specific project.

5.2.4 Avoidance and Minimization Measures for the Community Wildfire Protection Plan

A series of separate avoidance and minimization measures will be implemented to limit take of/impacts to the covered species and nesting birds during implementation of the fire hazard abatement treatments as part of the Community Wildfire Protection Plan (Table 5-4). These measures were developed by the USFWS and CDFW, which have worked closely with CAL FIRE since 2010 to develop and implement avoidance and minimization measures for listed species within the CWPP area (Section 2.2.7; Figure 2-7). They will be included as requirements in the Certificate of Inclusion that confers incidental take coverage to entities implementing the CWPP (Section 6.2.1). The measures for the four

covered species are designed to reduce take in the form of injury or mortality for Morro shoulderband snail, reduce the severity of impacts to Morro manzanita, and avoid take of/impacts to Morro Bay kangaroo rat and Indian Knob mountainbalm. Take of Morro shoulderband snail would be predominantly in the form of capture; trimming of Morro manzanita would be limited to the minimum required to achieve the fuel reduction objectives, with no removal of individual plants allowed. Based on the use of these measures as part of the LOHCP (Table 5-4) and the limited scope of abatement activities, implementation of the CWPP is expected to have a negligible effect on the covered species.

5.3 Compensatory Mitigation: The LOHCP Preserve System

In addition to avoiding and/or minimizing the impacts of the covered activities, the LOHCP conservation program will mitigate their negative effects on the covered species to a level that is commensurate with the impacts of the covered activities by:

- **Protecting** additional habitat from activities that would type-convert or degrade it;
- **Restoring** degraded habitat so that it can support larger and thus more viable populations of the covered species; and
- **Managing** protected habitat to ensure it remains suitable and can support persisting populations.

Habitat and covered species will be monitored in order to evaluate and enhance the long-term effectiveness of these compensatory mitigation components of the LOHCP conservation program. These activities will be conducted within the Los Osos Habitat Conservation Plan Preserve System—a network of protected lands managed as part of the LOHCP to maximize their long-term benefits for the covered species, as the communities and ecosystem they inhabit.

This section describes the approach used to design the LOHCP Preserve System, and then describes how the habitat it protects will be managed and restored to promote the biological goals and objectives. Section 5.7.2.3 describes how the Preserve System will be assembled over time, to mitigate the impacts of the LOHCP covered activities.

5.3.1 Preserve System Design

5.3.1.1 Background and Approach

The LOHCP encompasses much of the range of each covered species (Section 3.2.2, Appendix B). As a result, the LOHCP covered activities and conservation program have great potential to influence their persistence and recovery. In consideration of this, elements of the LOHCP were developed based in part on USFWS recovery plans for the Morro Bay kangaroo rat (USFWS 1999) and Morro shoulderband snail, Morro manzanita, and Indian Knob mountainbalm (USFWS 1998a), as well as updated recommendations provided in the species most recent status reviews and species reports (USFWS 2006. 2008, 2011b, 2013a).

Developed by the USFWS with input from outside biologists with additional expertise in these species, the recovery plans identify general strategies and specific measures to promote long-term viability of the listed species; the plans are designed to achieve the goal of either down listing (i.e., reclassify endangered species as threatened) or, where possible, delisting (removing the list of threatened and

endangered species). Recovery plan measures include habitat protection and management, as well as research to fill key data gaps to inform effective conservation measures. These plans feature additional components such as captive breeding program for Morro bay kangaroo rat; though outside of the scope of a habitat conservation plan, such efforts could be conducted by agencies and organizations in coordination with implementation of the LOHCP conservation program.

Since the plans were developed, agencies and organizations have implemented several measures of the recovery plans, including protecting habitat of high conservation value that is now within the Morro Dunes Ecological Reserve (CDFW) and Morro Bay and Montaña de Oro state parks. Elements of the LOHCP conservation program were designed to build upon these prior efforts to contribute to the recovery of the covered species and avoid jeopardizing their persistence in the wild. Most notably, to achieve the biological goals and objectives, the LOHCP Preserve System will include selected existing protected lands (Section 5.3.3.1), as well as the acquisition of new lands as mitigation for covered activities (Section 5.3.2). Enhancing management of existing protected lands will increase the long-term viability of the covered species by creating and maintaining the largest, most contiguous area of high-quality habitat possible, given the constraints in the landscape. The following sections provide the rationale as well as details for this approach to assembling LOHCP Preserve System.

5.3.1.2 Priority Conservation Area

A key consideration in developing the habitat protection, restoration, and management measures is where they should take place; specifically, identifying the land should be included in the LOHCP Preserve System to maximize the benefits for the covered species. Therefore, the LOHCP planning process evaluated habitat within the Plan Area for protection, restoration, and management. Properties that will ultimately be included in the LOHCP Preserve System will be determined during implementation of the plan by the County with the assistance of the Implementing Entity, which will work with willing landowners to acquire additional lands (Section 6.2.2) and enroll existing protected lands in the Preserve System based on approval from the USFWS (Section 6.2.3).

The LOHCP Preserves will primarily occur within the 1,510-acre Priority Conservation Area—the general area identified as most important for habitat protection, restoration, and management (Figure 5-1). The Priority Conservation Area was identified based on a critical review and analysis of the recovery plan conservation measures, including the recovery Conservation Planning Areas (USFWS 1998a), existing habitat conditions, and the principles reserve design (Soulé and Simberloff 1986, Soulé and Terbough 1999), including those to promote resiliency to climate change (Hannah et al. 2002, Morelli et al. 2016).

Located on the perimeter of Plan Area (Figure 5-1), the Priority Conservation Area:

1. features relatively large blocks of nearly contiguous and largely intact habitat on Baywood fine sands ecosystem;
2. supports the diverse mosaic of the natural communities and upland habitats that support the covered species; and
3. contains significant habitat adjacent to open space lands located outside of the Plan Area, that feature largely intact habitat including the estuary, wetlands, riparian areas, and dunes, as well as other upland communities, which are either protected or occur in large parcels featuring low-intensity land use.

As a result of this landscape context, habitat within the Priority Conservation Area is considered to provide the greatest conservation value, both in terms of current conditions and long-term viability; specifically, land within this area will be more conducive to effective, long-term management, which is essential to the persistence of the covered species (Section 5.7.2). Therefore, land within the portion of the Priority Conservation Area that is within the Permit Area (Figure 5-1) will be prioritized for additional habitat protection, restoration, and management, as part of the LOHCP Preserve System.

Conservation and management of habitat outside of the Priority Conservation Area can also promote achievement of the LOHCP biological goals and objectives. As part of implementation of the LOHCP, the Implementing Entity will evaluate additional land protection, restoration, and management opportunities that arise, and compare their relative conservation benefits to alternative actions, including future, unknown protection projects (Section 6.2.2). The cost-benefit analyses will critically evaluate the long-term contributions to achieving the goals and objectives, including long-term viability of the habitat and restoration and management needs and thus costs.

5.3.2 Habitat Protection

Protecting and connecting relatively large areas of comparatively intact habitat is essential to obtain the LOHCP biological goals and objectives (Table 5-1) and compensate for the permanent loss of habitat resulting from implementation of the covered activities (Section 4.2.1.1). Habitat for the covered species is naturally rare, and largely confined to the Baywood fine sand soils in the Plan Area (Section 3.2.2, Appendix B). Residential and commercial development has reduced the amount of habitat supporting the covered species and has contributed to their population declines. Habitat loss has also fragmented and led to the degradation of remaining habitat, including by promoting the invasion and spread of exotic species, and leading to fire exclusion. Protecting significant areas of remaining habitat will be essential to maintaining viable populations of the covered species.

As part of implementation of the LOHCP, unprotected habitat (i.e., privately-owned habitat not protected by conservation easements) will be protected and managed and monitored in perpetuity as part of the LOHCP Preserve System. Habitat protection will occur through one of two main mechanisms:

- **Acquisition of Fee Title or Conservation Easements**: Habitat mitigation fees and supplemental funding (e.g., grants) where available, will be used to acquire from willing sellers fee title or conservation easements. These conservation easements will protect habitat from activities that could result in its loss or degradation, such as new development, grading, and other land uses (e.g., agriculture); the easements will also allow the Implementing Entity periodic access to the property to conduct habitat management, monitoring, and in some cases, habitat restoration (Section 6.2.2.2).
- **Dedication of Conservation Easements**: If a private landowner developing vacant land inside the Priority Conservation Area chooses to participate in the LOHCP, they will be required to dedicate conservation easements approved by the USFWS and granted to the Implementing Entity at a ratio of 3:1 for the amount of habitat disturbed (Sections 2.2.4.1.1 and 5.7.2.1.1), as well as pay the Restoration/Management/Administration Fee (Section 5.7.2)[18].

[18] Proponents of new development projects on vacant parcels inside the PCA that are too small to set aside the required set aside based on the maximum disturbance envelop can either reduce the size of their project to a size that accommodates the requisite habitat set-aside or mitigate habitat loss through payment of the Habitat Protection Fee rather than on-site habitat set asides (Section 5.7.2.1.2).

Lands acquired in fee title will also be protected by a conservation easement approved by the USFWS and granted to the Implementing Entity . All conservation easements will provide the Implementing Entity and USFWS the right to access the conserved habitat to implement necessary habitat management and restoration (Section 5.3.3), and monitoring (Section 5.4). Additional information about the easements is provided in Section 6.2.2.

The newly protected lands incorporated within the LOHCP Preserve System will be located primarily within the Priority Conservation Area (Figure 5-1). They will specifically be chosen to achieve the following objectives:

1. protect habitat that supports, is suitable for, or can be restored to render it suitable for, one or more of the covered species;
2. protect relatively large areas of habitat, including by buffering and expanding existing protected habitat areas, in order to safeguard large areas that feature reduced perimeter-to-area ratios that are therefore more resistant to edge effects and can be effectively managed using techniques designed to promote diversity and long-term population persistence, including prescribed fire of fire surrogates;
3. maintain and restore critical landscape linkages between significant habitat areas, including protected lands and other large areas of relatively intact habitat. Connecting habitat that might otherwise become isolated will facilitate gene flow (exchange of genetic material) between individuals in otherwise isolated habitat, and recolonization of sites where populations are extirpated; and
4. protect habitat that can confer resiliency to climate change, including climate change refugia (Morelli et al. 2016) and linkages that can promote species migration in response to a changing climate (Keeley et al. 2018).

In addition, land protected as part of the LOHCP Preserve System must meet the following criteria:

- Contribute to meeting the biological goals and objectives of the LOHCP (Section 5.1);
- Permanently protect the biological functions and values that contribute to the LOHCP;
- Be managed in perpetuity according to the LOHCP Preserve System AMMP (Section 5.3.3.2);
- Be monitored according to the requirements and guidelines in Section 5.4; and
- Have no hazardous materials or property encumbrances that conflict with LOHCP goals and objectives.

The specific habitat areas to be protected as part of the LOHCP Preserve System will be identified during implementation of the LOHCP. For purposes of estimating mitigation needs and thus the fees, the LOHCP Preserve System was assumed to include 107.5 acres of newly protected habitat, with a minimum of 55.25 acres acquired in fee title and protected with a conservation easement (Section 5.7.2.3.2). Table 5-10 lists the total acres of habitat type that could be protected in newly protected lands, which are based on the proportions of each vegetation type within unprotected land within the Priority Conservation Area. The total acres of habitat, as well as the number of acres of each vegetation type, that are ultimately included in the LOHCP Preserve System will depend on the specific parcels acquired from willing sellers, and land dedications from participants in this voluntary plan. Most of the

habitat in the Priority Conservation Area (where land acquisition will primarily occur) is either coastal sage scrub or central maritime chaparral communities which are most suitable for one or more of covered species and thus will ensure that the first objective of habitat protection listed above is achieved.

Proponents of development projects that would impact Environmentally Sensitive Habitat Areas (ESHA) may be required to set aside additional habitat in order to comply with the California Coastal Act. While the LOHCP requires that proponents in the Priority Conservation Area set aside habitat at a 3:1 ratio, the State Coastal Commission may require that all remaining habitat outside of the development envelope be protected through a County open space easement, which limits uses to natural resource management. These habitats set-asides would protect additional habitat not included in the analysis of the conservation benefits of the LOHCP Conservation Program (Section 5.8.1).

5.3.3 Habitat Restoration and Management

Lands protected within the LOHCP Preserve System will be restored, where needed, and then managed in perpetuity. Restoration and management of habitat within the LOHCP Preserve System will be critical to attaining the biological goals of the plan, and to the recovery of the covered species. Much of the remaining habitat in the Plan Area has been degraded to some extent by a variety of factors which reduce populations of the covered species, thus threatening their long-term persistence. Described in detail in Appendix D, the three main factors that degrade habitat are:

1. **Exotic Plants:** plants that are not native to the region outcompete native plants, modify habitat for native animals, and have the potential to promote fire outside of the natural disturbance regime, which can further impact the covered species (Section D.1);
2. **Incompatible recreation activities:** intensive recreation (e.g., off-highway vehicle use), unmanaged use, and trespass removes vegetation, can cause erosion, and promote the invasion and spread of exotic plants (Section D.2); and
3. **Incompatible fire management:** vegetation clearing and other hazard abatement (e.g., mowing) removes habitat and can injure individuals, while the suppression of the natural fire regime alters the structure and species composition of the plant communities, degrades habitat for the covered animals, and can inhibit population regeneration of the covered plants (Section D.3).

The LOHCP Preserve System will be managed to restore priority degraded habitat areas and prevent further deterioration of its condition as a result of the above and other factors, including global climate change, by maintaining areas of contiguous habitat and microsite conditions that can confer resiliency to a future hotter and potentially drier climate. Mean annual temperature in San Luis Obispo County is projected to increase by 2.1 to 3.9 ◦F by 2045 and 4.1 and 7.6 ◦F by 2085 (Koopman et al. 2010), though coastal areas such as Los Osos may experience less dramatic changes. The effects of these and other changes on individual species or communities can be difficult to predict as they will be influenced by a host of cascading indirect effects mediated by complex species interactions. Promoting persistence of the covered species may entail additional measures to address the effects of climate change (Section 6.5.3).

While the terms “restoration” and “management” have a variety of definitions, the following are operational definitions for the Plan:

1. **Restoration:** specific projects designed to re-create native plant community structure and species composition and/or ecosystem functions where they have been lost or severely impacted by anthropogenic (human-related) factors (e.g., invasion by exotic plant species, vegetation removal). Restoration activities typically occur in discrete areas and over a discrete period of time to achieve specified performance criteria, after which habitat is subject to ongoing management.
2. **Management:** treatments designed to address current or future threats to habitat, in order to enhance and then sustain conditions. Management treatments occur over larger areas (than restoration) and are often recurring or even ongoing, in the case of habitat maintenance activities, to prevent negative impacts to habitat, or to continue to improve generally degraded conditions.

Examples of restoration activities include establishing native plant community structure and species composition where it has been degraded by erosion, dense infestations of invasive plants, and incompatible recreational use including large or gullied trails. Restoration can also include steps to manage fire within the natural fire regime, including conducting a prescribed fire in an area of senescent central maritime chaparral where fire has been excluded (i.e., through fire suppression).

Management activities include steps to detect and rectify anthropogenic stressors that degrade habitat including: ongoing control of exotic plants, installing and maintaining fences or conducting patrols to enforce trail use regulations, and other activities to enhance and maintain natural community structure and species composition.

When compared with management, restoration generally has greater relative benefits for the covered species, which are assumed to not be able to utilize many severely degraded habitat areas (e.g., erosion gullies that lack vegetation); in contrast, covered species may occur within areas that require management, albeit at reduced population levels, depending on the habitat condition. Restoration activities are also generally more costly than management, on a per-acre basis, as they require more intensive planning (e.g., engineered solutions for erosion) and often more extensive effort to implement (e.g., extensive exotic plant removal, or active revegetation of large, denuded areas).

These distinctions were used as the basis for assigning these compensatory mitigation activities 'mitigation equivalencies' or 'mitigation crediting ratios', which express the relative benefits for the covered species of restoring or managing habitat within existing protected land, to *not* implementing a typical covered activity (Section 5.7.2.3.1). These mitigation crediting ratios were used to evaluate the net-effects and costs of a LOHCP Preserve System configuration scenario that was developed to illustrate how the conservation strategy can mitigate the impacts of the covered activities (Sections 5.7.2.3.2 and 5.8.1). The ratios will also be used by the County and the Implementing Entity to track the status of the Plan's stay-ahead provision, which requires that compensatory mitigation measures keep pace with, or exceed, the impacts caused by the covered species (Section 6.2.4)

Specific habitat restoration and management activities will be identified in the LOHCP Preserve System AMMP, which will be developed during the first three years of Plan implementation (Sections 5.3.3.2 and 6.2.3.2). Lands that are enrolled in the LOHCP Preserve System, including existing protected lands and newly protected lands, will be evaluated based on the condition of the natural communities, in terms of plant community structure and species composition, and the anthropogenic factors degrading them. These existing conditions will be used to delineate restoration and management areas based on the criteria above. That is, areas where native plant species composition and structure, and/or

ecosystem functions have been lost of severely impacted by anthropogenic factors will be assigned to restoration units. Once the restoration treatments have been implemented and the area has achieved the performance criteria, mitigation will be credited. The restored area will become a habitat management unit and will be subject to ongoing management and monitoring as part of the larger preserve system. The remaining area outside of restoration units, which is either relatively intact or features only limited degradation not meeting the criteria for restoration, will be included within the preserve's management units; in these areas, efforts will be taken to enhance and maintain habitat as well as monitor its conditions over time. The LOHCP Preserve System AMMP will identify a schedule for the release of mitigation credits based upon the timing of the enhancement management tasks in each preserve, with mitigation credits released over time as additional management tasks are phased in (Section 5.3.3.2). As a result, the entire area within each preserve will be within either a restoration or management unit as part of this plan, as the entirety of the preserves will be restored and/or managed as well as monitored.

The AMMP will then identify the specific restoration, management, and monitoring activities that are proposed for each preserve. The following criteria will be used to select and prioritize projects across the preserves:

1. **Number of Plan Goals and Objectives Advanced:** Projects that can advance multiple biological goals and objectives of the Plan (Section 5.1, Table 5-1) will be prioritized over those that advance fewer goals. For example, projects that can restore habitat for multiple covered species, and connect existing protected habitat areas, will be prioritized over projects that might benefit just a single covered species.
2. **Likelihood of Success**: Projects with a high likelihood of being successful, in terms of advancing one or more Plan goals and objectives, will be prioritized over those that are experimental or otherwise have lower probability of success;
3. **Cost Effectiveness**: To maximize effective use funds at achieving the Plan's biological goals and objectives, projects that are lower cost relative to the benefits achieved will be prioritized over projects that are higher cost, all else being equal (i.e., if they advance similar numbers of goals and objectives); and
4. **Sustainability:** Restoration and management projects that can have sustained benefits for the covered species, communities, and ecosystem will be prioritized over those that will require ongoing treatments, all else being equal.

Restoration projects will be required to meet specified performance criteria before the acres of habitat benefited can be credited as mitigation and be used to offset the impacts of covered activities. The performance criteria will be developed in the LOHCP Preserve System AMMP and, as appropriate, in project-specific work plans that are developed to implement the AMMP by detailing individual restoration projects. The performance criteria will reflect the specific functions or values that the project or strategy is designed to address and provide quantitative methods for objectively evaluating its benefits for the covered species, communities, and/or ecosystem, in order to clearly link the proposed work to the biological goals and objectives of the LOHCP (Section 5.1, Table 5-1).

The effectiveness of enhanced management will be assessed through ongoing monitoring as part of the AMMP (Appendix E), which will be designed to ensure that the LOHCP is achieving its biological goals and objectives (Section 5.1). While specific activities management units, such as larger-scale management projects, can be monitored to assess their effectiveness and inform adjustments as part of

the adaptive management framework of the AMMP (Section 5.5.2), specific performance criteria will not be established for areas subject to enhanced management.

5.3.3.1 Incorporation of Existing Protected Lands in the LOHCP Preserve System

5.3.3.1.1 Conservation Benefits

Existing protected lands contain much of the largest and most important habitat areas for the covered species within the Priority Conservation Area (Figure 5-1, Section 2.1.3). Restoration and management of these lands are essential to the long-term persistence of the covered species. Presently, management of habitat in County Parks, State Parks, State Ecological Reserves, Bureau of Land Management lands, and privately held conservation lands in the Plan Area is constrained by the limiting funding of the respective land management entities. In many cases, the properties were relatively recently acquired, and habitat conditions still reflect the legacies of prior land uses, including cultivation and off-highway vehicle use. As a result, areas of habitat within these lands are degraded, and in need of active management and in some cases, restoration.

Increases in the human population in Los Osos, which will result, in part, from additional development permitted as a result of the LOHCP, may indirectly impact habitat in existing protected lands, and thus the populations of the covered species (Section 4.1.2). For example, increasing the human population will likely increase the frequency of recreational use, which can trample vegetation and cause erosion (Section D.2). Degradation of habitat within these parks and reserves will impede efforts to restore and manage habitat that is protected during implementation of the Plan. Also, uncontrolled exotic plant populations and incompatible recreational uses on existing protected lands can result in the degradation of habitat on adjacent or nearby habitat protected through the LOHCP. Conversely, efforts to control veldt grass or deter incompatible recreational uses on a property protected through the LOHCP would be more effective if similar efforts were undertaken on adjacent protected lands.

Recognizing that enhanced and coordinated management of protected habitat within the Priority Conservation Area will promote long-term persistence of the covered species, the LOHCP Preserve System will include existing protected lands, which will be managed and restored along with new land protected through implementation of the Plan, as part of a coordinated, strategy outlined below. In addition, the County and the Implementing Entity will work with managers of other conservation lands that are not part of the LOHCP Preserve System (e.g., State Parks and BLM), as resources allow, to coordinate management in order to achieve common goals and objectives for management, including control of exotic plants.

To ensure that management of existing protected lands promotes attainment of the LOHCP goals and objectives, agencies and organizations seeking to enroll their lands into the LOHCP Preserve System must guarantee the following:

1. **Maintenance of effort:** the agency or organization will continue existing restoration and management efforts on the property, such that efforts funded through the LOHCP have added benefit for the covered species and do not simply replace existing efforts; and
2. **Long-term habitat protection:** the agency or organization must demonstrate that the property, or at least the portion that will be managed as part of the LOHCP Preserve System, is

permanently protected from development or other activities that would result in loss or degradation of the habitat.

To ensure these conditions are met, participating agencies and organizations shall enter into an agreement with the County to provide these assurances; these agreements will be subject to the review and concurrence of the USFWS. Such a cooperative management arrangement, which must be in place before habitat management and/or restoration of the site can be credited toward mitigation in the LOHCP, will also establish other important aspects of how the lands will be managed, including access by LOHCP Preserve System personnel (Section 6.2.3). The cooperative management agreement will also identify the legal authorities that govern management of the sites, and otherwise demonstrate how the habitat management and restoration conducted within the properties will have lasting benefits, and not be undone as a result of development or incompatible land uses.

5.3.3.1.2 Existing Protected Lands to be Enrolled

As part of the LOHCP planning process, County staff met with representatives of respective agencies to discuss the opportunity for have their lands within the Plan Area managed as part of the LOHCP Preserve System. The County also worked with conservation landowners to evaluate whether any policies or legal agreements, including deed restricts or terms within grant agreements, might preclude them from having their lands subject to restoration and enhanced management (i.e., management above and beyond what the agency is already required to implement) as mitigation.

Representatives of California Department of Parks and Recreation (State Parks) San Luis Obispo District declined to have their lands be considered for restoration and management as mitigation for the LOHCP (Barker 2015). The County similarly determined that it could not manage or restore the County-owned portion of the Elfin Forest Natural Area, since it was purchased, in part, with a grant from the State Coastal Conservancy which precludes future use of the property for mitigation. The portion of the County's Monarch Grove Natural Area that features a dense stand of mature blue gum (*Eucalyptus globulus*), is also unsuitable for mitigation, as it lacks suitable habitat for the covered species and is unlikely restored as the trees provide nesting habitat for raptors and support overwintering monarch butterflies (*Danaus plexippus*). The BLM lands were eliminated from consideration for inclusion within the LOHCP Preserve System because take cannot be authorized on federal lands under a Section 10(a)(1)(B) permit.

Staff from CDFW determined that the proposed management and restoration of the Morro Dunes Ecological Reserve is consistent with the CDFW mitigation policy (CDFW 2012; Appendix G). Therefore, of the nearly 800 acres of existing protected land within the Priority Conservation Area (Table 5-5, Figure 5-1), 281.1 acres were found to be suitable for management and restoration as part of the LOHCP (Table 5-5). Of the 281.1 suitable acres, an estimated 35.4 acres (12.6%) will require restoration to address severely degraded habitat conditions (Table 5-5). This area was determined based on an estimate of the percent of each property that features highly degraded habitat, including dense veldt grass infestation and denuded areas (e.g., trails or old roads), which were observed in recent aerial imagery and through limited site reconnaissance. The remaining 245.7 acres (87.4%) are eligible for enhanced management.

The precise areas to be restored and managed as part of the LOHCP will be identified in the LOHCP Preserve System Adaptive Management and Monitoring Plan, which will be developed early during implementation of the LOHCP (Sections 5.3.3.2 and 6.2.3.2). This management plan will identify and

prioritize areas for restoration and enhanced management based upon a comprehensive assessment of the lands to be enrolled, and application of the criteria listed in Section 5.3.3. It will build upon the *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System,* which identifies initial, high-priority restoration projects for the Morro Dunes Ecological Reserve (McGraw 2020; Appendix M).

As noted above, in order for activities to count as mitigation in the LOHCP, they must be above and beyond that which the landowner is already obligated to do. For the MDER, Appendix G documents how the enhanced management and restoration will be above and beyond the existing responsibility of CDFW (R. Stafford, pers. comm. 2016), which are taken to be the management recommendations identified in the land management plan for the ecological reserve (CDFW 1982). Appendix G also outlines how management of the ecological reserve is consistent with CDFW's *Policy for Mitigation on Publicly Owned, Department Owned, and Conserved Lands* (CDFW 2012).

There is currently no management plan identifying existing management obligations for the County's Monarch Grove Natural Area. Prior to the potential enrollment of this property into the LOHCP Preserve System, the existing obligations for management will be identified and used to determine the enhanced management and restoration activities proposed in the LOHCP Preserve System Adaptive Management and Monitoring Plan.

Though the remaining 497.7 acres of habitat within existing protected lands inside the Priority Conservation Area are not eligible for enrollment in the LOHCP Preserve System, these BLM, State Parks, and County lands contain habitat that is important for recovery of the covered species. Effective management of these lands can help promote the biological goals and objectives of the LOHCP, by limiting the potential of stressors degrading habitat on adjacent lands, such as exotic plants and incompatible recreational use, from impacting the LOHCP Preserves. Accordingly, the County and the Implementing Entity will work with managers of other existing protected lands within the Priority Conservation Area to coordinate management in order to maximize effectiveness and achieve shared conservation goals for the region. Such coordinated management can also enhance the cost-effectiveness of efforts on the LOHCP Preserve System. For example, coordinating exotic plant management across properties can help prevent reinvasion of a preserve from an adjacent property and reduce the per-acre costs of management through economies of scale.

5.3.3.2 LOHCP Preserve System Adaptive Management and Monitoring Plan

Restoration and management of land within the LOHCP Preserve System, as well as monitoring (Section 5.4.2), will be implemented following an Adaptive Management and Monitoring Plan (AMMP) that identifies the coordinated strategies that will be implemented in perpetuity to achieve the greatest long-term conservation benefits for the covered species. To ensure that it is based upon the most current information about habitat conditions, species ecology, threats, and management, the LOHCP Preserve System AMMP will be developed by the Implementing Entity during the first three years of plan implementation. The AMMP will be subject to written approval of the USFWS as representatives of agencies whose lands will be managed as part of the LOHCP Preserve System, including CDFW (Section 6.2.3.2).

The LOHCP Preserve System AMMP will be developed based on information contained in the LOHCP, which provides the framework for its development based upon an up to date and detailed assessment

of habitat conditions. Specifically, the LOHCP Preserve System AMMP will be designed to promote achievement of the LOHCP biological goals and objectives (Section 5.1, Table 5-1), integrate the LOHCP's avoidance and minimization measures (Section 5.2), and prioritize restoration and management actions (Section 5.3.3) that will have the greatest lasting benefits for the covered species. The management plan will reflect other elements of the conservation program outlined in this Plan, including the appendices which contain the following information designed to inform the LOHCP Preserve System AMMP:

- Detailed descriptions of the covered species, with an emphasis on aspects of their ecology that can inform habitat management (Appendix B);
- a critical assessment of three main factors that degrade habitat— exotic species, unmanaged recreation, and altered fire regimes— and approaches to addressing them through restoration and management projects (Appendix D); and
- draft monitoring protocols for the covered species, natural communities, and general habitat conditions (Appendix E).

During the first three years of Plan implementation, the framework and initial information presented in the LOHCP will be integrated with new information obtained through the following:

- baseline surveys and monitoring of the habitats and covered species populations; and
- the latest scientific information including results of habitat management and restoration projects.

Collectively, this current information will be used to develop robust management and restoration strategies to achieve the biological goals and objectives of this plan (Section 5.1, Table 5-1). The site-specific surveys will also be used to identify the initial projects or tasks within the preserve system lands, which will be prioritized based on their long-term conservation value for the covered species, communities, and ecosystem. For example, exotic plant management strategies will reflect the distribution, abundance, and impacts of the exotic plants found in or near the preserves. These elements will be adapted over time, based on the results of monitoring that will be used to evaluate effectiveness of management and restoration, as well as to identify changed conditions (e.g., new invasive species).

The following are the specific objectives of Preserve System AMMP, which will:

1. **Evaluate current conditions of habitat**, including the structure and species composition of the vegetation and occurrences of the covered species;
2. **Examine existing and future threats** to habitat and the covered species, which include a variety of factors that can degrade habitat or reduce populations (Appendix B), such as exotic species, altered disturbance regimes, and current and historic land uses (Appendix D), as well as climate change;
3. **Identify goals and objectives**, which tier off the Plan biological goals and objectives (Section 5.1), reflect the desired future condition of habitat, and provide specific measures to evaluate success of management;
4. **Describe general treatments** that can be used to restore habitat degraded by erosion, exotic plants, incompatible recreation, wildfire, and fire exclusion (Appendix D) and abate threats presented by these and other anthropogenic factors that can degrade habitat;
5. **Prioritize restoration and management,** based on the criteria outlined in Section 5.3.3 and the results of the baseline surveys and monitoring, and identify a timeline or system of phasing

projects (e.g., short, medium, and long-term projects) to maximize long-term effectiveness of the regional strategy;

6. **Identify performance criteria for restoration projects** to be implemented on existing protected lands**,** which will specify the conditions that the projects are designed to achieve, in terms of quantitative measures of habitat condition that relate to the covered species, and/or direct measures of the covered species populations (e.g., occupancy or indices of abundance), and the timeframes in which the criteria will be achieved in order for the projects to be used as mitigation in the plan;
7. **Identify the Schedule for Management Actions:** identify a schedule for management actions and how mitigation credits will be released as management projects are conducted as part of enhanced management of existing protected lands. Newly protected lands will also be managed per a schedule outlined in the AMMP, but mitigation credits for these preserves will be generated at the time they are protected, rather than over time as restoration and management are implemented.
8. **Describe the final monitoring protocols** that will be used to evaluate status toward the goals and objectives and track trends in the covered species and their habitats (Appendix E), as well as evaluate the effectiveness of specific restoration and large-scale management projects; and
9. **Describe the adaptive management process** that will be used to make changes in restoration, management, and monitoring over time, to achieve the goals and objectives of the Plan.

By developing the LOHCP Preserve System AMMP at the outset of LOHCP implementation based on the framework and background information in this plan, combined with the information gained through current, site-specific surveys and assessments and a critical review of the latest scientific literature and management and restoration practices, the management plan will be able to most accurately identify the priority projects for properties incorporated in the LOHCP Preserve System. Once developed, the Preserve System AMMP will be updated at approximately five-year intervals, or as needed to ensure that it remains current and relevant and reflects the latest information as part of the adaptive management framework; specifically, to reflect monitoring results, scientific information, changed circumstances, and new measures to achieve the Plan's goals and objectives (Section 5.5).

The Preserve System AMMP will also be updated as new preserves are enrolled in the Preserve System following acquisition of fee title and/or easement (Sections 5.3.2 and 6.2.2). Specifically, as each property is added to the preserve system, it will be surveyed and evaluated to inform restoration and management. The LOHCP Preserve System AMMP will then be updated to include a property-specific management element (e.g., chapter) that identifies the restoration and management units, as well as priorities restoration and management activities for the new preserve. These preserve-specific priorities will be integrated into an updated prioritization for the entire LOHCP Preserve System, so that resources available for restoration and management are directed where they can maximally effective toward achieving the biological goals and objectives of the LOHCP.

5.3.3.3 Interim Adaptive Management and Monitoring Plan

The *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (McGraw 2020, Appendix M) was developed to guide initial restoration activities within the Morro Dunes Ecological Reserve, which the County proposes to enroll into the LOHCP Preserve System as part of initial work to implement the LOHCP conservation program (Section 6.2.5). The

Interim AMMP (or IAMMP) describes the existing conditions within the MDER, establishes the existing management effort by CDFW (the land manager), identifies priority restoration work to re-create natural community structure and species composition in communities in order to promote populations of the covered species, and describes how the work will be monitored to evaluate achievement of performance criteria so that the restoration can be credited as mitigation under the Plan (Appendix M). The IAMMP will be superseded by the AMMP, which will be developed while the IAMMP is being implemented.

5.4 Monitoring

Monitoring is an essential element of the LOHCP conservation program and is integral to implementation of the LOHCP in an adaptive management framework (Section 5.5). Monitoring for the LOHCP will include two main components:

1. **Implementation Monitoring:** steps taken to document implementation of the Plan and compliance with the terms of the incidental take permit; and
2. **Biological Effectiveness Monitoring**: methods to track the status and trends in the covered species populations and their habitats, examine the effectiveness of restoration and management projects, and evaluate progress toward attaining the LOHCP biological goals and objectives.

Table 5-6 identifies the monitoring methods that will be used to track implementation and effectiveness of the LOHCP toward achieving the Plan's biological goals and objectives (Table 5-1). Appendix E provides draft protocols for the biological effectiveness monitoring studies. These monitoring protocols will be finalized within the Preserve System AMMP (Section 5.3.3.2), which will identify changes designed to improve their effectiveness. During implementation of the Plan, monitoring results will be documented in the annual reports provided to the USFWS (Section 5.6).

5.4.1 Implementation Monitoring

The County will track implementation of the Plan, and compliance with the terms of the incidental take permit. The County will conduct monitoring of individual projects, to ensure that their impacts do not exceed the predetermined envelopes specified in their Certificate of Inclusion. If additional impacts are determined to have occurred, or if projects are conducted without a Certification of Inclusion, the County will contact the USFWS and County Code Enforcement and proceed with addressing the violations as outlined in Section 6.3.3.

The County will also conduct implementation monitoring to ensure that take/impacts due to the covered activities does not exceed the limits of the permit, and that the Plan is being implemented in compliance with the stay-ahead provision, which ensures that the habitat protection, restoration, and management activities keep pace with, or outpace, habitat and species impacts that result from covered activities (Section 6.2.4).

5.4.1.1 Covered Activities Implementation Monitoring

To track implementation of the covered activities, the County will create and maintain a database that documents their impacts as well as the success of the required mitigation elements. The spatial database will identify the type and location of each covered activity as well as the following:

1. **Impacts**: the area (i.e., square feet) of habitat temporarily impacted, the area of habitat permanently impacted, as well as the take of/impacts to individuals, if any is observed;
2. **Protection measures:** implementation of the measures established to avoid and minimize impacts to the covered species and avoid impacts to other listed species in the Plan Area (Section 5.2); and
3. **Mitigation**: payment of habitat mitigation fees, and dedication of conservation easements, where applicable, by the Plan participants (Section 5.7.2).

The database will be used to evaluate implementation of the Plan to ensure the covered activities are mitigated to a level that is commensurate with the impacts of the covered activities.

5.4.1.2 LOHCP Preserve System Implementation Monitoring

To track implementation of the compensatory mitigation, the County will work with the Implementing Entity to create and maintain a database that documents LOHCP Preserve System activities, including habitat protection, restoration, and management funded by the mitigation fees to collectively compensate for impacts of the covered activities (Section 5.7.2). The spatial database will track the following:

1. **Habitat Protection:** the area of new habitat permanently protected through acquisition of fee title, and the area protected through conservation easements;
2. **Habitat Restoration:** the degraded habitat area that was successfully restored to promote the ability of the habitat to sustain the covered species; and
3. **Habitat Management:** the type and area of habitat management treatments used address factors that degrade habitat for the covered species.

The database will track application of these activities to each of the vegetation and other land cover types mapped in the area and used for the take/impacts assessment (Table 4-3); this will enable the comparison of the net effects of Plan implementation on the covered species and their habitats and to determine whether the plan is being properly implemented in accordance with the terms of the Plan and permit. In order for the acres of habitat restored or managed to be counted as mitigation under the Plan, the treated area will need to meet the performance criteria identified in the AMMP (or IAMMP), which will be evaluated through the LOHCP effectiveness monitoring program, as described below.

The database will also track costs associated with these activities, to facilitate ongoing work to improve the cost-effectiveness of the conservation program, as well as facilitate updates to the mitigation program fee schedule (Section 7.4).

5.4.2 Effectiveness Monitoring

Monitoring will be conducted to evaluate the effectiveness of the conservation program, including:

1. **Long-Term Monitoring:** studies to evaluate the status and trends in the covered species populations and the conditions of their habitats, and thus progress toward the biological goals and objectives; and
2. **Project-Specific Monitoring:** studies to examine the effectiveness of specific restoration and management projects, to ensure that they achieve the performance criteria established to

gauge their effectiveness at promoting the biological goals and objectives of LOHCP Preserve System Management, and substantiate the mitigation to compensate for the impacts of the covered activities on the covered species.

The following sections describe the objectives and approaches to these two general types of monitoring. Appendix E provides draft monitoring protocols for the covered species and habitat conditions within the LOHCP Preserve System. Additional details will be developed in the LOHCP Preserve System AMMP that will be developed during the first two years of plan implementation (Sections 5.3.3.2 and 6.2.3.2).

5.4.2.1 Long-Term Monitoring

A suite of complementary studies will also be conducted to track the status of the covered species populations and evaluate the conditions of their habitat that could influence viability of their populations. Table 5-6 summarizes the monitoring protocols, while Table 5-1 identifies how they will track progress toward the goal and objectives. Initial monitoring protocols for the studies in Table 5-6 are outlined in Appendix E; these will be revised as part of efforts to develop the LOHCP Preserve System AMMP.

Long-term monitoring studies will be conducted in perpetuity as mitigation for the covered activities. During the permit period, the frequency of monitoring, or number of years between study implementation, varies depending on the life history and ecology of the biological system being examined, to maximize cost effectiveness of the overall monitoring effort. Specifically, annual monitoring will be conducted to evaluate the general conditions of the habitat to detect changes or threats that merit remedial actions. Annual monitoring will also be used to track populations of Morro shoulderband snail; this relatively short-lived species can exhibit greater population fluctuations than longer-lived species (e.g., Morro manzanita). More frequent monitoring is needed to identify natural fluctuations in the populations and understand factors that influence them (e.g., climate), and distinguish these from population declines that can threaten long-term persistence.

Morro manzanita and the other covered species will be monitored on a five-year interval. This interval will also be used to map exotic plants and the plant communities, as well as quantitatively assess plant community structure and species composition to evaluate habitat conditions (Table 5-6). While these factors can vary annually due to weather, the goal of the monitoring is to detect long-term changes due to management, or lack thereof.

After the permit has expired, and no additional take/impacts of the covered species will be permitted under the LOHCP, the habitat and covered species populations will continue to be monitored as part of in perpetuity implementation of habitat management, which will be designed to ensure that the biological goals and objectives related to their long-term persistence are attained. However, the frequency of monitoring for the covered species will decrease (Table 5-6) to reduce overall costs of the conservation program while still providing information needed to monitor success toward the biological goals and objectives in perpetuity.

5.4.2.2 Project-Specific Monitoring

As part of the adaptive framework that will be used to manage the LOHCP Preserve System, monitoring will also be conducted to examine the effects of individual restoration and large-scale management

projects. The purpose of project-specific monitoring is to evaluate achievement of the performance criteria needed to credit restoration as mitigation for the covered activities, and enhance long-term effectiveness of restoration and management by 'learning by doing' (Walters and Holling 1990). Wherever possible, restoration and large-scale management projects will be conducted using an experimental design, which enables quantitative examination of their effects. Such experimental methods include establishing controls or reference populations, and replicating treatments, wherever feasible. Smaller-scale management projects can also be monitored, as resources allow; however, restoration projects and management projects with the potential to have large effects will be the focus of project-specific monitoring.

Project-specific monitoring will be conducted for all restoration actions that are designed to offset the impacts of the covered activities. The monitoring methods will vary depending on the nature of the project, but in all cases will be designed to evaluate whether the restoration project has achieved the performance criteria: specific objectives of the action that reflect its effectiveness and enhancing habitat or promoting population growth and persistence directly (Section 5.3.3.2). Project-specific monitoring will also be used to identify the need for follow-up treatments as well as remedial actions to ensure the project meets the performance criteria.

Project-specific monitoring will be especially important for projects that can have uncertain or potentially deleterious effects on the covered species. To leverage expertise and other resources, the Implementing Entity will partner with research institutes such as California Polytechnic State University San Luis Obispo to design and implement effective monitoring studies.

Within a given study, the monitoring duration and interval will depend on the project and the monitoring objectives. Generally speaking, project-specific monitoring will be conducted three to five times during a five to ten-year period; longer monitoring periods may be required depending on the nature of the habitat or species response(s) being evaluated. For example, treatments to control the exotic perennial veldt grass could be evaluated in years 1, 3, and 5. Monitoring for a prescribed burn or fire surrogate designed to promote Morro manzanita regeneration could occur in years 1, 5, and 10. These and other details of project-specific monitoring protocols will be developed based upon the specific aspects of the project and the goals for monitoring.

5.4.2.3 Facilitate Research

As part of the LOHCP, the County will work with the Implementing Entity to facilitate research by scientists at universities, agencies, and organizations by maintaining a list of priority studies, conducting outreach to research institutions to engage their participation in research in the LOHCP Preserve System, and as feasible, seeking outside funds to support research (Section 6.1.1.8). The goal of the research, which will not constitute mitigation in the conservation program, will be to improve upon the understanding of the biology of the covered species in order to develop and implement effective conservation strategies to facilitate their persistence. Examples of such research identified in the recovery plan for the species include (USFWS 1998a, 1999):

- Examination of the species' habitat requirements;
- New exotic plant control methods that maximally benefit the covered species;
- Techniques to maintain a mosaic of vegetation appropriate for all listed and sensitive species; and

- Evaluate recolonization abilities of species.

The research studies will complement work by the Implementing Entity to increase understanding of the ecology and conservation needs of the covered species and the natural communities in which they occur through long-term and project-specific monitoring implemented as in the LOHCP Preserve System as described above and in Appendix E. New information developed through research as well as monitoring will be integrated into the adaptive management process used to promote effectiveness of the LOHCP.

5.5 Adaptive Management

The LOHCP conservation program will be implemented through an adaptive framework, in which the elements of the program are adjusted, over time, in order to enhance their long-term effectiveness at achieving the program goals (Figure 5-5). The adaptive management framework incorporates the four elements recommended by the USFWS for adaptive management in HCPs (65 FR 35252):

1. Identify uncertainties and the questions that must be addressed to resolve the uncertainties;
2. Develop alternative strategies and determine which experimental strategies to implement;
3. Integrate a monitoring program that is able to detect the necessary information for strategy evaluation; and
4. Incorporate feedback loops that link implementation and monitoring to a decision-making process.

The adaptive management process will be used to implement all elements of the conservation program, including the avoidance and minimization measures as well as habitat protection, restoration, management, and monitoring.

5.5.1 Adaptive Management of the Overall Conservation Program

The LOHCP conservation program will be managed adaptively as part of the annual cycle in which monitoring results (Section 5.4) are used to assess progress toward achieving the biological goals and objectives (Section 5.1). New scientific information and changed conditions or circumstances (Section 6.5) will also be evaluated to identify modifications to the conservation program components, including avoidance and minimization measures (Section 5.2) habitat protection strategies (Section 5.3) and habitat management and restoration techniques (Section 5.4). The annual report (Section 5.6) will identify proposed adjustments to enhance effectiveness of the program, which will be based on one or more the following:

- **Biological effectiveness monitoring results**, which can refine management strategies and techniques;
- **Implementation monitoring results**, which can identify additional or different protection measures;
- **New scientific information,** which can inform effective conservation and management of the covered species and the communities in which they occur; and

- **Changes in habitat conditions,** including threats to the covered species, such as invasion and spread of exotic plants or animals, fire, drought, or global climate change, which may necessitate additional or different management treatments (Section 6.5).

The County will work with the Implementing Entity to identify proposed adjustments to the LOHCP conservation program in the annual reports, which will be provided to the agencies by March 31 during the year following that which is covered by the report. The County will work with the Implementing Entity to convene a meeting of agency representatives to review the annual report and discuss proposed changes.

5.5.2 Adaptive Management in Management of the LOHCP Preserve System

The LOHCP Preserve System will be managed following adaptive management techniques, which address the uncertainty inherent in habitat restoration and management, enable managers to adapt to changed conditions within the LOHCP Preserve System, and will increase understanding of the covered species and communities over time, in ways that will promote long-term effectiveness of management.

As part of this adaptive approach, management and restoration projects will be conducted as experiments that can be used to evaluate their effects on the covered species and communities, and their effectiveness (Figure 5-5, Walters and Holling 1990, Nyberg 1998, Lee 1999, Elzinga et al. 2001). Should the projects succeed, monitoring will be used to document their long-term success. Should a project fail, the results will be used to refine the model for the system that will increase the likelihood of future restoration project success. Notwithstanding the objective of learning from unsuccessful projects, restoration projects will still be required to meet specified performance criteria, which will be identified in the LOHCP Preserve System AMMP and that reflect their conservation value for the covered species, in order to be credited as mitigation in the Plan (Section 5.3.3).

Adaptive management will also be needed to confront the changes in conditions during the course of management of the LOHCP Preserve System in perpetuity. Changes in community composition (e.g., the invasion of an exotic plant) and species populations (e.g., a decline in Morro shoulderband snail populations due to disease outbreak), among others, will require changes in management strategies and priorities. In addition, management techniques that might have been effective in one place or time may not be effective in another, requiring continued vigilance to achieve the conservation goals of the LOHCP.

Adaptive management will therefore by utilized at several levels during management of the LOHCP Preserve System to facilitate attainment of the biological goals and objectives. To fund the remedial management to address adaptive management, as well as changed circumstances, 10 percent was added to the estimated restoration, management, and monitoring costs (Section 7.2.3); this reflects remedial management costs budgeted in another recent regional HCP (County of Santa Clara et al. 2012).

5.6 Reporting

In order to document implementation of the Plan and its progress toward the goals and objectives, the County will work with the Implementing Entity to prepare and submit to the USFWS an annual report. The reports will be submitted by March 31 of the year immediately following the reporting year, to

allow time for results of annual monitoring studies, as well as all other requisite record keeping, to be prepared and synthesized.

The annual report will document the results of the implementation and biological effectiveness monitoring conducted during the calendar year, as well as provide the status of the overall conservation program to date. The following is an outline of specific elements that will be integrated into the annual report.

1. **Implementation Monitoring Report:** This component of the annual report will describe the effectiveness of efforts to implement the plan and quantify its impacts on the covered species. It will include the following:
    - **Plan Impacts to Covered Species:** The number of applications and approvals for take authorization, the area (i.e., square feet) of habitat temporarily impacted and the area of habitat permanently impacted, as well as the take/impacts of individual covered species, including that resulting from any pre-project surveys;
    - **Protection measures:** the results of compliance monitoring to ensure implementation of the measures to avoid and minimize impacts to the covered species and avoid impacts to other listed species in the Plan Area (Section 5.2); and
    - **Mitigation:** work to implement the conservation strategy, including mitigation fees collected, and acres of habitat permanently protected, restored, and managed.
2. **Biological Effectiveness Monitoring Report:** This component of the report will document the results of monitoring studies to evaluate condition of the habitat and covered species populations, and effectiveness of the plan at achieving its biological goals and objectives. Report components will depend on the studies conducted in the plan year, but will generally include:
    - Results of long-term monitoring studies for the communities, habitats, and covered species populations; and
    - Results of specific monitoring studies conducted for habitat management and restoration projects to examine the effects and effectiveness.
3. **Financial Report:** This report will document the financial status of the Plan, including mitigation fees collected, mitigation costs (funds expended to implement the conservation program), and the balances of the trust accounts that contain funds for management during the permit term, and the endowments that will be used to fund administration and management post-permit (Section 7.3.1). The report will also assess financial viability of the plan, which will address the sufficiency of the mitigation fees to implement the conservation program to the level needed to ensure that the mitigation is commensurate with the impacts of the covered activities.
4. **Changes to the Plan:** This component of the report will document any minor or administrative amendments to the Plan approved for the preceding year in accordance with the procedures described in Section 6.7. It will also outline any recommended changes identified as part of the adaptive management process (Section 5.5).

The annual report will contain as appendices the reports from studies to monitor specific projects, the covered species, and their habitats (Section 5.4.2; Appendix E).

The County and the Implementing Entity will convene a meeting with the USFWS to review the annual report during the second quarter of the year (April-June) to discuss changes to plan implementation and proposed plan amendments (Section 6.7). A separate meeting will be conducted in the fall to discuss preliminary monitoring results and their implications for the Plan in the coming year; the decision points from that meeting will be reflected in the annual report.

5.7 Mitigation Requirements and Implementation

The elements of the LOHCP conservation program will be implemented by the County in coordination with the Implementing Entity and the project proponents to mitigate the impacts of their permitted activities on the covered species and their habitats.

The mitigation in this plan includes two main components:

1. **Avoidance and Minimization measures,** to prevent or reduce the number or severity of take of/impacts to the covered species resulting from the covered activities, including by restoring temporarily disturbed habitat on-site; and
2. **Compensatory Mitigation,** to offset the unavoidable take/impacts of the covered species resulting from the covered activities by permanently protecting and managing habitat, as well as restoring degraded habitat.

Tables 5-2 through 5-4 outline the measures designed to avoid and minimize impacts. Table 5-7 identifies the compensatory mitigation requirements. These elements were developed so that collectively:

1. the LOHCP mitigates the impacts of the covered activities to level that is commensurate with the effects of the taking; and
2. there is rough proportionality between the take/impacts of the covered activities and the mitigation requirements.

The following sections describe the mitigation requirements; additional information about the actions themselves is provided in the preceding sections of this chapter.

5.7.1 Avoidance and Minimization

Participants in LOHCP will be required to avoid and/or minimize take of/impacts to the covered species (Table 5-2) and avoid impacts to other listed species not covered by the incidental take permit (Table 5-3). A separate suite of avoidance and minimization measures will be implemented for activities conducted to implement the CWPP (Table 5-4) to ensure these projects have negligible impacts on covered species (sections 2.2.7 and 5.2.4).

As part of the application review and permitting process, the County will identify the specific protection measures that must be conducted for each project permitted under the LOHCP. These measures will be identified within the Certificate of Inclusion issued for projects covered by the LOHCP (Appendix H).

Certain avoidance and minimization measures may entail costs (e.g., for pre-project surveys), which will be the responsibility of the project proponents. The mitigation fees provided to compensate for the

project impacts do not fund implementation of the avoidance and minimization measures; instead, the mitigation fees will fund the compensatory mitigation under the LOHCP (Chapter 7).

5.7.2 Compensation

Participants in the LOHCP will be required to compensate for the impacts of their permitted projects on the covered species by implementing mitigation to protect, restore, and manage habitat that contributes to the long-term viability of their populations. The level of compensatory mitigation will be commensurate with the impacts of the project activity and will be based on the amount of disturbance caused by the project. For purposes of this plan, disturbance is defined as any activity that removes vegetation or disturbs soil, including by displacing it or covering it. The disturbance envelope, for purposes of mitigation calculations, includes the entire area that is disturbed as a result of the project and that is not covered by existing impervious surfaces including existing buildings or other structures, and hardscapes such as concrete, asphalt, or other land cover that is impervious. Areas that are landscaped, denuded, or feature pervious surfaces, as well as natural or semi-natural habitat, are all included within the disturbance envelope.

The disturbance envelope includes the area surrounding buildings or other structures where fire hazard abatement and vegetation modification are required to create and maintain defensible space (Section 2.2.4), as well as the area of new improvements themselves, including buildings, hardscapes, and landscaping.

The disturbance envelope for purposes of compensatory mitigation includes the area of habitat that is temporarily impacted as a result of construction activities including access and staging, and is restored following completion of the project, as well as the area of permanent habitat impacts. This inclusive disturbance envelope ensures compensation for all take/impacts, including that which occurs in areas of temporary disturbance, as well as from permanent loss of habitat.

Compensatory mitigation is not required for the impacts of activities to restore, manage, and monitor the Preserve System, as outlined in the Preserve System AMMP (Section 5.3.3.2), as to do so would require compensation for the compensatory mitigation itself. Compensatory mitigation will also not be required for implementation of the CWPP activities, which are limited in scope and will have negligible and largely temporary impacts that will be adequately mitigated through implementation of the avoidance and minimization measures (Table 5-4; Section 5.2.4).

5.7.2.1 Habitat Protection Requirement

Safeguarding additional unprotected habitat from development or other factors that degrade habitat for the covered species is an essential component of the LOHCP conservation program (Section 5.3.2). In order to mitigate the covered activities, project proponents will be required to protect habitat on-site or off-site, with the specific requirement depending on the type of project (Table 5-7). To summarize, private residential landowners developing vacant parcels located within the Priority Conservation Area will be required to set aside habitat on site at a ratio of 3:1 for the impacts caused by the development projects (Section 5.7.2.1.1). Other project proponents will pay a Habitat Protection Fee which will be used to protect land through acquisition of fee title or conservation easements from willing sellers largely inside the Priority Conservation Area (Section 5.7.2.1.2). All project proponents will be required

to pay a habitat restoration, management, and administration fee, which will fund management of the LOHCP Preserve System, as well as administration of the Plan (Section 5.7.2.2).

5.7.2.1.1 On-Site Habitat Protection

Participants in the LOHCP conducting new residential development on vacant land within the Priority Conservation Area (Figure 5-1) will protect habitat on site at a ratio of 3:1 for the disturbance caused by the activity. For example, landowners seeking to develop a new single-family home and associated improvements that disturb 30,000 square feet will be required to set aside 90,000 square feet of habitat within the parcel. Proponents of new development projects on vacant parcels inside the PCA that are too small to set aside the required set aside based on the maximum disturbance envelop can either reduce the size of their project to a size that accommodates the requisite habitat set-aside or mitigate habitat loss through payment of the Habitat Protection Fee rather than on-site habitat set-asides (Section 5.7.2.1.2).

The undeveloped parcels located within the Priority Conservation Area generally feature habitat of greater general conservation value for the covered species than other parcels in the Plan Area (Section 5.3.1.2). This accounts for the higher ratio for habitat protection (3:1) when compared to that required for other projects (1:1), which will pay the habitat mitigation fee (Section 5.7.2.1.2). Protecting habitat within parcels in the Priority Conservation Area will help promote several of the biological objectives, most notably by promoting connectivity of habitat in the region (Table 5-1).

The location of the habitat set-aside will be determined by the Implementing Entity in coordination with the County and the USFWS, which will work with the landowner to identify a set-aside area that provides high conservation value and is conducive to long-term protection, management, and monitoring. The habitat will be permanently protected via a conservation easement dedicated to the Implementing Entity (Section 6.2.2). To ensure that the protected habitat facilitates the biological goals and objectives of the LOHCP (Section 5.1, Table 5-1), the easement will provide for permanent management and monitoring of the conserved area. (Section 6.2.2.2).

Proponents of development projects that would impact Environmentally Sensitive Habitat Areas (ESHA) may be required to set aside additional habitat in order to comply with the California Coastal Act. While the LOHCP requires that proponents in the PCA set aside habitat at a 3:1 ratio, the State Coastal Commission may require that all remaining habitat outside of the development envelope be protected through a County open space easement, which limits uses to natural resource management. These habitats set-asides would protect additional habitat not included in this analysis of the conservation benefits of the LOHCP Conservation Program.

Proponents of these projects must also pay a separate habitat restoration, management, and administration fee. This fee will be used to manage the LOHCP Preserve System in perpetuity, including that which they dedicate on site, as well as to administer the plan (Sections 5.7.2.2 and 7.2.5.2).

5.7.2.1.2 Habitat Protection Fee

Proponents of the other covered activities identified in Table 5-7 will pay a Habitat Protection Fee that will contribute to protection of additional privately held, unprotected land that will be included in the LOHCP Preserve System (Section 5.3.2). Proponents of these covered activities will be required to

mitigate their project impacts on a per-square foot basis: for every square foot of ground disturbance, project proponents will pay a fee that was calculated to cover the costs to acquire through fee or conservation easement (i.e., protect) in perpetuity suitable habitat as outlined in the sections describing the Preserve System Configuration (Section 5.7.3.2) and Funding (Section 7.3). As outlined above, ground disturbance includes any activity that removes vegetation or disturbs soil in an area not covered by existing impervious surfaces.

The Habitat Protection Fee was calculated based on vacant land costs in the area (Section 7.2.1). The fee will be re-evaluated after three years, and then every five years thereafter, with adjustments made, as needed, to ensure the fee is sufficient to fund habitat protection (Section 7.4).

Though on-site habitat protection is preferable in many cases, it was determined to be infeasible and/or ineffective at contributing to the biological goals and objectives of the LOHCP for the following types of projects designated to pay the Habitat Protection Fee (Table 5-7).

Private Development of Vacant Parcels outside of the PCA: Habitat within vacant parcels located outside the PCA has limited ability to promote population viability of the covered species. Much of it is on small, often isolated parcels and is therefore fragmented; a lot of this habitat has been degraded by more intensive land uses in this area, including frequent mowing or incompatible recreational uses. Habitat outside the PCA would be difficult to restore and manage due to its proximity to dense development, which increases the impacts of incompatible recreation use and inhibits effective fire management.

Redevelopment on Developed Parcels: Habitat on parcels that have already been developed either for commercial or residential uses, with all else being equal, is less valuable for conservation of the covered species, as it is fragmented by existing development, and degraded by the associated land use activities. The value of on-site set-asides established for redevelopment activities would be further limited by their small size; most redevelopment projects will affect 500 to 5,000 square feet which would lead to set-asides of just 1,500 to 15,000 square feet. Such small areas are extremely cost-ineffective to monitor and manage.

Public and Private Utility Projects: Many public and private utility projects will occur outside the PCA where habitat is fragmented and degraded, and has lower long-term viability as outlined above. Many will occur in the County right-of-way or on small parcels with existing facilities, where habitat protection is not feasible. As with redevelopment projects, many of the public and private utility projects are small, such that the value of resulting set-asides would be low relative to their costs to manage and monitor.

Proponents of these projects must also pay a separate fee is also paid to manage and restore habitat, as well as fund administration of the plan (Section 5.7.2.2).

5.7.2.2 Habitat Management and Restoration Requirement

All proponents of projects outlined in Table 5-7 must pay a Restoration/Management/Administration Fee, which will be used to restore, manage, and monitor habitat in the LOHCP Preserve System as outlined in the LOHCP Preserve System AMMP (Section 5.3.3.2); this fee will also fund administration of the Plan.

Restoration of habitat is necessary to compensate for the loss of habitat caused by the covered activities (Section 4.2). This off-site restoration designed to offset the impacts of the covered activities, is in addition to restoration of temporarily disturbed habitat on-site, which is required to minimize project impacts (Table 5-2). Ongoing management is required to ensure that the habitat restoration achieved is sustained, and that habitat protected from development in LOHCP Preserves is enhanced in terms of its functions for the covered species (Section 5.3.3). Long-term monitoring of the Preserve System is essential to ensuring long-term effectiveness of the restoration and management treatments (Section 5.4).

These critical components of the conservation program will be funded through a Restoration/Management/Administration Fee, which will also fund administration of the Plan, so that its costs are born by the Plan participants (Section 7.3). Like the Habitat Protection Fee, the Restoration/Management/Administration Fee is based on the area disturbed by the covered activity; this ensures the mitigation is proportional to the project impacts.

The initial fee was determined based on the anticipated costs of conducting the necessary habitat restoration, management, and monitoring activities within the LOHCP Preserve System, as well as administering the plan (Section 7.2). The cost analysis included establishment of endowments to fund ongoing management and monitoring of the LOHCP Preserve System (Section 7.3). These endowments will ensure the condition of habitat protected and restored within the LOHCP Preserve System is maintained in perpetuity.

Like the Habitat Protection Fee, the Restoration/Management/Administration Fee will be re-evaluated after three years, and then every five years thereafter or as needed; adjustments to the fee will be made, as needed, to ensure it funds the actual costs of restoration, management, monitoring, and administration (Section 7.4).

5.7.2.3 Preserve System Assembly and Management

In this programmatic, 25-year plan, the LOHCP Preserve System will be assembled over time as the Implementing Entity accepts conservation easements dedicated by landowners developing vacant land inside the Priority Conservation Area; uses Habitat Protection Fees collected from other project proponents identified in Table 5-7 to acquire fee title or easement from willing sellers of land inside the Priority Conservation Area; and uses restoration, management, and administration fees collected from all project proponents identified in Table 5-7, to restore, manage, and monitor the newly acquired land, as well as existing protected lands enrolled into the LOHCP Preserve System. These land protection, restoration, and management actions will be phased in over time and keep pace with the covered activities, such that at any time during plan implementation, the benefits of the Preserve System for the covered species exceed or at least match the impacts of the covered activities, such that the mitigation is commensurate with the impacts on the covered activities.

The County will work with the Implementing Entity to use the fees and habitat dedications to establish and manage the LOHCP Preserve System—the network of protected habitat, which will include existing protected lands as well as habitat protected through implementation of the Plan, which will be restored, managed, and monitored in a coordinated manner to achieve the biological goals and objectives of the

LOHCP. The LOHCP covered activities are estimated to result in 532 acres[19] of ground disturbance within the Baywood fine sands ecosystem (Section 2.2; Table 2-9). This will primarily result from private residential and commercial development (409.5 acres), including that of vacant parcels (253.8 acres) and redevelopment of partially developed parcels (155.7 acres). The remaining area (122.1 acres) is anticipated to be impacted by capital improvements and maintenance activities associated with public and private utility projects (Table 2-9).

To mitigate the impacts of these projects at a ratio of 1:1, the LOHCP Preserve System must benefit at least 532 acres of habitat suitable for the covered species. Analyses conducted to develop the Plan identified more than 300 acres of privately owned, unprotected land within the Priority Conservation Area, which is illustrated in Figure 5-1. These lands are highly suitable for long-term conservation and that could be protected (i.e., through acquisition of fee title and dedication of a conservation easement) and managed to mitigate the impacts of the covered activities. In addition, the Priority Conservation Area features 298.2 acres of habitat within existing protected lands that were identified as suitable for management as managed as part of the LOHCP; of these, an estimated 35.4 acres merit restoration to address highly degraded conditions (Section 5.3.3.1; Table 5-5).

During the permit period (Years 0-25 of Plan Implementation), the Implementing Entity will work with willing landowners to conduct habitat protection, restoration, and management projects to compensate for the impacts of the covered activities. Because the required mitigation is provided when plan participants receive their local building or other land-use permits, which is anticipated to occur throughout the 25-year permit term, the LOHCP Preserve System will be assembled over time. Plan participants mitigation fees will be used to fund elements of the conservation program, pay for Plan administration, and establish a non-wasting endowment that will fund management and administration in the post-permit term (Chapter 7). The Implementing Entity will also receive the land dedications (i.e., conservation easements) offered on vacant parcels developed for residential use inside the Priority Conservation Area (Section 5.7.2.1.1).

To maximize the long-term conservation benefits of the mitigation fees, the Implementing Entity will conduct further analyses to strategize conservation within the LOHCP Area, to identify the highest-priority habitat protection, restoration, and management projects; that is, those that are deemed most beneficial to long-term achievement of the biological goals and objectives. Developed based on the analysis presented in this Plan, the Implementing Entity's strategies will be continually updated, to reflect changing conditions that create new opportunities and constraints.

As mitigation funds accrue, they will be used to implement the priority conservation actions, which will include protecting and managing unprotected habitat, as well as conducting habitat restoration and additional management on existing protected lands that are enrolled in the LOHCP Preserve System (Section 5.3.1). The Implementing Entity will create and maintain a database that will be used track implementation of the various activities on a per-square-foot basis, according to the type of vegetation or other land cover type affected. This database will be used to track benefits to the covered species, based on the crosswalk between the vegetation and land cover types and their habitats (Table 4-4).

[19] Does not include take due to implementation of the conservation program and the Community Wildfire Protection Plan, which will result in additional temporary impacts to habitat.

5.7.2.3.1 Mitigation Crediting Ratios

Mitigation equivalencies will be used to track the mitigation value of different types of actions in this conservation program. These mitigation equivalencies are expressed as ratios that relate the conservation value of habitat protection, restoration, and additional management, to the impacts of the covered activities. Table 5-8 discusses the ratios and summarizes the rationale used to assign them based on the relative value of the actions for the long-term recovery of the covered species. They were developed by asking the question: *What is the relative value of protecting new habitat, restoring existing protected habitat, or providing enhanced management of existing protected habitat, for the long-term viability of the covered species, relative to* not *implementing a typical covered activity?*

Restoration and Management of Existing Protected Lands

The ratios for restoration (1.5:1) and management (1.25:1) of existing protected lands are both greater than 1:1, reflecting:

1. the imperative nature of active habitat management within the Baywood fine sands ecosystem in order to maintain and enhance the habitat conditions for the covered species, and the high importance of appropriate habitat conditions for achieving the biological goals and objectives for the covered species (Section 5.3.3); and
2. The greater conservation value of land within existing protected lands relative to much of the land that will be impacted by the covered activities.

Active Management and restoration of eligible existing protected lands, including the Morro Dunes Ecological Reserve (MDER; Table 5-5), will be essential to the long-term persistence of the covered species. This and other protected lands feature large areas of unfragmented habitat that have the greatest potential to support large and persisting populations. Although protected from development, habitat within the MDER has been degraded by a variety of factors that impair its ability to support the covered species populations including historic land uses, such are off-highway vehicle use, erosion resulting from old roads and trails, invasive plant species, and fire exclusion, much of which occurred prior to the acquisition of the property by CDFW. Funding and staff capacity within the Department of Fish and Wildlife are insufficient to conduct the restoration and habitat management tasks that are necessary to enhance and maintain the habitat but that are beyond that which is identified in the land management plan for the property (CDFW 1982). Conducting enhanced management and restoration within the MDER to address these and other factors that degrade habitat and otherwise impact the covered species within the MDER and any other existing protected lands that are ultimately enrolled in the LOHCP Preserve System can increase the distribution, abundance, size, and persistence of populations.

In doing so, such conservation actions will have greater long-term benefit for the covered species than *not* implementing a typical activity covered by the LOHCP. This is because the majority of covered activities will impact habitat that lacks the physical and biological features and landscape context to provide long-term conservation value for the covered species. Specifically, of the 532 acres of habitat that will be impacted by the covered activities in this plan, 461 acres (87%) are projected to be inside the USL—the area slated for urban (rather than rural) development in Los Osos, which features 95% of the parcels yet just 48% of the land in the LOHCP Area. This area inside the USL already features small parcels (median = 0.14 acres), the majority (885) of which area already developed; remaining

undeveloped land is scattered throughout the USL, rather than in contiguous areas, and has been degraded by prior land use including vegetation clearing. Indeed, of the 461 acres to be impacted within the USL, an estimated 197 acres (43%) will occur in parcels and in the right of way, which were mapped as developed (Figure 3-4); degraded habitat within these lands is anticipated to be impacted through public and private utility projects, infill, and redevelopment projects (Table 4-2, Figures 2-4 and 2-5). Such projects will similarly impact an estimated 9.2 acres of degraded habitat outside of the USL. Of the 532 acres of impacts from the covered activities, only 61.2 acres (12%) will affect intact habitat outside of the USL which, generally speaking, is of higher conservation value. Therefore, compensating for the loss of habitat (largely) inside the USL, much of which is already developed and fragmented and therefore has lower long-term conservation value, by restoring and enhancing the condition of habitat within existing protected lands, specifically the MDER, will have a net benefit for the long-term persistence of the covered species.

The value of restoration, relative to not implementing a covered activity, is greater (1.5:1) than for enhanced management (1.25:1), because restoration will recreate the appropriate habitat structure and/or functions for the covered species. In most cases, restoration will enable covered species to expand their distribution into restored areas. By increasing the area occupied by the species, restoration can promote population growth and resilience to the impacts of future perturbations in the landscape. While management activities are not anticipated to increase areal extent of occupied habitat, they are expected to increase the size of populations by increasing abundance and/or demographic performance in areas treated to improve habitat conditions by addressing anthropogenic factors that degrade it.

Areas that are subject to restoration and management within existing protected lands will be managed (i.e., following restoration) and monitored in perpetuity, to address future anthropogenic factors that might otherwise degrade their ability to support the covered species. This long-term management and monitoring of high-value conservation lands protected for the covered species will be essential to their recovery and vastly outweigh the negative impacts of the LOHCP covered activities. As a result, both management and restoration then management have ratios that exceed the 1:1, reflecting their net benefits for promoting population growth and persistence of the covered species relative to the average impacts of the LOHCP covered activities, which will primarily occur in habitat that has low long-term conservation value.

Protection and Management of New Habitat

The ratios used to credit protection of new habitat as mitigation for the covered activities will reflect the long-term conservation value of the habitat for the covered species, and its ability to facilitate achievement of the Plan's biological goals and objectives (Section 5.1, Table 5-1). Habitat protected through acquisition of fee title or conservation easement, which will primarily occur in the Priority Conservation Area (Section 5.3.2), will be assigned to one of four tiers, based on their size, development status, habitat condition, and landscape context, including potential to promote habitat connectivity. Table 5-8 identifies the general attributes of parcels that will be used to assign unprotected parcels into one of four tiers, the protection of which would be credited at ratios ranging from 0.5:1 to 2:1.

As with the mitigation crediting ratios for restoration and management of existing protected lands, the ratios for new habitat protection reflect the long-term value for species recovery of permanently protecting and then managing, in perpetuity, the currently unprotected habitat. The ratios reflect the net benefit of protecting and managing the habitat in perpetuity, relative to implementing a typical covered activity in the LOHCP.

As illustrated in Table 5-8, permanent protection of habitat in large (>10 acre) undeveloped parcels or moderately sized (3-10 acres) undeveloped parcels that are adjacent to protected lands, and that feature habitat that is intact and of high value to one or more of the covered species, will be credited at a ratio of 2:1. This high ratio reflects the far greater conservation value of the habitat in such parcels of Very High Conservation Value, relative to the generally low conservation value of most of the habitat that will be impacted by the covered activities. As described above, these activities will largely occur in small parcels and rights of way within the USL and many will affect either developed habitat or habitat that is degraded owing to prior land-use activities including vegetation clearing. Owing to its highly-fragmented nature, including extensive network of streets, habitat in this area has low long-term conservation value, such that funding protection of parcels in the Priority Conservation Area that are large and/or adjacent to existing protected lands will far outweigh the impacts of the covered activities on the covered species.

Protection of moderately sized parcels (3-10 acres) that feature habitat that can help connect existing protected land and Tier 1 parcels will be credited at a ratio of 1.5:1. Like the Very High Conservation Value parcels, protection of these High Conservation Value parcels will yield a net benefit for recovery of the covered species relative to implementation of the covered activities. Protection of smaller parcels (<3 acres) that have moderate conservation value due to their landscape context, including adjacency to existing protected lands, and intact habitat conditions, will be credited at a ratio of 1:1. Protecting and managing these parcels is anticipated to benefit the covered species at a level that is commensurate with the impacts of the covered activities. Protection of such small (<3 acre) parcels that lack adjacency to other protected lands, could still contribute to species recovery; however, they would not yield a net benefit such that twice as much habitat would have to be protected to mitigate the impacts of the covered activities on a per-acre basis (Table 5-8).

During implementation of the LOHCP Conservation Program, the Implementing Entity will work with the County and USFWS to protect habitat that is of the greatest long-term conservation value and that can maximally promote achievement of the LOHCP biological goals and objectives (Section 5.1, Table 5-1). The mitigation crediting ratios applied to new habitat protection projects will be determined during specific acquisition projects, based upon on-the-ground assessments of habitat conditions, evaluations of current landscape context, and other factors that influence conservation value, based on the criteria and value for recovery outlined in Table 5-8.

Collaborative Mitigation Projects

During the course of mitigation of the LOHCP over the anticipated 25-year permit period, the County may identify opportunities to implement collaborative projects in coordination with other entities seeking to conduct mitigation or other voluntary conservation actions. Such collaborative projects could leverage the funds available by the individual entities to conduct larger projects of greater conservation value than either entity could afford. For example, the entities could collaborate to implement a large or otherwise costly habitat protection project and/or restoration project, the costs of which exceed the funding and perhaps also the mitigation needs of the individual entities.

Collaborative projects could be designed in a variety of ways including:

- simple cost-sharing agreements, in which the parties split the costs of a single project (e.g., property acquisition);

- sequential projects that build upon each other, such as when one party protects habitat and the other restores and/or manages it.

When implementing collaborative mitigation projects in the LOHCP, the mitigation credits generated under the LOHCP will be based on the acres of habitat protected, restored, and/or subject to enhanced management using the LOHCP mitigation crediting ratios as outlined above. The acres credited to the County (as opposed to its collaborators) would be determined through the design of the collaborative agreement. To ensure that the mitigation is commensurate with the impacts of the project impacts in the LOHCP, the County will coordinate with the USFWS to ensure that the unit conservation benefits (mitigation credits) for the LOHCP covered species are not used to mitigate impacts of multiple projects.

Notwithstanding the need to avoid such 'double dipping', collaborative mitigation projects implemented under the LOHCP can be used to generate mitigation that could offset impacts to species and habitats *not* covered by the LOHCP. For example, the County could partner with another entity to purchase and then enroll into the LOHCP Preserve System a priority property for the LOHCP covered species that also features wetland habitat supporting rare aquatic species. Under this scenario, the County could receive the mitigation credits for habitat protection, restoration, and management of the acres of habitat supporting Baywood fine sands habitat to support the covered species, while the partner entity could receive mitigation credits for separate area of the property that supports wetlands and aquatic species, which are not covered in the LOHCP.

As part of work to develop collaborative mitigation projects or other cost-sharing agreements, the County will coordinate with the USFWS to ensure that the project is consistent with the terms of the LOHCP and ITP.

5.7.2.3.2 Preserve System Configuration Scenario

The mitigation crediting ratios in Table 5-8 were used along with the total estimated (and thus maximum permitted) habitat impacts (532 acres; Table 2-9), to develop a scenario for the configuration of the LOHCP Preserve System. The scenario was used to develop three components of the Plan.

1. **Financial Analysis:** Estimate the costs to implement the LOHCP Preserve System (Section 7.2), and therefore determination of the mitigation fees (Section 7.3).
2. **Impact Analysis:** Assess the net effects of Plan implementation on the covered species, their habitats, and the environment by comparing the anticipated impacts of the covered activities (Section 4) to the anticipated benefits of the conservation program (Section 5.8, Table 5-10), including in compliance with state and federal laws (i.e., CEQA and NEPA; Section 1.5).
3. **Alternatives to Take/impacts:** Develop and analyze the net effects of the alternatives to the take/impacts of the Plan (Chapter 8).

The following outlines the configuration of the LOHCP Preserve System in the realistic, albeit hypothetical, scenario for the ultimate LOHCP Preserve System design (Table 5-9). The County will work with the Implementing Entity to assemble the LOHCP Preserve System over time, by incorporating a mix of newly protected habitat and restoring and managing existing protected land to benefit the covered species in the greatest extent practicable (sections 5.3 and 6.2).

Management and Restoration of Existing Protected Lands (278.7 acres generating 357.1- acre mitigation credits): Of the 298.2 acres of habitat contained in three existing protected lands that

would be eligible for additional management and monitoring as part of the LOHCP (Table 5-5), this scenario assumes that the 278.7-acre Morro Dunes Ecological Reserve (MDER) will be enrolled in the LOHCP Preserve System. This enrollment will occur at the outset of LOHCP implementation, prior to take authorization. The County and Implementing Entity will coordinate its management activities with managers of the other protected lands inside the Priority Conservation Area; however, mitigation fees will not be used to provide additional management of these lands.

Of the MDER's 278.7 acres expected to be enrolled in the LOHCP Preserve System, 35.0 acres (12.5%) was projected in this preserve system scenario to be restored to address highly degraded habitat conditions, prior to ongoing active management (Tables 5-5 and 5-10). This acreage was identified based on an assessment and preserve management plan developed for the 230-acre Bayview Unit of the Morro Dunes Ecological Reserve (McGraw 2005), and conversations with the MDER's land manager regarding current habitat conditions and management units in that unit as well as the 48-acre Pecho Unit of the MDER (R. Stafford, pers. comm. 2016).[20] The remaining 243.7 acres of the MDER are in good, but not excellent, condition such that they will require only enhanced management above and beyond what CDFW has committed to implement to achieve the biological goals and objectives of the LOHCP (Table 5-9).

Based on the mitigation crediting ratios, the restoration of 35.0 acres within the MDER will yield 52.5 acres of mitigation credits, based on the 1.5:1 crediting ratio for restoration; meanwhile, the 1.25:1 crediting ratio for management will generate 304.6-acre-mitigation credits for management of the remaining 243.7 acres within the MDER.

Dedication of Easements (31 acres generating 31-acre mitigation credits): This preserve system scenario assumes that the Implementing Entity will be granted conservation easements for a total of 31 acres of habitat, as mitigation for impacts of private development on vacant parcels located within the Priority Conservation Area. This estimate assumes that project proponents required to set aside habitat will develop their parcels to the maximum allowed levels (Table 2-6). Proponents of residential development projects in vacant land in the Priority Conservation Area will be required to set aside habitat on site at a ratio of 3:1—for every square foot of habitat impacted, three square feet will be required to be protected through a conservation easement dedicated to the Implementing Entity, which will permanently protect, manage, and monitor the habitat (Section 5.7.2.1.1). Although the conservation value of habitat in these set-asides may vary, these habitat set-asides will all be credited at a ratio of 1:1, in which one square-foot-mitigation credit is generated to offset impacts of all covered activities for every square foot set aside (Table 5-8).

Fee title acquisition (76.5 acres generating 176 mitigation credits): In this preserve system configuration scenario, the Implementing Entity will acquire from willing sellers 76.5 acres of land, which will then be managed as part of the LOHCP Preserve System. Most (63.5 acres or 83%) would be in the Tier 1 (very high conservation value) parcels, with a smaller area (10 acres or 13%) protected in Tier 2 (high conservation value) parcels and just 3 acres (4%) protected in parcels of moderate conservation value; no Tier 4 (low conservation value) parcels are anticipated to be protected in this scenario (Table 5-9). In this scenario, the new habitat would be protected through

[20] The IAMMP, which was developed subsequent to this analysis, identified 27.74 acres of habitat in the MDER that merits restoration (McGraw 2020; Appendix M). The AMMP may identify additional acres that should be restored and will ultimately be used to determine the amount of the MDER that is in restoration and management units.

acquisition of fee title or conservation easements on parcels within the Priority Conservation Area and then actively managed as part of the LOHCP Preserve System (Section 5.3.1.2).

Under this scenario, the LOHCP Preserve System will include 107.5 acres of currently unprotected land, of which 10% (11 acres) will be restored and then managed, and the rest will be managed. The LOHCP Preserve System will contain 35 acres of degraded habitat in existing protected lands (i.e., the MDER) that will be restored, and an additional 243.7 acres of existing protected land that will be actively managed. In total, this hypothetical configuration for the LOHCP Preserve System will include 386.2 acres of habitat which will be protected, restored, and managed to generate 533.1-acre equivalents of benefits (Table 5-10); this mitigation will offset the 532 acres of habitat impacts at an overall ratio of 1:1. Permanent habitat loss is typically mitigated at a ratio greater than 1:1, with 3:1 ratios being common. However, the 1:1 ratio used in this Plan is appropriate since the habitat anticipated to be impacted by the covered activities is, generally speaking, of much lower long-term value for species recovery than the habitat that will be protected and managed inside the Priority Conservation Area (PCA; Section 5.3.1.2). As a result, the mitigation from the Plan will be commensurate with the impacts of the covered activities, as required under ESA.

As noted at the outset of this section, this Preserve System design described above and summarized in Table 5-9, is a realistic, albeit hypothetical, scenario for the ultimate LOHCP Preserve System. The scenario was developed to illustrate the anticipated benefits of the conservation strategy, estimate its costs, and thus determine the mitigation fees (sections 7.2 and 7.3); it was also used in the analysis of alternatives to the taking (Section 8). In this 25-year, programmatic plan, the actual Preserve System will be assembled over time as the Implementing Entity accepts conservation easements dedicated by landowners developing vacant land inside the Priority Conservation Area; uses Habitat Protection Fees collected from other project proponents identified in Table 5-7 to acquire fee title or easement from willing sellers of land inside the Priority Conservation Area; and uses restoration, management, and administration fees collected from all project proponents identified in Table 5-7, to manage and restore the newly acquired land, as well as manage and restore existing protected lands enrolled into the LOHCP Preserve System. These land protection, restoration, and management actions will be phased in over time and keep pace with the covered activities to ensure that the mitigation stays ahead of the impacts (Section 6.2.4), such that at any time during plan implementation, the benefits of the Preserve System for the covered species exceed or at least match the impacts of the covered activities, such that the mitigation is commensurate with the impacts on the covered activities.

The plan establishes mitigation equivalencies to relate the conservation value for species recovery, of restoration and management of existing protected lands to protection and management of unprotected habitat, enabling these two important elements of the overall conservation strategy to be implemented as appropriate, to achieve the biological goals and objectives (Section 5.1, Table 5-1). However, in order to ensure that new habitat is protected in this programmatic plan, the LOHCP Preserve System will include a minimum of 55.25 acres of habitat acquired from willing sellers if the anticipated 531.5 acres of impacts are permitted. Though the scenario used here assumes the Implementing Entity will acquire fee title or conservation easements for a mix of Tier 1, Tier 2, and Tier 3 parcels totaling 76.5 acres (Table 5-9), the minimum habitat protection requirement could be fulfilled through acquisition of just 55.25 acres of Tier 1 parcels, due to their higher mitigation credit ratio (Table 5-8). Thus, this minimum habitat protection target of 55.25 acres is designed to connect and buffer existing protected lands and safeguard important habitat in the Priority Conservation Area. The 55.25 acres to be acquired by the Implementing Entity in addition to the 31 acres of land that is anticipated to be dedicated voluntarily by those project proponents developing vacant parcels inside of the PCA. As a result, if the covered

activities are implemented in their entirety, a minimum of 86.25 acres of new habitat will be protected through implementation of the LOHCP conservation Strategy.

5.8 Benefits of the Conservation Program

Implementation of the LOHCP Conservation Program is anticipated to have benefits for the covered species that outweigh the effects of the taking caused by the covered activities, by protecting, restoring, and enhancing habitat that is greater long-term conservation value than the habitat impacted through the covered activities (Section 5.8.1). Indeed, the mitigation is anticipated to facilitate species recovery (Section 5.8.2).

5.8.1 Habitat Benefits

In order to compare the habitat benefits to the impacts (Section 4.2), the acres of vegetation and other land cover types to be benefited by the LOHCP Preserve System were extrapolated using proportions (Table 5-10). Acreages within existing protected lands were estimated based on the proportions of the vegetation and other land cover types contained within the parks and reserves identified as eligible for inclusion (Table 5-5). For the newly protected lands, the acreages were calculated using the proportions of the vegetation and other land cover types within vacant, unprotected parcels in the Priority Conservation Area; these are the parcels on which habitat set-asides will be established (if developed), and that the Implementing Entity will target for fee title acquisition and management using the mitigation fees (Section 7.2.1).

The specific vegetation types and other land cover types in the respective areas were summarized according to the general type (Table 5-10) and also used to calculate the area of habitat for Morro shoulderband snail and Morro manzanita, based on the crosswalk between the specific vegetation and other land cover types and the habitats, which was used to assess the impacts of the covered activities (Table 4-4).

The Preserve System will primarily benefit coastal sage scrub, which is estimated to comprise 240.4 acres or 60% of the land, and central maritime chaparral, which is estimated to occur on 109.6 acres or 30% of the preserve system (Table 5-10). In comparison, these two community types, which constitute the primary habitat for the four covered species and will comprise 90% of the land in the preserve system, are estimated to comprise just 25.4% of the habitat to be impacted by the covered activities (Table 4-3).

The analysis of alternatives of the take/impacts provides the comprehensive list of ratios for impacts to benefits (Chapter 8, Table 8-1). This analysis reveals that the benefits of the conservation program will more than offset the impacts of the covered activities. Specifically, for every acre of coastal sage scrub impacted (189 acres; Table 4-3) 1.7-acre equivalents will be benefited in the LOHCP Preserve System scenario, which will benefit 320-acre equivalents (Table 5-10). The ratio for central maritime chaparral communities is even greater (8.5 to 1); the 18 acres of this community that are anticipated by be impacted by the covered activities will be more than offset by the 156-acre equivalent benefits (Table 5-10).

Likewise, the ratio of habitat benefits to impacts for Morro manzanita is more than 8:1; the Preserve System is anticipated to benefit 176 acre-equivalents of Morro manzanita habitat (Table 5-10), whereas the covered activities are anticipated to impact just 41 acres of habitat (Table 4-4). This reflects the far

greater proportion of central maritime chaparral habitat in the Preserve System under the scenario used in this analysis, compared to the anticipated footprints of the covered activities.

The Preserve System will benefit 301-acre equivalents of habitat for Morro shoulderband snail. This value is lower than the total acres impacted (478 acres), which includes developed areas and County rights-of-way. These highly degraded habitat areas were included in the take/impacts assessment, as the species can be found in them; however, they provide low long-term conservation value for the species. The greater long-term viability of the habitat in the Preserve System, compared to that which will be impacted, elevates the ratio of conservation benefits to impacts anticipated (Section 4.2.1.3).

As a result, the mitigation provided through the LOHCP Conservation Program is expected to more than offsets the anticipated impacts of the covered activities, thus exceeding the incidental take permit issuance criterion, that the mitigation be commensurate with the impacts.

The scenario reflects levels of habitat protection, restoration, and management that can achieve the biological goals and objectives (Section 5.1), and that could be feasible based on anticipated landowner interest in participating in the LOHCP. The actual Preserve System configuration, which will almost certainly differ from this scenario, will depend on the willing sellers of private land, land prices, and the precise area of existing protected lands enrolled in land management and restoration, among other factors. These changes will influence costs and thus mitigation fees. To ensure adequate funding for the plan, the actual mitigation components and their costs will be tracked (Section 5.4.1.2) and used to update the financial analysis used to develop the mitigation fee schedule (Section 7.4). Ultimately, the mitigation crediting ratios used in the plan will enable the County to work with the Implementing Entity to implement a suite of conservation actions (habitat protection, restoration, and management) that will have benefits that are commensurate with the impacts of the covered activities and promote species recovery.

Proponents of development projects that would impact Environmentally Sensitive Habitat Areas (ESHA) may be required to set aside additional habitat in order to comply with the Los Osos Community Plan and therefore the California Coastal Act (sections 1.5.2.4 and 2.1.2.2). While the LOHCP requires that proponents in the PCA set aside habitat at a 3:1 ratio, the Los Osos Community Plan may require that all remaining habitat outside of the development envelope be protected through a County open space easement, which limits uses to natural resource management. These habitats set-asides would benefit additional habitat not included in this analysis.

5.8.2 Contributions to Species Recovery

In addition to compensating for the impacts of the covered activities on the covered species, the preserve system scenario will contribute to their recovery by protecting and restoring priority habitat, as well as restoring and managing existing protected lands of the greatest long-term conservation value for the covered species. The Priority Conservation Area, where the LOHCP Preserve System will be assembled and managed, incorporates much of the habitat that has been identified as important for protection in the recovery plans for the covered species (USFWS 1998a and 1999; Figure 5-1). It also features much of designated critical habitat for Morro shoulderband snail and Morro Bay kangaroo rat (Figure 4-3).

In addition to protecting high-priority habitat, the LOHCP Preserve System will also manage habitat to address exotic plants, non-native animals, fire exclusion, threat of catastrophic wildfire, and recreation;

these activities will help ensure that the habitat that is protected from development supports more viable populations. Also, by minimizing impacts of development of remaining vacant lands that are not protected within the Priority Conservation Area, the LOHCP will help promote landscape connectivity between protected habitat areas, which can be essential to maintaining genetic diversity and promoting long-term species persistence. These benefits will be achieved through implementation of the Plan's minimization measures (Table 5-2 through 5-4), including:

- Siting new development and other projects in already developed or degraded habitat areas (Measure C1), away from habitat occupied by the covered species (measures MSS-1, MBKR-1, IKM-1, and MM-1), wherever possible;
- Restoring areas of temporary disturbance (Measure C2); and
- Minimizing the impacts of vegetation management projects conducted for fire safety (i.e., defensible space; Measure C4).

The LOHCP will also contribute to species recovery and advance specific objectives of the USFWS recovery plans, by using surveys and long-term monitoring to increase understanding of the habitat factors influencing the distribution and abundance of the covered species, evaluating their management needs, and assessing the effectiveness of restoration and management strategies. Specifically, the studies and monitoring will be designed to fill data gaps identified in the recovery plans, including regarding the role of fire in promoting plant establishment and maintaining habitat for the covered animals (Section 5.4 and Appendix E).

The LOHCP AMMP, which will synthesize existing information, guide initial management and monitoring, and be adapted over time to incorporate new scientific information obtained through implementation of the plan, will inform and help prioritize restoration and management, as well as ongoing habitat protection, to further recovery of the covered species.

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
Ecosystem Goal: Promote persistence of the Baywood fine sands ecosystem and the natural processes that sustain it.			
Objective E1: Protect large, contiguous areas of land within the Baywood fine sands ecosystem, which can support large and therefore more viable populations of the covered species, feature greater native biodiversity, and enable effective management.	Protect or expand large habitat areas, as well as smaller areas that can expand and buffer existing protected lands, with an emphasis on land within the Priority Conservation Area that supports or can support one or more of the covered species.	Annual tracking of habitat protection projects will be used to document expansions to protected habitat.	Plant community sampling will be used to characterize native species cover and richness in lands protected through the LOHCP.
Objective E2: Maintain and enhance connectivity of habitat within and adjacent to the Baywood fine sands ecosystem, to promote dispersal and other ecological processes including gene flow, which are necessary to maintain viable populations of the covered species.	Protect land that can connect or maintain corridors between habitat within and adjacent to the LOHCP Area, with an emphasis on land that connects protected lands within the Priority Conservation Area.	Annual tracking of habitat protection projects will be used to document steps to connect protected habitat.	Plant community mapping will be used to evaluate status of habitat between protected habitat areas.
Objective E3: Maintain and enhance the natural mosaic of Baywood fine sands communities and their varying successional stages, to provide a range of habitat conditions for the covered species and the broader assemblages of native plants and animals in the ecosystem.	Use fire and fire surrogates—vegetation management treatments that mimic fire's beneficial effects—to create and maintain a mosaic of native plant communities of various successional stages and thus habitat conditions.	Annual tracking of habitat restoration and management projects will be used to document implementation of fire management/surrogate projects.	• Plant community mapping will be used to evaluate the status and trends in the mosaic of communities and their protected status. • Plant community sampling will be used to evaluate effectiveness of the treatments and identify the need for additional management.
Community Goal: Promote the natural structure and native species composition of the upland native plant communities of the Baywood fine sand.			
Objective C1: Protect land supporting representative areas of each of the natural communities and their successional stages within the Baywood fine sands ecosystem.	Protect additional areas of coastal sage scrub, central maritime chaparral, and oak woodland that provide habitat for the covered species, as well as the associated	Annual tracking of habitat protection projects will be used to document steps to protect habitat and the acres	• Plant community mapping will track the areal extent of the native plant communities by successional stage, as

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
	aquatic, wetland, and riparian communities.	of each community type protected in each project.	feasible, and evaluate their protected status. • Plant community sampling will be used to examine successional changes in protected habitat.
Objective C2: Restore degraded habitat to increase suitability for populations of the covered species and promote native biodiversity.	Restore habitat within the LOHCP Preserve System, within an emphasis on land within the Priority Conservation Area that has been degraded by prior land use, erosion, recreation, and/or dense infestations of exotic plant species.	Annual tracking of habitat restoration and management projects will be used to document the acres of habitat subject to restoration treatments.	• Project-specific monitoring protocols will be used to evaluate the effectiveness of restoration. • Plant community mapping will be used to document expansion of areal extent of communities into previously denuded or degraded areas. • Plant community sampling will be used to evaluate increases in native plant cover and species richness as a result of restoration.
Objective C3: Maintain habitat conditions suitable to support populations of the covered species and promote native biodiversity.	Actively manage habitat within the LOHCP Preserve System, to limit the negative effects of factors that degrade it, including incompatible recreation, erosion, exotic plants, and fire exclusion.	Annual tracking of habitat restoration and management projects will be used to document the acres of habitat subject to management treatments.	• For large-scale management projects (e.g., veldt grass control), project-specific monitoring protocols will be used to evaluate effectiveness of management. • Plant community sampling will be used to evaluate characteristics of habitat that make it suitable for the covered species (e.g., various

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
			structure and species composition variables). • Species-specific monitoring will be used to evaluate changes in covered species populations with respect to habitat changes.
Morro Shoulderband Snail Goal: Promote recovery and long-term population viability of Morro shoulderband snail.			
Objective MSS-1: Protect additional native habitat suitable for Morro shoulderband snail.	Protect additional coastal dune and coastal sage scrub communities, prioritizing large blocks of habitat and areas that can buffer and expand existing protected lands within the Priority Conservation Area.	Annual tracking of habitat protection projects will be used to document protection of additional coastal dune and coastal sage scrub communities.	• Plant community mapping will track the areal extent of the native plant communities and evaluate their protected status. • Plant community sampling will be used to examine conditions of protected habitat to evaluate its suitability for Morro shoulderband snail. • Morro shoulderband snail population monitoring will be used to evaluate the species distribution and abundance in habitat protected as part of the LOHCP.
Objective MSS-2: Connect Morro shoulderband snail populations within and adjacent to the LOHCP Area.	• Maintain permeability of habitat between lands within the LOHCP Preserve System, by protecting additional suitable habitat, and minimizing development footprints and promoting persistence of natural	Annual tracking of habitat protection projects will be used to document protection of additional coastal dune and coastal sage scrub communities.	Plant community mapping will be used to evaluate connectivity of habitat for Morro shoulderband snail between protected habitat areas.

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
	or semi-natural habitat conditions on intervening private land. • Manage and restore habitat within the LOHCP Preserve System to address factors that degrade and fragment habitat, including dense exotic plant infestations and wide trails or other denuded areas.		
Objective MSS-3: Increase the distribution and abundance of Morro shoulderband snail populations, by restoring degraded habitat within the LOHCP Preserve System.	Restore coastal dune and coastal sage scrub vegetation within protected lands that have been degraded by erosion, incompatible recreation, dense invasive species infestations, and/or other factors.	Annual tracking of habitat restoration will be used to document implementation of restoration projects in coastal dune and coastal sage scrub communities that can promote populations of Morro shoulderband snail	• Project-specific monitoring protocols will be used to evaluate the effectiveness of restoring habitat suitable for Morro shoulderband snail. • Morro shoulderband snail population monitoring will be used to evaluate the species distribution and abundance with respect to restoration projects, as feasible.
Objective MSS-4: Maintain or increase populations of Morro shoulderband by addressing factors that can degrade habitat within the LOHCP Preserve System.	• Control populations of invasive plants using methods that avoid or minimize impacts to Morro shoulderband snail. • Control populations of exotic snails and prevent their spread, where doing so can promote Morro shoulderband snail populations. • Limit impacts of recreational use of protected lands, by siting trails in the least sensitive areas, and managing trail use (type, frequency) to limit impacts.	Annual tracking of habitat management projects will be used to document projects in coastal dune and coastal sage scrub communities that can promote populations of Morro shoulderband snail	• For large-scale management projects (e.g., veldt grass control), project-specific monitoring protocols will be used to evaluate effectiveness of management. • Plant community sampling will be used to evaluate characteristics of habitat that make it suitable for Morro shoulderband snail.

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
	• Prevent unnatural succession of coastal dune and scrub which may occur as a result of fire exclusion, by managing fire or vegetation management techniques that mimic its beneficial effects; treatments should occur within the range of variation of the return interval of the natural disturbance regime.		• Species-specific monitoring will be used to evaluate changes in populations with respect to habitat changes.
Morro Bay Kangaroo Rat Goal: Maintain habitat suitable for Morro Bay kangaroo rat.			
Objective MBKR-1: Protect additional suitable habitat for Morro Bay kangaroo rat.	Protect additional coastal sage scrub and central maritime chaparral communities, prioritizing areas featuring open habitat conditions and areas where or near where the species has been most recently observed.	Annual tracking of habitat protection projects will be used to document protection of additional coastal sage scrub and central maritime chaparral communities, particularly those where the species has been most recently observed.	• Plant community mapping will track the areal extent of the native plant communities and evaluate their protected status. • Plant community sampling will be used to examine conditions of protected habitat to evaluate its suitability for Morro Bay kangaroo rat. • Morro Bay kangaroo rat population monitoring will be used to evaluate the species distribution and abundance in habitat protected as part of the LOHCP.
Objective MBKR-2: Maintain connectivity between suitable habitat for Morro Bay kangaroo rat.	• Maintain permeability of habitat between protected areas of coastal sage scrub and central maritime chaparral, particularly those in the Priority Conservation Area and where	Annual tracking of habitat protection projects will be used to document protection of additional coastal sage scrub	Plant community mapping will be used to evaluate connectivity of habitat for Morro Bay kangaroo rat between protected habitat

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
	Morro Bay kangaroo rat has been most recently observed, by protecting additional habitat, and minimizing development footprints and promoting persistence of natural or semi-natural habitat conditions on intervening private land. • Manage and restore habitat within the LOHCP Preserve System to address factors that fragment habitat for Morro Bay kangaroo rat, including dense exotic plant infestations, and areas of dense woody plants.	and central maritime chaparral communities.	areas where the species has most recently been observed.
Objective MBKR-3: Restore habitat that is suitable for Morro Bay kangaroo rat.	Restore open coastal sage scrub and central maritime chaparral communities in the LOHCP Preserve System that have been degraded, particularly where Morro Bay kangaroo rat was most recently observed.	Annual tracking of habitat restoration will be used to document implementation of restoration projects in coastal sage scrub and central maritime chaparral communities that can promote populations of Morro Bay kangaroo rat	• Project-specific monitoring protocols will be used to evaluate the effectiveness of restoring habitat for Morro Bay kangaroo rat. • Morro Bay kangaroo rat population monitoring will be used to evaluate the species distribution and abundance with respect to restoration projects, as feasible.
Objective MBKR-4: Manage habitat to maintain conditions suitable for Morro Bay kangaroo rat, and other species adapted to early-successional coastal sage scrub and central maritime chaparral.	• Use prescribed fire or fire surrogates in the LOHCP Preserve System to maintain open-canopy conditions characterized by relatively high density of herbaceous plants and open sand and relatively sparse cover of shrubs.	Annual tracking of habitat management projects will be used to document projects in coastal sage scrub and central maritime chaparral communities that can promote populations of Morro Bay kangaroo rat, particularly	• For large scale management projects (e.g., veldt grass control), project-specific monitoring protocols will be used to evaluate effectiveness of management.

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
	• Control populations of invasive plants that degrade conditions for Morro Bay kangaroo rat, including eucalyptus, veldt grass, and ice plant. • Manage recreation in the LOHCP Preserve System to minimize its impacts on Morro Bay kangaroo rat and other small mammal populations, including by limiting use to defined trails sited in the least impactful areas, and controlling dog use.	projects in areas of suitable habitat where the species was most recently observed	• Plant community sampling will be used to evaluate characteristics of habitat that make it suitable for Morro Bay kangaroo rat, including low cover of relatively short-statured shrubs, with high cover of herbs and subshrubs Species-specific monitoring will be used to evaluate changes in populations with respect to habitat changes.
Morro Manzanita Goal: Promote recovery and long-term viability of Morro manzanita.			
Objective MM-1: Protect additional suitable habitat for Morro manzanita.	Protect additional central maritime chaparral, prioritizing large habitat blocks, areas adjacent to existing protected lands, areas that support a relatively high density of Morro manzanita, and areas located within the Priority Conservation Area.	Annual tracking of habitat protection projects will be used to document protection of additional central maritime chaparral communities and the acreage supporting Morro manzanita.	• Plant community mapping will track the areal extent of the native plant communities and evaluate their protected status. • Plant community sampling will be used to examine the suitability of habitat for, and distribution of, Morro manzanita. • Morro manzanita population monitoring will be used to examine the distribution and population status (including demography) of Morro manzanita.

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
Objective MM-2: Promote connectivity of habitat between Morro manzanita populations	• Maintain permeability of habitat between protected areas of central maritime chaparral, particularly those in the Priority Conservation Area and where Morro manzanita occurs, by protecting additional suitable habitat, and minimizing development footprints and promoting persistence of natural or semi-natural habitat conditions on intervening private land. • Manage and restore habitat within the LOHCP Preserve System to address factors that fragment habitat for Morro manzanita, including dense exotic plant infestations and denuded habitat areas.	Annual tracking of habitat protection projects will be used to document protection of additional central maritime chaparral communities, particularly those occupied by Morro manzanita.	Plant community mapping will be used to evaluate connectivity of habitat occupied by Morro manzanita.
Objective MM-3: Restore central maritime chaparral supporting Morro manzanita.	Restore central maritime chaparral communities in the LOHCP Preserve System that have been degraded, particularly those adjacent to existing Morro manzanita chaparral and in the Priority Conservation Area.	Annual tracking of habitat restoration will be used to document implementation of restoration projects in central maritime chaparral and other communities, including degraded and denuded areas, which can support Morro manzanita.	• Project-specific monitoring protocols will evaluate the effectiveness of restoring populations of Morro manzanita. • Morro manzanita population monitoring will evaluate the species distribution, abundance, and demography with respect to restoration projects, as feasible.
Objective MM-4: Manage central maritime chaparral supporting Morro manzanita	• Control populations of invasive plants that degrade habitat for Morro manzanita, including eucalyptus and	Annual tracking of habitat management projects will be used to document projects in central maritime chaparral	• For large scale management projects (e.g., prescribed fire or fire surrogate), project-specific monitoring protocols

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
	exotic cypress, as well as veldt grass and ice plant. • Use prescribed fire or fire surrogates conducted within the range of variation of the natural fire return interval in the LOHCP Preserve System, to maintain areas of Morro manzanita chaparral that might otherwise transition to coast live oak woodland or become senescent, and to promote regeneration of Morro manzanita, which is an obligate seeding species. • Manage recreation in the LOHCP Preserve System to minimize its impacts on Morro manzanita, including by limiting use to defined trails sited in the least impactful areas.	communities and other areas, including degraded or denuded areas, which can promote populations of Morro manzanita.	will evaluate effectiveness of management. • Plant community sampling will evaluate suitability of habitat for Morro manzanita. • Morro manzanita population monitoring will evaluate changes in populations with respect to habitat management, including responses to management treatments designed to promote regeneration.
Indian Knob Mountainbalm Goal: Promote recovery and long-term viability of Indian Knob mountainbalm.			
Objective IKM-1: Protect additional suitable habitat for Indian Knob mountainbalm.	Protect additional central maritime chaparral, prioritizing large habitat blocks, areas adjacent to existing protected lands, and areas within the Priority Conservation Area.	Annual tracking of habitat protection projects will document protection of additional coastal sage scrub and central maritime chaparral communities, with potential to support Indian Knob mountainbalm.	• Plant community mapping will track the areal extent of the native plant communities and evaluate their protected status. • Plant community sampling will examine the suitability of habitat for, and distribution of, Indian Knob mountainbalm.

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
			• Indian Knob mountainbalm population monitoring will evaluate the demography of the species in the LOHCP Preserve System.
Objective IKM-2: Promote connectivity between habitat suitable for Indian Knob mountainbalm.	• Maintain permeability of habitat between protected areas featuring central maritime chaparral, particularly those in the Priority Conservation Area, by protecting additional suitable habitat, and minimizing development footprints and promoting persistence of natural or semi-natural habitat conditions on intervening private land. • Manage and restore habitat within the LOHCP Preserve System to address factors that fragment habitat for Indian Knob mountainbalm, including dense exotic plant infestations and denuded habitat areas.	Annual tracking of habitat protection projects will document protection of additional coastal sage scrub and central maritime chaparral communities.	Plant community mapping will evaluate connectivity of habitat for Indian Knob mountainbalm within the LOHCP Preserve System.
Objective IKM-3: Expand populations of Indian Knob mountainbalm.	Increase the distribution and abundance of Indian Knob mountainbalm within the LOHCP Preserve System by conducting habitat restoration treatments including prescribed fire or fire surrogates designed to promote its vegetative reproduction and/or establishment from seed.	Annual tracking of habitat restoration will document implementation of restoration projects in coastal sage scrub and central maritime chaparral communities that can promote populations of Indian Knob mountainbalm.	• Project-specific monitoring protocols will evaluate effectiveness of restoring habitat for Indian Knob mountainbalm. • Indian Knob mountainbalm population monitoring will evaluate changes in populations with respect to habitat changes.

Table 5-1: LOHCP Biological Goals and Objectives, showing associated conservation measures and monitoring activities

Goal and Objective	Conservation Measures	Implementation Monitoring	Effectiveness Monitoring
Objective IKM-4: Manage central maritime chaparral supporting Indian Knob mountainbalm.	• Control populations of invasive plants that degrade habitat for Indian Knob mountainbalm, including eucalyptus and exotic cypress, as well as veldt grass and ice plant. • Use prescribed fire or fire surrogates conducted within the range of variation of the natural fire return interval within the LOHCP Preserve System, to maintain areas central maritime chaparral that might otherwise transition to coast live oak woodland or become senescent, and to promote regeneration of Indian Knob mountainbalm. • Manage recreation in the LOHCP Preserve System to minimize its impacts on Indian Knob mountainbalm, including by limiting use to defined trails sited in the least impactful areas.	Annual tracking of habitat management projects will be used to document projects in coastal sage scrub and central maritime chaparral communities that can promote populations of Indian Knob mountainbalm, particularly projects in areas of suitable habitat where the species was most recently observed	• For large scale management projects (e.g., veldt grass control), project-specific monitoring protocols will evaluate effectiveness of management. • Plant community sampling will evaluate characteristics of habitat that make it suitable for Indian Knob mountainbalm, including measurement of the cover of exotic plants. • Indian Knob mountainbalm population monitoring will evaluate changes in populations with respect to habitat changes.

Table 5-2: Covered Species Avoidance and Minimization Measures

Type	Measure
Ecosystem	E1: Minimize habitat fragmentation and maintain connectivity between aquatic, riparian, and upland habitats by limiting the creation of barriers to species movement, maintaining corridors to connect remaining habitat for the covered species, clustering development, and minimizing length of driveways and other impervious surfaces.
Community	C1: Minimize loss and degradation of the natural communities of the Baywood fine sand ecosystem, including coastal sage scrub, central maritime chaparral, and oak woodlands, by minimizing the area of permanent and temporary habitat disturbance and by siting projects in already developed or degraded areas. C2: Restore all areas of temporary disturbance such as staging areas and impacted areas adjacent to the project footprint, to pre-project conditions or ecologically superior conditions for the covered species. Use plants native to the Baywood fine sand communities from sources located within the LOHCP Plan Area. C3: Avoid use of herbicide and pesticides; where necessary, apply biocides as part of integrated pest management strategies, and following all local, state, and federal regulations. C4: Minimize impacts of vegetation management projects conducted for fire safety, including to create and maintain defensible space, by implementing the best management practices. The list of BMPs will be maintained by the County and reviewed periodically by the USFWS and CDFW and will include specific fuel-reduction prescriptions designed to minimize impacts to the covered species. C5: Install temporary construction fencing to prevent disturbance outside of the designated footprint
Morro Shoulderband snail (MSS)	Avoid and minimize the impacts to Morro shoulderband Snail to the maximum extent practical, by locating projects away from known or likely occupied habitat, as well as suitable but unoccupied habitat. MSS-1: Prior to and during all ground-disturbing activities in habitat suitable for Morro shoulderband snail within designated parcels (Figure 5-2), a biologist approved by the USWFS shall capture and move all Morro shoulderband snails to suitable habitat away from the project impact area (Section F.2). MSS-3: Avoid introducing non-native snails, and the use of snail control applications, such as mulluscicide, beer, or salt.
Morro Bay Kangaroo Rat (MBKR)	MBKR-1: Prior to ground-disturbing activities in habitat suitable for Morro Bay kangaroo rat within designated parcels (Figure 5-3), the project proponent will retain a CDFW- and USFWS-approved biologist to conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied (Section F.1).

Table 5-2: Covered Species Avoidance and Minimization Measures

Type	Measure
Indian Knob Mountainbalm (IKM)	IKM-1: Prior to ground-disturbing activities in habitat suitable for Indian Knob mountainbalm, the project proponent will retain a USFWS-approved biologist to conduct a survey for the species in the project area. If the species is present, the project proponent will work with the County, USFWS, and CDFW to develop a plan to ensure that no take/impacts of this species occurs during project implementation. If a plan cannot be developed to avoid impacts to the species, the project proponent will be required to obtain a separate permit from CDFW in addition to the certificate of inclusion for this HCP.
Morro Manzanita (MM)	MM-1: Avoid and minimize impacts of project activities on Morro manzanita, by siting project disturbance envelopes at least 10 feet away from the copy of existing plants wherever possible. MM-2: Avoid removal and minimize trimming of Morro manzanita when conducting vegetation management including in association with required hazard abatement activities.[1] MM-3: Avoid planting manzanita species (*Arctostaphylos* spp.) other than Morro manzanita to reduce the likelihood of hybridization.

[1] Does not apply to projects to implement the conservation program, where impacts to individuals will be needed to promote regeneration and maintain suitable habitat.

Table 5-3: Avoidance Measures for Other Listed Species

Type	Measures
Ecosystems	Avoid altering aquatic systems, including streams, lakes, ponds, and the Morro Bay estuary.
Communities	Avoid impacts to open water or riparian vegetation and wetlands, including freshwater, brackish water, and saltwater wetlands. Conduct vegetation management activities that could affect nesting birds outside of the nesting period, which is currently February 1 – August 31, but may change as a result of climate change.
Species: California seablite, Salt marsh bird's beak, and marsh sandwort	Proponents of covered activities that occur within 100 feet of known or potential habitat for one of more of the listed plant species will arrange for a USFWS-approved biologist to conduct a survey to evaluate presence of the species within suitable habitat within the project parcel. Surveys will be conducted within the flowering period of the three species, which may change as a result of global climate change, but currently are as follows: • California seablite: July to October • Salt marsh bird's beak: May to October • Marsh sandwort May to August If one or more species are present, the project will be designed and implemented to avoid impacts to the species or its habitat. The following are specific measures that will be implemented. • The project disturbance envelope will exclude occurrences of the species. • Orange construction fencing shall be placed between the occurrence and the disturbance envelope and signs will be posted to restrict entry into the protected area. • A USFWS-approved biologist will provide a pre-project training to all project personnel regarding the species and the measures that must be taken to avoid impacts; the biologist will monitor project implementation to ensure the measures are being implemented and are effective. • Erosion and sedimentation control measures will be implemented for projects that have the potential to result in the sedimentation of occupied or suitable habitat.

Table 5-3: Avoidance Measures for Other Listed Species

Type	Measures
	• Herbicide application shall be limited to times outside of the rainy season to prevent runoff carrying the herbicide to potential or known habitat. In addition, herbicide application shall be conducted during times of low wind (<10 mph) to prevent herbicide drift into potential or known listed plant habitat.
South-Central California Coast Steelhead (*Oncorhynchus mykiss irideus*)	Proponents of covered activities that occur within or adjacent to habitat for steelhead including Los Osos Creek will implement best management practices to avoid impacts to the threatened species. The measures to be implemented will be identified during the application process, based upon aspects of the covered activity and the site it which it occurs, and may include the following: • All project activities shall minimize disturbance to riparian and upland vegetation. • A NMFS-approved biologist will provide a pre-project training to all project personnel regarding the species and the protection measures that must be taken to avoid impacts; the biologist will monitor the project to ensure the measures are being implemented and are effective. • Projects will be conducted between June 1 and October 15. • Appropriate erosion and sedimentation avoidance measures will be taken to prevent sediment runoff into flowing water. • Measures will be taken to ensure that petroleum products and other materials do not enter nearby streams and surface waters.
California red-legged frog (*Rana draytonii*)	Proponents of covered activities that occur within or adjacent to California red-legged frog breeding, dispersal, or foraging habitat will implement best management practices to avoid impacts to the threatened species. The measures to be implemented will be identified during the application process, based upon aspects of the covered activity and the site it which it occurs, and may include the following: • All project activities shall avoid disturbance to suitable breeding habitat, including ponds and streams. • A USFWS-approved biologist will provide a pre-project training to all project personnel regarding the species and the protection measures that must be taken to avoid impacts; the biologist will monitor the project to ensure the measures are being implemented and are effective. • All construction-related holes capable of entrapping wildlife will either be covered at the end of each workday or ramped in a manner that will prevent entrapment.

Table 5-3: Avoidance Measures for Other Listed Species

Type	Measures
	• Appropriate measures will be taken to ensure petroleum products and other hazardous materials do not enter nearby streams, ponds, and other aquatic habitat.
California Black Rail (*Laterallus jamaicensis coturniculus*)	Proponents of covered activities that occur within or adjacent to California black rail nesting or foraging habitat will implement best management practices to avoid impacts to the state-listed threatened and California Fully Protected Species. The measures to be implemented will be identified during the application process, based upon aspects of the covered activity and the site it which it occurs, and may include the following: • In or adjacent to potential or known California black rail habitat, work activities shall be confined to areas outside of known or potential habitat to the extent feasible. Staging, access, and parking areas shall be located outside of salt marsh and brackish marsh habitats. • If woody vegetation within or immediately adjacent to salt marsh habitat must be removed as part of the project, vegetation removal should be conducted between September and January, in order to avoid impacts on nesting birds. If vegetation removal must occur between February and August, a qualified biologist should conduct a pre-construction survey for nesting birds prior to disturbance. If nesting California black rail are identified, protection measures shall include avoiding work activities within 300 feet of the nesting location. • If an active California black rail nest is located closer than 300 feet to a construction or maintenance site and there is the potential for substantial disturbance to nesting birds due to construction activities, a plan to monitor nesting birds during construction shall be prepared and submitted to the CDFW for review and approval. • A qualified biological monitor shall be present during all work activities in or adjacent to California black rail habitat. If California black rail is detected during work activities, work shall be stopped immediately and the CDFW shall be contacted immediately. Work shall not resume at that location until authorization is obtained from the CDFW unless prior approval has been granted by the CDFW.
Golden Eagle (*Aquila chrysaetos*)	Proponents of covered activities that occur within 500 feet of a recorded golden eagle nest site will have a USFWS and CDFW-approved biologist conduct a golden eagle survey to determine whether there is a nest site within 400 yards of the proposed project footprint. Projects with confirmed nesting golden eagles within 400 yards will implement best management practices to avoid impacts to this California Fully Protected Species. The measures to be implemented will be identified during the application process, based upon aspects of the covered activity and the site it which it occurs, and may include the following:

Table 5-3: Avoidance Measures for Other Listed Species

Type	Measures
	• Avoid vegetation removal and other project activities that would disrupt nesting behavior during the primary nesting season, which is currently February to August though may change as a result of global climate change, or until the nesting cycle is determined by a USFWS and CDFW-approved biologist to be completed. • Avoid removing any suitable trees or other nest sites.
White-tailed kite (*Elanus leucurus*)	Proponents of covered activities that occur within 500 feet of a recorded or observed white-tailed kite nest site will have a CDFW-approved biologist conduct a white-tailed kite survey to determine whether there is an active nest site within 500 feet of the proposed project footprint. Projects with confirmed nesting white-tailed kite within 500 feet will implement best management practices to avoid impacts to this California Fully Protected Species. The measures to be implemented will be identified during the application process, based upon aspects of the covered activity and the site it which it occurs, and may include the following: • Avoid vegetation removal and other project activities that would disrupt nesting behavior during the primary nesting season (February-August), or until the nesting cycle is determined by the USFWS and CDFW-approved biologist to be completed. • Avoid removing any suitable trees or other nest sites.

Table 5-4: **Minimization Measures for the Community Wildfire Protection Plan**

Taxa	Measure	Description
All Covered Species	All-1: Procedures and Training	Clearly defined operational procedures will be developed and implemented by CAL FIRE. A USFWS-approved biologist will develop and deliver environmental awareness training sessions for all personnel involved in hazard abatement activities. The training will inform personnel regarding the identification, status, and presence of covered species likely to be present in each abatement area; those avoidance and minimization measures that must be implemented; and the legal ramifications associated with non-compliance. Training materials will include descriptions and pictures of the covered species, relevant provisions of the State and Federal Endangered Species Acts, and the project boundaries for each abatement action. CAL FIRE will ensure that all personnel who participate in hazard abatement activities within the Plan Area receive this training immediately prior to the start of any hazard abatement activities.
	All-2: Biological Monitor	A USFWS-approved biologist will monitor all vegetation removal activities that will take place within habitat suitable for the covered species. Monitoring activities will be required daily until completion of initial disturbance at each location to ensure that avoidance and minimization measures are implemented. The monitor will be granted full authority to stop work at his or her discretion if abatement-related activities occur outside the demarcated boundaries of the treatment footprint. The monitor will stop work if any of the covered species are detected within the proposed abatement area and take the appropriate species-specific avoidance or minimization measures.
Morro Shoulderband Snail	MSS-1: Pre-Project Survey and Translocation of Morro shoulderband snail	Prior to the start of any abatement activities within habitat suitable for Morro shoulderband snail within the designated parcels (Figure 5-2), a USFWS-approved biologist will conduct surveys to identify the location of any Morro shoulderband snails present in treatment areas. These surveys shall be conducted within 24 hours of the commencement of any activities associated with hazard abatement that could result in take of the species. The primary objective of the pre-activity surveys is to locate as many Morro shoulderband snails as possible so that they can be captured and moved out of harm's way. All live Morro shoulderband snails of any life stage found during pre-activity surveys, or any phase of hazard abatement, will be captured and moved out of harm's way to a pre-determined, USFWS-approved receptor site by the surveying biologist.
	MSS-2: Minimize Impacts to Native Plants Important to	Canopy thinning and limbing up of plant species of particular value to Morro shoulderband snail must be avoided or minimized to the maximum extent possible. Pre-project surveys of treatment areas should be used to identify plant species that should be avoided, which include but are not limited to

Table 5-4: **Minimization Measures for the Community Wildfire Protection Plan**

Taxa	Measure	Description
	Morro shoulderband snail	mock heather (*Ericameria ericoides*), dune bush lupine (*Lupinus chamissonis*), and sand almond (*Prunus fasciculata* var. *punctata*).
	MSS-3: Monitor for Morro shoulderband snail	Prior to initiating any hazard abatement activities, a USFWS-approved biologist will be present to ensure that the limits of work are clearly delineated. This biologist shall have the authority to order any reasonable measure necessary to avoid the take of Morro shoulderband snail and to stop any work or activity not in compliance with the conditions set forth in the HCP/ITP. The biologist will notify the Ventura Fish and Wildlife Office and the County of San Luis Obispo Department of Planning and Building of any "stop work" order that is issued and this order will remain in effect until the issue has been resolved.
Morro Bay Kangaroo Rat	MBKR-1: Avoid Impacts to Morro Bay Kangaroo rat	Prior to initiating any fire hazard abatement activities in areas featuring habitat suitable for MBKR within the designated parcels (Figure 5-3), a CDFW and USFWS-approved biologist will conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied (Section F.1)
Morro Manzanita	MM-1: Minimize Impacts to Morro Manzanita	No individual Morro manzanita plants will be removed and all canopy thinning and limbing up of lower branches of Morro Manzanita will be avoided or minimized to the extent that abatement goals can still be achieved.
Indian Knob Mountainbalm	IKM-1: Avoid Impacts to Indian Knob Mountainbalm	Prior to initiating any hazard abatement activities, a CDFW and USFWS-approved biologist will survey the treatment area to assess the presence of Indian Knob mountainbalm. If the species is detected within or adjacent to the treatment area, CAL FIRE must consult with the USFWS and CDFW to determine how to proceed as no impacts to individuals this species will be authorized.
Migratory Birds	MBA-1: Avoid Impacts to Migratory Birds	All hazard abatement activities will be conducted outside of the bird breeding season, which is generally considered to be between March 15 and September 15. This seasonal prohibition period will be adjusted, as needed, to reflect changes in the breeding bird season due to climate change or other factors. If it is necessary to conduct abatement activities during this timeframe, a USFWS-approved biologist must be retained to conduct breeding bird and nest surveys; treatments may only proceed if no breeding activity or nests are detected.

Table 5-5: Existing Protected Land within the Priority Conservation Area

Property and Management Entity	Total Acres[1]	Eligible for Mitigation[2]		Restoration[3]		Management[4]		Total Acres Eligible for Preserve System[5]
		Percent	Acres	Percent	Acres	Percent	Acres	
Morro Dunes Ecological Reserve (Department of Fish and Wildlife)	278.7	100%	278.7	13%	35	87%	243.7	278.7
San Luis Obispo County Parks[1]								
Elfin Forest (County Property) [6]	31.7	0%	0	0%	0	0%	0	0
Monarch Grove Natural Area	16.8	14.6%	2.4	15%	0.4	85%	2.0	2.4
State Parks[7]								
Elfin Forest (State Property)	34.8	0%	0	0%	0	0%	0	0
Los Osos Oaks State Natural Reserve	85.7	0%	0	0%	0	0%	0	0
Montaña de Oro State Park	235.9	0%	0	0%	0	0%	0	0
Morro Bay State Park	107.5	0%	0	0%	0	0%	0	0
Bureau of Land Management[8]	4.8	100%	0	0%	0	0%	0	0
Total	**795.9**		**281.1**		**35.4**		**245.7**	**281.1**

[1] Total acres within the LOHCP Priority Conservation Area (Figure 5-1).

[2] Percentage and acres of property held by willing landowners suitable for enrollment of lands in the LOHCP Preserve System, and that features upland habitat of the Baywood fine sands ecosystem.

[3] Percentage of acres eligible for mitigation that is severely degraded and requires restoration.

[4] Percentage of acres eligible for mitigation that would benefit from additional active habitat management.

[5] Total acres within property that is eligible for enrollment in the LOHCP Preserve System.

[6] The acquisition of this property was funded, in part, by a grant from the California Coastal Conservancy, which restricted its use for mitigation.

[7] State Parks has opted to exclude their lands from consideration for inclusion in the LOHCP Conservation Strategy.

[8] As federal land, the BLM parcel is not eligible for inclusion in the LOHCP Preserve System.

Table 5-6: Biological Effectiveness Monitoring Protocol Summary (Appendix E)

Focal Species or System	Description	Study Area	Frequency	
			Permit Term	Post-Permit
Plant Communities and Habitat Conditions				
General Habitat Condition	Qualitatively examine the general condition of habitat within lands being managed as part of the regional conservation strategy, to detect new threats and impacts to habitat and the covered species	Entire Preserve System	Annual	Annual
Exotic Plant Areal Extent Mapping	Track changes in the distribution and abundance of exotic plant species	Entire Preserve System	Every 5 years	Every 5 years
Plant Community Areal Extent Mapping	Map the plant communities according to series with successional stages (e.g., cover) as appropriate	Entire Preserve System	Every 10 years	Every 10 years
Plant Community Structure Monitoring	Quantify plant community structure and species composition to evaluate covered species habitat characteristics, including the diversity and cover of native and exotic plants, to track changes due to or to trigger restoration and management	Entire Preserve System	Every 5 years	Every 5 years
Covered Species Populations				
Morro Shoulderband Snail Population Monitoring	Quantitative monitoring of the species distribution and abundance to evaluate population trends and responses to management	Suitable habitat for MSS (~300 ac.)	Annual	Every 5 years
Morro Manzanita Population Monitoring	Quantitative monitoring of the species areal extent and demography to examine population trends and responses to monitoring	Suitable habitat for MM (~250 ac.)	Every 5 Years	Every 10 Years
Indian Knob Mountainbalm Population Monitoring	Demographic monitoring of the existing occurrences and any new occurrences established through management.	Single occurrences	Every 5 Years	Every 10 Years
Morro Bay Kangaroo Rat Population Monitoring	Presence/absence surveys followed by ongoing surveys to track distribution, abundance, and population demography if the species is detected.	Suitable habitat for MBKR	Every 5 Years	Every 10 Years

Table 5-7: Compensatory Mitigation Requirements for LOHCP Covered Activities[1]

Project Category	Habitat Protection		Restoration, Management, and Administration Fee
	On-Site	Fee	
Vacant, Private Land Development			
Outside of the Priority Conservation Area		✓	✓
Inside the Priority Conservation Area	3:1 ratio for disturbance		✓
Redevelopment of Developed Parcels			
All Residential or Commercial Projects[2]		✓	✓
Public Projects and Private Utility Projects			
All New Disturbance (inside and outside of the Priority Conservation Area)		✓	✓

[1] Covered activities to implement the conservation program in the LOHCP Preserve System (i.e., habitat management, restoration, and monitoring) as well as implementation of the Community Wildfire Protection Plan do not require compensatory mitigation.

[2] Proponents of projects on vacant parcels inside the Priority Conservation Area that are too small to set aside habitat on site for the project impacts (i.e., <2.75 acres for the maximum 30,000 sf or 0.69 acres of impacts) must pay the habitat mitigation fee.

Table 5-8: **Mitigation Crediting Ratios for Components of the LOHCP Conservation Strategy. Details provided in Section 5.7.2.3.1.**

Conservation Strategy Component	Definition	Example Characteristics	Mitigation Crediting Ratio[1]
Restoration of Existing Protected Lands[2]	Restore the natural community structure and species composition of habitat that has been severely degraded	Denuded trail corridors; eroded gullies; areas of debris or dense infestations of eucalyptus, ice plants, veldt grass, or other exotic species; or other areas where native habitat has been substantially degraded.	1.5:1
Enhanced Management of Existing Protected Land[2]	Improve condition of habitat that has been degraded by anthropogenic factors to enhance its natural community structure and species composition.	Vegetation management (including prescribed fire or fire surrogates), exotic plant species management, unauthorized uses management (e.g., installation of fences and signage), and long-term maintenance-level management and monitoring of conserved lands as part of the LOHCP Preserve System.	1.25:1
Dedication of Habitat Set-Asides[3]	Land protected on vacant parcels located inside the Priority Conservation Area, through conservation easements voluntarily granted by project proponents to the Implementing Entity at a ratio of 3:1 for project impacts (i.e., three square feet are set aside for every one square foot of ground disturbance).	New development on vacant parcels inside the Priority Conservation Area must be clustered and otherwise sited to minimize habitat impacts and fragmentation; the habitat set-aside will be located in areas that are most conducive to long-term species recovery.	1:1
<u>Protection (Acquisition of Fee Title or Conservation Easement) and Management of New Habitat</u>			
Tier 1: Very High Conservation Value	Protection of habitat in these parcels can greatly promote recovery of one or more covered species by securing a relatively large area of habitat that has high recovery value to one or more covered species	Large undeveloped parcels (>10 acres), or moderately sized (3-10 acres) undeveloped parcels that are adjacent to protected lands, that feature habitat that is intact and of high value to one or more of the covered species	2:1

Table 5-8: **Mitigation Crediting Ratios for Components of the LOHCP Conservation Strategy. Details provided in Section 5.7.2.3.1.**

Conservation Strategy Component	Definition	Example Characteristics	Mitigation Crediting Ratio[1]
Tier 2: High Conservation Value	Protection of habitat in these parcels can facilitate recovery of one or more covered species	Moderate sized (>3 acre) undeveloped parcels with good quality remaining intact habitat of recovery value to one or more of the covered species or partially developed parcels of moderate size where development is consolidated, undeveloped portions contain high quality intact habitat of high values, some of which is adjacent to, or can help connect, existing protected lands or Tier 1 parcels, such that it would contribute to the recovery of one or more of the covered species.	1.5:1
Tier 3: Moderate Conservation Value	Protection of habitat in these parcels can promote habitat connectivity, which can enhance long-term viability.	Smaller parcels (<3 acres) with moderate value in terms of landscape context, habitat condition, and/or habitat viability such as parcels adjacent to existing protected lands	1:1
Tier 4: Low Conservation Value	Protection of habitat in these parcels would do little to promote species recovery such that the benefits are likely not worth the anticipated financial costs	Smaller parcels (<3 acres) with low value in terms of landscape context (e.g., disjunct, isolated), habitat condition, and habitat viability (e.g., subject to edge effect, partially developed). Undeveloped portions would be adjacent to, or can help with connectivity to existing protected lands, such that it would contribute to the recovery of one or more of the covered species.	0.5:1

[1] Acres of mitigation credit earned for every acre of habitat benefited by the conservation strategy. For example, for every acre restored, the County will receive 1.5-acre credits to mitigate the covered activities at a 1:1 ratio (i.e., for every acre of habitat impacted, 1 acre must be benefited).

[2] For mitigation credits to be generated on existing protected lands, the property must be enrolled in the LOHCP Preserve System and restored or managed in accordance with the LOHCP Preserve System AMMP, which will outline the habitat restoration, management, and monitoring approaches that will be used to achieve the biological goals and objectives of the plan.

[3] Although habitat set-asides may vary in their conservation value, and the land itself will be set aside at a ratio of 3:1, the area set aside will be credited at a ratio of 1:1, in which one square foot mitigation credit is generated to offset the covered activities for every square foot set aside.

Table 5-9: Scenario for the LOHCP Preserve System

Conservation Strategy Component	Description	Acres of Land: Total Available	Acres of Land: Used in Scenario[1]	Mitigation Crediting Ratio[2]	Acres or Acre Equivalents
Management and Restoration of Existing Protected Lands					
Restore Habitat within Existing Protected Lands	Recreate the structure and/or functions of habitat in highly degraded areas within existing protected lands, and then actively manage and monitor the habitat in perpetuity	35.4	35.0	1.5:1	52.5
Manage Habitat within Existing Protected Lands	Actively manage and monitor in perpetuity habitat degraded by one or more anthropogenic factors with existing protected lands,	245.7	243.7	1.25:1	304.6
	Subtotal: Existing Protected Lands	**281.1**	**278.7**		**357.1**
New Habitat Protection					
Habitat Set-Asides	Private land protected through conservation easements dedicated at a 3:1 ratio by project proponents developing vacant parcels inside the Priority Conservation Area[3]		31.0	1:1	31.0
New Fee Title or Conservation Easement Acquisitions	New land to be protected through acquisition of fee title or conservation easements from willing sellers				
	Tier 1: Very High Conservation Value	302	63.5	2:1	127
	Tier 2: High Conservation Value	165	10.0	1.5:1	15
	Tier 3: Moderate Conservation Value	84	3.0	1:1	3
	Tier 4: Low Conservation Value	46	0	0.5:1	0
	Subtotal: New Habitat Protection	**597**	**76.5**		**176.0**
	Total Mitigation Credits[4]				**533.1**
	Acres Impacted by the Covered Activities (Table 2-9)				**531.5**

[1] Acres of land estimated to be included in the LOHCP Preserve System in this scenario developed to evaluate conservation benefits and estimate costs.

[2] Ratio reflecting the value of the component of the conservation strategy to the impacts of the covered activities on a per acre basis (Table 5-8)

[3] Estimated based on the anticipated number of privately held parcels inside the Priority Conservation Area that would be developed and are large enough to set aside easements at a 3:1 ratio relative to the disturbance.

[4] The preserve system scenario includes 1.6 acre-credits more than needed, to address computational errors including rounding error.

Table 5-10: Habitat within the LOHCP Preserve System Configuration Scenario

	Existing Protected Lands[1]						Newly Protected Lands[2]						Total Preserve System					
	Restoration & Management[3]		Management Only[4]		Total		Restoration & Management[5]		Management Only[6]		Total		Restoration & Management[3]		Management Only[4]		Total	
Preserve System Habitats	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**	**Ac.**	**Cr.[7]**
General Vegetation Types (Table 3-1)																		
Coastal Sage Scrub	26.0	39.0	181.0	226.3	207.0	265.2	3.3	5.5	30.1	49.2	33.4	54.7	29.3	44.5	211.1	275.5	240.4	320.0
Central Maritime Chaparral	8.5	12.7	58.9	73.7	67.4	86.4	4.2	6.9	38.0	62.2	42.2	69.2	12.7	19.6	97.0	135.9	109.6	155.5
Woodland	0.5	0.8	3.6	4.5	4.1	5.3	1.6	2.6	14.5	23.7	16.1	26.4	2.1	3.4	18.1	28.2	20.2	31.6
Grassland	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	1.0	0.7	1.1	0.1	0.1	0.6	1.0	0.7	1.1
Wetland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Riparian	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.1	5.8	9.5	6.5	10.6	0.6	1.1	5.8	9.5	6.5	10.6
Other	0.03	0.0	0.17	0.2	0.2	0.3	0.9	1.4	7.7	12.7	8.6	14.1	0.9	1.4	7.9	12.9	8.8	14.3
Total	**35.0**	**52.5**	**243.7**	**304.6**	**278.7**	**357.1**	**10.7**	**17.6**	**96.7**	**158.4**	**107.5**	**176.0**	**45.7**	**70.1**	**340.4**	**463.0**	**386.2**	**533.1**
Covered Species Habitats (Table 4-4)																		
Morro Manzanita Habitat	**22.3**	**33.4**	**188.6**	**235.8**	**210.9**	**269.2**	**5.2**	**8.5**	**46.5**	**76.2**	**51.7**	**84.6**	**27.5**	**41.9**	**235.1**	**311.9**	**262.6**	**353.8**
Morro Shoulderband Snail	**20.7**	**31.0**	**144.2**	**180.2**	**164.9**	**211.3**	**5.5**	**9.0**	**49.2**	**80.6**	**54.7**	**89.6**	**26.1**	**40.0**	**193.4**	**260.9**	**219.6**	**300.8**
Primary Habitat	10.8	16.1	91.0	113.8	101.8	129.9	**3.7**	6.1	**33.6**	55.1	37.4	61.2	14.5	22.3	124.7	168.9	139.2	191.1
Secondary Habitat	9.9	14.9	53.2	66.4	63.1	81.3	1.7	2.8	15.6	25.5	17.3	28.4	11.6	17.7	68.7	92.0	80.4	109.7

[1] Existing protected land to be restored and/or managed as part of the LOHCP. Acreages of habitat based on the Morro Dunes Ecological Reserve, which is anticipated to be enrolled in the LOHCP.

[2] Habitat protected through fee title or easement and then restored and/or managed as part of the LOHCP. Acreages based on unprotected habitat on parcels of at least 2 acres in size in the Priority Conservation Area. Area of restoration presumed to be 10% of the total area.

[3] Habitat subject to intensive activities designed to accelerate recovery of severely degraded habitat, followed by ongoing active habitat management, defined below. Acreages to be restored in each community are calculated based upon the proportion of the total acreage in the respective parcels.

[4] Habitat actively managed to address current and future threats to its condition through ongoing treatments. Acreage managed is the total acres minus the area that will be restored and then managed.

[5] 10% of newly acquired lands are estimated to require restoration.

[6] 90% of newly acquired lands are estimated to require enhanced management only

[7] Number of mitigation credits to be generated, based on mitigation crediting ratios that relate the conservation value of habitat protection, restoration, and management to the covered activity impacts (Table 5-8). For newly protected lands, the ratio was calculated as the weighted average based on the four ratios for new habitat protection: habitat set-asides (1:1), acquisition of Tier 1 parcels (2:1), acquisition of Tier 2 parcels (2:1), and acquisition of Tier 3 parcels (1.5:1).

Table 5-11: Summary of the Potential Effects and Conservation Program Activities for the Covered Species for the Main Categories of Covered Activities					
Covered Activity Category	**Covered Species**	**Potential Effects**	**Avoidance Measures**	**Minimization**	**Compensation**
All Public and Private Construction and Facility Maintenance Projects (includes: private land development, public and private utility and capital improvement projects, and maintenance projects)	Morro shoulderband snail	Direct Negative Effects • Individual mortality (e.g., from trampling or crushing) • Habitat loss Indirect Negative Effects • Habitat fragmentation • Habitat degradation due to the invasion and spread of non-native plants and animals • Increases in natural predators • Potential for spread of rodenticides • Potential increase in diseases • Increased risk of fire	MSS-1: Locate projects away from occupied habitat, as well as suitable but unoccupied habitat, whenever possible. MSS-3: Avoid introducing non-native snails, and the use of snail control applications, such as mulluscicide, beer, or salt.	MSS-2: For projects located in designated parcels (Figure 5-2), have a USFWS-approved biologist survey for, capture, and move all Morro shoulderband snails to the nearest suitable protected habitat away from the project impact area. E1: Minimize habitat fragmentation and maintain connectivity between aquatic, riparian, and upland habitats by limiting the creation of barriers to species movement, maintaining corridors to connect remaining habitat for the covered species, clustering development, and minimizing length of driveways and other impervious surfaces. C1: Minimize loss and degradation of the natural communities of the Baywood fine sand, including coastal sage scrub, central maritime chaparral, and oak woodlands by minimizing the area of permanent and temporary habitat disturbance and by siting projects in already developed or degraded areas. C2: Restore all areas of temporary disturbance such as staging areas or areas adjacent to the project footprint, to pre-project conditions or ecologically superior conditions for the covered species. Avoid installing plants identified as invasive by the California Invasive Plant Council and include plants native to the Baywood Fine Sands communities from local sources (i.e., the LOHCP Plan Area). C3: Avoid use of herbicide and pesticides; where necessary, apply biocides as part of integrated pest management strategies, and following all local, state, and federal regulations. C4: Minimize impacts of vegetation management projects conducted for fire safety, including to create and maintain defensible space, by implementing the best management practices. The list of BMPs will be maintained by the County and reviewed periodically by the USFWS and CDFW and will include specific fuel-reduction prescriptions designed to minimize impacts to the covered species. C5: Install temporary construction fencing to prevent disturbance outside of the designated footprint.	Inside the Priority Conservation Area (PCA): • set aside habitat at a 3:1 ratio for area of disturbance; and • pay 74.88 cents/square foot of disturbance to fund restoration, management, and plan administration. Outside of the PCA: • pay 13.93 cents/square foot of disturbance to fund habitat protection; and • pay 74.88 cents/square foot of disturbance to fund restoration, management, and plan administration.
	Morro Bay kangaroo rat	Direct Negative Effects • Habitat loss Indirect Negative Effects • Habitat fragmentation • Habitat degradation due to the invasion and spread of non-native plants and animals • Increases in natural predators • Increased pet encounters • Potential for spread of rodenticides • Potential increase in diseases • Increased risk of catastrophic fire	Prior to ground-disturbing activities in habitat suitable for Morro Bay kangaroo rat (Figure 5-3), a CDFW and USFWS-approved biologist will conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied (Section F.1).	Implementation of Measures E1 and C1-C5 as outlined in the first row will minimize impacts to Morro Bay kangaroo rat habitat. There are no minimization measures for individuals, as take of individuals must be avoided.	The mitigation measures for Morro shoulderband snail, described above, will also compensate for loss of habitat for Morro Bay kangaroo rat.

Table 5-11: Summary of the Potential Effects and Conservation Program Activities for the Covered Species for the Main Categories of Covered Activities					
Covered Activity Category	**Covered Species**	**Potential Effects**	**Avoidance Measures**	**Minimization**	**Compensation**
		• Exclusion of fire, resulting in unnatural succession of habitat			
	Morro manzanita	Direct Negative Effects • Individual mortality (e.g., from cutting or crushing) • Habitat loss Indirect Negative Effects • Habitat fragmentation • Habitat degradation due to the invasion and spread of non-native plants • Potential for impacts from herbicides • Increased fire frequency • Exclusion of fire, resulting in unnatural succession of habitat and 'senescence risk' of population • Genetic pollution or introgression (e.g., hybridization)	MM-1: Avoid and minimize impacts of project activities on Morro manzanita, by siting project disturbance envelopes away from existing plants to the maximum extent practicable. MM-2: Avoid or minimize trimming or removing Morro manzanita when conducting vegetation management including in association with required hazard abatement activities. MM-3: Avoid planting manzanita species (*Arctostaphylos* spp.) other than Morro manzanita.	Implementation of Measures E1 and C1-C5 as outlined in the first row will minimize impacts of the covered activities on Morro manzanita habitat. Implement measures MM1-MM 3 at left.	The mitigation measures for Morro shoulderband snail, described above, will also compensate for impacts to Morro manzanita.
	Indian Knob Mountainbalm	Direct Negative Effects • Habitat loss Indirect Negative Effects • Habitat fragmentation • Habitat degradation due to the invasion and spread of non-native plants • Potential impacts from herbicides (e.g., from nearby landscaping) • Increased fire frequency • Exclusion of fire, resulting in unnatural succession of habitat and 'senescence risk' of population	IKM-1: Prior to ground-disturbing activities in habitat suitable for Indian Knob mountainbalm, the applicant will retain a USFWS-approved biologist to conduct a survey to determine the presence of Indian Knob mountainbalm. If the species is present, the applicant will work with the County, USFWS, and CDFW to develop a project-specific plan to ensure that no take of this species occurs during project implementation.	Implementation of Measures E1 and C1-C5 as outlined in the first row will minimize impacts to Indian Knob mountainbalm habitat. There are no minimization measures for individuals, as take of individual Indian Knob mountainbalm must be avoided.	The mitigation measures for Morro shoulderband snail, described above, will also compensate for loss of Indian Knob mountainbalm habitat.
Community Wildfire Protection Plan	Morro shoulderband snail	Direct Negative Effects • Individual mortality (e.g., from trampling or crushing) • Temporary habitat loss Indirect Negative Effects • Temporary habitat fragmentation	All-1: Treatments will follow clearly defined operational procedures and a USFWS-approved biologist will train crews on the identification, status, and presence of covered species in each treatment area.	Implementation of Measures E1 and C1-C5 as outlined in the first row will minimize impacts of the covered activities on Morro shoulderband snail habitat. The avoidance measures for Morro shoulderband snail will also help minimize impacts to the species habitat and individuals. MSS-2: Canopy thinning and limbing up of plant species of particular value to Morro shoulderband snail must be avoided or minimized to the maximum extent possible. Pre-project surveys of treatment areas should be used to identify plant species that	None. The avoidance and minimization measures will render the impacts of the CWPP on Morro shoulderband snail negligible and the treatments will likely improve habitat for the species in the long term,

Table 5-11: Summary of the Potential Effects and Conservation Program Activities for the Covered Species for the Main Categories of Covered Activities					
Covered Activity Category	**Covered Species**	**Potential Effects**	**Avoidance Measures**	**Minimization**	**Compensation**
		• Habitat degradation due to the invasion and spread of non-native plants • Increased risk of fire Benefits: • Reduced risk of catastrophic wildfire • Maintenance of open canopy conditions.	All-2: A USFWS-approved biologist will monitor all vegetation removal activities that will take place within habitat suitable for the covered species. MSS-1: Prior to the start of any abatement activities, a USFWS-approved biologist will conduct surveys to capture and relocate to a USFWS-approved receptor site all Morro shoulderband snails identified during surveys.	should be avoided, which include but are not limited to mock heather (*Ericameria ericoides*), coastal busy lupine (*Lupinus arboreus*), and sand almond (*Prunus fasciculate* var. *punctata*). MSS-3: A USFWS-approved biologist will be present during all work to ensure that the limits of work are clearly delineated, take any reasonable measures necessary to avoid the take of Morro shoulderband snail, and to stop any work or activity not in compliance with the conditions set forth in the HCP/ITP.	such that compensatory mitigation is not required.
	Morro Bay kangaroo rat	Direct Negative Effects • Temporary habitat loss Indirect Negative Effects • Temporary habitat fragmentation • Habitat degradation due to the invasion and spread of non-native plants and animals • Increases in natural predators Benefits: • Reduced risk of catastrophic wildfire • Maintenance of open canopy/early successional habitat conditions required by the species.	MSS-3: Prior to initiating any fire hazard abatement activities in areas featuring habitat suitable for MBKR (Figure 5-3), a CDFW and USFWS-approved biologist will conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied (Section F.1)	There are no minimization measures for individuals, as take of individual Morro Bay kangaroo rats must be avoided. Implementation of Measures E1 and C1-C5 as outlined in the first row will minimize impacts of the covered activities on Morro Bay kangaroo rat habitat.	None. The avoidance and measures will avoid take of Morro Bay kangaroo rat through the CWPP treatments, which may improve habitat conditions for the species in the long term, such that compensatory mitigation is not required.
	Morro manzanita	Direct Negative Effects • Individual mortality (e.g., from cutting or crushing) Indirect Negative Effects • Temporary habitat fragmentation • Habitat degradation due to the invasion and spread of non-native plants Benefits: • Reduced risk of catastrophic wildfire • Maintenance of open canopy/early successional habitat conditions that can promote seedling establishment	MM-1: No individual Morro manzanita plants will be removed and all canopy thinning and limbing up of lower branches of Morro Manzanita will be avoided or minimized to the extent that abatement goals can still be achieved.	The avoidance measure for Morro manzanita will also help minimize impacts to individuals of the species. Implementation of Measures E1 and C1-C5 as outlined above will minimize impacts of the covered activities on Morro manzanita habitat.	None. The avoidance and minimization measures will render the impacts of the CWPP on Morro manzanita negligible and the treatments may improve habitat for the species in the long term, such that compensatory mitigation is not required.

Table 5-11: Summary of the Potential Effects and Conservation Program Activities for the Covered Species for the Main Categories of Covered Activities					
Covered Activity Category	**Covered Species**	**Potential Effects**	**Avoidance Measures**	**Minimization**	**Compensation**
		• Can facilitates use of prescribed fire to promote recruitment			
	Indian Knob Mountainbalm	Direct Negative Effects • None—all impacts to individuals will be avoided. Indirect Negative Effects • Temporary habitat fragmentation • Habitat degradation due to the invasion and spread of non-native plants Benefits: • Reduced risk of catastrophic wildfire • Maintenance of open canopy/early successional habitat conditions that can promote recruitment • Can facilitates use of prescribed fire to promote recruitment	IKM-1: Prior to initiating any hazard abatement activities, a CDFW and USFWS-approved biologist will survey the treatment area to assess the presence of Indian Knob mountainbalm. If the species is detected within or adjacent to the treatment area, CAL FIRE must consult with the USFWS and CDFW to determine how to proceed as no impacts to individuals this species will be authorized.	There are no minimization measures for individuals, as take of individual Indian Knob mountainbalm must be avoided. Implementation of Measures E1 and C1-C5 as outlined in the first row will minimize impacts of the covered activities on Indian Knob mountainbalm habitat.	None. The avoidance measures will avoid impacts of the CWPP on Indian Knob mountainbalm and the treatments may improve habitat condition for the species in the long term, such that compensatory mitigation is not required.
Conservation Program Implementation (Habitat Restoration and Management, and Habitat and Species Monitoring)	Morro shoulderband snail	Direct Negative Effects • Individual mortality (e.g., from trampling or crushing) • Temporary habitat loss Indirect Negative Effects • Temporary habitat fragmentation • Temporary habitat degradation due to the invasion and spread of non-native plants and animals Benefits • Promote habitat condition in the long term, by increasing the cover and richness of native plants by controlling exotic plants. • Increase distribution and abundance by restoring and managing habitat to address stresses (e.g., exotic plants, erosion, incompatible recreation, and fire exclusion). • Increase understanding of the conservation biology of the species through-long term monitoring and		MSS-2: Prior to and during all ground-disturbing activities in designated parcels (Figure 5-2), a biologist approved by the USWFS shall capture and move all Morro shoulderband snails to suitable habitat away from the project impact area (Section F.2). Implementation of Measures E1 and C1-C5 as outlined in the first row, wherever appropriate, will also help minimize short-term negative impacts of the conservation program on Morro shoulderband snail.	None. The conservation program is the compensatory mitigation for the LOHCP, and the short-term negative impacts of the conservation program on Morro shoulderband snail are negligible.

Table 5-11: Summary of the Potential Effects and Conservation Program Activities for the Covered Species for the Main Categories of Covered Activities					
Covered Activity Category	**Covered Species**	**Potential Effects**	**Avoidance Measures**	**Minimization**	**Compensation**
		adaptive management, to promote management and recovery actions elsewhere.			
	Morro Bay kangaroo rat	Direct Negative Effects • Temporary habitat loss Indirect Negative Effects • Temporary habitat fragmentation • Temporary habitat degradation due to the invasion and spread of non-native plants and animals. Benefits • As for Morro shoulderband snail (above) • Create and maintain open habitat conditions required for Morro Bay kangaroo rat using fire and/or fire surrogates	MBKR-1: Prior to ground-disturbing activities in habitat suitable for Morro Bay kangaroo rat (Figure 5-3), a CDFW and USFWS-approved biologist will conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied (Section F.1).	There are no minimization measures for individuals, as take of individual Morro Bay kangaroo rats must be avoided. Implementation of Measures E1 and C1-C5 as outlined in the first row, wherever appropriate, will also help minimize short-term negative impacts of the conservation program on Morro Bay Kangaroo rat habitat.	None. The conservation program is the compensatory mitigation for the LOHCP, and the short-term negative impacts of the conservation program on Morro Bay kangaroo rat are negligible.
	Morro manzanita	Direct Negative Effects • Individual mortality (e.g., from cutting or crushing) Indirect Negative Effects • Temporary habitat fragmentation and habitat degradation (e.g., to conduct restoration and management projects) Benefits: • As for Morro shoulderband snail (above) • Promote regeneration of the population using fire and/or fire surrogates	MM-1: Avoid and minimize impacts of project activities on Morro manzanita, by siting project disturbance envelopes at least 10’ away from the copy of existing plants wherever possible.	MM-2: Avoid or minimize trimming or removing Morro manzanita when conducting vegetation management including in association with required hazard abatement activities. Implementation of Measures E1 and C1-C5 as outlined in the first row, wherever appropriate, will also help minimize short-term negative impacts of the conservation program on Morro manzanita.	None. The conservation program is the compensatory mitigation for the LOHCP, and the short-term negative impacts of the conservation program on Morro manzanita are negligible.
	Indian Knob Mountainbalm	Direct Negative Effects • Individual mortality (e.g., from cutting or crushing) Indirect Negative Effects	IKM-1: Prior to ground-disturbing activities in habitat suitable for Indian Knob mountainbalm, the applicant will retain a CDFW and USFWS-approved biologist to conduct a survey to determine the	There are no minimization measures for individuals, as take of individual Indian Knob mountainbalm must be avoided. Implementation of Measures E1 and C1-C5 as outlined in the first row, wherever appropriate, will also help minimize short-term negative impacts of the conservation program on Indian Knob mountainbalm habitat.	None. The conservation program is the compensatory mitigation for the LOHCP, and the short-term negative impacts of the

Table 5-11: Summary of the Potential Effects and Conservation Program Activities for the Covered Species for the Main Categories of Covered Activities					
Covered Activity Category	**Covered Species**	**Potential Effects**	**Avoidance Measures**	**Minimization**	**Compensation**
		• Temporary habitat fragmentation and habitat degradation (e.g., to conduct restoration and management projects) Benefits: • As for Morro shoulderband snail (above) • Promote regeneration of the population using fire and/or fire surrogates	presence of Indian Knob mountainbalm. If the species is present, the applicant will work with the County, USFWS, and CDFW to develop a project-specific plan to ensure that no take of this species occurs during project implementation.		conservation program on Indian Knob mountainbalm are negligible.



Figure 5-1: Priority Conservation Area

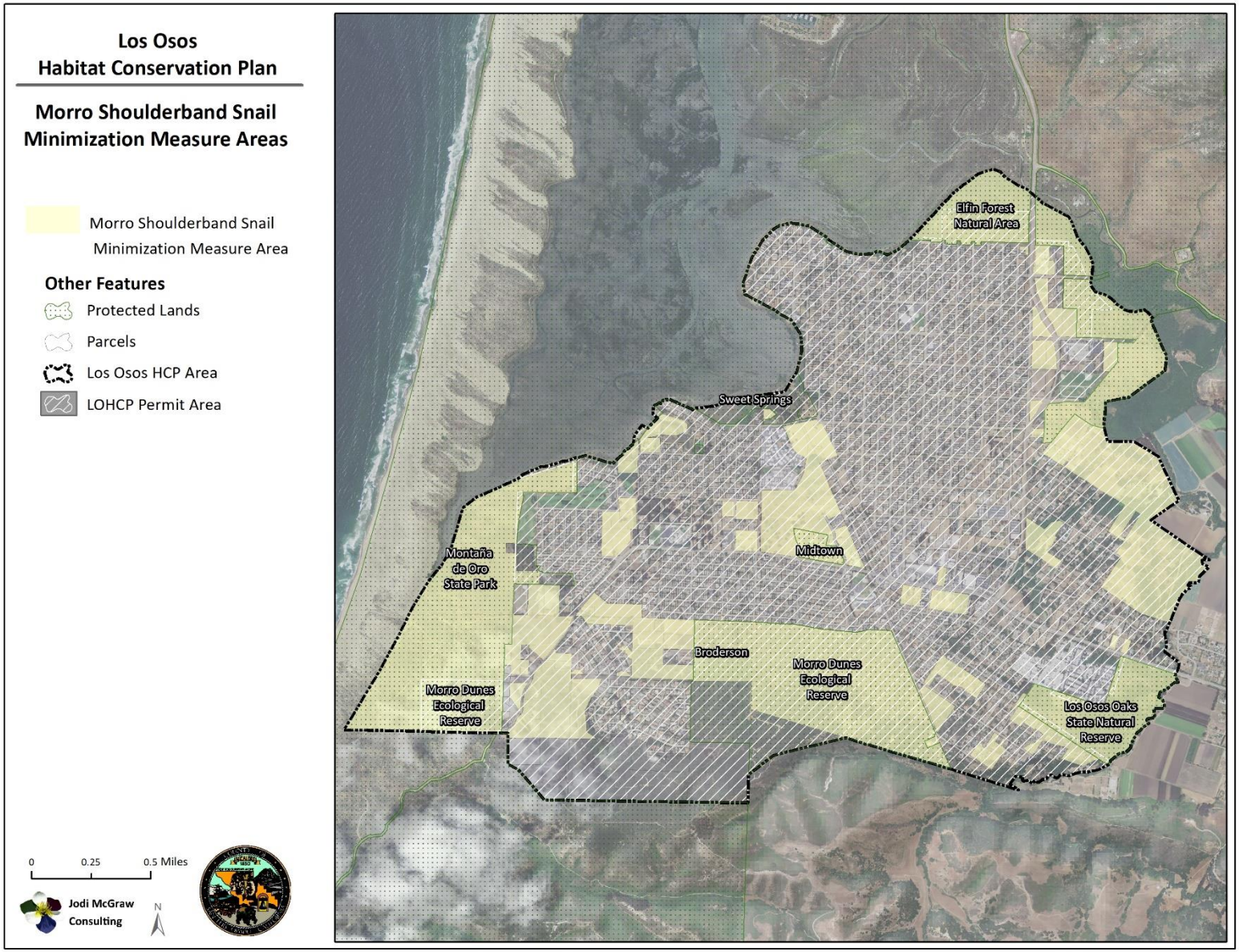


Figure 5-2: Morro Shoulderband Snail Minimization Area

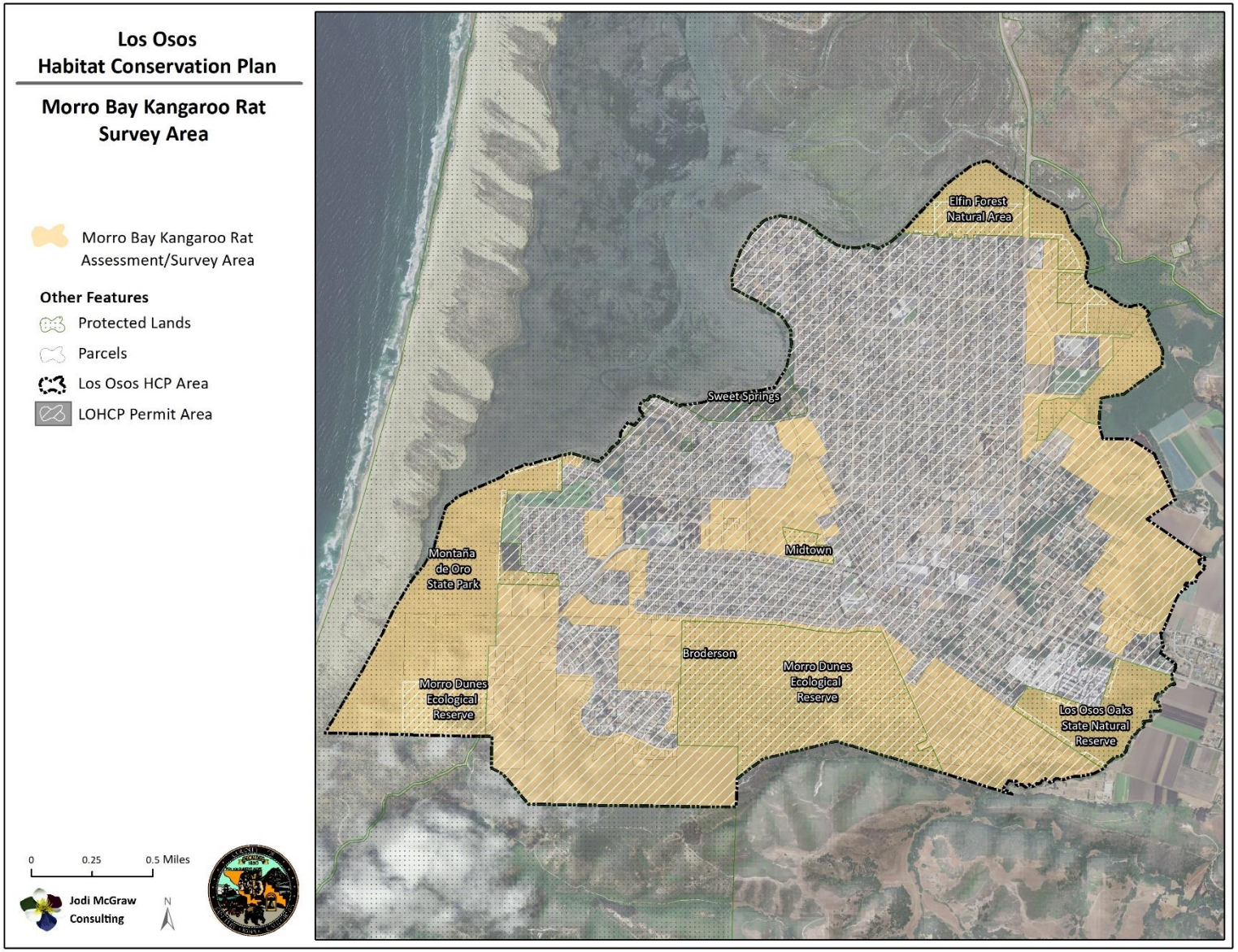


Figure 5-3: Morro Bay Kangaroo Rat Avoidance Area

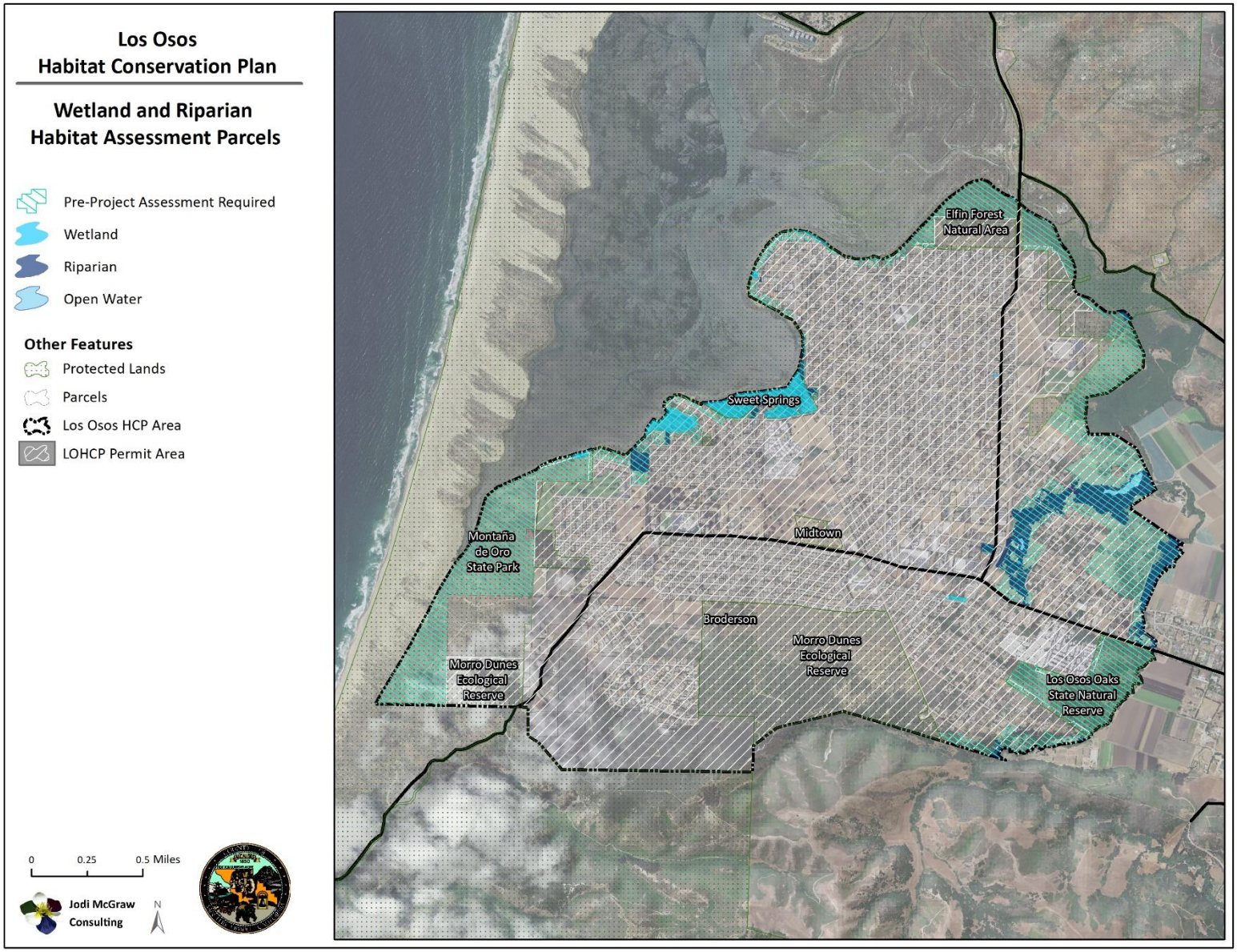


Figure 5-4: Wetland and Riparian Pre-Project Habitat Assessment Area

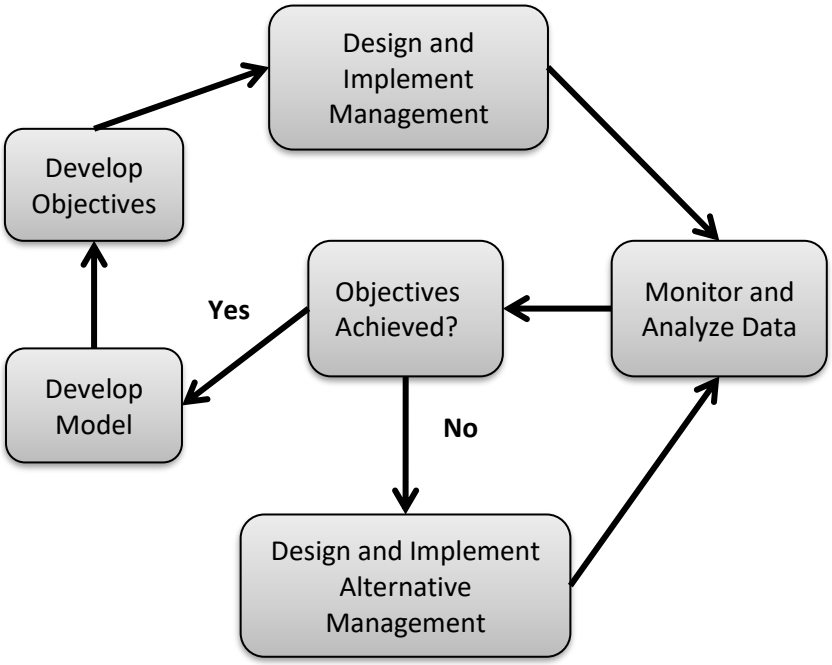


Figure 5-5: Adaptive Management Cycle (Elzinga et al. 2001)

6 Plan Implementation

This chapter describes the LOHCP implementation plan, including organizational structure, project approval and permitting processes, roles and responsibilities, and plan amendment modification procedures.

Implementation of the LOHCP will begin once the MOU is executed between the County and the CDFW, and the USFWS issues to the County the incidental take permit (ITP; Section 1.4).

6.1 Responsibility for Plan Implementation

As the permittee, the County of San Luis Obispo (County) will implement the LOHCP with oversight from the USFWS. The County envisions contracting with an Implementing Entity—an existing or newly created non-profit conservation organization (e.g., land trust or conservancy) approved by the USFWS and CDFW, that will provide expertise in land conservation and management for endangered species, among other skills necessary to implement the conservation program. However, the County remains responsible for implementation of all aspects of the LOHCP.

This plan envisions that the Implementing Entity will take on roles and responsibilities primarily focused on implementing the conservation program including protecting new habitat, restoring habitat, and managing and monitoring habitat incorporated within the LOHCP Preserve System. The County roles and responsibilities are anticipated to include screening and reviewing applications, ensuring participant compliance, and implementing regulatory functions. These respective roles and responsibilities are aligned with the expertise and typical operation of both parties and reflected in the letter of intent regarding the Implementing Entity and County roles in implementing the Plan (Appendix N).

The following sections provide an overview of the anticipated roles of the County, Implementing Entity, and USFWS. The County will work with the Implementing Entity to formalize an agreement that identifies the specific roles of each entity, which may ultimately differ from what is outlined below. As the land manager of the Morro Dunes Ecological Reserve (MDER), CDFW will enter into an MOU with the County (Appendix J) which will allow the MDER to be enrolled into the LOHCP Preserve System at the outset of plan implementation for purposes of restoration and enhanced management under the LOHCP (Section 5.3.3.1.2). The CDFW will also be responsible for implementing CESA and other state regulations administered by the Department (Section 1.5.2); however, CDFW will not be issuing a state incidental take permit under Section 2081 of CESA as the LOHCP will avoid take, as defined by the state act, of state-listed species (Morro Bay kangaroo rat and Indian Knob mountainbalm). County

As the recipient of the ITP based on the LOHCP, the County has primary responsibility for implementing the LOHCP. As noted above and detailed in the following sections, the County intends to delegate specific responsibilities to implement aspects of the LOHCP conservation program through contracts for services with an Implementing Entity. Ultimately, the County is responsible for implementing the LOHCP and otherwise complying with the terms of the ITP so will coordinate closely with the Implementing Entity on all aspects of plan implementation. The County remains responsible for ensuring compliance with the permit by the Implementing Entity and third parties who choose to obtain incidental take coverage through the permits and commits to use its police powers to ensure compliance with the HCP and permit by the Implementing Entity and third-party participants.

6.1.1.1 Identify or Establish the Implementing Entity

With input from and the approval of the USFWS and CDFW, the County will either identify an existing conservation organization that can carry out the responsibilities of the Implementing Entity (Section 6.2) or see that a new entity is formed following bylaws that are approved by the County. In either case, the Implementing Entity will be a non-profit organization designated under Section 501(c)3 of the United States Internal Revenue Code and will be approved by the USFWS and CDFW.

6.1.1.2 Contract with and Oversee the Implementing Entity

The County envisions contracting with the Implementing Entity to fulfill some of its responsibilities, as outlined below. The County will also review work conducted by the Implementing Entity, to ensure that the Plan elements are successfully implemented and that it is in compliance with the terms and conditions of the incidental take permit. The task of County oversight will be headed by the LOHCP Coordinator—a designated County staff member who will be responsible for overseeing the Implementing Entity and coordinating directly with the agencies. The County LOHCP Coordinator will work with the assistance of other County staff or outside personnel with biological expertise, as needed, to review aspects of plan implementation including reviewing biological monitoring reports.

6.1.1.3 Review Applications and Issue Certificates of Inclusion

The County will review all applications from project proponents seeking to implement activities covered under this plan in the LOHCP Area. The County will screen all development and related projects that it permits in the Permit Area as part of its local land-use authority, to determine whether they meet the criteria for take authorization under the LOHCP (Section 6.3). The County will require proponents of these projects to complete an application for a Certificate of Inclusion (COI), which will confer take coverage under the ITP (Appendix H).

The County will also accept and review applications for take coverage from the proponents of projects that are not under County land use authority, but that meet the LOHCP eligibility criteria. The County will refer applicants whose projects are determined to be ineligible for permitting under the LOHCP to the state and federal agencies to discuss alternative options for take coverage.

As part of its review of applications, the County will identify the specific avoidance and minimization measures (AMMs), as well as best management practices (BMPs), that are necessary for each covered activity, based on the general approaches (Section 5.2) as well as site and project-specific conditions. The County will include the relevant AMMs and BMPs as requirements within the COI for each project.

6.1.1.4 Ensure Compliance with Permit Terms

The County will ensure that plan participants comply with the terms of their COI and the ITP. Specifically, the County will:

- Review reports from pre-construction surveys (which will also be reviewed by the USFWS and CDFW) and use results to evaluate the need for the project proponent to implement additional AMMs (Section 5.2), including adjust the project design;

- Ensure compliance of all plan participants to ensure they implement the AMMs and BMPs to prevent impacts to other listed species not covered under the permit; and
- Maintain a database of all avoidance and minimization measures, including survey results, which will be used to develop the annual report as well as to increase understanding of the species distribution and abundance.

Should a participant fall out of compliance, the County will notify them. If voluntary compliance is not provided, the County will revoke the Certificate of Inclusion and issue a stop-work order on any County-permitted projects as described in greater detail in Section 6.3.3. The County remains liable under the permit for compliance with all applicable permit terms by each plan participant. Any violation of or failure to comply by a plan participant with the terms of the permit or the terms of any Certificate of Inclusion issued by or on behalf of the County shall be attributed to the County.

6.1.1.5 Accept the Mitigation Fees

The County will accept from all participants in the LOHCP the mitigation fees required to compensate for the impacts of their projects (Section 5.7). These include Habitat Protection Fees (Section 5.7.2.1.2) for those who do not set aside habitat on site, and habitat restoration and management fees, which are required for all participants identified in Table 5-7 (Section 5.7.2.2). The Implementing Entity will accept easements from landowners who set aside habitat onsite (Section 5.7.2.1.1, Section 6.2.2.2).The County will work with the Implementing Entity to secure the required on-site mitigation following approval of project applications and before development permits and COIs are issued.

The County will deposit habitat mitigation fees into a dedicated trust account which is anticipated to be held by the Implementing Entity (the trustee) on behalf of the County (the third-party owner), to ensure that they are applied to implement the Plan. A portion of the fees will be used to establish the endowment that will be held by the National Fish and Wildlife Foundation and will be used to fund habitat management and monitoring post permit (Section 7.3.1).

6.1.1.6 Maintain a Covered Activities Database

The County will conduct Covered Activities Implementation Monitoring for the LOHCP (Section 5.4.1). Specifically, the County will create and maintain a database to record relevant information about each COI application submitted:

- The amount and location of habitat impacted by each covered activity;
- Whether all of the required AMMs and BMPs required in the COI were implemented, and the effectiveness of the measures;
- The number and type of COIs issued during each calendar year and cumulatively since the take permit was issued; and
- The mitigation provided (i.e., the acres protected via conservation easement and fees accepted) for each covered activity.

6.1.1.7 Prepare Annual Reports

The County will work with the Implementing Entity to prepare the annual report documenting implementation of the LOHCP (Section 5.6). Each report will be developed based the covered activities database (Section 6.1.1.6) and the conservation program database (Section 6.1.2.2) and will evaluate whether the area protected, restored, and managed as part of the conservation program is sufficient to meet the LOHCP stay-ahead provision (Section 6.2.4). The annual reports will document the steps conducted to promote long-term effectiveness of the plan at achieving the biological goals and objectives (Sections 5.1 and 5.5). These include:

- Updating the overall conservation program as well as the LOHCP Preserve AMMP, based on changed conditions, new scientific information, and results of monitoring;
- Assessing the financial viability of the plan and the need to adjust fees (Section 7.4); and
- Identifying proposed changes to the plan, including administrative changes as well as minor and major amendments (Section 6.7).

6.1.1.8 Conduct Other Implementation Duties

The County will work with the Implementing Entity to complete additional tasks to effectively implement the LOHCP including:

- **LOHCP Communications:** maintain a publicly available website that provides information about the LOHCP, including annual reports and monitoring studies;
- **Promote Partnerships:** engage with agencies and organizations in the LOHCP Area, to promote their support for efforts to achieve the LOHCP goals and objectives. This includes conducting outreach to researchers to engage them in studies that will fill data gaps, evaluate effectiveness of monitoring, and otherwise inform the conservation program (Section 5.4.2.3);
- **Pursue Supplemental Funding**: as feasible, seek outside funds to support research as well as additional restoration, management, and monitoring to complement the LOHCP conservation program. Such funds sources would not replace or otherwise alter the mitigation responsibilities of the County or the plan participants; rather, additional funding would be used to improve the quality of management of the LOHCP Preserve System.
- **Convene Meetings:** at least annually, or sooner if warranted, convene representatives from the Implementing Entity and the USFWS, as well as owners/agency managers of land within the LOHCP Preserve System to keep these parties apprised of progress towards conservation goals and objectives, and provide updates on funding, monitoring, adaptive management, and other topics relevant to long-term effectiveness of the LOHCP.

6.1.2 Implementing Entity

The County will work with the Implementing Entity to implement the conservation program, including protecting new habitat, restoring habitat, and managing and monitoring habitat incorporated within the LOHCP Preserve System. This section describes the anticipated roles and responsibilities of the Implementing Entity.

6.1.2.1 Assemble, Manage, and Monitor the LOHCP Preserve System

The County intends to delegate to the Implementing Entity the tasks associated with assembling the LOHCP Preserve System (Section 5.3) and conducting all activities to restore, manage, and monitor the preserves in order to achieve the biological goals and objectives of the LOHCP (Section 5.1). This includes steps to protect, manage, restore, and monitor habitat.

To protect habitat, the County will work with the Implementing Entity to:

- Secure easements from landowners mitigating on site, by reviewing applications and identifying the set-aside area, and working with the USFWS to ensure the easement will protect habitat that is of high long-term conservation value for the covered species (Sections 5.7.1.1 and 6.2.2.2).
- Use habitat mitigation fees to acquire, from willing sellers, additional lands of high conservation value to be included in the LOHCP Preserve System, by working with the USFWS to identify parcels of greatest conservation value, conducting outreach to identify willing sellers, negotiating with landowners or their agents, and ultimately securing fee title or conservation easements. Lands acquired in fee simple title are anticipated to be held by the County and permanently protected by conservation easements held by the Implementing Entity.
- Monitor and enforce, where necessary, compliance with conservation easements over properties protected as part of the LOHCP to ensure long-term protection of the habitat.

6.1.2.1.1 Accept Conservation Easements for New Preserves

The Implementing Entity will accept conservation easements from plan participants who set aside habitat on site within the Priority Conservation Area (Section 5.7.2.1.1). The Implementing Entity will also accept conservation easements for habitat acquired in fee title by the County using the Habitat Protection Fees (Section 5.7.2.1.2).

The County anticipates having the Implement Entity serve as the easement holder (rather than the County) for a variety of reasons including:

1. As a 501(c)3 land trust, the Implementing Entity will be most qualified to develop easements designed to protect the conservation values, and enforce the terms of the easements, as needed;
2. The Implementing Entity is anticipated to lead habitat restoration, management, and monitoring in conjunction with monitoring the easements, so the Implementing Entity is anticipated to more readily able to detect any violations; and
3. The County envisions holding fee title to lands acquired using mitigation fees collected through the LOHCP, and granting a conservation easement for said lands to the Implementing Entity..

As described in Section 6.2.2.2, the easement grantee will designate a successor to the easement, in the event the easement grantee is dissolved.

6.1.2.1.2 Enroll Existing Protected Lands

The County will work with the Implementing Entity and CDFW and County Parks to enroll lands to be managed, restored, and monitored as part of the LOHCP Preserve System (Section 5.3.3.1.2). This includes:

- Identifying the priority areas for habitat restoration and management and the techniques that will be used to ensure the habitat is protected in perpetuity;
- Determining the management goals and objectives for the property, which will be consistent with the biological goals of the LOHCP (Section 5.1) and the goals and objectives of the LOHCP Preserve System AMMP (Section 5.3.3.2); and
- Developing and executing MOUs or other cooperative agreements with the eligible land management entities who may elect to enroll their lands, including CDFW and County Parks (Section 5.3.3.1); such agreements would specify what they will continue to do (i.e., as part of their maintenance of effort) and what the County and Implementing Entity will do directly, or under contract with the land manager, as mitigation under the LOHCP.

6.1.2.1.3 Restore, Manage, and Monitor the Preserve System

The Implementing Entity is anticipated to conduct all habitat management, restoration, and monitoring within the LOHCP Preserve System directly or through administration of contracts (i.e., cooperative management agreements) with agencies and organizations that own land managed as part of the LOHCP Preserve System. Habitat management and monitoring responsibilities that are anticipated to be carried out by the Implementing Entity include:

- Implement the IAMMP, which identifies high-priority restoration work within the MDER to jump start the conservation program (Section 6.2.5; Appendix M).
- Prepare and implement the LOHCP Preserve System AMMP, which will identify the goals and priority restoration and management projects for the lands within the Preserve System, based on a critical examination of the biological conditions on site, as well as the role of the preserve in the broader landscape (Section 5.3.3.2).
- Prepare annual work plans and budgets to identify the habitat management and monitoring tasks that will be conducted to implement the IAMMP/AMMP each year, based on the priorities and existing funding, derived from habitat mitigation fees and other sources (e.g., grants).
- Conduct or oversee habitat restoration, management, and monitoring. Ensure that habitat management, restoration, and enhancement activities are carried out as outlined in the LOHCP Preserve System AMMP, the LOHCP, and the ITP and facilitate County efforts to ensure that the work is keeping pace with or exceeding the pace of the take/impacts in compliance with the Plan's stay-ahead provision (Section 6.2.4).
- Update the LOHCP Preserve System AMMP as part of the adaptive management process, in which changed conditions, new scientific information, and the results of prior projects and monitoring, among other changes, are addressed to promote long-term effectiveness of the conservation strategy (Section 5.5.2).

6.1.2.2 Document Implementation of the Conservation Program

To document implementation of the conservation program, the Implementing Entity will establish and maintain one or more databases to continuously track the following, which will be used to prepare the annual reports provided to the USFWS (Section 5.6):

- The amount and location of new habitat protected (i.e., habitat acquired by the Implementing Entity and habitat set-aside by project proponents on site; Section 5.7.2.1);
- The amount and location of habitat subject to each type of restoration treatment (e.g., erosion control);
- The amount and location of habitat subject to enhanced management, including the type(s) of management activities conducted in the area (e.g., veldt grass control);
- Progress toward the biological goals and objectives, based on monitoring; and
- A summary of the annual and cumulative costs spent to implement the conservation program.

6.1.3 USFWS

The USFWS will monitor and enforce the County's compliance with the ITP. The agency will review and comment on annual reports, which will identify the projects covered and mitigation provided under the ITP (Section 5.6), and annual work plans for the AMMP (Section 6.1.2.1.3). The USFWS is expected to remain involved in other aspects of implementation of the plan during the term of the ITP. Specific anticipated roles of USFWS include:

- Provide input and ultimately approval in the process of selecting the Implementing Entity;
- Monitor plan implementation through review of annual reports and work plans for the AMMP, and promptly notify the County if implementation of the plan is not proceeding in compliance with the ITP;
- Review and provide timely approval for all land acquisition and conservation easement proposals to ensure consistency with the habitat protection component of the conservation program (Section 5.3.3);
- Review, provide comments on, and approve the LOHCP Preserve System AMMP;
- Review annual reports documenting plan implementation and monitoring; and
- At their discretion and consistent with agency priorities and legal mandates, assist the Implementing Entity in attempting to secure funding to enhance the conservation program.

The USFWS is not expected to be involved in permitting activities on a project-by-project basis. Accordingly, the County will not transmit copies of application materials to the USFWS on a routine basis. If requested, the County will provide such information to the USFWS. The USFWS may identify issues with a particular application and otherwise offer comments to the County with regard to a particular project, but the extension of take authorization to individual covered activities will be carried out by the County in accordance with the ITP conditions. As the sole permittee, the County remains the sole entity liable for any non-compliance with the Plan or its ITP by any entity acting under the ITP.

6.2 Conservation Program Implementation

The County will work with the assistance of an Implementing Entity to implement the Plan conservation program. This will include implementation of the avoidance and minimization measures, and work with willing landowners in the region, to establish and manage the LOHCP Preserve System. The Preserve System is the network of public and private conservation lands, including land protected through implementation of the LOHCP, as well as existing protected lands where additional management and restoration will be conducted to promote the biological goals and objectives (Section 5.3.1). The County will work with an Implementing Entity to protect new habitat, as well as enroll existing protected lands in the LOHCP Preserve System. The County will ensure that habitat benefits in the LOHCP Preserve System keep pace with, or outpace, habitat impacts caused by the covered activities as part of the Plan's Stay Ahead Provision (Section 6.4).

6.2.1 Avoidance and Minimization Measure Implementation

As part of the process to review and permit applications for take coverage, the County will identify the necessary avoidance and minimization measures for each project as set forth in Tables 5-2 through 5-4, verify that projects can be implemented in a way that avoids impacts to Morro Bay kangaroo rat and Indian Knob mountainbalm individuals, condition the COI for each project on their successful implementation, and conduct monitoring to ensure that avoidance and minimization measures are effectively implemented as part of the LOHCP; this includes monitoring to ensure that the impacts are confined to the specified disturbance envelope. The County will address any violations to the COI and ITP as outlined in Section 6.3.3.

The following are specific tasks that the County will conduct to facilitate implementation of the AMMs.

1. **Maintain Database:** The County will establish and maintain a GIS database to identify the locations of known occurrences and suitable habitat for the four covered species and the eight additional listed species not covered by the LOHCP permit, as well as known nests of birds of prey including golden eagle and white-tailed kite. The database will contain the latest available public information (e.g., California Natural Diversity Database), information available from conservation organizations (e.g., California Native Plant Society and Morro Coast Audubon Society), and data synthesized from prior applications and projects (e.g., results of project-specific surveys). The database will be assembled prior to issuance of the permit so that it can be used to screen the first applications (Table 6-1).
2. **Evaluate Covered Activities:** The County will evaluate each project proposed for take coverage under the LOHCP to identify its potential impacts on the covered species and other listed species. This evaluation will consider the location of the project with respect to known occurrences and suitable habitat in the database, characteristics of the project (e.g., type, size, and seasonality) and the ecology and life history of the species that could potentially be affected. The County may require that project proponents prepare a habitat assessment to provide the information needed for the evaluation. The specific protection measures identified based on the above general criteria as well as site and project-specific considerations, will be included as conditions COI that is issued to confer take coverage for the project.
3. **Ensure Avoidance of Other Listed Species:** Prior to issuing a COI, the County will make the following determination for each project:

a. No take: The project can be conducted as designed without causing take of listed species not covered by the permit as well as Indian Knob mountainbalm and Morro Bay kangaroo rat individuals;

b. No take with implementation of avoidance measures: The project can avoid take to additional listed species through implementation of protection measures; or

c. Potential for take: There is a significant potential for take, which cannot be avoided through implementation of avoidance measures.

The County will refer proponents of projects with the potential for take of listed species not covered by the permit (Item 3c, above) and/or Indian Knob mountainbalm or Morro Bay kangaroo rat individuals (Item 3a, above) to the USFWS and CDFW to discuss permitting options; the County will also notify the wildlife agencies of such referrals. Such projects will only be permitted under the LOHCP if the applicant provides the County with documents substantiating compliance with the state and/or federal regulations (Section 6.3.1)

4. **Identify AMMs and BMPs**: The County will identify in each COI issued the AMMs and BMPs that must be implemented during each project to avoid or minimize take/impacts resulting from their covered activity. Tables 5-2 through 5-4 list the avoidance and minimization measures, which may be updated periodically by the County in coordination with the USFWS and/or CDFW, as part of the adaptive management framework to implement the Plan to promote effective species protection.
5. **Implement Species Protection Measures:** Plan participants will be required to implement the applicable measures required by the County in the COI. Plan participants are solely responsible for the costs associated with implementing AMMs and BMPs.
6. **Conduct Implementation Monitoring:** The County will monitor the covered activities to ensure that the requisite AMMs and BMPs are conducted (Section 5.4.1.1). This includes ensuring that the project impacts are confined to the predetermined disturbance envelope. The County may require that plan participants contract with a third-party biologist to implement this monitoring, in which case the County will review the reports provided by such third parties. The County will record the monitoring results into a database, which the County will use to quantify take/impacts including loss of habitat in the annual report (Section 5.6). Violations will be addressed as outlined in Section 6.3.3.

These steps outlined above will be revised, as needed, to ensure effective species protection.

6.2.2 Habitat Protection Process

The County will work with the Implementing Entity to use mitigation fees to acquire habitat in accordance with the biological goals and objectives. The Implementing Entity is anticipated to also receive land conservation easements from plan participants who are required to set aside habitat on-site, to meet the habitat protection requirement of the compensatory mitigation (Section 5.7.2.1). Section 5.3 identifies the important conservation considerations for habitat protection. This section describes the process and provides greater detail about the conservation easements.

6.2.2.1 Land Acquisition

The County will work with the Implementing Entity to use the habitat mitigation fees to acquire additional privately held land for inclusion within the LOHCP Preserve System. This section outlines the general stepwise process that will be followed to secure suitable land.

1. Identify properties with the highest potential to promote attainment of the biological goals and objectives, which include protecting, buffering, or connecting suitable and/or occupied habitat for the covered species (Section 5.3.2).
2. Discuss potential for acquisition of fee title or easement with the landowner and the USFWS.
3. Secure landowner permission to conduct site assessments and surveys, which will be funded using mitigation fees.
4. Determine if the property features encumbrances (e.g., existing easements), title issues, resource extraction rights, hazardous materials, or other issues that conflict with LOHCP goals and objectives. Areas subject to incompatible easements or management will be excluded from the LOHCP Preserve System unless such incompatibilities can be resolved.
5. Reach agreement on the terms of the conservation easement, which must be approved in writing by the USFWS, and will include language enabling the easement grantee, which is anticipated to be the Implementing Entity, to conduct habitat management and monitoring necessary to maintain or restore the conservation values. The Implementing Entity is also anticipated to be the grantee for easements conserving on-site habitat set-asides (Section 5.7.2.1.1). Lands acquired in fee title by the Implementing Entity will be transferred to the County which will grant a conservation easement, approved in writing by the USFWS, to the Implementing Entity.
6. Conduct an appraisal of the property value (easement or fee) or have an appraisal conducted by the property owner reviewed by an independent real-estate specialist or appraiser responsible to the County or Implementing Entity.
7. Obtain written concurrence from the County and USFWS, regarding the land selected for acquisition. The County will work with the Implementing Entity to provide the agencies with all available information about the property (including include maps, legal descriptions, preliminary title documents, Phase 1 Site Assessments, and draft conservation easements) along with a request for concurrence.
8. Negotiate fair-market price and final easement conditions, if applicable, with owner.
9. Acquire or place a conservation easement, approved by the USFWS, on the property.
10. If a site is purchased in fee simple title, fee title will be held by the County and the County will concurrently execute a conservation easement (approved by the USFWS) in favor of the Implementing Entity.
11. The County will work with the Implementing Entity to prepare a preserve-specific management plan, reviewed and approved by the USFWS, that will be integrated into the LOHCP Preserve System AMMP. If a conservation easement is purchased, the County will work with the Implementing Entity to prepare a preserve-specific management plan, which will be developed with the landowner and reviewed and approved by the USFWS. These plans will be consistent with the LOHCP Preserve System AMMP (Section 5.3.3.2) and feature an adaptive management framework (Section 5.5).

12. Initiate preserve management and monitoring and conduct habitat restoration (if applicable). Monitoring and management will be initiated within one year of preserve establishment and will be seasonally timed as outlined in the management plan. The timeline for restoration projects will depend on the circumstances, including habitat conditions and available funding, which will be addressed in the preserve management plan which will be reviewed and approved by the USFWS.

6.2.2.2 Conservation Easements

All habitat to be protected through the LOHCP will have its conservation values permanently protected through dedication of a conservation easement. Conservation easements are anticipated to be granted to the Implementing Entity which, as a 501(c)3 land trust, will be responsible for monitoring and defending the easement terms; however, the County can also serve as the conservation easement grantee

The County will work with the Implementing Entity to acquire conservation easements to protect habitat in the LOHCP under three circumstances:

1. Private landowners developing vacant land inside the Priority Conservation Area will grant easements to protect the habitat set-asides that they establish on site at a ratio of 3:1, wherein three square feet of habitat is protected via conservation easement for every one square foot impacted by development (Sections 5.7.2.1.1 and Section 6.1.2.1.1);

2. The County will grant to the Implementing Entity conservation easements over properties that the County acquires in fee simple title directly or through transfer from the Implementing Entity, as part of the habitat protection component of the LOHCP (Section 5.3.2); and

3. Landowners willing to donate or sell conservation easements to protect additional intact habitat on their parcels, particularly privately-owned parcels that feature residential development or other improvements for which the landowners wish to maintain fee simple ownership.

These conservation easements must meet the following criteria:

- Be in perpetuity;
- Be developed according to California Civil Code sections 815 et seq.;
- Be voluntarily offered by the holder of the underlying fee, and not as a mandatory condition of any project approval[21];
- Be submitted to the USFWS for review and approval; and
- Name the USFWS, and the County as third-party beneficiaries, with rights of entry and

[21] Although conservation easements are required as mitigation for those developing vacant parcels inside the Priority Conservation Area in order to participate in the LOHCP, such easements are not a mandatory condition of project approval as landowners seeking to develop in these areas can satisfy state and federal endangered species act requirements through other means, including preparing their own HCP.

enforcement.

The terms and prices of the easements will be negotiated on a case-by-case basis with the landowner, who must abide by the terms of the conservation easement. Easement terms will depend on site conditions, including species occurrences and habitat conditions and management needs, and landowner preferences, including land-use activities.

Conservation easements will be drafted to ensure that the area of the property covered by the easement will be kept in its natural or existing condition to protect the conservation values of the property forever, to confine the allowable uses of the property to those activities that ensure or promote the preservation or restoration of those conservation values consistent with the LOHCP, and to prevent any use of the property which would impair or interfere with the conservation values of the property. The conservation values shall be specifically described in terms of both the covered species and their habitat, and other natural communities on the property.

The County will work with the Implementing Entity to obtain the following documentation prior to accepting a conservation easement:

- A baseline survey of the property documenting the presence and of the covered species, condition of their habitat, and factors that threaten their future condition;
- A preliminary title report and legal description of the property;
- Evidence of all other easements, covenants, restrictions, and reserved rights;
- A Phase I environmental analysis for hazardous materials;
- A map of the parcel in relation to other components of the LOHCP Preserve, or other properties subject to other permanent protections for conservation purposes;
- A Property Analysis Report (PAR) or comparable assessment of the initial and capital costs and ongoing funds required to manage and monitor the lands; and
- A detailed list of the allowable uses and use restrictions on the parcel as approved by the USFWS.

The above information shall be provided to the USFWS at their request.

All recorded conservation easements must include the items listed below:

- Provisions for access both by the easement grantee (i.e., the Implementing Entity or the County) or its designee to monitor the terms of the conservation easement and to carry out all applicable management and monitoring requirements. A right of reasonable access to monitor compliance with the terms of the conservation easement shall also be granted to the USFWS. The easement shall include provisions for public access, where appropriate (e.g., trail corridors on properties connecting public lands) and approved by the USFWS.
- Provisions for enforcement and available remedies for the easement grantee or other party in the event that title holder or third party violates the terms of the conservation easement. Such right of enforcement and remedies provisions shall also be granted to the USFWS.

Appendix I contains a template conservation easement, which will be updated early during plan implementation, and as necessary to ensure long-term effectiveness at protecting habitat.

6.2.3 Habitat Restoration, Management, and Monitoring Process

The County will work with the Implementing Entity to manage, restore, and monitor habitat within the LOHCP Preserve System.

6.2.3.1 Enroll Existing Protected Lands in the LOHCP Preserve System

The County and/or the Implementing Entity will meet with the agencies and conservation organizations responsible for the existing protected lands within the Priority Conservation Area, to discuss potential coordination of management and restoration as part of the LOHCP Preserve System (Section 5.3.3). The purpose will be to identify the following:

1. **Habitat to be Enrolled:** the specific habitat areas to be enrolled in the LOHCP Preserve System, which must meet the following criteria:
    - provide suitable habitat for one or more of the covered species; and
    - have management or restoration needs that are not the current responsibility of the landowner/manager and met by available resources.

    If the property will be enrolled over time, the management units and their sequence or phasing will be determined.

2. **Habitat Treatments**: the specific habitat restoration and management activities that will be implemented to improve habitat conditions as mitigation for the LOHCP.

3. **Method of Habitat Protection:** the legal mechanism that will be used to ensure that the enrolled habitat is permanently protected from development, so that the restoration and management benefits resulting from mitigation are not wasted. Legal mechanisms can include conservation easements, permanent deed restrictions, and other legal documents (e.g., contracts) that restrict land use and associated activities, as appropriate and as approved by the USFWS. If the landowner cannot provide written, legal assurances that the enrolled habitat will be permanently protected from development or other activities that could affect habitat, then the County will provide written assurances to the USFWS that the County will be responsible for providing alternative compensatory mitigation acceptable to the USFWS for any loss of mitigation value resulting from a change in condition of the habitat due to such a change in land use.

4. **Maintenance of Effort Plan:** the current management and restoration activities that are being implemented by the landowner. These activities will continue to be implemented by the landowner to ensure that the LOHCP mitigation has added benefits for the covered species.

The information outlined above will be addressed in a legal agreement between the County and the landowner that will establish the basis for cooperative management of the land enrolled in the LOHCP Preserve System. It will also inform development of, or updates to, the LOHCP Preserve System AMMP, which will identify the complete restoration and management treatment plan for each enrolled property, to guide overall coordinated management of the preserves (Section 6.2.3). Section 6.4

describes how the County and CDFW developed a memorandum of understanding that addresses these cooperative management requirements outlined above.

6.2.3.2 Develop Preserve System Adaptive Management Plan

To guide restoration, management, and monitoring of habitat within the LOHCP Preserve System, the County will work with the Implementing Entity to develop the LOHCP Preserve System AMMP—an action plan for the Preserve System, which will identify the coordinated strategies that will be used to achieve the greatest long-term conservation benefits for the covered species (Section 5.3.3.2) and achieve the biological goals and objectives (Section 5.1). Developed during the first three years of implementation of the LOHCP (Table 6-1), this living document will be updated as new preserves are established (e.g., new habitat is protected, or protected lands are enrolled), and otherwise be revised, as needed, to identify the priority restoration and management projects for the lands within the LOHCP Preserve System.

Section 5.3.3.2 outlines the anticipated contents and key functions of the LOHCP Preserve System AMMP. To develop the plan, the County will work with the Implementing Entity to conduct baseline biological effectiveness monitoring studies (Table 5-6) of land anticipated to be included in the Preserve System (Section 5.3.3.1). The surveys, which will be conducted with permission of the landowners, will be designed to identify the distribution and relative abundance of the covered species, characterize the condition of their habitats, and identify initial priorities for restoration and management (Section 5.4.2.1).

To ensure adequate funding for this initial work, which will be conducted prior to accrual of sufficient mitigation fees, development of the LOHCP Preserve System AMMP, including implementation of the baseline monitoring protocols, were included as part of the three-year Preserve Start-Up Costs, that will be funded by the County; the County will be reimbursed for these and other initial costs, over time, using future mitigation proceeds (Section 7.3.2).

6.2.4 Stay-Ahead Provision

During the course of LOHCP implementation, the County will work with the Implementing Entity to ensure that the habitat benefits resulting from habitat protection, restoration, and management stay ahead of or equal the impacts/take. which will be measured in terms of area of Baywood fine sand soil habitat impacted by the covered activities. Evaluation of the status of the LOHCP toward compliance with the Stay-Ahead Provision will be conducted on an ongoing basis using the records maintained in the project databases which the County will use to ensure it does not permit take beyond the available habitat benefits accrued from implementation of the conservation program. The annual reports that the County will provide to the USFWS (Sections 5.4 and 6.1.1.7) will document successfully work to meet the stay-ahead provision, by showing the running total take/impacts covered by the permit do not exceed the total compensatory mitigation credits accrued through implementation of the conservation program.

The County will work with the Implementing Entity to implement the LOHCP conservation program in coordination and collaboration with willing landowners. Habitat mitigation activities will be funded by the fees collected from proponents of projects covered by the ITP issued based on the LOHCP. Given these circumstances, the two most likely factors that would prevent compliance with the Stay-Ahead

Provision are:

1. insufficient time to complete habitat protection projects, or for habitat restoration and management projects to be designed, implemented, and achieve their performance criteria (for restoration projects); and
2. insufficient funding accrued to finance the highest priority projects, which may also be capital intensive.

To address these potentialities and meet the Stay-Ahead Provision, the County developed a plan to jump start the LOHCP.

6.2.5 Jump Start for the LOHCP

During the first three years of plan implementation, while the AMMP is being developed, the County plans to conduct habitat restoration activities within the Morro Dunes Ecological Reserve (MDER). The work will be implemented following the terms of a memorandum of understanding (MOU) between the County and CDFW that will enroll the Morro Dunes Ecological Reserve (MDER) into the LOHCP Preserve System (Section 6.4, Appendix K). The MOU between the County and CDFW addresses the four requirements of cooperative management outlined above (Appendix K).

The Initial restoration and management of the MDER will be implemented as described in the *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (McGraw 2020; Appendix M), which is an appendix to the MOU between CDFW and the County. The IAMMP identifies three initial, high-priority projects to restore habitat that has been degraded by invasive plants and incompatible recreational use. The County is anticipated to implement one or more of the restoration projects in the IAMMP to provide an initial source of mitigation to offset covered activities while the AMMP is being developed based on additional surveys and planning. This 'jump start' will facilitate the County's compliance with the LOHCP's 'stay-ahead provision', which requires that the benefits of the conservation program keep pace with the impacts of the covered activities (Section 6.2.4).

Based on the LOHCP's mitigation equivalency ratios, which relate the value of habitat restoration to habitat impacts (1.5:1; Section 5.7.2.3.1), successful restoration of the total 27.74 acres as outlined in the IAMMP (Appendix M) would mitigate 41.61 acres of habitat impacts. However, the actual mitigation credits generated by initial restoration will be determined based on the acres of habitat that achieves the performance criteria (Section 3.4 in Appendix M). For the eucalyptus removal, the performance criterion is successful removal of the trees and their biomass; this reflects the immediate benefit of tree removal on the natural communities. For the control of veldt grass and co-occurring invasive plants and restoration of denuded trails, the performance criteria relate to establishing native plant community structure and species composition in the restoration treatment areas over a five-year period (Section 4.2 in Appendix M).

The funding analysis for this Plan included implementation of the IAMMP (Appendix M). To implement the IAMMP, the County will develop specific work plans that identify the areas to be treated in the MDER. These areas may be less than those identified in the IAMMP, as the restoration projects will likely exceed County funding to jump start the conservation program (Section 7.2.4). Any remaining areas or projects in the IAMMP that are not treated will be evaluated for inclusion in the LOHCP Preserve System AMMP, which will be developed during the first three years of LOHCP

implementation.

During this same period, the County will work with the Implementing Entity to actively pursue land protection projects with willing landowners, in order to secure fee title or conservation easements to new habitat to be protected as part of the LOHCP Preserve System. Land protection projects will be prioritized with input from the USFWS regarding the properties that are of the greatest long-term conservation value for the covered species and conducting outreach to landowners.

The County will also evaluate whether its existing lands are suitable for permanent protection. Specifically, the County holds two contiguous, undeveloped parcels totaling 2.32 acres which are in the Priority Conservation Area near the Bayview Unit of the Morro Dunes Ecological Reserve. The County may decide to enroll these parcels in the LOHCP Preserve System in order to jump start the LOHCP.

No take/impacts will be authorized under the ITP until the initial mitigation has been implemented and, for habitat restoration, the project has achieved the performance criteria in the IAMMP or mitigation is otherwise credited through land protection.

The County will work with the Implementing Entity to conduct one or more of the following to ensure compliance with the stay-ahead provision:

- Conduct work to complete habitat protection projects, including acquisition using the Habitat Protection Fees paid as mitigation;
- implement additional priority habitat restoration on lands managed as part of the LOHCP Preserve System; and/or
- process applications only for activities that will not cause take that exceeds the mitigation available.

6.3 Application Review, Take Authorization, and Oversight

Upon issuance of the ITP by USFWS and successful work to "jump start" the mitigation (Section 6.2.5), the County will have the ability to extend take coverage to proponents of eligible projects.

The County will issue COIs that confer take coverage for projects, provided that they meet the LOHCP eligibility criteria (Section 2.2.1). Landowners and other project proponents who receive take coverage are collectively referred to as third-party participants.

As part of the permitting process, the County will accept applications for covered activities and review them to determine whether they meet the criteria for take authorization under the LOHCP. The applications for covered activities will be used to:

1. evaluate eligibility of the project for coverage;
2. assess the effects on covered species;
3. identify the applicable avoidance, minimization, and compensatory mitigation requirements, including fees; and
4. ensure compliance with the LOHCP conditions if the project is approved.

If the application is complete and the project meets the eligibility criteria, the County accept the fees and the County will work with the Implementing Entity to accept conservation easements for required on-site habitat set-asides (Section 5.7.2.1.1). Following receipt of the mitigation, the County will issue a COI, which will establish and impose the project conditions of approval including required avoidance and minimization measures (Section 5.7.1). A list and copies of COIs will be included in the annual report provided to the USFWS (Section 5.6). For projects that are under the County land-use authority, the County will not issue local development or building permits until it issues a COI.

The County will monitor all third-party participants to ensure that they implement the required avoidance and minimization measures and comply with other terms of the COI and incidental take permit. Should a participant become out of compliance, the County will notify them. If voluntary compliance is not provided, the County will take steps to address the violation as outlined in Section 6.3.3.

The following sections describe two types of projects for which COIs would not be issued:

- **Ineligible Projects:** activities that may result in take/impacts, but that do not meet the LOHCP eligibility criteria (Section 2.2.4.1) or would result in take of other listed species for which take coverage is not provided by the LOHCP permit, and for which take coverage has not been secured; and
- **Exempt Projects**: activities that meet the LOHCP eligibility criteria (Section 2.2.4.1) but will not be covered by the LOHCP permit, because the project proponent has identified an alternative means of complying with ESA and CESA, such as through Section 7 of ESA.

6.3.1 Ineligible Projects

Projects may be ineligible to receive take coverage under the County incidental take permit if they do not meet the eligibility criteria (Section 2.2.4.1), or if they fall into a category of activity not permitted by the LOHCP (Section 2.3). Most notably, projects that cannot avoid impacts to other listed species not covered by the LOHCP ITP will not be eligible for permitting unless they can demonstrate that they have complied with CESA and ESA protections for the other additional species in the area (Section 3.2.3). The County will require proponents of any such project to demonstrate that the project is not likely to result in the take of any listed species other than species covered under the permit or that, if the project is likely to result in take of non-covered listed species, the project proponent has obtained take authorization for take from CDFW and/or USFWS, as appropriate. Evidence that the project is not likely to result in take may be demonstrated by a letter from CDFW or USFWS, issued at the discretion of the agency, stating that agency's opinion that take is not likely to occur. If take is likely to occur, the County will require a copy of the incidental take permit(s) issued for the covered activity.

Proponents of projects determined by the County to be ineligible for permitting under the LOHCP will be referred to the state and federal agencies to discuss options for take coverage.

6.3.2 Exempt Projects

Proponents of activities that meet the eligibility criteria of the LOHCP but that have already received the necessary take authorizations under CESA and ESA or has otherwise complied with the state and federal endangered species acts will not be required to comply with the LOHCP requirements. In order for such

a project to be deemed exempt from the requirements of the LOHCP, the project proponent must provide a copy of the incidental take permit(s) or biological opinion issued for the covered activity.

6.3.3 Oversight, Enforcement, and Violations

The County will provide the necessary oversight of projects covered under the ITP to ensure that proponents implement the avoidance and minimization measures and do not exceed the take authorization, otherwise enforce the terms of the COI (Appendix H) and address any violations.

The County will conduct implementation monitoring (Section 5.4.1.2) to ensure that plan participants implement covered activities per the terms outlined in the COI for their project, which will specify:

- The requisite avoidance and minimization measures (Tables 5-2 to 5-4); and
- The habitat impacts permitted (i.e., the project disturbance envelope) in terms of location and area (e.g., square feet).

If monitoring reveals that a project proponent has violated the terms of the COI, the County LOHCP Coordinator will notify County staff including County Code Enforcement and County Counsel, as needed, to enforce the terms of the COI.

The County process for addressing violations of the terms of the COI will include the following steps:

1. The County LOHCP Coordinator will contact the USFWS as well as County Code Enforcement to provide the information about the apparent violation;
2. The County will place a 'hold' on the permit, such that no additional work will be permitted until the violation is resolved;
3. A County Code Enforcement Officer will begin to investigate the case within 10 working days, with the assistance of the County LOHCP Coordinator; and
4. For projects that are determined to have violated the terms of the COI, the County will outline the terms that the project proponent must fulfill to address the violation before the County will remove the 'hold' on the permit.

For projects in which the actual area disturbed exceeds the area permitted in the COI, the project proponent will be required to pay on a per-square-foot basis, a fee that covers the additional area impacted. For projects conducted without a COI, the stipulation agreement will require landowners to first restore any habitat that was impacted, and then to obtain a COI (and County permit, if required) to do the work, including through payment of the fees. The County will use its authority to levy fines when/if the project proponent does not resolve the violation as outlined in the stipulation agreement.

6.4 Memorandum of Understanding

The County and CDFW have developed a MOU to establish the terms and conditions upon which the CDFW will authorize the County to conduct habitat management, restoration, and monitoring activities on CDFW lands enrolled within the LOHCP Preserve System including the Morro Dunes Ecological Reserve (MDER; Appendix J). The MOU also addresses the required elements of a cooperative management agreement between the County and CDFW to enroll its existing protected lands in the

LOHCP Preserve System (Section 6.2.3.1).

While the term of the MOU shall be five years, it is the intent of the County, CDFW, and USFWS to have the MOU extended for five consecutive five-year terms, totaling 25 years, to coincide with the term length of the HCP. The requested (and anticipated) permit term will remain 25 years; however; in the event that the MOU established between the County and CDFW lapses, the County commits to (must) suspend its approval of any activities covered under the HCP/ITP.

6.5 Changed Circumstances

6.5.1 Summary of Circumstances

Changed circumstances are changes in circumstances affecting a species or geographic area covered by an HCP that can reasonably be anticipated by plan developers and the USFWS and for which plan responses can be prepared (50 CFR 17.3). If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and these additional measures are provided for in the LOHCP (e.g., the conservation management activities or mitigation measures expressly agreed to in the LOHCP), then the County will work with the Implementing Entity to implement those measures as specified in the LOHCP. However, if additional conservation management and mitigation measures are deemed necessary to respond to changed circumstances and such measures were not provided for in the LOHCP, the No Surprises rule (50 CFR 17.22(b)(5) and 17.32(b)(5)) generally provides that USFWS will not require these additional measures absent the consent of the County, provided that the LOHCP is being "properly implemented", which is to say that the commitments and the provisions of the LOHCP have been or are being fully implemented.

Section 10 regulations [(69 Federal Register 71723, December 10, 2004, as codified in 50 Code of Federal Regulations (C.F.R.), Sections 17.22(b)(2) and 17.32(b)(2))] require that an HCP specify the procedures to be used for dealing with changed and unforeseen circumstances that may arise during the implementation of the HCP. In addition, the HCP No Surprises Rule [50 CFR 17.22 (b)(5) and 17.32 (b)(5)] describes the obligations of the County and the USFWS. The general purpose of the No Surprises Rule is to provide regulatory assurance to the non-federal landowners that obtain incidental take permit under Section 10(a)(2)(B) of the ESA that no additional land restrictions or financial compensation beyond the measures committed to under the plan will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

The following sections outline reasonably foreseeable circumstances and their anticipated effects on the covered species. For each, the LOHCP identifies additional conservation and mitigation measures that will be used to respond to the changes in circumstances. To fund the remedial management to address changed circumstances as well as adaptive management, 10 percent was added to the estimated management costs (Section 7.2.3). This amount is anticipated to cover the costs to address the changed circumstances, based on the anticipated restoration, management, and monitoring costs. It also reflects the remedial management costs budgeted in other recent regional HCPs, which feature similar changed circumstances and plan responses (JSA 2006, County of Santa Clara et al. 2012).

If the USFWS determines that a change circumstance has occurred, triggering the adaptive management provision, and the County has not changed its management practices in accordance with Section 5.5, the USFWS will notify the County and direct the County to make the required changes. Within 30 days of

receiving such notice, the County will make the required changes and report to the USFWS on its actions. Such changes are provided for in the HCP and, hence, do not constitute Unforeseen Circumstances.

6.5.2 Newly Listed Species Not Covered by the LOHCP/Designation of Critical Habitat

During the course of implementation of the LOHCP, the USFWS and/or CDFW (the wildlife agencies) may list as threatened or endangered under ESA or CESA a species that occurs in the LOHCP area but is not covered by the Plan. In the event that a new species is federally listed, the County, in consultation with USFWS, will ensure that LOHCP covered activities are modified if and as necessary to ensure that those activities are not likely to jeopardize, or result in the take of, or adverse modification of the designated critical habitat, if any, of the newly listed species. The County shall work to implement the modifications to the LOHCP covered activities identified by the USFWS as necessary to avoid the likelihood of jeopardy to, take of, or adverse modification of the designated critical habitat of the newly listed species. The County shall continue to implement such modifications until such time as the County has applied for and the USFWS has approved an amendment to the permit, in accordance with applicable statutory and regulatory requirements, to cover the newly listed species or until the USFWS notifies the County in writing that the modifications to the LOHCP's covered activities are no longer required to avoid the likelihood of jeopardy to, take of, or adverse modification of the designated critical habitat, if any, of the newly-listed species. In the event that a species becomes state-listed, the County will consult with the CDFW and make similar arrangements to avoid take and secure an incidental take permit, as needed, or otherwise ensure compliance with CESA.

In addition, if critical habitat is designated or revised for an existing covered species, and the USFWS determines that one or more covered activities is likely to result in adverse modification of the newly designated or revised critical habitat of the covered species, the County shall implement the modifications to the LOHCP covered activities identified by the USFWS as necessary to avoid the likelihood of adverse modification of the newly designated or revised critical habitat of the covered listed species. The County shall continue to implement such modifications until such time USFWS notifies the County in writing that the modifications to the LOHCP's covered activities are no longer required to avoid adverse modification of the newly designated or revised critical habitat of the covered species.

6.5.3 Climate Change

Increased greenhouse gases, including primarily carbon dioxide, that are present in the atmosphere as a result of human activities are altering the climate; these alterations are anticipated to continue, and cause secondary effects including sea-level rise (IPCC 2007).

Mean annual temperature in San Luis Obispo County is projected to increase by 2.1 to 3.9 °F by 2045 and 4.1 and 7.6 °F by 2085, with summer temperature increases larger than those in winter (Koopman et al. 2010). Some of the models evaluated predict that temperature increases will be lower on the coast including in the Plan Area, than in inland portions of the county, while others do not (Koopman et al. 2010).Though precipitation projections varied across three models evaluated in a local study, a statewide analysis found consensus between six models that Central California would be drier (Westerling et al. 2009).

Unless global climate change brings substantial increases in precipitation, increased temperatures will have a net negative effect on soil moisture as a result of increased evapotranspiration. This climatic water deficit may be exacerbated by continuation of a trend of 33% reduction in the frequency of summer fog in coastal California (Johnstone and Dawson 2010).

The hotter and likely drier climate could affect natural biological systems within the LOHCP Area through a variety of mechanisms, including:

- shifting plant and animal distributions into regions with currently cooler climatic envelopes, thus increasing or reducing plant and animal species within their current range (Parmesan 1996, Schneider and Root 2001, Loarie et al. 2008);
- causing changes in vegetation structure (i.e., forests transition to shrublands, shrublands transition to grasslands, or potentially new plant communities emerge as a result of novel climates (Ackerly et al 2010);
- altering plant and animal phenologies (Stenseth and Mysterud 2002, Parmesan and Hanley 2015);
- increasing fire frequency, potentially promoting fire-adapted species, and reducing fire-sensitive species (Lenihan et al. 2003, Halofsky et al. 2020);
- increasing pest and pathogen outbreaks due to drought-stress (Kurz et al. 2008); and
- promoting the spread of exotic species, due in part to increased fire (Walter et al. 2009).

While some studies suggest that species that presently co-occur will shift their distributions together in response to climate change, causing communities to move together (Breshears et al. 2008), other studies suggest that the unique combinations of temperature and precipitation not currently found in the region (Ackerly et al. 2010)) will result in new assemblages of species (Stralberg et al. 2009).

Some species may be more vulnerable to climate change, as a result of their greater exposure or sensitivity, and reduced capacity to adjust to change (Hanson and Hoffman 2011). Several aspects of the covered species render them more vulnerable, including:

- they occupy specialized habitat or microhabitats (i.e., they are endemic to the communities of the Baywood fine sand in Los Osos);
- due to their narrow geographic distribution, they may have relatively narrow environmental tolerances that are likely to be exceeded by climate change; and
- they have limited dispersal abilities and thus poor ability to colonize new, more suitable locations if they were to exist.

The effects of climate change on the covered species and communities can be difficult to predict as they will be influenced by a host of indirect effects mediated by complex species interactions. The potential effects of climate change on fog frequency may have important implications for the covered species, which inhabit coastal sage scrub and central maritime chaparral communities, which are tied to the coastal fog. The predictions for future summer fog frequency on California's coast are unclear. While a 33% reduction in the frequency of California summer fog has been observed over the past century (Johnstone and Dawson 2010), the predicted increase in temperature differential between coastal and

inland areas, which is a major driver of fog, may increase the frequency of summer fog, thus mitigating the effects of global change on temperatures in coastal San Luis Obispo County.

If the climate becomes hotter and drier, as currently predicted, fire could become more frequent, and may alter the structure and species composition of the natural communities within the LOHCP Area. Morro manzanita has been found to be vulnerable to frequent fire, which can prevent sufficient seed from being available to replace adult shrubs, which are killed by fire (Odion and Tyler 2002). Research in other shrub-dominated systems has shown that frequent fire in shrublands can convert them to grasslands, as part of a grass-fire cycle (D'Antonio and Vitousek 1992).

Sea-level rise due to thermal expansion and melting ice caps as a result of global climate change may also impact the covered species of the LOHCP, by reducing available habitat. Projections for sea-level rise range from 3.3 to 4.6 feet above current levels by 2100 (Hegeberger et al. 2009). In the LOHCP Area, this will result in increased flooding risk, and in some areas, permanent inundation of the coastal wetlands on the northern perimeter of the Plan Area. Where adjacent land is suitable (e.g., not developed), wetlands may migrate inland (Hebeger et al. 2009), thus inundating current upland habitat including coastal sage scrub and central maritime chaparral, which are occupied by Morro shoulderband snail and Morro manzanita, respectively. Due to the coarse nature of the statewide analysis (Hebeger et al. 2009), the precise amount of habitat loss is difficult to predict; finer-scale models are needed (Moser and Eksrom 2012). Sea-level rise is also anticipated to erode a large area of the dunes west of the Plan Area, which may impact Morro shoulderband snail populations occupying the sand spit.

Given that climate change is a foreseeable event, it is regarded as a changed circumstance. The LOHCP conservation program, including establishment, restoration, management, and monitoring of the LOHCP Preserve System, includes elements designed to confer resiliency of the covered species to climate change impacts (Sections 5.3 and 5.4). Specifically, the LOHCP Preserve System will protect and actively manage large, interconnected habitat areas, which will feature a mosaic of communities that reflect a variety of microhabitat conditions including variation in microclimate. Cooler and moister microsites can potentially provide refugia to Morro shoulderband snail in particular, in a future hotter, drier climate (Morelli et al. 2016). By maintaining and promoting connectivity between protected habitat areas, the conservation program will enable species shifts in response to changing climatic conditions (Keeley et al. 2018).

A major focus of the conservation program is enhancing and actively managing habitat within the LOHCP Preserve System to address the various factors that threaten persistence of the covered species populations, including exotic species, fire outside of the natural disturbance regime, and impacts of historic land uses (e.g., cultivation and incompatible recreation; Section 5.3). Actively addressing these threats to species can enhance their resiliency to climate change by increasing their populations and reducing the potential for climate change to exacerbate other threats (Heller and Zavaleta 2009). Importantly, the LOHCP monitoring program will be designed to detect changes in the covered species populations and habitats that may result directly or indirectly from climate change (Section 5.4.2; Appendix E). Management strategies can be adjusted over time as part of an adaptive management process to promote resiliency of the covered species to climate change (Section 5.5).

As a foreseeable event, the limits of climate change as a changed circumstance must be defined. Based on the best available prediction for San Luis Obispo County (Koopman et al. 2010), the anticipated maximum increase in temperature by 2045 of 3.9 °F (measured as 10-year rolling average) is considered a changed circumstance for which remedial actions will be funded as part of the LOHCP. The nature of

the change will depend on the circumstances caused, and will be identified as part of an adaptive management process involving coordination with the USFWS, but could include:

- increased monitoring of the covered species or the communities to evaluate impacts of climate change on the populations and habitats;
- adjustments to management and restoration treatments to address changes that degrade habitat for the covered species, such as active revegetation with species adapted to current climate conditions, in areas where plant die-offs result from desiccation stress and thus alter the structure of habitat and reduce availability of food for the covered animals; and/or
- expansion of the exotic plant management program to address species that might invade, spread, or become more competitive due to climate change.

6.5.4 Fire

Fire is a component of the natural disturbance regime in the Baywood fine sands ecosystem (Section D.3.1). While the covered species exhibit many important adaptations to fire and/or the habitat conditions it creates, fire can have detrimental effects on the populations, particularly if the fire occurs outside of the range of natural variation of the disturbance regime (e.g., inappropriate season, intensity, severity, or frequency), or if it promotes the invasion and spread of invasive plants.

Due to the differences in plant species and thus fuel availability, the plant communities of the Baywood fine sands ecosystem may have experienced somewhat different fire regimes—characteristics of fire including type (e.g., surface or crown fire, severity (understory burn or stand replacing), areal extent (size), and return interval (time since last fire; Sousa 1984). Like other types of central maritime chaparral, Morro manzanita chaparral is thought to have a natural fire regime characterized by high-intensity, high-severity, stand-replacing fires that occurred every 50 to 100 years; these fires are likely to have occurred during late summer and early fall when fuel moisture is lowest and air temperatures are high (Greenlee and Langenheim 1990, Tyler and Odion 1996, Odion and Tyler 2002).Coastal sage scrub likely historically burned primarily in the late-summer and fall every 20-100 years, as part of moderate to high-intensity crown fires. Coast live oak woodlands experienced a similar regime, though the oldest, most mature stands may have experienced surface fires, rather than crown fires.

At the landscape scale, fire likely played an important role in creating and maintaining a mosaic of these communities in the Baywood fine sands ecosystem. More frequent fire may promote coastal sage scrub species over central maritime chaparral shrubs including Morro manzanita, which requires longer fire-free periods to produce sufficient seed to regenerate (Odion and Tyler 2002). Similarly, longer fire return intervals lead to succession of central maritime chaparral to coast live oak woodland where abiotic conditions (e.g., soils and microclimate) can support oaks. These trees are killed by fire when young (seedlings or saplings), however they are more resilient when mature (adults). In the absence of fire, oaks can eventually shade out chaparral shrubs.

The covered species exhibit many adaptations to fire and the conditions it creates. Fire promotes Morro manzanita seed germination and creates conditions appropriate for seedling establishment (Tyler et al. 2000). Fire also likely promotes establishment of Indian Knob mountainbalm from seed as well as vegetatively (Wells 1962, USFWS 1998a). Fire is thought to have played an important role in maintaining early successional conditions characterized by a low density of subshrubs and perennial herbs (e.g., *Croton* sp*., Horkelia* sp*.,* and *Acmispon* sp.), which is the preferred habitat of Morro Bay

kangaroo rat (USFWS 1999). Fire may similarly create and maintain habitat for Morro shoulderband snail, which occurs in coastal sage scrub but is not typically observed in later-successional central maritime chaparral. While fire may maintain their habitat, Morro shoulderband snails are vulnerable to mortality due to fire (Roth 1985, Walgren 2003a).

Mortality due to fire could have profound impacts on the covered species populations in the LOHCP Area. Two of the species, Morro Bay kangaroo rat and Indian Knob mountainbalm, occur at extremely low density, such that a fire could extirpate them from the preserve system. Fires could similarly eliminate occurrences of Morro shoulderband snail (Walgren 2003a). Due to the fragmented nature of the remaining habitat, recolonization of habitat following fire may be inhibited.

In addition to killing individuals and potentially extirpating occurrences or populations, fire may negatively impact the covered species populations by causing soil erosion, which can preclude native plant re-establishment, and by promoting the invasion and spread of exotic plant species (D'Antonio and Vitousek 1992).

Many exotic plants are adapted to establishing within the low-litter, open-canopy conditions created by fire (Hobbs and Huenneke 1992, Haidinger and Keeley 1993). The risk of exotic plant invasion and spread following fire is greatest within the Morro manzanita chaparral and the coast live oak woodland: closed-canopy communities which currently feature a relative low abundance and diversity of exotic plant species, which are primarily restricted to old roads, trails, and gaps between shrubs, where competition from dominant shrub and trees is reduced. Fire may promote expansion of exotic plants currently present at low abundance or in high light available microhabitats, and create opportunities for new species to invade (Zedler and Scheid 1988, Hobbs and Huenneke 1992, Haidinger and Keeley 1993).

Negative fire effects are expected to be greater if the fire occurs outside of the natural regime, in terms of seasonality, intensity, and frequency. For example, if the fire return interval (i.e., time between fires) is too short, fire could reduce the population of Morro manzanita, by killing adults prior to establishment of a sufficient density of seeds in the soil (seed bank) to re-establish a cohort of seedlings that can replace the pre-fire population (Odion and Tyler 2002). While carefully planned and implemented prescribed fires will likely be an important tool for maintaining habitat required by the covered species, wildfires have the potential to cause negative impacts (Section D.3). The risk of wildfire may be exacerbated by climate change, which may increase the annual percentage of San Luis Obispo County burned by wildfire from a historical average of 3.7% to 6.8 – 7.3% by 2035 – 45 by 8.1 – 8.5% by 2075-85 (Koopman et al. 2010). A separate study found projected substantial increases in area burned by wildfire, with much of San Luis Obispo County expected to experience 200-350% increase in acreage burned by 2085 as compared to the historic (1961-1990) amount (Westerling et al. 2009).

Given the small size of the LOHCP Plan Area and that fire is a natural part of the disturbance regime of the Baywood Fine Sands Ecosystem, all fires, including a fire that burns the entire LOHCP Preserve System, are foreseeable events and will be subject to remedial measures. If a wildfire occurs within the LOHCP Area, the County will notify the USFWS of this changed circumstance, and then implement the following actions:

- assess the damage caused by the fire, including the areal extent of communities and covered species habitat affected;

- develop and implement an exotic plant early detection and rapid response plan, to prevent the affected area from becoming dominated by invasive plants;
- develop and implement a monitoring program to evaluate recovery of the affected area for five years;
- if monitoring indicates that native plant re-establishment is insufficient, or that the indirect effects of fire including erosion and the invasion and spread of exotic plants, are degrading habitat in ways that impact the covered species, develop and implement a restoration plan designed to improve habitat conditions, through an adaptive management and monitoring program; and
- if monitoring indicates that the fire has reduced populations of the covered species below levels from which they are likely to be able to naturally recover, implement a plan to increase populations through active revegetation (covered plants) or translocation programs (covered animals).

6.5.5 Exotic Species and Diseases

Habitat within the LOCHP Area has been degraded by a suite of species not native to the area, including several invasive species, such as: perennial veldt grass (*Ehrharta calycina*), red brome (*Bromus madritensis* ssp. *rubens*), jubata grass (*Cortaderia jubata*), blue gum (*Eucalyptus globulus*) and other eucalyptus (*Eucalyptus* spp.), Monterey pine (*Pinus radiata*), Monterey cypress (*Hesperocyparis macrocarpa*), ice plant (*Carpobrotus* spp.) and narrow leaved iceplant (*Conicosia pugioniformis*; Section D.1).

These and other exotic species can have strong, negative impacts on the covered species and their habitats through a variety of direct and indirect mechanisms, including (Levine et al. 2003):

- directly reduce plant population abundance through competition;
- degrade habitat conditions for animals, by altering vegetation structure and species composition, including food availability; and
- promote fire, which can alter vegetation structure and species composition, including convert shrublands to grasslands.

Given their impacts and likelihood of future invasion and spread, exotic species will be a key focus of efforts to restore and manage habitat as part of the LOHCP conservation program. Specifically, the LOHCP Preserve System AMMP will identify measures to control existing occurrences of invasive plants including veldt grass, and ice plant species, and prevent the establishment of new plants and animals through implementation of an early detection and rapid response program (Sections 5.3 and D.1).

Non-native animals in the LOHCP Area that currently pose threats to the covered species include domestic cats (*Felis domesticus*), which can predate upon Morro Bay kangaroo rat, and garden snails (*Helix aspersa*), which may outcompete Morro shoulderband snail due to the exotic species' superior size (Hill 1974), though exotic snails are deemed unlikely to threaten the species' persistence (USFWS 2006).

Diseases can also cause morbidity and mortality to the covered species, as well as impact them directly by modifying their habitat. Notably, sudden oak death (SOD) is a disease caused by the pathogen

Phytophthora ramorum, which infects and kills several tree species including coast live oaks and can infect manzanitas (*Arctostaphylos* spp.). Though not yet observed in San Luis Obispo County, sudden oak death has caused widespread mortality of tan oaks in coastal Monterey County, where it has altered the structure and species composition of forests.

The greatest predictor of sudden oak death is the presence of the host, California bay laurel (*Umbellularia californica*), a tree that is not known from the LOHCP Area, though is documented as occurring in Morro Bay State Park just north of the Plan Area. Given the appropriate climatic conditions and host species abundance, the LOHCP Area has been identified as an area of high risk for SOD (Smith 2002), though a subsequent model classified the region as only marginally suitable based on climate (Vennette and Cohen 2006).

Additional exotic plants, animals, and diseases have the potential to negatively impact the covered species directly, by causing morbidity and mortality to individuals, and indirectly, by degrading habitat conditions. In the LOHCP, the invasion of new invasive plants, animals, or diseases within up to 25% of the total habitat contained within the LOHCP Preserve System is considered a change circumstance for which remedial actions will be implemented. The nature of the actions will depend on the exotic species and its impacts. The County will work with the Implementing Entity to conduct an assessment and develop a plan to:

- control and to the extent possible, eradicate, the species; and
- remediate the impacts it caused to the covered species and habitats, including through restoration of the affected areas.

6.5.6 Drought

Extended periods of below-average precipitation can impact the covered species of the LOHCP through a variety of mechanisms including:

- reducing covered plant abundance due to desiccation stress;
- reducing covered animal abundance, due to scarcity of food plants, free water, and moist microsites required by Morro shoulderband snail; and
- increasing the frequency of wildfire. Although a natural part of the Baywood fine sands ecosystem, fire can also directly kill the covered species and degrade their habitat by promoting the invasion and spread of exotic plants. If fire is too frequent, it can also reduce populations of Morro manzanita (Sections 6.5.4 and D.3).

Multi-year droughts are a natural part of the Mediterranean climate of California's Central Coast. Climate change may increase or decrease their likelihood by altering precipitation patterns. Climate change may also exacerbate the effects of drought if it results in reduced frequency of summer fog (Section 6.5.3).

Droughts can also hamper efforts to restore and manage habitat within the LOHCP Preserve System. Specifically, periods of drought during the typical rainy season (October-April), as well as multi-year droughts, can reduce the success of restoration plantings conducted in areas degraded by erosion, fire, and dense exotic plant infestations.

For purposes of the LOHCP, a drought is defined as two or more consecutive years with rainfall below 75% of average. Over the 53-year period of record for which daily rainfall was measured at the Morro Bay Fire Station Coop weather station (WRCC 2013), 21 years had precipitation under 12.4 inches, which is 75% of the 16.6-inch average; however, two or more consecutive dry years occurred just four times: 1960 - 1961, 1984 - 1985, 1989 - 1990, and 2007 - 2009. These years are the rainfall years, which are defined as July 1 of the prior year to June 30 of the year referenced above.

Recognizing that climate change may increase the frequency of drought, for purposes of the LOHCP, drought is defined as a changed circumstance if it occurs more than four times during the 25-year permit term (nearly twice the frequency of the period of record), or if a single drought extends up to four years in duration.

In the event that a drought during the permit term negatively impacts the covered species or efforts to promote their persistence as part of the conservation strategy, the County will work with the Implementing Entity to prepare a report assessing the impacts and identify strategies to ameliorate or repair them. The strategies will be based upon the monitoring results indicating the effects of the drought on the covered species and their habitats, and the best available scientific information that can guide management responses. For example, if the drought reduces fire has reduces covered species populations levels below that from which they are likely to recover naturally, the County will work with the Implementing Entity to implement a plan to increase populations through active revegetation (covered plants) or translocation programs (covered animals). If the drought causes substantial mortality of native woody vegetation that could create a fire hazard that would threaten the species populations, the County will work with the Implementing Entity to develop and implement a plan to reduce the fuels to protect the area from such a wildfire.

The report will be provided to the USFWS for review and comment and the County will work with the Implementing Entity to implement the remedial measures identified in the report or as recommended by USFWS.

6.6 Unforeseen Circumstances

Unforeseen circumstances as defined in USFWS regulations, are changes in circumstances that affect a species or geographic area covered by the HCP that could not reasonably be anticipated by plan developers and the USFWS at the time of the HCP's negotiation and development and that result in a substantial and adverse change in status of the covered species (50 CFR 17.3). The term "Unforeseen Circumstances" is used to define the limit of the County's obligation under the "No Surprises" regulations set forth in 50 code of Federal Regulations, Sections 17.22 (b)(5) and 17.32 (b)(5).

In case of an unforeseen circumstance, the County shall immediately notify the USFWS. In deciding whether Unforeseen Circumstances exist which might warrant requiring additional conservation measures, the USFWS shall consider, but not be limited to, the factors identified in 50 Code of Federal Regulations, Sections 17.22(b)(5)(C) and 17.32(b)(5)(C) (the No Surprises Rule), which are:

1. the size of the current range of the affected species;
2. the percentage of the range adversely affected by the LOHCP;
3. the percentage of the range conserved by the LOHCP;
4. the ecological significance of that portion of the range affected by the LOHCP;

5. the level of knowledge about the affected species and the degree of specificity of the conservation program for that species under the LOHCP; and
6. whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

As described in 50 C.F.R., Sections 17.22(b)(5)(C) and 17.32(b)(5)(C), the No Surprises Rule, the USFWS shall have the burden of demonstrating that Unforeseen Circumstances exist, using the best data available. Any findings of Unforeseen Circumstances must be clearly documented and based upon reliable technical information regarding the biological status and habitat requirements of the affected species.

Except where there is substantial threat of imminent, significant adverse impacts to a Covered Species, the USFWS will provide the County at least sixty-(60)-calendar-days written notice of a proposed finding of Unforeseen Circumstances, during which time the USFWS will meet with the County to discuss the proposed finding, to provide the County with an opportunity to submit information to rebut the proposed finding, and to consider any proposed changes to the conservation program.

Pursuant to the No Surprises rule, if the USFWS determines that additional conservation and mitigation measures are necessary to respond to the Unforeseen Circumstances, the additional measures required of the County must be as close as possible to the terms of the original LOHCP and must be limited to modifications within any conserved habitat area or to the Plan's operating conservation program for the affected species. Additional conservation and mitigation measures shall not involve the commitment of additional land or financial compensation or restrictions on the use of land or other natural resources otherwise available for development or use under original terms of the LOHCP without the consent of the County.

6.7 Plan Modifications

During the course of LOHCP implementation, it may be necessary to make changes to the Plan. The County and USFWS may seek to modify the LOHCP provided the changes are consistent with the terms of the incidental take permit and other state and federal laws and regulations. The following sections outline three types of plan modifications, administrative changes, minor amendments, and major amendments, which reflect increasing magnitude of change and thus require increasing effort to modify the plan. The USFWS will evaluate proposed plan changes identified by the County, including changes recommended in annual reports (Section 5.6), to determine whether they constitute an administrative change, minor amendment, or major amendment, and identify the course of action to modify the plan based on those outlined below.

6.7.1 Administrative Changes

Administrative changes are modifications to the LOHCP that do not affect the take assessment or other aspects of the impact analysis, implementation of the conservation program, or the decision documents, including the biological opinion. Examples of administrative changes include clerical changes to plan text or maps to address non-substantive errors, as well as adjustments to the mitigation fees that are necessary to implement the conservation strategy over time (Section 7.4).

The County can make administrative changes following a written request, which includes documentation supporting the proposed change, and the concurrence of the USFWS. The County will coordinate with the USFWS when evaluating whether a change is administrative. Administrative changes shall not require any amendment to the LOHCP or the ITP. The annual report shall include a summary of administrative changes made to the LOHCP in the preceding calendar year.

6.7.2 Minor Amendments

Minor amendments are changes that do not materially modify the conservation program, change the amount of take, add new species or new covered activities, or result in impacts to the environment that were not evaluated under applicable laws at the time of permit issuance. The following are examples of minor amendments to the LOHCP:

- minor revisions to survey, monitoring, management, and/or reporting protocols that clearly do not adversely affect covered species or overall LOHCP Preserve System functions and values; and
- minor changes to the Priority Conservation Area boundaries that do not result in less or materially different conservation for the covered species under the plan or encompass new lands not analyzed in the original permit and environmental documents.

The County may propose minor amendments to the LOHCP by providing written notice to the USFWS. Such notice shall include a description of the proposed minor amendment, an explanation of the reason for the proposed minor amendment, an analysis of its environmental effects including any impacts to the conservation of covered species, and a description of why the effects of the proposed minor amendment:

1. are not materially different from, and are biologically equivalent to, the terms in the LOHCP as originally adopted;
2. substantially conform to the terms in the LOHCP as originally adopted; and
3. will not reduce the ability to acquire the additional lands or otherwise implement the conservation strategy.

The USFWS shall use their reasonable efforts to provide comments and concurrence with the proposed minor amendments in writing within sixty days of receipt of such notice. Upon receipt of written concurrence of the USFWS, the minor amendment shall be incorporated into the plan and implemented. If the USFWS does not concur that the proposed amendment qualifies as a minor amendment, the amendment will be processed as a major amendment.

The annual reports shall include a summary of all minor amendments made to the LOHCP in the preceding calendar year.

6.7.3 Major Amendments

Major amendments are those that affect the scope of the LOHCP, materially change the conservation program, increase the amount of take, add new species or covered activities, result in new or different impacts to the environment, or change the boundaries of the permit area. Examples of such changes include:

- all amendments, as determined by the USFWS to not qualify as minor amendments, or administrative changes to the LOHCP;
- non-clerical changes to the permit area of the LOHCP Area;
- addition of one or more species to the covered species list or the addition of new covered activities; and
- material changes in the LOHCP Preserve System assembly, or management and restoration funding, strategies, and schedules.

A major amendment requires an amendment to the permit and requires compliance with all applicable laws and regulations governing permit issuance, including NEPA and ESA, and an opportunity for public review and comment. Major amendments shall be subject to review and approval by the County and the USFWS, as appropriate, at noticed public hearings. The USFWS will use reasonable efforts to process proposed major amendments within one hundred twenty days after publication in the Federal Register.

6.8 Suspension or Revocation of Permits

The USFWS may suspend or revoke the ITP for cause if the County fails to implement the LOHCP in compliance with the terms and conditions of the permit or if suspension or revocation is otherwise required by law. Suspension or revocation of the Section 10(a)(1)(B) permit, in whole or in part, by the USFWS shall be in accordance with 50 CFR 13.27-29, 17.22(b)(8),17.32 (b)(8).

6.9 Permit Renewal

Though the initial permit term requested, 25 years, is anticipated to provide sufficient time for completion of the covered activities, it is possible that some might not have been completed or initiated when the permit expires. The Section 10(a)(1)(B) permit may be renewed in accordance with governing laws and regulations in effect at the time of the proposed renewal.

6.10 Schedule

Table 6-1 outlines the anticipated timeline for initiation of key components of the LOHCP; it begins with steps that will be taken to prepare for implementation prior to issuance of the permit, continues through the permit term, and then covers steps that will take place after the permit has expired. Greater detail about the steps is provided in the sections referenced in the table.

Table 6-1: General Timeline for LOHCP Implementation

Timeline	Task and Section Reference	Description
Prior to Permit Issuance	Identify or create the Implementing Entity (Section 6.1.1.1)	The County will identify qualified and interested entities to fulfill the responsibilities of the Implementing Entity (Section 6.1.2). If no suitable organizations exist, then the County will determine the necessary steps to establish one. The Implementing Entity will be specified by the County, with the concurrence of the USFWS and CDFW.
	Execute the Memorandum of Understanding (Section 6.4)	The County will finalize and execute the Memorandum of Understanding (Appendix J) between the County and CDFW.
After Permit Issuance but Prior to Issuance of COIs	Establish Application and Review Process (Section 6.3)	The County will prepare the application package that project proponents will complete for take coverage under the LOHCP, outline the detailed application processing steps, develop the database that will be used to determine and track avoidance and minimization measures (Section 6.2.1), and train staff to review and process the applications.
	Apply for State and Federal Grants (Section 6.1.1.8)	As feasible, the County will initiate work with the Implementing Entity and the agencies to prepare applications for state or federal grants that can complement implementation of the LOHCP, which can be submitted once the ITP have been issued.
	Begin Assembling the LOHCP Preserve System	The County will work with the Implementing Entity to take initial steps to prepare lands for enrollment in the Preserve System, following issuance of the ITP, by drafting cooperative management agreements (including memoranda of understanding) with agencies and organizations responsible for existing protected lands (Section 6.2.3.1)

Table 6-1: General Timeline for LOHCP Implementation

Timeline	Task and Section Reference	Description
	Revise the Template Conservation Easement (Section 6.2.2.2)	The County will work with the Implementing Entity to revise the conservation easement templates to protect habitat set-asides offered in lieu of the Habitat Protection Fee and provide it to the USFWS for review and approval (Appendix I).
	Create and Maintain the Implementation Monitoring Databases (Sections 6.1.1.6 and 6.1.2.2)	The County and Implementing Entity will create the databases that will be used to track applications, certificates of inclusion, implementation of avoidance and minimization measures, and impacts of covered activities, as well as implementation of the conservation program (i.e., habitat protection, management, restoration, and monitoring activities).
After Permit Issuance Year 1	Begin Reviewing Applications for Coverage (Section 6.3)	The County will begin processing applications for take coverage under the LOHCP, and issue COIs pending application approval, and mitigation needed to satisfy the stay-ahead provision.
	Begin Managing the Preserve System	The Implementing Entity will begin managing the LOHCP Preserves including by conducting the baseline surveys, preparing the Preserve System AMMP (Section 6.2.3.2), initiating work to protect habitat, and conducting the initial restoration, if selected to jump start the conservation program, as outlined in the IAMMP (Appendix M) and Section 6.2.4.
	Begin Accepting Mitigation (Section 6.1.2.1.1)	The County will work with the Implementing Entity to begin accepting mitigation, including habitat mitigation fees that the County will deposit in a trust account, and conservation easements granted for habitat set-asides on site in lieu of fees, where allowed (Section 5.7.2.1.1). The accounts will include those designed to fund ongoing management, as well as one

Table 6-1: General Timeline for LOHCP Implementation

Timeline	Task and Section Reference	Description
		to fund management and monitoring in perpetuity.
	Prepare first Annual Report (Section 6.1..1.7)	The County will work with the Implementing Entity to prepare the first annual report, which will be submitted to the USFWS by March 31 of the year following the first year of plan implementation.
	Document Compliance with the Stay-Ahead Provision (Section 6.2.4)	As part of the first annual report and in every annual report thereafter, the County will document compliance with the stay-ahead provision, by demonstrating how habitat mitigation is keeping pace with, or outpacing, habitat impacts resulting from the covered activities.
Year 3	Complete LOHCP Preserve System Adaptive Management and Monitoring Plan (Sections 5.3.3.2 and 6.2.3.2)	The County will work with the Implementing Entity, in coordination with USFWS and CDFW, to prepare the LOHCP Preserve System AMMP based on the Plan conservation strategy framework and results of surveys of initial preserve(s) (Section 5.3.3.2).
	Initial Financial Update (Sections 6.1.2.3 and 7.4)	The County will work with the Implementing Entity to review the assumptions, unit costs, and other aspects of the financial analysis used to calculate the initial mitigation fees and update the fee schedule, as needed..
Year 22	Evaluate Permit Renewal (Section 6.9)	Within three years of expiration of the permit, the County will evaluate whether to request that the permit be extended and if so, take necessary steps to do so.
After Permit Expiration	Conduct In-Perpetuity Habitat Management	Using funding from the endowment held by the National Fish and Wildlife Foundation, which will be established during the permit term, the County will work with the Implementing Entity to manage and monitor the LOHCP Preserve System, in perpetuity, as part of the broader adaptive management framework,

Table 6-1: General Timeline for LOHCP Implementation

Timeline	Task and Section Reference	Description
		to ensure that the biological goals and objectives continue to be attained.

7 Funding

This chapter provides planning-level estimates of the cost of implementing the LOHCP conservation program (Chapter 5). As required by Section 10(a)(1)(B) of the ESA, this chapter also identifies a funding approach to cover the plan implementation costs.

These costs were based on the elements of the LOHCP conservation program and the Plan's required compensatory mitigation, in which the proponents of projects permitted by the LOHCP pay fees and, in some cases, set aside habitat on site in order to implement the conservation program (Section 5.7.2). This mitigation approach was developed to ensure that the benefits of the mitigation for the covered species are commensurate with the impacts (Section 5.8).

Mitigation fees for covered activities were developed to cover the full costs (estimated in 2021-dollar terms) that will be incurred by the County to work with the Implementing Entity to administer the Plan including the conservation program designed to mitigate the impacts of the covered activities. Individual project proponents may incur additional costs to implement the required avoidance and minimization measures, such as pre-project surveys to design their projects (Sections 5.2 and 5.7.1). These measures, which were not evaluated as part of this financial analysis, will be required by the County through the approval process for development projects and other covered activities (Section 6.2.1).

During the 25-year period of LOHCP implementation, numerous factors will result in variations and fluctuations in implementation costs. For example, market cycles may affect habitat protection costs and vary the pace of development, and thus mitigation fees; additionally, adaptive management may be needed to achieve the biological goals and objectives of the conservation program. Accordingly, this chapter outlines the financial adaptive management measures to track and review mitigation costs and, as necessary, adjust the financing mechanism to ensure adequate funding is maintained through time.

This chapter begins by summarizing the mitigation costs and funding approach (Section 7.1); it then outlines the costs for various components of the mitigation and the assumptions used to estimate them (Section 7.2). The chapter ends by outlining the initial funding program including mitigation fees (Section 7.3), and the methods that will be used to adapt them over time (Section 7.4).

7.1 Overview of Costs and Funding

The covered activities that are required to pay mitigation fees will disturb a maximum of 531.5 acres of habitat in the LOHCP Area (Tables 2-9, 4-2, and 5-7), with private development impacting an estimated 409.5 acres, and government and private utilities impacting an additional 122 acres. To compensate for the impacts of these activities on the covered species, the County will work with the Implementing Entity to establish and manage the LOHCP Preserve System—a network of public and private protected lands (Section 5.3), which will be managed as part of a coordinated strategy designed to achieve the LOHCP biological goals and objectives (Section 5.1).

The total, planning-level costs to implement the LOHCP Conservation Program is estimated at $27.7 million in 2021 dollars. These costs, which are expected to change over time due to inflationary and market factors, include the following:

- **Habitat protection (14%):** acquire a total of 107.5 acres of unprotected land from willing sellers and participants in this Plan;

- **Preserve start-up (4%):** conduct initial surveys, develop the Preserve System AMMP, which will guide management and restoration, and conduct initial restoration as part of the IAMMP to jump start the conservation program (Section 6.2.5);
- **Restoration (8%):** restore an estimated 45.7 acres of degraded habitat within the Preserve System; and
- **Habitat management and monitoring (32%):** actively manage habitat to promote the covered species and monitor their populations and habitat within the estimated 386-acre Preserve System during the permit term and through a non-wasting endowment that will be used to manage and monitor the land in perpetuity. This component also includes funding to respond to changed circumstances.

The costs also include funds for the County to work with the Implementing Entity to administer the program during the permit term (32%), including process applications and conduct all implementation monitoring and reporting. The remaining costs (10%) will fund the portion of the endowment that will be used to fund program administration, including oversight of management, and monitoring, after the permit has expired.

Funds to implement the Plan will be provided by the proponents of projects covered by the Plan, who will pay fees based on the mitigation approach outlined for the covered activities (Section 5.7.2). To ensure that the fees are proportional to the impacts of the covered activities, they are charged based on the areal extent of the project impacts to habitat on a per-square foot basis. All funding for administrative, management, monitoring, and restoration costs will come from the Restoration /Management/Administration Fee, which will be paid by all those conducting projects outlined in Table 5-7. To protect habitat, plan participants developing vacant parcels inside the Priority Conservation Area will set-aside habitat on-site at a ratio of 3:1 for the habitat disturbed by their project (Table 5-7); these habitat-set-asides will be protected by conservation easements granted to the Implementing Entity. Proponents of all other projects, which will largely occur in areas where on-site habitat set-asides would have limited conservation value (Section 5.7.2.1.2), will pay a Habitat Protection Fee (in addition to the Restoration/Management/Administration Fee), which will be used to purchase fee title or conservation easements from willing sellers of land that that will be managed as part of the LOHCP Preserve System.

Table 7-1 shows the initial mitigation fee schedule, which was developed based upon an updated analysis of the mitigation costs in 2021-2022 and is designed to ensure adequate funding for Plan implementation. Initial funds to jump start the mitigation program will be provided by the County, which will be reimbursed by the mitigation fees (Section 7.3).

This is the anticipated starting mitigation fee schedule for adoption at the start of Plan implementation; adjustments to the plan, or significant delays in its adoption (e.g., three or more years) would necessitate an adjustment to the fee. The mitigation fee schedule will be refined as needed to ensure funding is sufficient to meet implementation plan costs as they fluctuate over time (Section 7.4). The County will fund the initial work to jump start the conservation program to generate mitigation credits that can be used to offset the impacts of covered activities prior to sufficient fees being collected to fund habitat protection, restoration, and management. The County will be reimbursed for this initial outlay over time using the mitigation fees that are collected (Section 7.3.2).

7.2 Mitigation Costs

Mitigation costs were estimated in this Plan based on the LOHCP Preserve System configuration scenario—a hypothetical though plausible scenario for the final preserve system design, which identifies the acres of land that will be acquired, restored, and managed to mitigate the impacts of the covered activities (Section 5.7.2.3.2). This scenario was used to estimate the mitigation costs, based on a series of assumptions outlined in this section. Conservation program implementation costs include:

- **One-time costs:** Costs for habitat acquisition, habitat restoration, and preserve start-up activities (e.g., inventories). They are anticipated to be incurred only during the permit term; and
- **Ongoing costs:** Costs for habitat management, monitoring, and administration that will continue after the permit term.

Because most of the impacts of the covered activities are permanent, the conservation actions must also be permanent and be implemented on an ongoing basis, in order to ensure that the habitat benefits are maintained. Specifically, land within the LOHCP Preserve System must continue to be managed in perpetuity, beyond the permit term, to ensure that it retains the biological values enhanced during the permit term (Section 5.7.2.2).

7.2.1 Habitat Acquisition

As outlined in the LOHCP Preserve System scenario (Section 5.7.2.3.2), the Implementing Entity will protect habitat by accepting easements from plan participants, which are estimated to result in the protection of 31 acres, as well as by purchasing an estimated 76.5 acres of land from willing sellers. The easements granted by plan participants developing parcels inside the Priority Conservation Area to fulfill their habitat protection mitigation requirement (Section 5.7.2.1.1) will be dedicated to the Implementing Entity at no cost; administrative costs for the Implementing Entity to obtain the easements are included as part of program administration (Section 7.2.5).

The cost to acquire the 76.5 acres of land anticipated from willing sellers within the Priority Conservation Area (Section 5.7.2.1.2) was estimated using comparable land sales data available from the County of San Luis Obispo Assessor as well as several private vendors (Table 7-2). The transactions reflected sales of vacant parcels located primarily within the LOHCP Area; however, comparables for larger parcels were also drawn from neighboring areas due to limited sales of large parcels within the Plan Area. Bayside parcels were excluded from the comparables list as they had much higher per-acre values owing to their waterfront location which is dissimilar to parcels in the Priority Conservation Area, where land will primarily be protected. Sales occurred between 2017 and 2021, with most occurring in 2020 and 2021 (Table 7-2). All costs were converted to reflect 2021 dollars using the consumer price index (CPI).

Per-acre land costs vary greatly based on parcel size, which is also a major determinant of the tiers used to rate the conservation value of land that will be incorporated LOHCP Preserve System (Section 5.7.2.3.1, Table 5-8). Accordingly, parcels were divided into three size categories to estimate the per-acre- costs: less than two acres, two to 10 acres, and greater than 10 acres (Table 7-2).

The total cost of acquiring the land in the preserve system scenario was then estimated by multiplying the acreages of land protected in each of the three conservation value tiers by the per-acre costs for the

parcel size category in which the habitat is most likely to occur (Table 7-3). Tier 1 parcels were assumed to be greater than 10 acres while Tier 2 and 3 parcels are anticipated to be two to 10 acres. Tier 4 parcels which will largely be less than two acres, were not included in the preserve system scenario (Table 5-9), as they generally feature low long-term conservation value, as well as significantly higher per-acre costs (Table 7-3).

Based on the land value analysis and assumptions outlined above, the total planning-level estimate for the Implementing Entity to acquire 76.5 acres of vacant land within the Priority Conservation Area in fee title is approximately $3.9 million. This represents an average land cost of $50,345 per acre (Table 7-3).

Actual habitat protection costs will vary depending on a variety of factors including:

- Aspects of the specific parcel, including size, development potential, and location, including proximity to roads, existing improvements, and scenic values; and
- The timing of the acquisition with respect to market conditions that influence land costs, including land supply and demand.

Additionally, the analysis presented here assumes that the County will work with the Implementing Entity to protect habitat by acquiring fee title from willing sellers; the County will, in turn, dedicate conservation easements over said lands to the Implementing Entity, to ensure the conservation values are protected in perpetuity (Section 6.1.2.1.1). This strategy is anticipated to be more conducive to long-term conservation, when compared to acquiring conservation easements, as fee-title lands are easier to manage and experience fewer indirect effects associated with easement lands which are partially developed. However, acquisition of conservation easements to protect remaining habitat on partially developed parcels inside the Priority Conservation Area can also be used to protect habitat of high conservation value as part of work to assemble the LOHCP Preserve System. Acquiring such conservation easements may result in reduced land protection costs relative to fee title acquisition.

The Implementing Entity will track land sales for comparable parcels to continue to update and refine the estimated per-acre, planning-level land cost as part of the process to adapt the funding plan over time (Section 7.4).

7.2.2 Restoration

Of the 386 total acres of habitat included in the LOHCP Preserve System under the scenario used to estimate costs (Section 5.7.2.3.2), 45.7 acres (12%) will require restoration to ameliorate its highly degraded condition, which limits its ability to promote viable populations of the covered species. The total acreage, which includes 35 acres in existing protected lands and an additional 10.7 acres of private lands to be protected as part of the LOHCP, was estimated based on a reconnaissance-level examination of the conditions within the Priority Conservation Area based on prior planning and updated using aerial imagery (Section 5.7.2.3.2).

For cost estimation purposes, a suite of anticipated restoration projects was identified based on examination of existing protected lands eligible to be included in the preserves (Table 5-5), and the assessment of their management and restoration outlined in Appendix D. These restoration projects include (Table 7-4):

- Stabilization of gullies and other erosion issues caused by washed out roads and trails;

- Intensive efforts to control dense infestations of exotic plants, such as veldt grass;
- Active revegetation including seeding and propagation, where it is necessary to promote native plant establishment and prevent exotic plant reinfestation in areas treated for erosion and exotic plant control; and
- Active vegetation management using fire or fire surrogates (e.g., manual or mechanical vegetation removal) to promote the population of Indian Knob mountainbalm, which is senescent and threatened with extirpation (local extinction).

The restoration costs include a 25 percent contingency designed to cover unanticipated components or overages, as well as the need for adaptive management. In total, restoration is estimated to cost $2.19 million for an average of $47,815 per treated acre.

7.2.3 Management and Monitoring

The entire anticipated 386-acre LOHCP Preserve System will require active management to ensure that the condition of habitat is maintained to support the covered species; the Preserve System must also be monitored to evaluate effectiveness of management at achieving the biological goals and objectives (Section 5.1) and inform the need for adaptive management (Section 5.5).

Management and monitoring costs were estimated for the 386-acre preserve system in the scenario based on the estimated per-unit costs of the anticipated activities (Appendices D and E), as well as their frequency (Table 7-5). The actual management projects and monitoring studies will be outlined in the LOHCP Preserve System AMMP, which will be developed as part of the Preserve Start-Up (Sections 5.3.3.2 and 7.2.4). To fund additional items not reflected in the initial list (Table 7-5) and ensure sufficient funds to address habitat needs, a 25 percent contingency was added to the itemized costs. In addition, 10 percent was added to these costs to fund remedial actions necessary to address the changed circumstances of the LOHCP (Section 6.5); this rate reflects remedial management costs budgeted in another recent regional HCP with similar changed circumstances and plan responses (JSA 2006, County of Santa Clara et al. 2012).

The resulting annual cost estimate for management and monitoring of the 386-acre LOHCP Preserve System during the 25-year permit term is $339,900 or $880 per acre of habitat managed. Because the frequency of management and monitoring will be reduced after the permit is expired, the costs decline post permit to $195,525 per year, or $506 per acre, per year. Based on these annual costs, $6.5 million will need to be established within the endowment that will be used to fund management and monitoring post-permit and in perpetuity. To achieve this, $4.8 million will be contributed from participant fees while an estimated $1.7 million will be generated by investment earnings on the fees. To fund the management and monitoring costs post permit, a per-acre-mitigation fee of $9,016 is required. Section 7.2.5.2 describes how additional mitigation fees will be used to establish the portion of the endowment that will be used to fund administration costs post-permit.

The endowment calculations assumed a three percent net capitalization (real interest rate)—the long-term net, real interest rate (i.e., the average interest rate after inflation and money management fees are removed). This net capitalization rate is similar to that used in the Natomas Basin HCP (City of Sacramento et al. 2003) and is consistent with assumptions used by the National Fish and Wildlife Foundation (NFWF) —a foundation established by the U.S Congress in 1984, which acts as program manager and trustee for funds arising from conservation and mitigation plans. The actual net interest

rate will depend on the particular investment strategy and overall market performance. A portion of the total habitat mitigation fees will be placed into the endowment, which is designed to be fully funded by the end of the 25-year permit term (Section 7.3). For the purposes of this analysis, it is assumed that the endowment funds will be held by NFWF.

7.2.4 Preserve System Start-Up

Preserve System start-up costs include the costs to prepare for, and to conduct, restoration and management work within the LOHCP Preserve System. These include conducting baseline monitoring for the covered species and communities, as well as preparing the Preserve System AMMP (Table 7-6). They also include initial costs to install fences and signage to protect areas from trampling and other unauthorized activities.

The total preserve system start-up costs were estimated for the initial 278-acre portion of the Preserve System that will be comprised of existing protected lands, based on the anticipated monitoring and planning tasks (Table 7-6). These preserve start-up costs are estimated to total $1,315,000, or about $4,119 per acre of habitat that will be initially managed as part of the Preserve System.

The preserve system start-up costs were estimated prior to development of the IAMMP, which provided greater detail for the restoration and management activities that can be implemented at the outset of Plan implementation (McGraw 2020; Appendix M). The County will identify final costs to implement initial habitat restoration and management in work plans developed to implement the IAMMP (Appendix M).

7.2.5 Program Administration

Program administration costs include the costs for the County and the Implementing Entity to administer the Plan. They include salaries for the County Planning staff (i.e., the LOHCP Coordinator) and the Implementing Entity, as well as fees for outside professionals including attorneys, auditors, real-estate professionals, and others who will assist with plan implementation (Table 7-7).

Administration costs were estimated separately for the permit term, and the period post-permit, to reflect the greater personnel time to implement the plan during the permit term (Table 7-7). As with other aspects of the program, administration cost will be tracked by the County and the Implementing Entity over time so that adjustments can be made, as needed, to ensure funds are sufficient to implement the plan.

7.2.5.1 Permit Term

During the term of the permit (Years 0 to 25), the County will work with the Implementing Entity to implement the following:

1. **Covered Activities:** The County will process applications for covered activities and tracking permittees' compliance with the avoidance and minimization measures;
2. **Habitat Protection**: With the help of the County, the IE will research habitat protection opportunities, conducting outreach to landowners, negotiating fee title land acquisition, and processing conservation easements including those granted by plan participants in the Priority Conservation Area (Section 6.2.2):

3. **Preserve Management:** The County will oversee work by the IE to implement habitat maintenance, management, restoration, and monitoring projects directly and through contractors;
4. **Reporting:** The County will work with the IE to conduct implementation monitoring and prepare the annual reports; and
5. **Coordination:** The County and IE will coordinate with the USFWS and LOHCP Preserve System landowners including CDFW regarding implementation of the plan.

During the permit term, the County roles will be largely fulfilled by a full-time Supervising Planner, who will be assisted as needed by outside experts. . The County staff costs, combined with fees of outside professionals, are estimated to be $210,000 per year (Table 7-7). The IE staff costs were estimated based on the specific tasks and the hourly rates for participating staff and which total $143,000 per year during the permit term.

7.2.5.2 Post-Permit

When the permit expires 25 years after it is issued, administrative costs to implement the LOHCP will be reduced, as tasks related to covered activities, habitat protection, restoration, and reporting on covered activities will no longer occur. Preserve management and monitoring and some level of coordination will continue, albeit at a reduced level. For example, there will be less administrative oversight needed as a result of completion of the habitat restoration components during the permit term. However, habitat management and monitoring will occur in perpetuity, in order to ensure the conservation benefits for the covered species are maintained (Section 5.7.2.2). Implementation of these tasks is assumed to require work by a quarter-time County Planner, who will be supported by outside experts (consultants) at 25% of the permit-term amount. . The County Planner salary and professional fees are estimated at $52,500 each year post-permit (Year 26 and beyond). The tasks anticipated to be implemented by the IE including easement monitoring and administering ongoing preserve management will cost an additional $55,000 for a total of $107,500 in administrative costs post-permit (Table 7-7).

As with the long-term management, and monitoring of the preserve, the administration post-permit will be funded through the proceeds of a non-wasting endowment. In order to achieve the required $6.52 million in the endowment that will be needed to fund administration, about $4.8 million will be required from mitigation fees with the remaining $1.7 million generated by interest on the fees during the permit period. These contributions are in addition to those that will be used to achieve $5.7 million in the endowment to fund management and monitoring post-permit. To fund the administration costs post-permit, a per-acre-mitigation fee of $4,957 is required. A portion of the total habitat mitigation fees will be placed into the endowment that will be used to fund post-permit administration as well as management and monitoring; the endowment is designed to be fully funded by the end of the 25-year permit term (Section 7.3).

7.2.6 Total Mitigation Costs

Based on the estimates described above, the total planning-level estimated cost to implement the LOHCP is $27.7 million (Table 7-8). Habitat management and monitoring (including both permit term and post-permit costs) represent 32 percent of the total cost. Plan administration (including post-permit

costs) represents 42 percent, habitat acquisition costs comprise 14 percent, and restoration and preserve system start-up constitute 8 percent and 4 percent of the total cost, respectively (Table 7-8).

7.3 Funding

7.3.1 Fees

Plan implementation costs will be fully funded through mitigation fees paid by the project proponents to compensate for the habitat impacts of the covered activities (Section 5.7.2). The fees were calculated by dividing the plan implementation costs by the acres of anticipated permitted habitat impacts (532). The per-acre fee was converted to a per-square-foot fee, as fees charged will be based on the number of square feet of ground disturbance caused by the project; therefore, they are proportional to the project impacts (Section 5.7.2).

Proponents of residential development projects on vacant land inside the Priority Conservation Area, who are required to protect habitat on-site through dedication of conservation easements, are only required to pay the approximately[22] $1.03 per-square-foot Restoration /Management/Administration Fee; proponents of other projects covered by the plan that are listed in Table 5-7 pay this fee as well as the approximately $0.17 per square foot Habitat Protection Fee (Table 7-1). In order to fund management and monitoring and administration post-permit, about 31% or $0.32 of the Restoration/Management/Administration fee will be placed in a non-depleting endowment (Section 7.2.3).

The County will collect these fees from participants whose applications have been approved for take coverage. Fees must be paid before the County will issue plan participants a Certificate of Inclusion, which confers take coverage (Appendix H), and any local land use and building permits (Section 6.3).

The County will deposit the portion of the funds to be used for activities during the permit term into a trust account held by the Implementing Entity (the trustee) on behalf of the County (the third-party owner) for use solely to implement the HCP. A database will be used to separately track Restoration/Management/ Administration Fees and Habitat Protection Fees. However, the funds will be pooled and used to maximize their effectiveness at achieving the biological goals and objectives. That is, Habitat Protection Fees can be used to fund habitat management, and likewise, the Restoration/Management/Administration Fees can be used to fund key habitat acquisitions. Pooling funds enhances flexibility in implementing the conservation program by, for example, enabling funds from the habitat protection fee to be used to complete an in-progress restoration project to achieve the performance criteria needed to receive credit the restoration as mitigation prior to moving forward with habitat acquisition. Nonetheless, the LOHCP Preserve System must still acquire from willing sellers a minimum of 55.25 acres of habitat, assuming that the permit covers the maximum allowed take of 531.5 acres (Section 5.7.3.2). Proposed expenditures will be identified in annual work plans included as part of annual reports provided by the County (Section 6.1.1.7).

The portion of fees needed to establish the endowment that will fund post-permit management and monitoring and post-permit administration will be provided to NFWF for deposit in a separate trust account on behalf of the County. The endowment account will be established in year one of the Plan

[22] The fees will be calculated to the nearest hundredth of a cent (Table 7-8); they are rounded to the nearest cent in the text for simplicity.

and funds will be added throughout the permit term as projects are implemented and mitigation fees are paid. Since the Preserve System will be assembled as covered activities are implemented, and its size will depend on the amount of disturbance caused by the covered activities, the costs to manage and monitor the LOHCP Preserves will be lower if fewer covered activities are permitted than anticipated. Therefore, based on the level of participation and the corresponding amount of management and monitoring necessary, it is anticipated the endowment will be fully funded to necessary levels at the end of the 25-year permit term. Nevertheless, to ensure that the endowment has sufficient funds to manage and monitor the LOHCP Preserves post-permit, as part of the adaptive financial management of the LOHCP (Section 7.4), the funding plan will be reviewed at least once every three year during the permit term and will be modified over time, if necessary, to ensure the endowment is adequately funded, including fee increases as needed.

7.3.2 County Jump Start

7.3.2.1 Background

On December 15, 2020, the Board of Supervisors tentatively approved the following growth rates for new residential development in Los Osos (pending California Coastal Commission certification of the Los Osos Community Plan):

- Before the Phase 1 Basin Plan Programs are implemented - 0% annual growth rate; and
- After the Phase 1 Basin Plan Programs are implemented - 1.3% annual growth rate.

As of December 31, 2021, there is a zero percent growth rate for new residential dwelling units within the Los Osos sewer service area, preventing development of undeveloped parcels in that portion of the Plan Area. However, there is a significant amount of interest to develop currently undeveloped parcels in Los Osos, as evidenced by the established waitlist for residential development: there are 232 parcels on the waitlist for development of single-family dwellings and 17 parcels on the waitlist for development of multi-family dwellings. Once growth is permitted, those on the waitlist will have priority for building permits.

Since development in Los Osos will be limited until sufficient mitigation credits are accrued and a growth rate above 0% is established, the costs to implement the HCP will exceed the mitigation fees collected in the initial years of Plan implementation. To address this, the County intends to allocate general fund support for the implementation of the LOHCP, including, but not limited to, preserve start-up, restoration project, management and monitoring, and administration. The amount of general fund support appropriated for the implementation of the LOHCP each fiscal year would be largely dependent on the credit-accruing actions (such as restoration projects and fee title acquisitions) that the County and Implementing Entity choose to accomplish during that fiscal year. Portions of the mitigation fees paid by Plan participants will go towards replenishing the general fund. Any surplus mitigation fees collected will be deposited into an account specifically for the implementation of the LOHCP.

7.3.2.2 Anticipated Timeline

The County anticipates that the Phase 1 Basin Plan Programs will be implemented by the start of 2025. In the meantime, the County intends to start up mitigation credit accrual by funding implementation

activities that would yield mitigation credits proportional to the anticipated development in Los Osos. By "jump-starting" the accrual of mitigation credits, the County would be able to issue Certificates of Inclusion around the same time a growth rate greater than zero percent would be expected to take effect. The mitigation fees paid by LOHCP participants will replenish the County funds used for the "jump-start" implementation activities. Based on an annual growth rate of 1.3%, it would take approximately five years for undeveloped residential parcels on the waitlists to build out.

The following provides an example timeline for funding of conservation actions to "jump start" the LOHCP as described in Section 6.2.5. The assumptions are based on the best available information as of December 31, 2021; the actual timeline is subject to change based on new information.

July 2022

- County funds and initiates jump-start activities.
- Phase 1 Basin Plan Programs are underway.

July 2025

- Phase 1 Basin Plan Programs are implemented, allowing the 1.3% annual growth rate for new residential development to become effective.
- Sufficient mitigation credits have been accrued from the County jump-start implementation activities, allowing for Certificates of Inclusion to be issued for the undeveloped parcels on the waitlists.
- Development of the waitlist parcels begins.

July 2030

- Undeveloped parcels on the waitlists are built out.
- County funds used to jump-start the Plan are replenished through payment of mitigation fees.

If development activity is low and the amount of mitigation fees collected does not sufficiently replenish the general fund allocation within the anticipated timeline, the County will continue to appropriate general fund support as necessary to maintain minimum upkeep, but will not take on any new credit-accruing actions until the demand for development warrants pursuit of additional credits. The County will perform periodic cost reviews and make mitigation fee adjustments, in addition to the automatic annual mitigation fee adjustments to account for inflation, as part of the Adaptive Financial Management of the Plan.

7.4 Adaptive Financial Management

Just as adaptive management will be used to ensure that the elements of the LOHCP conservation program achieve the Plan's biological goals and objectives (Section 5.5), adaptive financial management will be used to ensure that the Plan is adequately funded, so that the impacts to covered species are fully offset by the mitigation in accordance with the incidental take permit.

The mitigation fees identified in this Plan were developed based on planning-level cost analyses, which required a series of assumptions regarding the cost of land, habitat restoration projects, and administration, among other factors that will influence actual Plan implementation costs. In addition, the mitigation costs and thus fees were developed based a specific scenario for the LOHCP Preserve System configuration (Section 5.7.2.3.2) that is anticipated to be both feasible and achieve the biological goals and objectives. Variation in landowner interests in participating in the voluntary program as well as land costs will almost certainly lead to a different Preserve System Configuration. While the mitigation crediting ratios used to calculate the mitigation benefits (Section 5.7.2.3.1) will ensure that a Preserve System with a different mix of land protection, restoration, and management will be equivalent in conservation benefits to the scenario used for analysis in the Plan (Section 5.7.3.2), the costs for the Preserve System will necessarily differ from those estimated in this Plan. Finally, the scenario used to evaluate funding assumes complete implementation of the covered activities (or other eligible activities impacting the same area); reductions in participation in the Plan and adjustments to the pace of permitting could affect the actual costs of HCP implementation.

To address uncertainties in the actual costs to implement the Plan, as well as general inflationary pressures on costs, a two-part process will be followed to adjust cost estimates and mitigation fees over time:

1. **Annual Adjustments**: Automatic adjustments to mitigation fees will be made annually based on the Consumer Price Index measure of inflation. This will ensure the mitigation fees do not fall behind due to general inflation.
2. **Annual Financial Viability Analysis**: The annual report will assess financial viability of the plan, including sufficiency of the mitigation fees to implement the conservation program to the level needed to ensure that the mitigation is commensurate with the impacts of the covered activities (Section 5.6).
3. **Periodic Detailed Cost Review and Mitigation Fee Adjustment**. Mitigation costs will be reviewed, and mitigation fees adjusted, every three years or as needed to ensure that the conservation program can provide mitigation that is commensurate with the impacts. With the assistance of the Implementing Entity, the County will use the data collected about actual implementation costs, as well current market information that affects the Plan (e.g., land costs), to update the assumptions, unit costs, and overall cost estimates and derive a revised mitigation fee schedule. The County will review the results of the analysis and its recommendation for adjustment of the fees with the USFWS; changes to the fees will constitute administrative changes under the plan (Section 6.7.1). The County's failure to modify the fees as necessary to ensure the Plan is fully funded and implemented would expose the incidental take permit to potential suspension or revocation.

Table 7-1: Mitigation Fee Schedule

Fee Category	Fee Per Disturbed Acre ($)	Fee Per Disturbed Square Foot ($)[1]
Restoration /Management/Administration Fee	44,844.50	1.0295
Habitat Protection Fee[2]	7,389.43	0.1696
Total	**52,233.93**	**1.1991**

[1] Project fees will be calculated by multiplying the area of ground-disturbing activities in square feet by the values listed here. In the text, fees are rounded to the nearest cent for ease of discussion.

[2] Project proponents conducting new residential development projects on vacant parcels located inside the Priority Conservation Area will be required to establish an on-site habitat set-aside rather than pay the Habitat Protection Fee (Section 5.7.2.1).

Table 7-2: Land Sale Comparables used to Assess Habitat Protection Costs

Property and Parcel Size Class[1]	Acreage	Sale Date	Sale Price ($)[2]	Price/ Acre ($)[3]	Adjusted Price/ Acre ($)[3,4]
< 2 Acres					
1442 14th St	0.144	12/18/2020	75,000	522,636	559,411
1324 17th St	0.143	6/18/2020	110,990	776,164	839,405
1565 11th St	0.215	12/6/2021	100,000	464,640	464,640
438 Mitchell Dr	0.180	12/2/2021	280,000	1,553,732	1,553,732
1851 Sunnyhill Rd	0.092	10/12/2021	65,000	707,850	713,514
1262 7th St	0.143	10/27/2021	59,500	414,691	418,009
1662 4th St	0.215	10/7/2021	140,000	650,496	655,701
1491 5th St	0.187	8/2/2021	199,000	1,066,885	1,087,301
2049 Andre Ave	1.000	12/18/2020	325,000	325,000	347,868
1295 San Luis Ave	1.200	3/19/2020	225,000	187,500	202,527
1724 Los Osos Valley Rd	1.000	4/17/2017	175,000	175,000	199,532
Weighted Average for Parcels <2 acres	**0.411**		**159,499**	**388,249**	**407,208**
2 - 10 Acres					
2082 S Bay Blvd	3.710	12/20/2021	251,269	67,727	67,727
1865 N Pecho Rd	2.813	7/21/2021	216,450	76,946	78,580
1610 Sage Ave	5.190	6/14/2019	822,500	158,478	172,497
1549 Nipomo Ave	6.860	1/29/2019	365,000	53,207	58,933
Weighted Average for Parcels 2-10 acres	**4.643**		**413,805**	**89,120**	**95,400**
>10 Acres					
0 Pecho Rd	17.74	4/20/2021	715,000	40,304	42,077
2420 Paradise Ln	11.83	3/18/2019	665,000	56,213	61,653
Pecho Valley Rd	22.53	2/11/2019	850,000	37,727	41,611
2615 Black Walnut Rd	26.50	12/16/2020	765,000	28,868	30,899
Weighted Average for Parcels <10 acres	**19.65**		**748,750**	**38,104**	**41,121**

[1] Land sales predominantly from the LOHCP Area. However, for larger parcels, several sales comparables were drawn from neighboring areas due to limited sales within the plan area.

[2] Sources: Redfin, Zillow, Google Maps and gis.slocounty.ca.gov.

[3] Values may not appear correctly calculated due to rounding error.

[4] Adjusted to 2021 dollars using inflation calculator from the Consumer Price Index (CPI) as reported by the U.S. Bureau of Labor Statistics (https://www.bls.gov/data/inflation_calculator.htm).

Table 7-3: Estimated Costs to Acquire Land from Willing Sellers

Category	Acres in LOHCP Preserve System[1]	Assumed Parcel Size Category[2]	Estimated Per-Acre Land Costs ($) [3]	Total Costs ($)
Tier 1 [4]	63.5	> 10 Acres	41,121	2,611,204
Tier 2 [5]	10.0	2-10 acres	95,400	953,996
Tier 3 [5]	3.0	2-10 acres	95,400	286,199
Tier 4 [6]	0.0	< 2 acres	407,000	0
Total	**76.5**			**3,851,399**
			Average Per Acre	**50,345**

[1] Based on the LOHCP Preserve System scenario (Section 5.7.2.3.2, Table 5-9).

[2] Based on criteria for parcel tiers that reflect their conservation value (Table 5-8).

[3] Rounded values from calculation using comparable land sales (Table 7-2).

[4] The estimated land cost for parcels in this tier was based upon an estimated $1.0 M cost for parcels greater than 10 acres inside the LOHCP Priority Conservation Area, which average 31.5 acres.

[5] The Tier 2 and Tier 3 parcels are anticipated to be 2-10 acres.

[6] Tier 4 parcels, which are assumed to be less than 2 acres, are not included in the LOHCP Preserve System scenario.

Table 7-4: Estimated Restoration Costs[1]

Type	Description	Assumptions	Unit Cost ($)
Road/Trail Restoration	Intensive work to restore eroded and denuded trails and historic roads	15 acres of affected area, which will be addressed in five, 3-acre restoration efforts.	$750,000
Initial Exotic Plant Removal	Initial, intensive work to control veldt grass, ice plants, and pampas grass	Total treatment area is 50 acres. Treatment will occur as part of 10 projects, each of which will take place over 5-10 years and will include phased work as well as follow-up treatment to achieve restoration goals.	$500,000
Active Revegetation	Using seed and some limited propagation and installation of container stock to revegetate denuded areas	50 acres of roads and areas heavily infested by veldt grass, or treated for road/trail restoration, that are not naturally recolonized, or where active revegetation will reduce erosion and/or invasive plant recolonization. Treatment will occur as part of 10 projects each of which will include 2-3 years of seeding, planting, and monitoring.	$300,000
IKM Population Restoration	Vegetation management and other techniques to promote establishment of IKM	Design and implementation of an experimental management program with 3-5 years of effectiveness monitoring.	$200,000
		Base Total	**$1,750,000**
		Contingency (@25%)	**$437,500**
		Total with Contingency	**$2,187,500**
		Assumed Acreage[2]	**45.7**
		Cost Per Acre	**$47,815**

[1] Estimated costs for restoration projects habitat within the LOHCP Preserve System based on the known management and restoration issues (Appendix D) and the Interim Adaptive Management and Monitoring Plan (Appendix M). The Preserve System Adaptive Management and Monitoring Plan will identify actual restoration projects and estimate their costs.

[2] A total of 45.7 acres of habitat within the LOHCP Preserve System includes the 35 acres of existing protected land that are estimated to require restoration (Table 5-5) plus 10.7 acres (10%) of the newly-protected private land to be protected and managed as part of the LOHCP Preserve System: 31 acres of habitat set-asides on the lands of plan participants plus 76.5 acres of lands to be acquired (Table 5-9). of The acres treated is less than the total estimated acres of projects identified in this table, as some areas will receive more than one treatment (e.g., exotic plant control and active revegetation).

Table 7-5: Estimated Habitat Management Costs

Type	Description	Assumptions	Unit Cost ($)	Return Interval (Years)[1]		Frequency[1]		Annual Cost ($)	
				Permit Term	Post Permit	Permit Term	Post Permit	Permit Term	Post Permit
Management									
Exotic Plant Control	Control of veldt grass, ice plants, jubata grass, and other invasive species	General treatment of approximately 15 acres of lower infestation each year	$83,000	1	2	1	0.5	$83,000	$41,500
Recreation Management	Trail maintenance including routine erosion control, closures, signage, and patrol to limit impacts to covered species	8 miles of trails to be managed	$15,000	1	2	1	0.5	$15,000	$7,500
Vegetation Management	Prescribed fire and surrogates in maritime chaparral	Treat approximately 50 of the 300 acres of upland habitat on a rotating basis to maintain natural community structure and species composition	$200,000	10	10	0.1	0.1	$20,000	$20,000
IKM Population Management	Vegetation management or other treatments to promote population growth	Treatment conducted once every five years following initial restoration (Table 7-4)	$20,000	5	5	0.2	0.2	$4,000	$4,000
Pre-Project Surveys and Translocation	Pre-project surveys, project monitoring, and salvage for MSS	30 days/year	$30,000	1	2	1	0.5	$30,000	$15,000
Monitoring									
Exotic Plants	Areal Extent Mapping of Exotic Plants	Entire Preserve System (~386 ac.) mapped	$35,000	5	5	0.2	0.2	$7,000	$7,000
Plant Community Mapping	Areal Extent Mapping of Native Plant Communities	Entire Preserve System (~386 ac.) mapped	$22,000	10	10	0.1	0.1	$2,200	$2,200

Table 7-5: Estimated Habitat Management Costs

Type	Description	Assumptions	Unit Cost ($)	Return Interval (Years)[1] Permit Term	Return Interval (Years)[1] Post Permit	Frequency[1] Permit Term	Frequency[1] Post Permit	Annual Cost ($) Permit Term	Annual Cost ($) Post Permit
Plant Community Sampling	Quantitative Sampling of Plant Community Structure and Species Composition	Entire Preserve System (~386 ac.) sampled	$25,000	5	5	0.2	0.2	$5,000	$5,000
General Habitat Condition	Qualitative Examination of Habitat to Detect Impacts from Recreation, New Invasions, and other threats	Entire Preserve System (~386 ac.) assessed	$20,000	1	1	1	1	$20,000	$20,000
Morro Shoulderband Snail	Population Distribution/ Abundance Sampling	Suitable habitat (~300 ac.) sampled	$35,000	1	5	1	0.2	$35,000	$7,000
Morro Manzanita	Population Distribution/ Abundance Sampling	Suitable habitat (~250 ac.) sampled	$40,000	5	10	0.2	0.1	$8,000	$4,000
Indian Knob Mountainbalm Mountain	Demographic Monitoring	Three populations monitored	$25,000	5	10	0.2	0.1	$5,000	$2,500
Morro Bay Kangaroo Rat	Presence/Absence Monitoring	Suitable habitat for MBKR (~300 ac.)	$65,000	5	10	0.2	0.1	$13,000	$6,500
						Total Annual Costs		**$247,200**	**$142,200**
						Contingency (@25%)		**$61,800**	**$35,550**
						Total with Contingency		**$309,000**	**$177,750**
						Remedial Management for Changed Circumstances or Adaptive Management (@10%)		**$30,900**	**$17,775**
						Total		**339,900**	**195,525**
						Cost Per Acre for Preserve (386 ac.)		**$880**	**$506**

[1] Number of years between events. For example, a return interval of 1 indicates the activity is conducted every year, while a return interval of 5 indicates that the activity is conducted every five years.

Table 7-6: Preserve System Start-Up Costs[1]

Type	Description	Assumptions	Unit Cost ($)
Baseline Surveys			
Morro Shoulderband Snail Monitoring	Initial survey to identify the distribution and relative abundance of MSS to inform management	Quantitative sampling within ~160 acres of suitable and potentially suitable habitat in the initial Preserve System	75,000
Morro Manzanita Mapping	Initial surveys to characterize the distribution, relative abundance, and stand condition	Areal extent mapping, canopy cover sampling, and demographic monitoring within ~210 acres of suitable habitat	40,000
Morro Bay Kangaroo Rat Survey	Surveys to evaluate presence/absence of MBKR	Visual Assessment within ~250 acres of suitable habitat followed by limited surveys (track plates and live trapping), if sign detected	65,000
Indian Knob Mountainbalm Monitoring	Survey suitable habitat for the species and then establish demographic monitoring study	Only a single population occurs within the LOHCP Area	20,000
Exotic Plant Mapping	Areal Extent Mapping of Exotic Plants	Mapping throughout the initial Preserve System	35,000
Plant Community Mapping	Areal Extent Mapping of Native Plant Communities	Sampling throughout the initial Preserve System	22,000
Plant Community Structure	Quantitative Sampling of Plant Community Structure	Sampling throughout the initial Preserve System	25,000
General Habitat Condition	Qualitative Examination of Habitat to Detect Impacts from Recreation, New Invasions, and other threats	Assessment within the initial Preserve System	20,000
Preserve System AMMP	Develop management plan for the preserve system through field reconnaissance and mapping and coordination with landowners	Assessment and planning for the initial Preserve System	167,000
Fences and Signage	Install wildlife-friendly perimeter fences and signs where doing so will facilitate trail restoration	As described in the IAMMP	568,000

Table 7-6: Preserve System Start-Up Costs[1]

Type	Description	Assumptions	Unit Cost ($)
Exotic Plant Management	Initial Exotic Plant Management Work to jump start the program	As described in the IAMMP	278,000
		Total	**1,315,000**
		Per Year for Three Years	**438,333**
		Cost Per Acre (278 ac. Initial Preserve) [1]	**4,119**

[1] Estimated costs to begin enhanced management within the 278-acre Morro Dunes Ecological Reserve. Actual costs may differ.

[2]Acreages differ from those in Table 7-5, which addresses costs to manage and monitor the entire preserve system that will created following full implementation of the plan. The per-acre start-up costs exclude the costs to prepare the Preserve System AMMP.

[3] The IAMMP, which was developed after this funding analysis, identified 0.84 acre of eucalyptus, 22.6 acres of veldt grass and co-occurring invasive plants, and ~4.3 acres to be restored through trail closures. Actual treatment areas will be identified by the County in work plans developed to implement the IAMMP (Appendix M).

Table 7-7: Administrative costs for the LOHCP

Type	Description	Permit Term		Post-Permit Term	
		Assumptions	Cost ($)	Assumptions	Cost ($)
Covered Activities and Coordinating Conservation Program	Processing applications, track compliance with permit terms, incl. species protection measures. Create and maintain databases to track impacts and mitigation. Coordinating conservation program implementation.	One Full-Time Planner, County of San Luis Obispo	180,000	One 25% Time Planner, County of San Luis Obispo	45,000
Habitat Protection	Research habitat protection opportunities including conduct landowner outreach; process conservation easements for habitat set-asides offered in lieu of the habitat protection fee; monitor and enforce easements	Based on estimated hours and rates of participating IE staff and indirect costs	53,000	Easement monitoring only	16,000
General Administration, Coordination, and Contracting	Coordinate with the County and agencies to implement plan; coordinate with the contractors implementing preserve management tasks; coordinate with agencies and organizations involved in the Preserve System	Based on estimated hours and rates of participating IE staff and indirect costs	74,000	50% of effort in permit term	37,000
Reporting	Prepare annual report	Based on estimated hours and rates of participating IE staff and indirect costs	16,000	IE provides reports to the County only (Agency reporting not needed post-permit)	2,000
	Total Administration Costs (per year)		**323,000**		**100,000**

Table 7-8: Summary of Mitigation Costs and Fees [1]

Category	Planning Level Mitigation Costs ($)	Percentage of Total Mitigation Costs
Mitigation Cost		
Administration (permit term)	8,825,000	30%
Administration (post-permit)	2,634,814	9%
Management and Monitoring (permit term)	4,248,750	16%
Management and Monitoring (post-permit)	4,792,310	18%
Preserve Start-Up	1,148,000	4%
Restoration	2,187,500	8%
Acquisition of Fee Title	3,851,399	14%
Total Cost	**27,687,773**	**100%**
Mitigation Fee Summary per Acre		
Restoration /Management/Administration Fee	44,844	
Habitat Protection Fee	7,389	
Total	**52,234**	
Mitigation Fee Summary per Square Foot[2]		
Restoration /Management/Administration Fee	1.0295	
Habitat Protection Fee	0.1696	
Total	**1.1991**	

[1] Values may not appear correctly calculated due to rounding error.

[2] Project fees will be charged by multiplying the area of ground-disturbing activities in square feet by the values listed here. In the text, the per-square-foot fees are rounded to the nearest cent for ease of discussion.

8 Alternatives to Take

The federal Endangered Species Act (ESA) requires that habitat conservation plans (HCPs) discuss alternatives to the taking of listed species due to the covered activities (Project) and the reasons why such alternatives are not implemented. These are alternatives to the taking, and not overall Project alternatives and impacts, which are discussed in the LOHCP EIR (County of San Luis Obispo 2020a) and EA (USFWS 2020b).

8.1 Alternative 1: No Take

Under the No-Take Alternative, the USFWS would not approve the Section 10(a)(1)(B) incidental take permit application.

In this scenario, landowners and other project proponents seeking to conduct activities that would result in take/impacts of one or more of the Plan's four covered species, would either have to abandon their activity or apply for an incidental take permit by preparing their own HCP, to avoid violating Section 9 of the ESA. The latter scenario could result in development of potentially hundreds of individual HCPs and associated CEQA/NEPA compliance documents in Los Osos, as well as other regulatory permits and authorizations (e.g., California Coastal Act compliance). This alternative would therefore create a large burden on agencies while delaying development, facilities maintenance, and other covered activities.

The No-Take Alternative would also create an economic burden on landowners and other project proponents, who would need to fund preparation of individual HCPs. As a result of the added costs and time required to receive an ITP in this alternative, some project proponents might be more likely to attempt to conduct activities in violation of ESA, resulting in adverse impacts to the covered species and potential civil and criminal penalties to project proponents.

Permitting the covered activities of this programmatic plan through numerous individual HCPs would likely result in lower conservation benefits for the covered species and their habitats. To mitigate the impacts of the typical project, which would be less than one acre, individual HCPs would protect and/or manage small, often isolated habitat areas. This piecemeal approach to conservation would have dramatically reduced benefit for the covered species relative to implementation of the strategic, coordinated conservation plan outlined in this plan. Moreover, without a mechanism to contribute to off-site mitigation of high-quality habitat, as outlined in the conservation program for this Plan, the individual HCPs would likely conduct habitat protection and management on site. As the vast majority of the projects would occur within the already densely developed area of Los Osos inside the urban services line, the mitigation would likely be of limited long-term conservation value for the covered species relative to habitat protection in the Priority Conservation Area as part of the Project (Section 5.3.1.2). As a result, the No-Take Alternative would provide less conservation benefit than the proposed Project.

Due to the extended timeline and costs for permitting to lawfully conduct projects in the absence of a programmatic permit resulting from this community-wide HCP, the No-Take Alternative would slow the pace and may ultimately reduce the amount of habitat conversion. This could limit the impacts to Morro shoulderband snail and Morro manzanita individuals and populations relative to the proposed Project; however, it would be unlikely to have a net benefit for the species. The benefits of preserving, restoring,

and managing high-quality habitat in the Priority Conservation Area as part of the proposed Project's conservation program will not only outweigh the negative impacts associated with the covered activities, but also promote recovery of the species relative to the No-Take Alternative.

For each of these reasons outlined above, the No-action Alternative was rejected.

8.2 Alternative 2: Reduced Take

Under the reduced-take alternative, the total acres of habitat disturbed by the covered activities would be capped at 266 acres, or 50% of the maximum amount under the proposed Plan (532 acres). Rather than helping protect the covered species, capping habitat disturbance as part of a Reduced-Take Alternative will negatively impact them relative to implementing the proposed Plan for several reasons.

The Reduced-Take Alternative will reduce the benefits of the conservation program for the covered species and their habitat. The ratios relating the benefits of the conservation program for the covered species habitats to the impacts of the covered activities on a per-acre basis are at or exceed 1:1 (Table 8-1). For example, while 41 acres of Morro manzanita habitat are anticipated to be impacted, the conservation program in this Plan is anticipated to benefit 354-acre equivalents, resulting in a more than 8:1 ratio of habitat benefits to impacts. Because the conservation program leverages the mitigation to improve habitat, reducing the amount of take/impacts by 50% will similarly reduce the habitat benefits of the conservation program (Table 8-1). These ratios reflect the fact that habitat protection, restoration, and management will benefit habitat that is of greater long-term conservation value for the covered species, than the habitat impacted by the covered activities (sections 4.2 and 5.8.1).

As a result, for every acre of coastal sage scrub or central maritime chaparral impacted by the covered activities, which generally will occur in degraded and more fragmented habitat, 1.7 acres of coastal sage scrub and 8.5 acres of central maritime chaparral will be benefited (Table 8-1); this habitat will largely occur within the Priority Conservation Area (Figure 5-1), where habitat conservation efforts can better facilitate long-term viability of the covered species.

Habitat not developed (or protected, restored, and managed) under this Reduced-Take Alternative will continue to degrade due to exotic species, incompatible fire management, and incompatible recreational use, among other factors.

The Reduced-Take Alternative will reduce the biological effectiveness of the conservation program. A key approach of the LOHCP conservation program is to conserve and effectively manage the most important land within the Baywood fine sands ecosystem, including existing protected lands as well as land protected as part of the Plan, as part of a coordinated strategy that will maximize effectiveness (Section 5.3). Reducing the amount of take/impacts reduces the mitigation revenue and thus the amount of habitat that is able to be conserved, restored, and managed as part of the LOHCP Preserve System. Unless other funds for habitat protection and management are obtained, habitat outside of the Preserve System will continue to degrade and impede effective management of habitat within the Preserve System. For example, uncontrolled erosion and exotic plant infestations on habitat adjacent to the preserves can degrade habitat contained within and necessitate more intensive management of the preserves.

The Reduce-Take Alternative will reduce the cost effectiveness of the conservation program. There are economies of scale associated with many aspects of habitat restoration, management, and monitoring: per-acre costs associated with such activities are generally lower as the size of the area treated increases (CNLM 2004). Moreover, many components of the administrative costs of the conservation program are fixed. As a result, the Reduced-Take Alternative will increase the per-acre costs of operating the Preserve System, which provides the compensatory mitigation for the covered activities. To address this, the mitigation fee would need to be increased, thus putting added burden on the project proponents. Alternatively, the amount of habitat protection, restoration, management, and monitoring would have to be scaled back, thus reducing the benefits of the Reduced-Take Alternative relative to the Proposed Project.

The above assessment assumes that if the Reduced-Take Alternative is implemented, the other covered activities will not be conducted. However, this is unrealistic, as many of these activities important for the Los Osos community (e.g., library and parks expansions, facilities maintenance). After the cap on maximum disturbance for the LOHCP permit is reached, project proponents would instead need to prepare individual HCPs in order to receive take coverage. The increased timeline and costs for project permitting may result in issues similar to the No-Take Alternative, including projects being conducted without take coverage, and therefore without mitigation. Projects that are permitted as a result of individual HCPs would result in small, piecemeal mitigation and uncoordinated and inconsistent management that is less effective than what would be accomplished under the Proposed Plan.

8.3 Alternative 3: Greater Mitigation Requirement

Under the Greater-Mitigation Requirement Alternative, project proponents would be required to mitigate the impacts of their projects at a ratio of 2:1; for every acre of habitat disturbed, two acres of habitat be benefited through habitat protection, restoration, and/or management, rather than just one acre, as in the Proposed Plan (Alternative 4). The anticipated covered activities (Section 2.2) would impact 532 acres of habitat[23] and would be offset by 1,064-acre equivalents of mitigation activities in the LOHCP Preserve System.

This higher mitigation alternative could be achieved by doubling the acres of habitat presumed to be restored, managed, and/or protected within the LOHCP Preserve System based on the scenario used for this Plan (Section 5.7.2.3.2). Doubling the habitat protection would entail protecting 772 rather than 386 acres (Table 5-10). When compared with the Proposed Plan, the preserve system scenario under this alternative would protect 215 acres of currently unprotected habitat, rather than 107.5 acres; restore and manage 70 acres of existing protected lands, as opposed 35 acres; and manage 487 acres of existing protected lands rather than 243.5 acres. The Preserve System under this scenario would be expected to have double the benefits (and double the ratios) of the Proposed Project for vegetation and species habitat (Table 8-1).

This alternative is likely infeasible because there is not enough suitable habitat available for use as mitigation. Of the 948 acres of existing protected lands within the LOHCP Area (Table 2-4), only 796 acres are within the Priority Conservation Area where habitat management and restoration activities can most effectively promote long-term persistence of the covered species (Section 5.3.1.2, Table 5-5).

[23] Does not include take due to implementation of the conservation program and the Community Wildfire Protection Plan, which will result in temporary impacts to habitat.

Of this area, 498 acres were identified by the landowners as unavailable for use as mitigation (Section 5.3.3.1).

It would also be infeasible to achieve this higher mitigation ratio through protection of twice as much habitat. The Priority Conservation Area contains only approximately 621 acres of unprotected upland habitat of which only 386 acres are in undeveloped vacant parcels; the remaining 235 acres of habitat is within existing developed parcels. The Plan already assumes that 107.5 acres of unprotected land would be protected through acquisition of conservation easements or fee title (Table 5-9). Protecting additional acreage to bring the mitigation ratio to 2:1 would require participation of numerous additional landowners who may not be interested in selling their parcels or conservation easement over portions of them. Protecting additional habitat outside of the Priority Conservation Area would be possible but would not achieve the full desired additional benefits intended by a higher ratio, because land outside of the Priority Conservation Area is less suitable for long-term conservation and management, though it could still contribute to species conservation (Section 5.3.1.2).

Doubling the mitigation ratio would therefore be unlikely to double the benefits for the covered species, as might be intended in such an alternative. This is because the additional habitat that would be protected, restored, and managed, would be of generally lower long-term conservation value for the covered species. Including habitat within parcels that are smaller, partially developed, and/or located outside of the Priority Conservation Area, would result in a more fragmented preserve system that has lower habitat connectivity and is more challenging to cohesively manage.

Increasing the mitigation ratio from 1:1 to 2:1 would also likely more than double the mitigation fees for Plan participants. The Habitat Protection fee required to protect the additional habitat would be expected to more than double, because doubling the land protected would require acquisition of a larger number of smaller parcels, thus resulting in higher per-acre land costs (Section 7.2.1) as well as higher transactional costs (i.e., administration). The Restoration/Management/Administration fee would also be expected to double as a result of the 100% increase in the amount of habitat to be restored, managed, and monitored. Any economies of scale associated with increasing the area managed would likely be outweighed by the increased management costs associated with managing multiple, smaller, and likely disjunct parcels. All else being equal, such parcels are anticipated to experience greater threats to the covered species, such as higher richness and abundance of exotic plants, due to their greater edge effects resulting from their lower area-to-perimeter ratios.

More than doubling the mitigation fees for Plan participants would increase the costs associated with habitat mitigation as well as the overall costs associated with infrastructure, capital facilities, and mitigation fees collectively. Plan participants will need to pay other existing infrastructure and capital facility fees such as water and school fees. In addition, some Plan participants will also be required to separately fund required avoidance and minimization measures. For example, some participants will be required to contract the services of a qualified biologist to conduct pre-project habitat assessment and surveys, and to salvage and relocate Morro shoulderband snail (Section 5.2). The costs for these services will be determined by the market and will depend on the nature of the survey and the project. Given these additional costs, doubling LOHCP mitigation fees could challenge the feasibility of new development.

Doubling the mitigation fees would also increase the cost of public capital improvement projects, such as bike lane construction, water utility improvements, library expansion, and park development. In an era of constrained public resources, these additional costs could make some of these projects cost

prohibitive for public agencies. As a result, requiring greater mitigation could impede the goals for development and enhancement of the Los Osos community, which the proposed Plan is designed to achieve along with the biological goals and objectives for the covered species (Section 5.1).

To summarize, the greater mitigation requirement alternative would make implementation of the LOHCP potentially infeasible due to the anticipated limited habitat available from willing sellers, which would have reduced per-acre conservation value for the covered species due to the higher per-acre costs and lower conservation value. The greater mitigation alternative would similarly present a higher cost burden to plan participants and could render cost prohibitive some development and enhancement projects including those that can benefit the Los Osos Community.

8.4 Alternative 4: Proposed Plan

Under the Proposed Plan, private landowners, public agencies, and private utilities will receive take coverage for their respective development, infrastructure, and facilities maintenance activities, provided that their projects meet the eligibility criteria and they agree to implement the required mitigations of this voluntary program.

The covered activities will collectively impact a maximum of 532 acres of land within the Baywood fine sands ecosystem. The habitat impacts will be concentrated (87%) inside the Urban Services Line (USL)—the existing, largely-developed portion of community, where additional development will be focused as part of the Estero Area Plan (County of San Luis Obispo 2009, 2015). Concentrating development within the USL will minimize impacts to the largely intact habitat on the perimeter of the Plan Area. Nearly 40% of the impact area was characterized as developed, as it features some existing improvements. Due to the small size of parcels, this habitat is already highly fragmented and degraded though may support the covered species.

To mitigate the impacts of the covered activities on the covered species, the Implementing Entity will protect, restore, manage, and monitor habitat at a 1:1 ratio relative to the impacts. The protected habitat will be within the LOHCP Preserve System—a network of protected lands located on the perimeter of the Plan Area in the Priority Conservation Area (Figure 5-1), where habitat has been identified as most essential to the recovery of the covered species (Section 5.3.1.2). The Preserve System will feature habitat protected through implementation of the Plan, as well as existing protected lands where habitat will be restored and managed to achieve the Plan's biological goals and objectives (Section 5.1).

The Preserve System will be assembled during implementation of the Plan as project proponents pay fees that are calculated based on their project impacts. The fees will be used to acquire new land from willing sellers via acquisition of fee title or conservation easements. Fees will also be used to restore habitat, such as by controlling erosion or conducting fire management, and actively manage habitat to address other factors that degrade it, including exotic plants and incompatible recreational uses. The Implementing Entity will also accept conservation easements granted by proponents of new private development projects in the Priority Conservation Area, who will set aside habitat on-site rather than paying the Habitat Protection Fee paid by others to fund off-site habitat protection.

The precise configuration of the Preserve System will depend on a variety of factors, including the interest of landowners in developing or conserving their land. Based on the Preserve System

configuration scenario used to assess impacts and develop funding strategy for the Plan (Section 5.7.2.3.2), the 386-acre Preserve System will:

- **Protect 107.5 acres** of currently unprotected land, of which 10 acres will be restored and then managed (the other 97.5 acres will be actively managed);
- **Restore 35 acres** of degraded habitat within existing protected lands, to increase its ability to support the covered species; and
- **Actively manage 244 acres** of habitat within existing parks and reserves, to meet the unmet management needs and address factors that threaten long-term persistence of the covered species.

Based upon the mitigation crediting ratios, which relate the conservation value of protecting new habitat, and managing and restoring existing protected lands to the benefits of *not* implementing the covered activities (Section 5.7.2.3.1), the 386-acre Preserve System will provide 533-acre equivalents of habitat benefits, thus mitigating the impacts of the covered activities at a ratio of 1:1 (Table 5-10). Proponents of development projects that would impact Environmentally Sensitive Habitat Areas (ESHA) may be required to set aside additional habitat in order to comply with the California Coastal Act, effectively increasing the ratio of habitat protected through activities covered in this Plan above 1:1 (Section 5.7.2.1.1).

To issue a Section 10(a)(1)(B) permit, the USFWS must have sufficient evidence to find that take has been avoided and minimized to the maximum extent practicable and that the mitigation is commensurate with the impacts of the taking. The County believes the mitigation and avoidance and minimization measures of the Proposed Plan address the impacts of the proposed take under ESA including by fully offsetting the impacts of the taking, as illustrated in the analysis of the Greater-Mitigation Requirement Alternative (Section 8.3). The minimization and mitigation measures are also the maximum extent practicable, given the circumstances in the landscape including availability of habitat and also financial resources to fund its protection.

In addition, the coordinated conservation program of this Plan will promote recovery of the four covered species by protecting and managing habitat that has the greatest long-term viability for conservation. It will also help conserve other native plants and animals that comprise the endemic communities of the Baywood fine sands ecosystem.

Unlike the greater-mitigation alternative, which would protect, manage, and restore more habitat and thus have greater benefit for the covered species, the Proposed Plan is more feasible to implement, as it will not encounter limitations of land available from willing sellers. The Proposed Plan also provides a more cost-effective permitting solution for project proponents, which are anticipated to include public as well as private entities seeking to conduct much needed infrastructure and utility projects, as well as development projects that can enhance the Los Osos Community.

Table 8-1: Proposed Project and Reduced-Take Alternative Acreages

	LOHCP Area[1]		Proposed Project					Reduced Take[5]	
			Impacted[2]						
	Total	Protected	Inside USL	Outside USL	Total	Benefited[3]	Ratio[4]	Impacted	Benefited
General Vegetation/Land Cover (Table 3-1)									
Coastal Sage Scrub	866	382	160	28	189	320	1.7	94	160
Central Maritime Chaparral	503	309	6	13	18	156	8.5	9	78
Woodland	367	192	22	11	33	32	1.0	16	16
Grassland	39	2.2	21	0.5	21	1.1	0.1	11	1
Wetland	43	31	2.9	0	2.6	0.0	0.0	1	0
Riparian	77	9	3.1	0	3.1	11	3.4	2	5
Other (Primarily Developed)	1,750	23	248	18	265	14	0.1	133	7
Total	**3,644**	**948**	**464**	**70**	**532**	**533**	**1.0**	**266**	**267**
Covered Species Habitats (Table 4-5)									
Morro Manzanita Habitat	798	491	21	20	41	354	8.6	21	177
Morro Shoulderband Snail[6]	2,833	580	429	49	478	301	0.6	239	150
Primary Habitat	935	445	160	29	189	191	1.0	95	96
Secondary Habitat[6]	1,898	135	269	20	289	110	0.4	145	55

[1] Total and protected acres of vegetation and other land cover (Table 4-3), and covered species habitat (Table 4-5), based on the crosswalk of vegetation and habitats (Table 4-4).

[2] Total proposed acres of vegetation and other land cover (Table 4-3) and covered species habitat (Table 4-5) to be impacted inside the Urban Services Line (USL), an area which is already densely developed, and outside the USL. Impacts will be limited to the 3,209-acre permit area.

[3] Total acres to benefit from acquisition of new protected lands, and restoration and management of existing protected lands (Table 5-10).

[4] Total acres to be benefited divided by the total acres to be impacted by the anticipated covered activities.

[5] Take reduced by 50% relative to the Proposed project (266 acres rather than 532 acres).

[6] These ratios are below 1, because secondary habitat includes developed areas where the species can be found, and where many covered activities (redevelopment, infill development, etc.) will occur. Such areas lack the long-term conservation value of the intact habitat, which will be protected at a higher ratio (1.0).

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Appendices

Appendix A Species Summaries

A.1 Animal Species Summaries

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Invertebrates						
Obscure bumble bee (*Bombus caliginosus*)	-	-	-	Coast range mountains of northern Washington to southern California	Relatively humid and foggy areas	Known. The CNDDB (2016) has three records for wintering sites within the LOHCP Plan Area
Monarch butterfly (*Danaus plexippus*)	-	-	-	Roost in coastal regions from San Francisco to Baja California.	Winter roost sites Extend Along the Coast from Northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey Pine, cypress), with nectar and water sources nearby.	Known. The CNDDB (2016) has three records for wintering sites within the LOHCP Plan Area. The records in the Plan Area consist of a eucalyptus grove in Skyline Grove, which is near the intersection of Doris Avenue, West Woodland Ave at the end of Monarch Lane, and Sweet Springs Marsh, north of Ramona Street.
Morro shoulderband snail (*Helminthoglypta walkeriana*)	FT	-	-	Inhabits areas on the south end of Morro Bay and is endemic to the western portion of San Luis Obispo County, California.	Coastal dune and scrub communities with the dominant shrub associated with the snail's habitat being California goldenbush (*Ericameria ericoides*), as well as a variety of ruderal, developed, and degraded habitats including non-native grasslands.	Known. The CNDDB (2016) has ten records for the Morro shoulderband snail in the LOHCP Plan Area.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Morro Bay blue butterfly (*Plebejus icarioides morroensis*)	-	-	-	Locally common from March to July and resides only along the immediate coast of San Luis Obispo and western Santa Barbara counties.	Found in close proximity to host plant silver dune lupine (*Lupinus chamissonis*).	Known. The CNDDB (2016) has five records for Morro Bay blue butterfly within the LOHCP Plan Area.
Mimic tryonia (*Tryonia imitator*)	-	-	-	Historically occupied coastal lagoons and areas where creek mouths joined the tidal marsh, from San Diego to Sonoma County. Present populations are scattered throughout the former range; Sonoma County populations are likely extirpated.	Coastal lagoons and where creek mouths join tidal marshes.	Known. The CNDDB (2016) has one record for mimic tryonia within the LOHCP Plan Area.
Fish						
Tidewater goby (*Eucyclogobius newberryi*)	FE	-	SSC	From the Agua Hedionda Lagoon, San Diego County, in the south to the mouth of the Smith River (Tillas Slough), Del Norte County, in the north.	Sandy and silty bottoms of shallow lagoons and lower stream areas where the water is brackish (salinities usually <10 ppt) to fresh.	Known. The CNDDB (2016) has one record for tidewater goby within the LOHCP Plan Area.
Steelhead-South/ Central California Coast DPS (*Oncorhynchus mykiss irideus*)	FT	-	SSC	They occur in Malibu Creek, Ventura River, Santa Clara River, and Santa Ynez River, although in greatly reduced numbers. Recent records show that they have been found in Mission and Atascadero creeks (Santa Barbara County) and Mulholland, Big Sycamore, and Topanga canyons (Los Angeles Co.).	Steelhead inhabit riparian, emergent, palustrine habitat. Perennial streams usually characterize spawning and rearing habitat with clear, cool to cold, fast flowing water with high dissolved oxygen content and abundant gravels and riffles.	Potential to occur. The CNDDB (2016) and existing literature have no records for south/central steelhead occurrence within the LOHCP Plan Area, but suitable habitat is available within Los Osos Creek, on the eastern perimeter of the Plan Area.
Amphibians						

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
California red-legged frog (*Rana draytonii*)	FT	-	SSC	Found along the coast and coastal mountain ranges of California from Humboldt County to San Diego County; Sierra Nevada (mid elevations [above 1,000 feet] from Butte County to Fresno County).	Inhabits lowland streams, wetlands, riparian woodlands, and livestock ponds.	Potential to occur. The CNDDB (2016) and existing literature have no records for the CRLF within the LOHCP Plan Area. There is suitable habitat in the LOHCP Area and they are found in the Morro Bay tributaries that include Los Osos Creek.
Reptiles						
Black legless lizard and silvery legless lizard (*Anniella pulchra nigra* and *A. p. pulchra*)	-	-	SSC	Antioch (Contra Costa County), south through the Coast, Transverse, and Peninsular ranges; parts of the San Joaquin Valley; and the western edge of the Sierra Nevada Mountains and Mojave Desert to El Consuelo (Baja California Norte).	Areas with sandy or loose loamy soils under the sparse vegetation of beaches, chaparral, or pine-oak woodland; or sycamores, cottonwoods, or oaks that grow on stream terraces.	Known. The CNDDB (2016) has five records for black legless lizard/silvery legless lizard within the LOHCP Plan Area.
Western pond turtle (*Emys marmorata*)	-	-	SSC	Occurs along the central coast of California east to the Sierra Nevada and along the southern California coast inland to the Mojave and Sonora Deserts; range overlaps with that of the northwestern pond turtle throughout the Delta and in the Central Valley from Sacramento County to Tulare County.	Inhabits slow moving permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons.	Potential to occur. The CNDDB (2016) and existing literature have no records for western pond turtle within the LOHCP Plan Area, but suitable habitat is available. This species is thought to occur at the Sweet Springs Nature Preserve.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Coast horned lizard (*Phrynosoma blainvillii*)	-	-	SSC	California endemic with distribution from Lake Shasta southward along the edges of the Sacramento Valley into much of the South Coast Ranges, San Joaquin Valley, and Sierra Nevada foothills to northern Los Angeles, Santa Barbara, and Ventura counties. Several fine-scaled populations in the Shandon-Cuyama Valley region, Santa Barbara, and San Luis Obispo counties.	Inhabits exposed gravelly-sandy substrate containing scattered shrubs (e.g., California buckwheat) to clearings in riparian woodlands, to dry uniform chamise chaparral to annual grassland with scattered saltbush. Maximum abundance is reached in sandy loam areas on alkali flats.	Known. The CNDDB (2016) has two records for coast horned lizard within the LOHCP Plan Area.
Birds						
Cooper's hawk (*Accipiter cooperii*)	-	-	WL	Throughout California except high altitudes in the Sierra Nevada; winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range.	Nests primarily in riparian forests dominated by deciduous species; forages in open woodlands.	Potential to occur. The CNDDB (2016) has one historical record of nesting within the LOHCP Plan Area in Baywood. The existing literature regards the species as a resident of San Luis Obispo County, nesting and foraging in and near deciduous riparian areas.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Sharp-shinned hawk (*Accipiter striatus*)	-	-	WL	Permanent resident in the Sierra Nevada, Cascade, Klamath, and north Coast Ranges at mid-elevations and along the coast in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey counties; winters over the rest of the state except very high elevations.	Prefers riparian habitats; not restricted to them and are found in mid-elevation habitats such as pine forests, woodlands, and mixed conifer forests. For nesting they occur in dense tree stands that are cool, moist, well shaded, and usually near water. For hunting habitat, they often use openings at the edges of woodlands and also brushy pastures.	Potential to occur. The CNDDB (2016) and existing literature have no records for sharp-shinned hawk within the LOHCP Plan Area. There is suitable wintering habitat present in LOHCP Plan Area.
Golden eagle (*Aquila chrysaetos*)	-	-	FP, WL	Foothills and mountains throughout California; uncommon non-breeding visitor to lowlands such as the Central Valley.	Cliffs and escarpments or tall trees for nesting; annual grasslands, chaparral, and oak woodlands for hunting.	Potential to occur. The CNDDB (2016) and existing literature have no records for golden eagles within the LOHCP Plan Area. No suitable nesting habitat is present within LOHCP Plan Area.
Burrowing owl (*Athene cunicularia*)	-	-	SSC	Restricted to the Central Valley extending from Redding south to the Grapevine, east through the Mojave Desert and west to San Jose, the San Francisco Bay area, the outer coastal foothills area which extend from Monterey south to San Diego and the Sonoran Desert.	Inhabits dry, sparse grasslands, desert scrub, and agricultural areas.	Potential to occur. The CNDDB (2016) and existing literature have no records for western burrowing owl within the LOHCP Plan Area. There is potentially suitable wintering and foraging habitat present in LOHCP Plan Area, although it is outside of its known range.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT	-	SSC	Coastal areas from Del Norte County to San Diego County.	Nests, feeds, and takes cover on sandy or gravelly beaches along the coast, on estuarine salt ponds, alkali lakes, and at the Salton Sea.	Potential to occur. The CNDDB (2016) and existing literature have no records for western snowy plover within the LOHCP Plan Area. There is no suitable nesting habitat present in LOHCP Plan Area.
Northern harrier (*Circus cyaneus*)	-	-	SSC	Occurs from annual grassland up to lodgepole pine and alpine meadow habitats. It breeds from sea level to 5,700 ft. in the Central Valley and Sierra Nevada, and up to 3,600 ft. in northeastern California. It is a permanent resident of the northeastern plateau and coastal areas; it is a less common resident of the Central Valley.	Grasslands, meadows, marshes, and seasonal and agricultural wetlands providing tall cover.	Known. The CNDDB (2016) and existing literature have no records for northern harrier within the LOHCP Plan Area. The northern harrier is a frequent forager on the southern portion of Morro Bay S.P. and the Bayview Unit of the Morro Dunes E.R. (J. Chesnut, pers. comm.).
White-tailed kite (*Elanus leucurus*)	-	-	FP	Lowland areas west of Sierra Nevada from head of Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border.	Forage in low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands. Breeds in lowland grasslands, agriculture, wetlands, oak-woodland, and savannah habitats, and riparian areas associated with open areas.	Known. A large roosting concentration of white-tailed kite has been observed north of Nipomo Avenue and east of South Bay Blvd near Eto Creek. The birds are winter resident, with occasional summer presence (J. Chesnut, pers. comm.).

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Merlin (*Falco columbarius*)	-	-	WL	Does not nest in California; rare but widespread winter visitor to the Central Valley and coastal areas.	Forages along coastlines, open grasslands, savannas, and woodlands; often forages near lakes and other wetlands.	Potential to occur. The CNDDB (2016) and existing literature have no records for merlin within the LOHCP Plan Area. There is no suitable breeding habitat in the LOHCP Plan Area. This species may be a wintering visitor, but presence is unlikely in the LOHCP Plan Area.
Prairie falcon (*Falco mexicanus*)	-	-	WL	Uncommon permanent resident and migrant that ranges from southeastern deserts northwest along the inner Coast Ranges and Sierra Nevada. It is distributed from annual grasslands to alpine meadows within this region. It is not found in the northern coastal fog belt, or along the coastline.	Annual grasslands to alpine meadows, but they are also associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas, typically dry environments of western North American where there are cliffs or bluffs for nest sites.	Potential to occur. The CNDDB (2016) and existing literature have no records for prairie falcon within the LOHCP Plan Area. Suitable foraging habitat is present in LOHCP Plan Area, but the LOHCP Plan Area is out of its known range.
Peregrine falcon (*Falco peregrinus anatum*)	DE	DE	FP	Common along the coast north of Santa Barbara, in the Sierra Nevada, and in other mountains of northern California. In winter, found inland throughout the Central Valley, and occasionally on the Channel Islands. Migrants occur along the coast and in the western Sierra Nevada in spring and fall.	Open habitats, including tundra, marshes, seacoasts, savannas and high mountains. Breeds mostly in woodland, forest, and coastal habitats.	Known. The CNDDB (2016) have no record of known peregrine falcon occurrence within the LOHCP Plan Area. However, the undeveloped shorefront lots in Baywood are a preferred hunting area for the Morro Bay peregrine falcons. They are frequently observed feeding on shorebirds at the end of Pine Street, 2nd Street frontage, and Pecho Valley Road (J. Chesnut, pers. comm.).

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Loggerhead shrike (*Lanius ludovicianus*)	-	-	SSC	Found throughout the foothills and lowlands of California as a resident. Winter migrants are found coastally, north of Mendocino County.	Forage over open ground within areas of short vegetation, pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, riparian areas, open woodland, agricultural fields, desert washes, desert scrub, grassland, broken chaparral, and beach with scattered shrubs.	Potential to occur. The CNDDB (2016) has no records for loggerhead shrike within the LOHCP Plan Area. Suitable foraging habitat present in LOHCP Plan Area.
California black rail (*Laterallus jamaicensis coturniculus*)	-	ST	FP	Northern reaches of the San Francisco Bay estuary, especially the tidal marshland of San Pablo Bay and associated rivers; several small, fragment subpopulations still existed at Tomales Bay, Bolinas Lagoon, Morro Bay, and in southeastern California.	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations.	Known. The CNDDB (2016) has two records for the California black rail within the LOHCP Plan Area. Observed at Sweet Springs Preserve, adjacent to Cuesta-by-the-Sea. Also found at other locations in the LOHCP Plan Area during the Morro Coast Audubon Christmas Bird Counts.
Marbled godwit (*Limosa fedoa*)	-	-	-	The species winters in greatest numbers along the Pacific coast from central California south through Southern California. A number of Important Bird Areas (IBAs) in both the United States and Canada help protect important habitat for marbled godwit. These sites include California's Morro Bay IBA, which regularly hosts over 2,000 wintering godwits.	Winters in coastal mudflats.	Potential to occur. The CNDDB (2016) and existing literature have no records for marbled godwit within the LOHCP Plan Area, but suitable habitat is available.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Long billed curlew (*Numenius americanus*)	-	-	WL	Breeding grounds include northeastern California. Wintering range along entire Pacific Coast of California.	Breed mainly in the native grasslands of arid western regions and are often found in farm fields and grasslands during migration and on their wintering grounds. Occur in coastal marshes and mudflats during the winter. Nest on the ground in the open, on dry prairie.	Potential to occur. The CNDDB (2016) and existing literature have no records for long billed curlew within the LOHCP Plan Area, but suitable habitat is available.
Whimbrel (*Numenius phaeopus*)	-	-	-	Winter along the coast of California	Dry heath uplands to dwarf shrub, and mossy lowlands. During the winter, it forages in tidal flats, mangroves, and a variety of other coastal habitats.	Potential to occur. The CNDDB (2016) and existing literature have no records for whimbrel within the LOHCP Plan Area, but suitable habitat is available.
Large-billed savannah sparrow [*Passerculus sandwichensis rostratus (wintering)*]	-	-	SSC	Winter along the coast of California	Salt marches or dune grasses.	Potential to occur. The CNDDB (2016) and existing literature have no records for large-billed savannah sparrow within the LOHCP Plan Area, but suitable habitat is available.
California brown pelican (*Pelecanus occidentalis californicus*)	DE	DE	FP	Ranges along entire California coast. Breeds on Channel Islands (Santa Barbara, Anacapa, and Santa Cruz). Also, occasionally can be found on Salton Sea.	Estuarine, marine subtidal, and marine pelagic waters along the California coast. Specifically, they are found on rocky shores and cliffs, in sloughs, and coastal river deltas.	Potential to occur. The CNDDB (2016) and existing literature have no records for brown pelican within the LOHCP Plan Area, but suitable habitat is available.
California clapper rail (*Rallus longirostris obsoletus*)	FE	SE	FP	Currently limited to San Francisco Bay, San Pablo Bay, Suisun Bay, and tidal marshes associated with estuarine sloughs draining into these bays.	Marshes supporting tidal sloughs that provide direct tidal circulation throughout the area and shallow water and mudflats with sparse vegetation.	Potential to occur. The CNDDB (2016) and existing literature have no records for California clapper rail within the LOHCP Plan Area, but suitable habitat is available.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
Allen's hummingbird (*Selasphorus sasin*)	-	-	-	Breeds in a narrow strip along the Pacific coast, throughout California.	Inhabit mixed evergreen, riparian woodlands, eucalyptus and cypress groves, oak woodlands, and coastal sage scrub areas in breeding season.	Potential to occur. The CNDDB (2016) and existing literature have no records Allen's hummingbird within the LOHCP Plan Area, but suitable habitat is available.
Yellow warbler (*Setophaga petechial*)	-	-	SSC	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes in the Sierra Nevada; winters along the Colorado River and in parts of Imperial and Riverside counties; two small permanent populations in San Diego and Santa Barbara counties.	Breeds in lowland and foothill riparian woodlands dominated by cottonwoods, alders, or willows and other small trees and shrubs typical of low, open-canopy riparian woodland.	Potential to occur. The CNDDB (2016) and existing literature have no records for the yellow warbler within the LOHCP Plan Area.
California spotted owl (*Strix occidentalis occidentalis*)	-	CT	SSC	The south Cascade Range and northern Sierra Nevada from near Burney (Pit River), Shasta County, California south through the remainder of the western Sierra Nevada and Tehachapi Mountains to Lebec, Kern County.	In northern California it resides in dense, old growth, multi-layered mixed conifer, redwood, and Douglas-fir habitats. In southern California, it occurs at low elevations (sea level to 3,300 ft.), and occupies habitats dominated by hardwoods, primarily oak and oak-conifer woodlands.	Potential to occur. The CNDDB (2016) and existing literature have no records for California spotted owl within the LOHCP Plan Area, but suitable habitat is available.
Elegant tern (*Thalasseus elegans*)	-	-	WL	Breed in nesting colonies located in southern California. Disperse northward to central and northern California following breeding season.	Found along the shallow waters of estuaries and bays along the ocean. During the breeding season, they nest on sandy or rocky islands.	Potential to occur. The CNDDB (2016) and existing literature have no records for elegant tern within the LOHCP Plan Area, but suitable habitat is available.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
California thrasher (*Toxostoma redivivum*)	-	-	-	Endemic in what is known as the California Biotic Province (mostly in the western part of the state).	Breeds from sea level to the higher parts of the montane chaparral. It will breed in adjacent oak woodlands and pine-juniper scrub as well as occasionally in parks and gardens, but only if dense cover is available.	Potential to occur. The CNDDB (2016) and existing literature have no records for California thrasher within the LOHCP Plan Area, but suitable habitat is available.
Mammals						
Pallid bat (*Antrozous pallidus*)	-	-	SSC	Occur throughout California, except in the high Sierra Nevada.	Inhabit a variety of habitats, including grasslands, shrublands, woodlands, and forests from sea level up through mixed coniferous forests.	Potential to occur. The CNDDB (2016) and existing literature have no records for pallid bat occurrence within the LOHCP Plan Area, but suitable habitat is available.
Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*)	FE	SE	FP	Restricted to stabilized sand dunes south of Morro Bay in San Luis Obispo County.	Associated with coastal sage scrub and chaparral communities on stabilized sand dunes.	Known. The CNDDB (2016) has five records for Morro Bay kangaroo rat within the LOHCP Plan Area.
Southern sea otter (*Enhydra lutris nereis*[5])	FT	-	FP	Año Nuevo, San Mateo County to Point Sal, Santa Barbara County.	Shallow ocean waters, particularly in the vicinity of kelp beds.	Potential to occur. The CNDDB (2016) and existing literature have no records for southern sea otter within the LOHCP Plan Area, but suitable habitat is available.
Long-eared myotis (*Myotis evotis*)	-	-	-	Widespread in California but avoids the arid Central Valley and hot deserts. Occurs along the entire coast and in the Sierra Nevada, from sea level to at least 9,000 ft.	Prefers coniferous woodlands and forests, but is found in brush, woodland, and forest habitats.	Potential to occur. The CNDDB (2016) and existing literature have no records for long-eared myotis within the LOHCP Plan Area, but suitable habitat is available.

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]
San Diego desert woodrat (*Neotoma lepida intermedia*)	-	-	SSC	Found in two disjunct areas in California. Found throughout southern California, with range extending northward along the coast to Monterey County, and along the Coast Range to San Francisco Bay.	Common to abundant from sea level to 8,500 feet in a variety of habitats which includes Joshua tree, pinyon-juniper, mixed and chamise-redshank chaparral, sagebrush, and most desert habitats.	Potential to occur. The CNDDB (2016) and existing literature have no records for San Diego desert woodrat within the LOHCP Plan Area, but suitable habitat is available.
Harbor seal (*Phoca vitulina*)	-	-	-	Found on California islands and along entire mainland coast.	Prefers to remain close to shore in subtidal and intertidal habitats. Often swims into bays and estuaries. Groups form on emergent offshore and tidal rocks, mudflats, sandbars, and sandy beaches.	Potential to occur. The CNDDB (2016) and existing literature have no records for harbor seal within the LOHCP Plan Area, but suitable habitat is available.
Mexican free-tailed bat (*Tadarida brasiliensis*)	-	-	-	Found throughout California, mostly absent from high Sierra Nevada (from Tehama to Tulare cos.) and north coastal region (from Del Norte and Siskiyou counties to northern Sonoma County).	All habitats up through mixed conifer forests are used, but open habitats such as woodlands, shrubland, and grasslands are preferred. Requires caves, mine tunnels, crevices, or buildings for roosting and hibernation.	Potential to occur. The CNDDB (2016) and existing literature have no records for Mexican free-tailed bat within the LOHCP Plan Area, but suitable habitat is available.
American badger (*Taxidea taxus*)	-	-	SSC	An uncommon, permanent resident found throughout most of the state, with the exception of the North coast area.	Grasslands, savannas, mountain meadows, and openings in desert scrub.	Potential to occur. The CNDDB (2016) and existing literature have no records for American badger within the LOHCP Plan Area, but suitable habitat is available.

[1] **ESA Status:** Listing Status under the Federal Endangered Species Act

FE: Federal Endangered

FT: Federal Threatened

[2] **CESA Status:** Listing Status under the California Endangered Species Act

Table A-1: Animal Species Summaries

Species	ESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Area[4]

SE: State Endangered

ST: State Threatened

[3] Other State Designations

FP: Fully Protected - may not be taken or possessed at any time without a permit for necessary scientific research or relocation

SSC: Species of Special Concern

WL: Watch List - previously SSCs but no longer merit SSC status

[4] Based on known records and observations, which are not comprehensive of all actual occurrences and therefore underrepresent species distributions.

[5] The southern sea otter (*Enhydra lutris neris*) has a Special Species of Concern designation by the Marine Mammal Commission

A.2 Plant Species Summaries

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
Vascular Plants						
Hoover's bentgrass (*Agrostis hooveri*)	-	-	1B.2	Native and endemic to California. Occurs in Los Osos Valley, San Luis Valley, and the east slope of Santa Lucia Mountains in San Luis Obispo County and south to La Purisima Hills in Santa Barbara County.	Occurs in chaparral, cismontane woodland, and valley foothill grassland communities with dry sandy soil.	Potential to occur. The CNDDB (2016) and existing literature have no records for Hoover's bent grass within the LOHCP Plan Area.
Arroyo de la Cruz manzanita (*Arctostaphylos cruzensis*)	-	-	1B.2	Found in San Luis Obispo and Monterey counties.	Found in broad-leafed upland forest, coastal bluff scrub, closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland.	Known. The CNDDB (2016) has one record for Arroyo de la Cruz manzanita within the LOHCP Plan Area.
Santa Lucia manzanita (*Arctostaphylos luciana*)	-	-	1B.2	San Luis Obispo County endemic found in locally abundant stands in the southern portion of the Santa Lucia mountain range.	Found in chaparral and woodland areas, on shale substrates and outcrops on hill slopes.	Potential to occur. The CNDDB (2016) and existing literature have no records for Santa Lucia manzanita within the LOHCP Plan Area, which largely features inappropriate substrate for the species.
Morro manzanita (*Arctostaphylos morroensis*)	FT	-	1B.1	San Luis Obispo County, from Morro Bay to just south of Hazard Canyon.	The distribution of Morro manzanita is correlated with Baywood fine sand and is found in association with coastal sage scrub, central maritime chaparral, and coast live oak woodland communities in sites with no or low to moderate slopes.	Known. The CNDDB (2016) has three records for Morro manzanita, which is known to occur throughout much of the central maritime chaparral within the LOHCP Plan Area.

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
Oso manzanita (*Arctostaphylos osoensis*)	-	-	1B.2	Narrowly endemic to the mountains north of Los Osos Valley, San Luis Obispo County.	Grows in chaparral and in cismontane woodland on dacite porphyry buttes.	Known. The CNDDB (2016) has one record for Oso manzanita within the LOHCP Plan Area.
Pecho manzanita (*Arctostaphylos pechoensis*)	-	-	1B.2	California endemic found in the Pecho Hills area of San Luis Obispo County.	Closed-cone coniferous forest, chaparral, coastal scrub, siliceous shale outcrops.	Potential to occur. The CNDDB (2016) and existing literature have no records for Pecho manzanita within the LOHCP Plan Area.
Dacite manzanita (*Arctostaphylos tomentosa* ssp. *daciticola*)	-	-	1B.1	Near Cambria and northeastern portion of Los Osos Valley, San Luis Obispo County.	Located in chaparral and cismontane woodland on dacite porphyry buttes.	Potential to occur. The CNDDB (2016) and existing literature have no records for dacite manzanita within the LOHCP Plan Area.
Marsh sandwort (*Arenaria paludicola*)	FE	SE	1B.1	Occur within the counties of Los Angeles, San Bernardino (in southern San Bernardino), Santa Cruz (Felton), San Francisco (northern), and San Luis Obispo (Oceano).	Stoloniferous, perennial herb; blooms May to August; occurs in freshwater marshes and swamps, bogs, and fens, and some coastal scrub, ranging from 10 to 558 feet in elevation; common associates include Typha, Juncus, and Scirpus.	Known. The CNDDB (2016) has one record for marsh sandwort within the LOHCP Plan Area.
Coulter's saltbush (*Atriplex coulteri*)	-	-	1B.2	Primarily found in South Coast of California: Channel Islands and Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, and San Diego counties. Four record accounts in San Luis Obispo County (CalFlora 2011).	Coastal dunes, coastal scrub, and edges of coastal salt and brackish marsh and swamp communities between 1 and 35 m elevation.	Potential to occur. The CNDDB (2016) and existing literature have no records for Coulter's saltbush within the LOHCP Plan Area.
Cambria morning-glory (*Calystegia subacaulis* ssp*. episcopalis*)	-	-	4.2	Found in central Outer South Coast Ranges in San Luis Obispo County.	Chaparral and cismontane woodland at elevations from 60 to 500 meters. Perennial herb that blooms from April to May.	Potential to occur. The CNDDB (2016) and existing literature have no records for Cambria morning-glory within the LOHCP Plan Area.

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
Hardham's evening-primrose (*Camissoniopsis hardhamiae*)	-	-	1B.2	Grows in outer South Coast Ranges in both Monterey and San Luis Obispo counties.	Prefers sandy soil, limestone, and disturbed oak woodland.	Known. The CNDDB (2016) has one record for Hardham's evening-primrose within the LOHCP Plan Area.
Coastal goosefoot (*Chenopodium littoreum*)	-	-	1B.2	Endemic to the south central coast between Los Angeles and San Luis Obispo counties	Coastal dunes and other sandy soils	Known. The CNDDB (2016) has two records for coastal goosefoot within the within the LOHCP Plan Area.
Salt marsh bird's beak (*Chloropyron maritimum ssp. maritimum*)	FE	SE	1B.2	Cuesta-By-The-Sea and at Sweet Springs Marsh, San Luis Obispo County.	Grows in the higher reaches of coastal salt marshes to intertidal and brackish areas influenced by freshwater input.	Known. The CNDDB (2016) has one record for salt marsh bird's beak within the LOHCP Plan Area.
Compact cobwebby thistle (*Cirsium occidentale* var. *compactum*)	-	-	1B.2	Grows in Central Coast (San Luis Obispo, Monterey counties, formerly San Francisco).	Chaparral, coastal dunes coastal prairie, coastal scrub at elevations from 5 to 150 meters. Perennial herb that blooms from April to June.	Potential to occur. The CNDDB (2016) and existing literature have no records for compact cobwebby thistle within the LOHCP Plan Area.
Surf thistle (*Cirsium rhothophilum*)	-	ST	1B.2	An endemic to the dunes of southern San Luis Obispo and northern Santa Barbara counties.	Perennial herb; blooms April through June; ranges in elevation from 10 to 197 feet; occurs in coastal dune and coastal bluff scrub communities.	Potential to occur. The CNDDB (2016) and existing literature have no records for surf thistle within the LOHCP Plan Area.
Blochman's leafy daisy (*Erigeron blochmaniae*)	-	-	1B.2	Endemic to Santa Barbara and San Luis Obispo counties.	Rhizomatous, perennial herb; blooms July through August; ranges from 10 to 147 feet in elevation and occurs in coastal dunes and coastal scrub.	Known. The CNDDB (2016) has two records for Blochman's leaf daisy within the LOHCP Plan Area. Blochman's leafy daisy is also found in undisturbed areas of the LOHCP Plan Area (J. Chesnut, pers. comm.). The species has also been documented on Bayview Unit of the Morro Dunes E.R. (Holland and Kiel 1985).

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
Saint's daisy (*Erigeron sanctarum*)	-	-	4.2	Occur in Santa Barbara, Santa Cruz Island, Santa Rosa Island, and San Luis Obispo	Found in chaparral, cismontane woodland, and coastal scrub.	Known. The CNDDB (2016) has no records for Saint's daisy within the LOHCP. However, it has been documented throughout the LOHCP Plan Area by Holland and Keil (1985).
Indian Knob mountainbalm (*Eriodictyon altissimum*)	FE	SE	1B.1	Between San Luis Obispo and Pismo Beach on Indian Knob Ridge, San Luis Obispo County.	Central maritime chaparral and coastal scrub. Ridges in open, disturbed areas within chaparral on Pismo sandstone.	Known. The CNDDB (2016) has two records for Indian Knob mountainbalm within the LOHCP Plan Area; the one in the center of the Bayview Unit of the Morro Dunes Ecological Reserve is extant (USFWS 2016a).
Suffrutescent wallflower (*Erysimum suffrutescens*)	-	-	4.2	Found in coastal regions of Los Angeles County northward into San Luis Obispo, Santa Barbara, and Ventura counties.	Flowers from December to August and is found on stabilized coastal sand dunes and coastal scrub vegetation from 0 to 150 m elevation.	Potential to occur. The CNDDB (2016) and existing literature have no records for suffrutescent wallflower within the LOHCP Plan Area. However, this species has been documented on the Broderson Site and adjacent Morro Dunes Ecological Reserve (MBA 2008).
Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)	-	-	1B.1	Generally found in dry, sandy soils with coastal chaparral.	Sandy or gravelly sites in chaparral, cismontane woodland, and coastal scrub communities between 70 and 810 m elevation.	Known. The CNDDB (2016) has one record for mesa horkelia within the LOHCP Plan Area.
Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*)	-	-	1B.1	Found coastally along central coast and outer south coast ranges.	Perennial herb; blooms April through September; ranges from 33 to 656 feet in elevation; occurs in closed-cone coniferous forest, maritime chaparral, and coastal scrub on sandy or gravelly soils, often in open areas.	Potential to occur. The CNDDB (2016) and existing literature have no records for Kellogg's horkelia within the LOHCP Plan Area.

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)	-	-	1B.1	From interior portions of Monterey County, south to coastal and interior portions of San Diego County, and on Santa Rosa Island.	Occurs in coastal salt marshes.	Known. The CNDDB (2016) has one record of known occurrence for Coulter's goldfields within the LOHCP Plan Area. The species is also known to occur on the undeveloped lots at the shore end of Pine and Ramona (J Chestnut, pers. comm.).
Carmel Valley bush-mallow (*Malacothamnus palmeri* var. *involucratus*)	-	-	1B.2		Chaparral, cismontane woodlands; talus hills andslopes, sometimes on serpentine. Commonly found in burned area. Elevations from 90 to 3,500 feet.	Potential to occur. The CNDDB (2016) and existing literature have no records for Carmel Valley bush-mallow within the LOHCP Plan Area.
Crisp monardella (*Monardella undulata ssp. crispa*)	-	-	1B.2	Known in Santa Barbara and San Luis Obispo counties. Occurs in the dunes of Point Arguello, Guadalupe, Point Sal, Casmalia, and Oceano.	Rhizomatous, perennial herb; blooms April through August; ranges from 33 to 394 feet in elevation and occurs on sandy soils in coastal dunes and coastal scrub.	Potential to occur. The CNDDB (2016) and existing literature have no records for crisp monardella within the LOHCP Plan Area.
San Luis Obispo monardella (*Monardella undulata ssp. undulata*)	-	-	1B.2	San Luis Obispo monardella is found from Marin to Santa Barbara counties.	Occurs in coastal sand dune, chaparral, and coastal scrub communities.	Known. The CNDDB (2016) and existing literature have no records for San Luis Obispo monardella within the LOHCP Plan Area. However, Holland and Keil (1985) have documented the species within Los Osos.
Coast woolly-head (*Nemacaulis denudata* var. *denudata*)	-	-	1B.2	South central coast between San Luis Obispo and San Diego counties	Coastal dunes and beaches	Known. The CNDDB (2016) has one record for this species within the LOHCP Plan Area.

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
Short-lobed broomrape (*Orobanche parishii* ssp. *brachyloba*)	-	-	4.2	San Diego County, San Luis Obispo County, San Nicolas Island, Santa Catalina Island, Santa Cruz Island, San Miguel Island, Santa Rosa Island; Baja California and Isla Guadalupe, Mexico.	Found in coastal bluff scrub and coastal dunes.	Potential to occur. The CNDDB (2016) and existing literature have no records for short-lobed broomrape within the LOHCP Plan Area.
Sand almond (*Prunus fasciculata* var. *punctata*)	-	-	4.3	Endemic to Santa Barbara and San Luis Obispo counties.	Found in maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and sand.	Known. The CNDDB (2016) has no records for sand almond within the LOHCP Plan Area. However, previous surveys by Morro Group have documented sand almond within the LOHCP Plan Area.
Chaparral ragwort (*Senecio aphanactis*)	-	-	2B.2	Found growing in central western California, south coast, and Channel Islands.	Found in chaparral, cismontane woodland, coastal scrub/alkaline.	Potential to occur. The CNDDB (2016) and existing literature have no records for chaparral ragwort within the LOHCP Plan Area.
California seablite (*Suaeda californica*)	FE	-	1B.1	Grows along central coast and specifically occurs along the perimeter of Morro Bay in San Luis Obispo County.	It is restricted to the upper intertidal zone within coastal marsh habitat.	Known. The CNDDB (2016) has one known occurrence for California seablite within the LOHCP Plan Area in Baywood Park at Sweet Springs Marsh. It is also found on the shoreline of Morro Bay on undeveloped properties/
Lichens						
Spiraled old man's beard (*Bryoria spiralifera*)	-	-	1B.1	North and Central Coastal California endemic. Humboldt, Sonoma, Monterey, and San Luis Obispo counties.	Occurs on twigs and small branches of trees and older shrubs within coast live oak woodland, chaparral, and coastal scrub.	Known. The CNDDB (2016) and existing literature have three records for spiraled old man's beard within the LOHCP Plan Area.

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
Popcorn lichen (*Cladonia firma*)	-	-	2B.1	Believed to only occur in the Elfin Forest in Los Osos.	Common at the base of small shrubs.	Known. The CNDDB (2016) has three records for popcorn lichen within the LOHCP Plan Area.
Los Osos black and white lichen (*Hypogymnia mollis*)	-	-	-	Fog belt of Central California: Monterey, San Luis Obispo, Riverside, and San Diego County.	Occurs on bark and twigs of trees and older shrubs in Coast Live Oak Woodland, Chaparral, and Coastal Scrub.	Known. The CNDDB (2016) does not have any occurrences for Los Osos black and white lichen within the LOHCP Plan Area. The Consortium of North American Lichen Herbaria documents 5 occurrences of Los Osos Black and White lichen within the LOHCP Plan Area (CCH 2016).
Long fringed parmotrema (*Parotrema hypolecinum*)	-	-	-	Fog belt of Central and Southern California: Marin, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego County.	Occurs on bark and twigs of trees and older shrubs in Coast Live Oak Woodland, Chaparral, Coastal Scrub, and Arroyo Willow Series.	Known. The CNDDB (2016) does not have any occurrences for long-fringed parmotrema within the LOHCP Plan Area. The Consortium of North American Lichen Herbaria documents two occurrences of long fringed parmotrema within the LOHCP Plan Area (CCH 2016).
Splitting yarn lichen (*Sulcaria isidiifera*)	-	-	1B.1	Los Osos/Baywood Park area, San Luis Obispo County.	On trunks of coast live oaks, chamise and Ceanothus.	Known. The CNDDB (2016) has four records for splitting yarn lichen within the LOHCP Plan Area.

[1] **ESA Status:** Listing Status under the Federal Endangered Species Act

FE: Federal Endangered

FT: Federal Threatened

[2] **CESA Status:** Listing Status under the California Endangered Species Act

SE: State Endangered

ST: State Threatened

[3] **Other State Designations**

California Rare Plant Rank Designations:

List 1B: Plants rare, threatened, or endangered in California and elsewhere

Table A-2: Plant Species Summaries

Species	FESA[1]	CESA[2]	Other State[3]	Distribution	Preferred Habitat	Occurrence in LOHCP Plan Area[4]
List 2B: Plants rare, threatened, or endangered in California, but more common elsewhere						
List 3: Plants about which more information is needed—a review list						
List 4: Plants of limited distribution or infrequent presence throughout California —a watch list						
California Rare Plant Threat Ranks, represented as decimals after status categories (e.g., "List 1B.1"):						
0.1: Seriously threatened populations						
0.2: Marginally threatened populations						
0.3: Populations with limited threats						

[4] Based on known records and observations, which are not comprehensive of all actual occurrences and therefore underrepresent species distributions.

Appendix B Covered Species Profiles

B.1 Morro Shoulderband Snail (*Helminthoglypta walkeriana*)

B.1.1 Listing and Conservation Status

The Morro shoulderband snail (*Helminthoglypta walkeriana*: Helminthoglyptidae) is a federally listed threatened species (USFWS 1994, USFWS 2022). The U.S. Fish and Wildlife Service (USFWS) completed a recovery plan for the endangered snail and four plants from western San Luis Obispo County (USFWS 1998a) and designated critical habitat for Morro shoulderband snail (USFWS 2001). The USFWS conducted a five-year review for this species in 2006, providing additional information about its ecology and conservation status (USFWS 2006).

B.1.1.1 Recovery Plan

The recovery plan for Morro shoulderband snail, which also addresses Morro manzanita and Indian Knob mountainbalm and two other plant species that are not present in the LOHCP Area, identifies four conservation planning areas in and around Los Osos that support other listed and sensitive species and where recovery potential is high. Specific criteria used to designate the planning areas where conservation activities should be focused included:

1. The distributions of the Morro manzanita, Morro shoulderband snail, and Indian Knob mountainbalm overlap or are contiguous with one another, with historic or occupied habitat for the Morro Bay kangaroo rat, or with the distributions of other sensitive species; and,
2. Natural habitats are relatively large and unfragmented by development; or,
3. Natural habitats are in public ownership or are adjacent to areas that are already secured and are to be managed for their biological diversity.

The recovery plan set as a down-listing criterion protection of relatively unfragmented habitat blocks in each of the four conservation planning areas that can support populations that are large enough to minimize extinction risk in the short term (i.e., for the next 50 years). The recovery plan also provides guidance on management of these areas to recover the Morro shoulderband snail, which requires intact habitat that is relatively unfragmented by urban development, and is secure from threats of exotic snail predation, pesticides, recreational use, and invasion of exotic plants. Special management needs include controlling exotic pest plants to maintain intact native habitat, restoring and maintaining connectivity among isolated populations to preserve genetic diversity, controlling pesticides in snail areas, controlling exotic predatory snails, and restoring native plant communities.

In the first in-depth review of the species' status since the recovery plan was developed, the USFWS (2006) concluded in its five-year review that Morro shoulderband snail populations are stable to increasing, and that threats due to habitat loss and degradation have been reduced considerably. The USFWS also stated its intention to work to expand habitat maintenance activities in other areas essential for the species using habitat conservation plans and other regulatory mechanisms as applicable (USFWS 2006). A five-year review recommended that the species be down listed to 'threatened' (USFWS 2006). ON February 3, 2022 Morro shoulderband snail was downlisted from 'endangered' to 'threatened' (USFWS 2022).

B.1.1.2 Critical Habitat

The USFWS designated critical habitat for MSS throughout the species' existing range. Within this area, the primary constituent habitat elements are: sand or sandy soils needed for reproduction; a slope not greater than 10 percent to facilitate movement of individuals; and the presence of native coastal sage scrub vegetation. This vegetation is typically, but not exclusively, represented by mock heather (*Ericameria ericoides*), seaside buckwheat (*Eriogonum parvifolium*), eriastrum (*Eriastrum densifolium*), dune lupine (*Lupinus chamissonis*) and dudleya (*Dudleya sp*.); and in more inland locations by California sagebrush (*Artemesia californica*), coyote brush (*Baccharis pilularis*) and black sage (*Salvia mellifera*) (USFWS 2001).

Critical habitat mapped in three units total approximately 2,576[24] acres (Figure 4-4). The units correspond to the areas delimited in the recovery plan, with except that the Morro Spit and West Pecho units were merged for purposes of critical habitat (Figure 4-3).

Unit 1: Morro Spit and West Pecho: This unit consists of 1,831 acres of land that is largely (90.4%) protected and managed by Montaña de Oro State Park (Dunes Natural Preserve) and the City of Morro Bay (north end of spit), including the length of the spit and the foredune areas extending south toward Hazard Canyon, and private lands further inland. It features several significant viable populations of MSS and is deemed essential to maintaining genetic diversity of the species. The LOHCP Area includes 376 acres (20.5%) of this unit.

Unit 2: South Los Osos: Unit 2 features 331 acres on the lower slopes of the Irish Hills that supports central maritime chaparral and coastal sage scrub. Located almost entirely within the LOHCP Area (33, this area is considered essential to the conservation of the Morro shoulderband snail because, appropriate management maintain habitat allowing the core population to expand and threats to the species to be reduced (USFWS 2001). Of the 661 acres, 282 (85%) is protected within the Bayview Unit of the Morro Dunes Ecological Reserve and the County's Broderson Property.

Unit 3: Northeast Los Osos: This 414-acre unit, of which 274 acres (66%) is within the Plan Area, includes 256 acres (62%) that is protected in State and County-owned Elfin Forest Preserve and portions of Morro Bay State Park. It features 416 acres of undeveloped area between Los Osos Creek and Baywood Park, which supports coastal sage scrub, with scattered stands of central maritime chaparral and coast live oak woodland (*Quercus agrifolia*). Protection and recovery of this unit is essential to maintain the genetic variability of the species and the full range of ecological setting within which the snail is found. Habitat conditions are favorable for the expansion and persistence of the core population and, with the reduction of threats through appropriate management, this area could support a larger Morro shoulderband snail population and contribute to the recovery of the species (USFWS 2001).

[24] This is the acreage in a geographic information system shapefile produced by the USFWS, which differs slightly from the 2,556 acres listed in the critical habitat designation (USFWS 2001).

B.1.2 Available Information

Morro shoulderband snail research has examined the species taxonomy and morphology (Pilsbry 1939, Miller 1985, Roth 1985, Walgren 2003a, Tupen and Roth 2005) b), geographic distribution (Walgren 2003a), and habitat specificity (Adams et al. 2000, Reeves et al. 2000). These and other studies have used observations to hypothesize about aspects of the animal's dispersal (Walgren 2003a), parasitism (Hill 1974, Walgren 2003a), and competition within introduced snails (Hill 1974, Walgren 2003a). Additional information about the distribution, abundance, and habitat of MSS has been developed through pre-project surveys and salvage conducted to construct and hook up homes and business to the Los Osos Wastewater Treatment Plant (SWCA 2012-2017).

B.1.3 Taxonomy

Also commonly known as the banded dune snail (USFWS 1998a), the Morro shoulderband snail (*Helminthoglypta walkeriana*) is a member of the Helminthoglypta family which is in the Class Gastropoda of the Phylum Mollusca. Species in the genus *Helminthoglypta* occur in a wide range of habitats west of the Sierra Nevada from Baja California to southwestern Oregon (Miller 1985) and have similar shell characteristics, which include the shoulderband—a revolving dark band on the shell (Walgren 2003a). Based on morphometric analysis of shell characteristics, Walgren (2003b) recommended that MSS populations be divided into two subspecies, which were as recognized at the time of MSS listing in 1944 as *H. w. walkeriana* and *H. w. morroensis*. Roth and Tupen (2004) argued for the separation of two distinct species: *H. walkeriana* and *H. morroensis*. The USFWS accepted the results of Roth and Tupen (2004) that elevated to the taxa to the species level (USFWS 2006).

B.1.4 Description

Morro shoulderband snail is a terrestrial snail with a slightly translucent shell featuring 5-6 whorls. Its shell is 18-29 mm in diameter and 14-25 mm tall (Roth 1985). The Morro shoulderband snail can be differentiated from the Big Sur shoulderband snail (*Helminthoglypta umbilicata*) as the MSS has incised spiral grooves and an occluded umbilicus—the cavity in the center of the base of the shell that is surrounded by the whorls. Rather than a distinct band, the exotic brown garden snail (*Helix asper*) has a marbled color pattern on its shell and a completely occluded umbilicus (Roth 1985, Walgren 2003a). In differentiating between subspecies of *H. walkeriana*, Walgren (2003b) defined *H. w. morroensis* by its profuse, coarse, papillations (bumps) and weak incised spiral grooves and *H. w. walkeriana* by its weak papillation and strong incised spiral grooves. He found that *H. w. walkeriana* was larger at time of sexual maturity than *H. w. morroensis*.

B.1.5 Distribution

The current known range of Morro shoulderband snail is approximately 7,700 acres (Roth and Tupen 2004). Most of the area is centered on Los Osos north of Hazard Canyon, west of Los Osos Creek, and south of Morro Bay; however, it also includes a narrow strip of coastal dunes north of Morro Bay in Morro Strand State Park (Roth and Tupen 2004, USFWS 2006).

B.1.6 Habitat

Within the Los Osos area, the Morro shoulderband is primarily found on the Baywood fine sands soils and the active dunes of the Morro Bay sand spit (Walgren 2003a). In a single location, MSS were observed on a "clay" soil in Los Osos Oaks Reserve approximately 200 m from the nearest mapped Baywood fine sands soil. Based on this description, the "clay" soil was likely the Conception loam, which has a higher proportion of smaller soil particles (clay and silt) than Baywood fine sands (USDA 1984). However, other locations supporting live snails were all located on Baywood fine sand soils (Walgren 2003a).

Due to a combination of factors which affect plant growth, including topography, soil conditions, disturbance history, and land use history, the Baywood fine sand soils support a diverse mosaic of plant assemblages varying from open dunes to dense woodlands. Originally, MSS was thought to be restricted to coastal dune and scrub communities which predominant in the Los Osos region (Roth 1985, USFWS 1998a, 2001). It was hypothesized that early and mid-successional coastal sage scrub communities would provide optimal MSS habitat by featuring greater density of immature shrubs which, unlike mature shrubs, have lower branches in contact with the soil (Roth 1985).

The California Department of Parks and Recreation commissioned two studies to characterize the distribution and habitat of MSS within coastal dune and coastal sage scrub of the Los Osos region (Adams et al. 2000, Reeves et al. 2000), and a third study examined the distribution of MSS with respect to eucalyptus (Walgren and Andreano 2012).

Adams et al. (2000) examined vegetation characteristics near Shark's Inlet then sampled the abundance of MSS and characterized the vegetation in 101 plots randomly located in "representative vegetation" in the Montana de Oro and the Elfin Forest. The analyses based on biased sampling in which a greater number of plots were deliberately located within coastal sage scrub preclude determination of whether the MSS is preferentially found within the different community types described and mapped. The study did not examine potential correlations of snail distribution and abundance with individual plant species or other habitat characteristics. However, the researchers reported that, of the 44 MSS observed in the 101 sampled 20 m^2 circular quadrats, 26 were found in the litter under mock heather (*Ericameria ericoides*) and 14 were found under iceplant (*Carpobrotus* sp.) (Adams et al. 2000).

Reeves et al. (2000) sampled litter, vegetation, and MSS abundance in 3.14 m^2 quadrats located along transects deliberately located within known MSS populations at three sites: the Sand Spit and Sharks Inlet areas of Montaña de Oro State Park and the Elfin Forest. Their results indicated the following:

- MSS occurred in plots with 17% more litter cover by weight than habitat without;
- MSS occupied plots with 10% less open sand and therefore more plant cover;
- Species composition in plots with MSS differed from those without, though not single plant species were predictive of MSS occurrence;
- *Senecio blochmanii, Eriogonum parvifolium, Corethrogyne filaginifolia* var. *filaginifolia* and *Dudleya lanceolata* showed trends toward greater abundance in plots with MSS that those without MSS;
- *Corethrogyne filaginifolia* var. *californica* and *Artemesia californica* exhibited trends toward lower abundance in plots with MSS than those without MSS;

- MSS was more likely to be found in plots with greater percentage of vegetation in contact with the soil; and,
- Live MSS snails occurred with MSS shells in the 3.14 m^2 plots more likely than predicted by chance alone, suggesting that MSS may occupy the same small patches through time.

During a more recent distribution survey of the Los Osos Valley, Walgren (2003b) observed Morro shoulderband snails in a variety of plant associations that he classified as follows:

- coast live oak woodland;
- California annual grassland;
- dune lupine-goldenbush;
- introduced perennial grasslands (*Ammophila* sp. and *Ehrharta* sp.); and
- iceplants.

In a more recent study, Walgren and Andreano (2012) evaluated MSS distribution with respect to eucalyptus (*E. cephalocarpa*) in Montaña de Oro State Park and found just one MSS under the exotic tree canopy compared to 37 MSS in intact habitat away from the exotic trees. A lower number of MSS were similarly salvaged from eucalyptus litter than from coastal sage scrub and veldt grass areas in the Broderson site, as part of efforts to capture and relocate MSS at the Broderson site as part of the wastewater treatment plant (SWCA 2013). Though the mechanisms limiting MSS abundance under eucalyptus are unknown, it may reflect alterations in the availability of plant detritus, competition (including predation) by other snail species, and/or modifications to abiotic habitat conditions, including light, temperature, moisture, or soil chemistry (Walgren and Andreano 2012).

Though there is little information about the relative abundance of MSS within these communities, these observations suggest that the species occupies a wider range of plant communities within the Baywood fine sand soils than simply coastal dune and sage scrub. Importantly, the species has been found in association with a variety of anthropogenically disturbed habitat areas, including areas where coastal sage scrub has been converted to non-native grassland due to vegetation clearing and mowing, areas covered by veldt grass and iceplant, landscaping and ornamental plantings, woodpiles, and other habitats within developed areas and rights-of-way (SWCA 2013, 2014, 2015, 2016, and 2017). Indeed, frequent observation of MSS within a range of habitat conditions found within existing developed parcels areas as well as remaining vacant parcels suggest MSS has the potential to occur throughout the urban services line and Los Osos Wastewater Treatment Plant Area (Figure 2-2), as well as intact habitat on the perimeter of the Plan Area.

Based on his observations and the results of Adams et al. (2000) and Reeves et al. (2000), Walgren (2003a) suggests that snail presence may be primarily influenced by moisture retention and protection from solar radiation, which are in turn influenced by leaf litter density, vegetation density, and the extent to which the vegetation is in contact with the soil, and that the species of plant is less important in predicting soil presence than its habit or physiognomy. This finding is similar to that observed for the congener *H. arrosa*, which was deemed a habitat generalist as it inhabits a variety of coastal communities on Bodega Head, in Sonoma County, California (Van der Laan 1971).

B.1.7 Life History

Few studies have examined aspects of the ecology or life history of the Morro shoulderband snail. The following summary provides current known and hypothesized information; however, much more research is needed.

B.1.7.1 Longevity

No studies have examined the life cycle of MSS. Based on population biology research on the congeneric *Helminthoglypta arrosa* (Van der Laan 1971), Roth (1985) hypothesized that MSS may live six to ten years and reach sexual maturity at three years. Growth of MSS is determinant, and sexual maturity is reached shortly after maximum size is attained. When compared to adult MSS, immature shells are smaller, have fewer whorls, and lack an aperture lip (Roth 1985).

B.1.7.2 Activity and Behavior

Like all land snails, which are susceptible to desiccation, MSS activity is closely tied to moisture. They are primarily active during or soon after rainfall events during the wet season (November – March). During the dry season (May-October), their activity is tied to the occurrence of precipitation from dense coastal fog, which can be frequent especially during the early morning hours; however, they are occasionally observed during dry periods within the rainy season (Ballantyne 2016). During dry periods, MSS likely estivate within the litter layer or below ground covering vegetation to avoid desiccation (Roth 1985).

Morro shoulderband snails are most often observed underneath plant or litter cover. Hill (1974) noted that the five snails he located during searches of the lower limbs and litter of vegetation were attached to the undersides of limbs of mock heather (*Ericameria ericoides*). The five live MSS individuals observed by Roth (1985) were under a mat of *Carpobrotus* sp. (n=3) or under boards located in the habitat. Though the small number of observations and methods of searching in both studies do not enable definitive conclusions about microhabitat, these observations are consistent with the behavior of reducing exposure to radiant energy, wind, and predators. These observations are similar to those of the congener *H. arrosa*, which frequently attached to the trunks of bush lupine (*Lupinus arboreus*) in the coastal scrub of Bodega Bay, CA (Van der Laan 1971).

Roth (1985) did not locate MSS below the surface of the soil during excavations around the base of mock heather, and thus stated that it appears the species is not fossorial. He did not quantify the level of effort in the search, and it is not clear whether additional searches in different years, sites, and/or plant species might provide different results. During efforts to capture and relocate MSS as part of the Los Osos Wastewater Treatment Plan project construction, biologists observed MSS occurring in shallow divots in the soil, of no more than half of an inch (Belt 2016, Ballantyne 2016).

At Bodega Head in Sonoma County, a coastal area supporting coastal scrub vegetation, *H. aspersa* was typically active during reduce solar illumination, including under overcast skies and at night (Van der Laan 1971).

B.1.7.3 Reproduction

No studies have examined the reproductive ecology of Morro shoulderband snails. Based on a study of the congener *H. arrosa* in coastal Sonoma County (Van der Laan 1971) and the constraints on snail

activity that result from the marked dry season in the Mediterranean climate of Los Osos, Roth (1985) hypothesized that copulation, oviposition, and growth of MSS occur primarily during the wet season (November – April).

The eggs of MSS may be susceptible to mortality caused by desiccation or heat. Roth (1985) observed desiccated 2 mm diameter eggs in mock heather (*Ericameria ericoides*) litter on the Morro Spit, which he attributed to Helminthoglypta spp., though could not distinguish between *H. walkeriana* and *H. umbilicata*. Because most eggs of *H. arrosa* were viable (Van der Laan 1971), Roth (1985) suggested that drought and/or heat may have caused mortality of the eggs he observed. Due to the abundance of scattered eggs relative to the low density of live MSS, Roth (1985) speculated that the eggs were a result of several years of oviposition.

B.1.7.4 Feeding

There have been no studies to determine the feeding ecology of the Morro shoulderband snail. Hill (1974) suggests that the rows of small file-like structures in the radula (mouth parts) of the MSS are consistent with that of herbivorous land snails and that MSS may feed on fungal mycelia in litter. However, no studies have been conducted to test these hypotheses (Walgren 2003a).

B.1.7.5 Competition

Within the Los Osos Valley, MSS co-occur with four other snail species: Big Sur shoulderband (*Helminthoglypta umbilicata*), Chorro shoulderband snail (*H. morroensis*), brown garden snail (*Helix aspersa*), cellar glass snail (*Oxychilius cellarius*), and California lancetooth (*Haplotrema minimum*; Walgren 2003a, Tenera 2006). Hill (1974) suggested that, because brown garden snails co-occur with MSS and because he observed each species on the same plant, brown garden snails compete with MSS.

Roth (1985) and Walgren (2003a) both point out that there is weak evidence to support the claim that brown garden snails compete with MSS. Roth (1985) observed that brown garden snails inhabit the interior portions of shrubs and MSS the litter near the canopy edge. Walgren (2003a) noted that the brown garden snail is primarily found in wetter microsites, including perennial wetlands, along estuaries and riparian edges, and near human structures, where MSS are also known to occur (SWCA 2013).

In the 101 sampled 20m^2 circular quadrats located within coastal dune and sage scrub within Montaña de Oro State Park, Adams et al. (2000) found 46 Morro shoulderband snails in a total of 21 quadrats, 2 of which contained a total of 6 live brown garden snails, and 9 of which contained a total of 37 Big Sur shoulderband snails. The researchers note that the greatest number of MSS were observed in two quadrats that lacked Big Sur shoulderband and brown garden snails (n=10 and n=4). However, this observation could suggest different microhabitat affinities (Walgren 2003a) as well as interspecific competition.

Though more research is needed to evaluate the effects of competition on MSS, management should still prevent the invasion and spread of brown gardens snails, as well as other exotic animals, into MSS habitat.

B.1.7.6 Predation

Heagy (1980) speculated that deer mice (*Peromyscus maniculatus*), alligator lizards (*Elgaria coerulea*), and unidentified beetles may prey upon MSS as they do with other snail species. Roth suggested that a broken MSS shell was indicative of rodent kill (Roth 1985). The shells of MSS have been observed on the feeding perches of unidentified birds (Walgren 2004.).

In nearby Diablo Canyon, the Decollate snail (*Rumina decollata*), an introduced, predatory snail, has been observed. These snails are sold in nurseries in unregulated counties and states as a way to control garden snails. Introduction of this snail may present a threat to MSS (Walgren 2004). It is unknown whether these snails currently occur within the range of Morro shoulderband snail.

B.1.7.7 Parasitism

The presence of Sarcophagid fly puparia (pupa casings) within Morro shoulderband snail shells has lead researchers to hypothesize that MSS are parasitized by these flies (Hill 1974, Roth 1985). Walgren (2003a) points out that the presence of puparia cannot be used to infer parasitism as Sarcophagid flies commonly feed on dead flesh and may simply be saprophagous (i.e., carrion feeders). In their study, Adams et al. (2000) observed no evidence of parasitism in 121 live MSS and Big Sur shoulderband snails sampled. Based on his literature review, field observations, and discussions with entomologists, Walgren suggests that the pupae found in MSS shells are from consumption of already dead snails (Walgren 2003a).

Two studies have documented the frequency of occurrence of Sarcophagid fly puparia within MSS shells. Walgren (2003a) found that the frequency of puparia presence ranged from 1.9% to 32% among 7 sites sampled throughout the range of H. w. walkeriana and H. w. morroensis. At Montaña de Oro State park, Adams et al. (2000) found that 3.7% (4 of 109) of MSS shells had Sarcophagid fly puparia.

If the presence of puparia does indeed indicate parasitism-induced mortality, it is not clear how these rates of would influence MSS population dynamics and persistence. Moreover, though attempts to identify the species of fly found in MSS shells have been foiled by difficulty in rearing the larva in the lab, there is no current evidence that the species of fly observed in MSS shells is non-native or introduced (Walgren 2003a).

B.1.8 Population Abundance and Density

No studies have quantified the abundance of MSS. In 1985, Roth estimated the total abundance of MSS as “in the hundreds”, though added that additional field research would be required to accurately estimate abundance (Roth 1985). Adams et al. (2000) sampled density of MSS in 101, 20 m^2 circular quadrats located on transects deliberately placed in habitat known or hypothesized to support populations of MSS. They reported densities ranging from 0 – 10 snails/ 20 m^2 but did not report the mean or variance for the samples. Though Reeves et al. (2000) also counted the number of MSS found within sampled quadrats along transects, they did not report the density of individuals observed.

Walgren (2003a) examined MSS presence/absence and thus did not report population abundance, though thought that, based on the number of individuals observed during distribution sampling, the population is likely greater than the hundreds estimated by Roth (1985).

As part of efforts to minimize the impacts of installation of the Los Osos Wastewater Treatment Plant and associated connections (i.e., laterals), biologists have conducted pre-disturbance surveys to capture and relocate MSS from disturbance areas since 2012. These surveys have been conducted on the County's Broderson and Midtown properties, where the wastewater treatment infrastructure was installed, and on hundreds of residential and commercial parcels, as well as adjacent County rights-of-where, where landowners are connecting buildings to the collection system. Since 2012, 2,121 MSS have been encountered during the surveys (SWCA 2016 and 2017). The survey reports do not indicate the total number of parcels or area surveyed, nor do they report negative findings, such that it is not possible to use these data to assess MSS frequency or density. Nonetheless, these surveys have indicated that MSS can be very abundant in the Plan Area, both in intact habitat as well as degraded habitat associated with existing development. For example, 404 MSS were captured at the County's 12.2-acre Midtown Property, while 245 were captured in a 0.14-acre parcel near San Luis Avenue and 6th Street (SWCA 2016).

B.1.9 Dispersal and Colonization

No studies have examined dispersal of MSS. Active dispersal of MSS would likely involve slow, short distance migration during periods of favorable conditions. Over time, perhaps several generations, the species could actively disperse larger distances, provided populations persist and favorable conditions are maintained.

As with other land snails, MSS active dispersal may be limited by natural and anthropogenic barriers. Natural barriers, such as bodies of water or inappropriate vegetation types (e.g., dense riparian vegetation or woodlands), may inhibit dispersal, either by preventing snail locomotion or by lacking the appropriate stimulants, such as food odors, to attract snails (New 1995). Human-created barriers such as structures, landscaping, wide trails, and roads can similarly inhibit snail movement. Roads may present particular barriers as they can cause desiccation if the snails cannot create sufficient mucus to traverse the dry surfaces.

Morro shoulderband snails might be able to disperse across barriers and over larger distances through passive migration. Various mammals, birds, and insects may vector the species, as could wind or rafting on floating objects. Human activity might also result in longer distance dispersal of MSS.
Walgren (2003a) suggests that MSS have colonized areas that were previously unoccupied. He observed live or recently dead MSS in three locations that had either been highly disturbed or created in the recent past (an artificial peninsula and an artificial dune created by deposition of dredged material and a former mine). Though they were not known to be deliberately introduced, it is not clear whether MSS naturally dispersed or if their colonization resulted from anthropogenic factors (Walgren 2003a).

B.1.10 Threats

Due to its limited geographic range (Los Osos Region) and narrow habitat specificity (Baywood fine sand soils and stabilized dunes), the Morro shoulderband snail is naturally rare. Though the original acreage of habitat occupied by the species is unknown, loss of habitat due to conversion for development and agriculture has no doubt reduced the distribution and abundance of MSS. Fragmented habitat may support smaller populations of MSS that would be more vulnerable to extirpation due to environmental stochasticity, such as fire, drought, or disease, reductions in population growth due to insufficient population size (Allee effects), and reduced fitness due to inbreeding depression. Frequent observations

of MSS in areas of anthropogenically modified habitat, including landscaped areas (SWCA 2013), suggest populations may be able to persist in such areas.

Little is known about the factors that influence the distribution, abundance, and population persistence of Morro shoulderband snails, making it difficult to understand the threats to the populations within protected habitat. Previous reports have identified parasitism by Sacrophagid flies and competition from brown garden snails (*Helix asper*) as potential threats to MSS populations (Hill 1974, USFWS 1994, 2001); however, the five-year review for MSS concluded that there is no evidence to substantiate these threats (USFWS 2006).

Three additional factors that may threaten the persistence of MSS even within protected habitat: wildfire, unnatural succession due to fire exclusion, disturbance due to recreation, and the invasion and spread of exotic species.

B.1.10.1 Fire

A large wildfire could potentially threaten persistence of Morro shoulderband snail populations. Snails cannot evade fire, and unless the fire is cool or very patchy, it will likely kill all snails. Arson within Morro Strand State Beach killed all snails within the approximately three-acre area burned (M. Walgren, pers comm. 2004). State Parks ecologists have established permanent plots to monitor potential snail recolonization from adjacent, intact habitat; however, no data are yet available (Walgren 2003a).

Prescription fires designed to simulate the natural fire regime of the Baywood fine sand communities, increase native biodiversity, and facilitate populations of fire-adapted species including Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*), Morro manzanita (*Arctostaphylos morroensis*), and Indian Knob mountainbalm (*Eriodictyon altissimum)* could directly negatively impact populations of Morro shoulderband snail. Roth (1985) observed two recently dead MSS shells and no live snails after a 19-acre prescription fire in coastal sage scrub designed to enhance Morro Bay kangaroo rat habitat. Fire management should incorporate avoidance and minimizations measures designed to reduce the potential for such direct negative impacts and maximize the potential for fires to facilitate long term persistence of MSS populations, including removing snails prior to conducting burns and using small, narrow, rectangular burns that can enhance the likelihood of snail recolonization (Roth 1985, Simmons et al. 1995).

B.1.10.2 Fire Exclusion

Roth (1985) has hypothesized that MSS population growth is maximized in early to mid-successional coastal sage scrub habitat, where younger shrubs provide softer tissues for food and foliage that is contiguous with the ground litter layer, for shelter. Unnatural succession of the coastal dune and sage scrub plant communities due to widespread fire exclusion could reduce the areal extent of such early and mid-successional assemblages. The extent to which fire threatens MSS populations is unclear, however, because the species' specific habitat requirements are uncertain. Moreover, though fire is a natural component of the Baywood fine sand communities, aspects of the natural fire regime and the successional relationships between the plant assemblages are unknown. More research is needed to understand the role of fire in maintaining habitat conditions required for MSS.

B.1.10.3 Recreation

Recreation within the Baywood fine sand communities causes disturbance. It removes established plant cover, including litter, and depending on the intensity and frequency, causes erosion and prevents plant re-establishment. Because plants and their litter create cover and shade and retain moisture required by MSS, recreation that removes plant and litter cover degrades or removes habitat for MSS. Recreation can also directly kill MSS, as their size and low vagility limits their ability to move away approaching humans, horses, and bicycles. Dogs allowed to wander unrestrained through the habitat may eat, harass, or otherwise impact MSS. Equestrians and humans could also trample MSS.

B.1.10.4 Exotic Animals

Exotic animals including rats (*Rattus rattus* and *R. norvegicus*) and feral cats (*Felis domesticus*) may prey upon MSS and could reduce their populations. This potential has increased the proximity of MSS habitat to development, with which these species are associated. Introduced predatory snails such as *Oxycheilus* sp. and the Decollate snail (*Rumina decollata*), which was recently identified in Diablo Canyon, could similarly negatively impact MSS populations (Roth, 1985, Walgren 2004); however, there is currently no direct evidence that exotic animals impact MSS populations (USFWS 2006).

B.1.10.5 Exotic Plants

The invasion and spread of exotic plant species can potentially threaten the persistence of MSS populations by degrading habitat and thus reducing or eliminating MSS populations. Many exotic plants are presently found within remaining intact habitat in the Los Osos region. These species vary greatly in their distribution, abundance, and aspects of their ecology that influence their potential impacts to MSS, which also depend on aspects of MSS ecology.

In general, exotic plants might indirectly threaten MSS populations by a variety of mechanisms. First, invasive, exotic trees can transform the native shrublands into woodlands, rendering habitat conditions unsuitable for MSS. In a recent study, MSS was not observed within stands of eucalyptus (*Eucalyptus* sp.) (Adams et al. 2000) and MSS has not been described as occurring in eucalyptus forests in any other studies (Walgren 2004). These trees have invaded native vegetation from initial plantations in Montaña de Oro State Park and Los Osos. They produce abundant shade and litter and competitively exclude native shrubs and herbs, thus limiting the distribution of MSS. Other exotic trees within the region including Monterey pine (*Pinus radiata*) and Monterey cypress (*Callitropsis macrocarpa*) might similarly restrict the distribution of MSS.

Herbaceous exotic plant species including iceplants and grasses can outcompete and, in some cases, competitively exclude native plant species on which MSS might rely for food or shelter. The threatened snail has been found in a wide variety of plant assemblages on the Baywood fine sands, including those dominated by invasive exotic species including iceplant (*Carpobrotus* spp.), veldt grass (*Ehrharta calycina*), and annual grasses (*Avena* spp., *Bromus diandrus*, and *B. rubens* ssp. *madritensis*) (Walgren 2003a), as well as fennel (*Foeniculum vulgare*), and ornamental/landscape plants (SWCA 2013). Though these exotic plants may not restrict the distribution of MSS, areas infested by these exotic plants may support smaller populations of MSS, though this has not yet been examined.

Finally, exotic plants can enhance the flammability of the vegetation and thus increase the risk of wildfire, thus indirectly threatening MSS populations. Eucalyptus is highly flammable while the annual

and perennial grasses that have invaded coastal sage scrub create dry, fine fuels in the summer that are highly flammable. MSS populations are likely to be completely eliminated by fire, as discussed above.

B.2 Morro Manzanita (*Arctostaphylos morroensis*)

B.2.1 Conservation Status

Morro manzanita (*Arctostaphylos morroensis* Wiesl & B. Shreiber Ericaceae), is a federally listed threatened species (USFWS 1994) and is ranked as most threatened and endangered according to the California Rare Plant Ranking (List 1B.1; CNPS 2016).

B.2.2 Available Information

A number of studies have examined many aspects of Morro manzanita biology, including: distribution and morphological variation (Mullany 1990), seed ecology and reproductive biology (Tyler and Odion 1996, Tyler et al. 1998, Tyler et al. 2000), and seed bank response to prescribed burning (Tyler et al. 2000, Odion and Tyler 2002). Research conducted on other species of *Arctostaphylos* in California, particularly those occurring in central maritime chaparral, provides additional information to help conserve and manage the endangered shrub. The USFWS conducted a five-year review for this species in 2008, providing additional information about its ecology and conservation status (USFWS 2008).

B.2.1 Distribution

Morro manzanita is endemic to the Los Osos region in coastal San Luis Obispo County where it occurs primarily on Baywood fine sands soils. Based on the likely historic distribution of these soils, Morro manzanita may have covered between 2,000 and 2,700 acres (McGuire and Morey 1992). Much of the Morro manzanita habitat has been converted for development, especially in the center of its historic range which is now occupied by the community of Los Osos. Currently, the range of *A. morroensis* is estimated to be approximately 840-890 acres, with the total number of individuals ranging between 86,000 and 153,000 (Crawford, Multari and Clark 2005).

B.2.2 Biology

B.2.2.1 Morphology

Morro manzanita is an evergreen tree-like shrub that grows to be 1.5-4.0 m tall. This non-burl forming manzanita has deep red stems with gray, shredding bark. The 2.5- to 4-cm long leaves are oblong to ovate to elliptic. Attached to the stems by 2- to 6-mm long petioles, Morro manzanita leaves nearly overlap along the stem, resulting in a whorled appearance despite their alternate arrangement (Hickman 1993). The upper surface of the leaves is dark green and smooth but can have a gray appearance due to a white or bluish film. The lower leaf surface is gray, owing to dense white hairs (Hickman 1993). Morro manzanita has white to pinkish urn shaped flowers that are 5- to 9-mm long and occur in dense racemes at the end of branches. The 8-13 mm diameter fruits are red to orange brown and contain 8 - 10 seeds each (Hickman 1993, USFWS 1994).

Morro manzanita can be differentiated from the co-occurring La Cruz manzanita (*Arctostaphylos cruzensis*) by the endangered shrub's shaggy grey bark, leaf base shape, and short woolly hairs on its lower leaf surface (USFWS 1994).

B.2.2.2 Phenology

Morro manzanita flowers in the mid-winter through early spring (January-May) and develops fruit between early spring (March) and early summer (Tyler et al. 2000). A 1999 study showed that fruits begin to fall from the plant as early as May, with the majority falling between August and early October (Tyler et al. 2000).

As with other shrubs in California's Mediterranean climate, Morro manzanita seeds likely germinate with the onset of the rains between October and December. In a study examining post-fire seedling establishment, maximum seedling abundance was observed in March, though no observations were made prior, making it difficult to say how early the seedlings established.

B.2.2.3 Life History

The age or size of shrubs at the onset of reproduction is currently unknown. Observations of small plants (<50 cm tall) with fruits on the old Broderson Road at the Bayview Unit of the Morro Dunes Ecological Reserve suggest that plants become reproductive within 5-8 years of establishment (J. McGraw, pers obs.)

Morro manzanita adults may be relatively long-lived. Analysis of historical aerial photographs combined with dendrochronology (annual ring counting of shrub stems) suggested that the oldest stands of Morro manzanita were 62 years old (in 2011); however, these analyses were constrained by the fact that earliest aerial photographs of the region were from 1949 (Tyler and Odion 1996). Tyler et al. (1998) observed recent mortality in the Elfin Forest stand, which was hypothesized to be the oldest stand of Morro manzanita (Tyler and Odion 1996). However, it is not known whether this mortality was the result of senescence or other site-specific conditions (e.g., soil pathogens).

B.2.3 Ecology

B.2.3.1 Habitat Preference

Though small portions are located on Santa Lucia shaly clay loam, Morro manzanita primarily occurs on the Baywood fine sand soils (Tyler et al. 2000). Formed from Pleistocene aeolian sand dunes, these soils are very deep and somewhat excessively drained. Due to its relatively coarse nature, the Baywood fine sand soils have low water holding capacity and, relative to loam and clay soils, low nutrient availability (H).

Of the three slope categories in the Baywood fine sand series (2-9% slope, 9-15% slope, and 15-30% slope), Morro manzanita cover is greater on the 9-15% and 15-30% slopes (Tyler and Odion 1996). This pattern may reflect the species' requirement for older, more developed soils that may feature a clay lens, which increases water holding capacity and thus is more conducive to the growth of large statured plants including Morro manzanita (JSA 1997). It could also reflect the disproportionately high rate of habitat conversion on areas of gentle slopes, which have been more recently cleared for agriculture than the steeper slopes (Tyler and Odion 1996). Determining whether Morro manzanita can persist on

gentle slopes and whether it did prior to human alterations in the region is important for restoration and management.

B.2.3.2 Reproduction

Morro manzanita flowers are perfect; they contain both stamens and a pistil. These flowers are not self-fertilized, however, and instead require pollination to produce viable seed (Tyler et al. 1998, Tyler et al. 2000). It is not known whether plants are self-compatible; that is, whether viable seed can be produced from pollen from the same plant.

B.2.3.3 Pollination Biology

Pollinator studies conducted in 1998 and 1999 revealed that the most abundant pollinators of Morro manzanita were bumblebees (*Bombus vosnesenksii*). Addition pollinators include an Anthophorid bee (*Anthophora urbana*), several bee flies (*Bombylius* sp.) and Syrphid flies. In both years, the researchers noted the surprising low abundance of pollinator activity, even on warm, sunny days (Tyler et al. 1998, Tyler et al. 2000).

There is no record of Morro manzanita nectar robbery, in which animals obtain nectar from without pollinating the flower, typically by accessing nectaries through the corolla wall, rather than its aperture. Nectar robbery was observed to reduce seed production in the endangered silverleaf manzanita (*Arctostaphylos silvicola*), endemic to northern maritime chaparral in Santa Cruz County (Jacobson 1994).

B.2.3.4 Fruit Set

In 1998, an average of only 10% of Morro manzanita flowers produced fruits (Tyler et al. 1998). This rate is expected to vary from year to year depending on pollinator abundance, which can be influenced by spring weather, and flower production, which can be influenced by rainfall in the previous year when buds are produced (Keeley 1977).

B.2.3.5 Seed Biology

Morro manzanita is an obligate seeding species (Hickman 1993). Unlike many manzanita species (e.g., *Arctostaphylos tomentosa*), it does not have an underground burl from which it can regenerate following moderate to high intensity fires that consume aboveground biomass. Instead, population persistence requires successful germination of seeds.

Extensive research has been conducted to determine the factors which might influence the regeneration of Morro manzanita from seed following disturbance (Tyler and Odion 1996, Tyler 1996, Tyler et al. 1998, Tyler et al. 2000).

B.2.3.6 Seed Production

From limited available data, it is estimated that Morro manzanita produces 8-10 seeds per fruit (USFWS 1994).

B.2.3.7 Seed Predation

A 1998 study examining Morro manzanita fruit predation found that an average of 60% of fruits were removed from trays located under and away from Morro manzanita shrubs over a 46-day period (Tyler et al. 1998). Rodents, including woodrats (*Neotoma lepida*) and brush rabbits (*Sylvilagus bachmani*), were hypothesized to be responsible for removing fruits as their nests and scat, respectively, were observed near the experimental trays in which the fruits were placed. Because the fruits were presumed to be removed by small mammals, which eat seeds within the fruits (Keeley and Hays 1976), the authors concluded that fruit predation results in seed predation and thus dramatically reduces the amount of available seed (Tyler et al. 1998).

B.2.3.8 Seed Dispersal

Birds and large mammals including by coyote (*Canis latrans*) and mule deer (*Odocoileus hemionus*) may eat Morro manzanita fruits from the stems and perhaps disperse viable seed as observed for other species of manzanita (Keeley and Hays 1976). However, the majority of Morro manzanita seeds likely fall to the soil below. These may be secondarily dispersed by birds and mammals. Seeds not killed during digestion can be dispersed by these animals. However, a study in another California chaparral system found that the majority of *Arctostaphylos* seeds remained within the canopy radius (Keeley 1977). Tyler and Odion (1996) found that that soil cores extracted from 1.5 m away from the canopy edge had an average of 90% fewer seeds than cores taken below the Morro manzanita canopy, suggesting secondary dispersal is likely limited.

B.2.3.9 Seed Viability

Studies have found that Morro manzanita seed obtained from the litter and soil has low viability (Tyler and Odion 1996, Tyler et al. 1998, Tyler et al. 2000). In 1996, mean seed viability across four sites was 4.8%, with the Elfin Forest sites having only 1.7% viable seed. In both 1996 and 1998, 45% of seeds examined lacked an embryo (Tyler and Odion 1996, Tyler et al. 1998). Such low fertility could indicate inbreeding problems associated with small populations (Tyler and Odion 1996).

Viability was slightly, but significantly lower in the litter (3.6%) compared to the soil (5.8%) (Tyler et al. 2000). Seed viability varied among sampled shrubs and ranged from less than 1% to 11% (Tyler et al. 2000). Viability was not lower in the soil at a depth of 5-10 cm, compared the top 5 cm of soil (Tyler and Odion 1996). Viability of seed collected under and dead live shrubs also did not significantly differ (Tyler et al. 1998).

B.2.3.10 Seed Dormancy

Morro manzanita exhibits some seed dormancy; some viable seed does not germinate but instead persists over several years and perhaps decades despite the presence of appropriate environmental cues during the fall/winter seasons. Though research has not specially examined the dormancy mechanism for Morro manzanita seeds, congeners including *Arctostaphylos glandulosa, A. patula, A. uva-ursi* and *A. alpina* all exhibit physiological dormancy: a physiological inhibiting mechanism prevents germination of the seed even in the presence of appropriate environmental conditions (Baskin and Baskin 2001). This dormancy is likely overcome by warm and/or cold stratification (Keeley 1977, 1991, Baskin and Baskin 2001). These species are found in different habitats and not surprisingly, require different temperature regimes to break dormancy (Baskin and Baskin 2001).

Laboratory studies (Tyler et al. 1998, Tyler et al. 2000) indicated that there is not complete dormancy in Morro manzanita, since some seeds do germinate without any stratification, scarification, or treatment other than watering. Tyler et al. 2000 found 40% germination of viable seeds in controls. Seed treated with heat and charate to simulate the effects of fire germinated at a rate 80%, however.

B.2.3.11 Seed Bank

As a result of its dormancy, Morro manzanita has a seedbank—a population of viable seed in the soil and litter. A series of studies investigating the distribution and abundance of seed in the seedbank have found the following (Tyler and Odion 1996, Tyler et al. 1998, and Tyler et al 2000):

- 80% of seed occurred in the top 5 cm of the soil, and 20% in the lower 5 cm;
- 10 times more seed is found under the shrub canopy than 1.5 m away;
- a mean of 1,482 viable seeds/m^2 were observed across four sites, which varied greatly
- 35% fewer seeds were found under dead shrubs than live shrubs at the Elfin Forest;
- sites differed significantly in total seed in the seed bank;
- approximately 600 seeds/m^2 (not all viable) were added to the seedbank each year;
- sites vary in seed production and predation, and thus the amount of seed added to the bank; and,
- prescription fire greatly reduced the density of viable seed in the top 5 cm of the soil.

B.2.3.12 Seed Germination

Fire enhances Morro manzanita seed germination. Tyler et al. (2000) evaluated the combined effect of heat and charate--chemicals resulting from combustion of plant material--in overcoming dormancy and initiating Morro manzanita seed germination. They found that untreated, viable seed germinated at a rate of 40% while seed treated with heat and charate germinated at a rate of 80% (Tyler et al. 2000).

Morro manzanita germination was measured following a prescription fire (Tyler et al. 2000), though the lack of control plots limited the ability to evaluate the effects of fire on seed germination. Seedlings established at equal rates during the first two years following the prescription burn after which the plots were not monitored (Tyler et al. 2000). Other studies of fire in maritime chaparral have found no shrub emergence after the first year following fire, perhaps because the seed bank was exhausted by fire induced germination and mortality (Keeley 1991, Odion 2000, Odion and Davis 2000). Though the authors note that no studies have documented germination of obligate seeding species more than two years following fire (Tyler et al. 2000), they also suggest that seedling establishment occurred at rates lower than expected based on analysis of the post fire density of viable seed. In the absence of ongoing monitoring of the prescribed burn plots, it is not clear whether additional Morro manzanita seedlings may have established following the prescribed burn.

Like other obligate seeding species in the genus, *Arctostaphylos morroensis* may experience increased seed germination following fire. However, even in “refractory seed species”, in which germination is triggered by an environmental stimulus, some of the seed crop is non-refractory; it will germinate without the stimulus (Keeley 1991). This could explain the low density of Morro manzanita seedlings

observed in areas of the Bayview Unit of the Morro Dunes Ecological Reserve that have not likely burned in decades (J. McGraw, pers obs.).

B.2.3.13 Seedling Establishment

Though seeds of Morro manzanita can germinate in the absence of heat and charate under laboratory conditions (Tyler et al. 2000), very few young Morro manzanita are found in unburned areas. One exception is in an area that receives chronic soil disturbance due to recreation and associated erosion on the old Broderson Road in the Bayview Unit of the Morro Dunes Ecological Reserve. There, a stand of approximately 10 Morro manzanita that are juvenile to small adult (< 50 cm tall but reproductive) occur along a deep gully that presumably was caused by water erosion on the steep slopes of the former road (J. McGraw, pers obs.). It is possible that these individuals were planted as part of an informal restoration project; however, there has been no indication that this is the case.

These observations suggest that soil disturbance may create aspects of this fire-adapted species' regeneration niche. However, more research is needed to determine whether other disturbances can be used to successfully establish Morro manzanita seedlings. In a field experiment in another maritime chaparral system, *A. purissima* seedling establishment was enhanced by fire but not manual removal of shrubs, suggesting some aspect of fire (e.g., heat or charate) is required for germination (Tyler 1996). It is important to note that Morro manzanita seedling establishment may result in the absence of disturbances, as laboratory trials found that some seed germinated without treatments intended to remove the dormancy mechanism (Tyler et al. 1998, 2000).

Morro manzanita seedlings established even in sample plots that lacked adults prior to prescription fire (Tyler et al. 2000). Though none of the seedlings survived, their establishment itself surprised the researchers, given the low density of viable seed detected in soil cores obtained away from shrub canopies (Tyler et al. 1998).

B.2.3.14 Seedling Survival

Morro manzanita seedlings are highly susceptible to mortality. The first-year cohort (annual crop of seedlings) following fire exhibited 95% mortality over 1 year (March 1998 to March 1999); only 2 of the 41 sampled seedlings surviving the first year (Tyler et al. 2000). Survivorship was not monitored further, nor was survivorship of the second-year cohort examined.

Mortality was likely caused by several factors including desiccation stress and herbivory. Available soil moisture in the sandy soil is low throughout the year and may result in mortality during the long summer drought (May-October). Seedling mortality caused by herbivory by both large (deer) and small (rabbits) mammals might have also been a factor. The authors speculate that the small burn size may have resulted in unnaturally high levels of herbivory and thus seedling mortality. Trampling may have also reduced survival of small seedlings (Tyler et al. 2000).

B.2.3.15 Adult survivorship

No studies have examined the factors affecting survival of adult Morro manzanita; however, observations suggest that survivorship is high. In 1998, Tyler et al. observed mortality of adults in the Elfin Forest stand, which was hypothesized to be the oldest stand of Morro manzanita. However, it is not

known whether this mortality is due to senescence or other site-specific conditions (e.g., disease). Mortality may increase as the stands age and individuals become more susceptible to disease.

B.2.4 Threats

B.2.4.1 Habitat Loss

As a narrowly distributed endemic species, Morro manzanita is threatened by habitat destruction. The loss of habitat due to conversion for development and agriculture has reduced the areal extent of the species by over 50% and fragmented remaining habitat patches (Tyler et al. 2000). As a result, the overall population of Morro manzanita has been reduced, and remaining populations are artificially small. Small populations face greater extinction risks due to environmental stochasticity (e.g., wildfire, drought, disease), Allee effects (reductions in population growth due to insufficient population size), and reduced fitness due to inbreeding depression.

Within protected habitat, populations of Morro manzanita are threatened by wildfire, fire exclusion, and exotic species.

B.2.4.2 Wildfire

Previous research found that Morro manzanita subject to prescription burning at Montaña de Oro State Park likely failed to re-establish at the pre-burn population density due to insufficient seedling establishment, likely because the return interval at the stand was too short to allow sufficient accumulation of viable seed (Tyler et al. 2000, Odion and Tyler 2002). These results suggest that frequent fires could reduce populations.

B.2.4.3 Fire Exclusion

The widespread exclusion of fire from the LOHCP Preserve System could also threaten persistence of Morro manzanita in the long term. Fire is the natural disturbance that promotes population regeneration. Morro manzanita seedlings do not appear to recruit in stand replacing densities in the absence of fire. Though it is not known at what age stands senesce, mortality of adult Morro manzanita will presumably increase at some time following fire. In the absence of fire, the canopy gaps created might be colonized by other species already present, including exotic plants, rather than recruiting Morro manzanita seedlings. Suppression of naturally occurring wildfire and avoidance of prescription fire as a management tool due to proximity of development may, in the long term, cause type conversion of Morro manzanita chaparral (e.g., to coast live oak woodland). The USFWS (2008) identified managing disturbance to regenerate and revitalize Morro manzanita populations as the primary issue for recovery of the species, after protecting habitat from conversion.

B.2.4.4 Exotic Plants

Exotic plant species threaten the persistence of Morro manzanita directly through competition, and indirectly, by altering abiotic conditions, rendering them unsuitable for Morro manzanita population persistence. Large, shade producing trees including eucalyptus (*Eucalyptus* spp.), and introduced conifers including Monterey pine (*Pinus radiata*) and Monterey cypress (*Callitropsis macrocarpa*) can outcompete seedling and adult Morro manzanita for both light and soil resources (e.g., water). Expansion of a eucalyptus grove in Montaña de Oro State Park has reduced the areal extent of Morro

manzanita over the past 100 years (Tyler and Odion 1996). Though not currently invasive like eucalyptus, spp., Monterey pine and Monterey cypress are both fire adapted species and could increase their populations and further compete with Morro manzanita following fire or other disturbance (Tyler and Odion 1996, Tyler 1996).

Iceplants including *Carpobrotus* spp. and *Conicosia pugioniformis* are widespread through the coastal sage scrub communities and occur in canopy gaps with the Morro manzanita chaparral. Following wildfire or prescription burn, these species can spread and form dense mats that can compete with small, slowing growing Morro manzanita seedlings, thus precluding successful stand regeneration (D'Antonio 1990a, D'Antonio 1993, D'Antonio et al. 1993).

Like the iceplant species, veldt grass (*Ehrharta calycina*) may spread following fire and compete with Morro manzanita seedlings, reducing their establishment. In addition, the perennial grass will increase the density of fine fuel and, in doing so, might increase the frequency of fire, thus extirpating Morro manzanita. Annual grasses including red brome (*Bromus madritensis* ssp. *rubens*), ripgut brome (*Bromus diandrus*), and wild oats (*Avena* spp.) similarly threaten Morro manzanita populations, both by competing with seedlings for scarce soil resources and initiating a deleterious grass-fire cycle that can convert maritime chaparral to degraded grassland (D'Antonio and Vitousek 1992, Brooks 1999).

B.3 Indian Knob Mountainbalm (*Eriodictyon altissimum*)

B.3.1 Conservation Status

Indian Knob mountainbalm (*Eriodictyon altissimum* P. Wells; Boraginaceae) has been listed as endangered under both the California and federal endangered species acts and is ranked as most threatened and endangered according to the California Rare Plant Ranking (List 1B.1; CNPS 2016).

B.3.2 Available Information

There is little available information about the biology of Indian Knob mountainbalm (IKM). It was first collected in 1960 and described in 1962 (Wells 1962). No known research has examined the ecology of the species. The role of leaf resins in deterring insect herbivory of a widespread congener, yerba santa (*Eriodictyon californicum*) has been investigated (Johnson et al. 1985). The USFWS conducted a five-year review for this species in 2013, providing additional information about its ecology and conservation status (USFWS 2013a).

B.3.3 Distribution

Indian Knob mountainbalm is known from just seven occurrences in western San Luis Obispo County (CNDDB 2016). Two occurrences are on Indian Knob, an area south of San Luis Obispo and north of Pismo Beach. Two additional occurrences represented by a total of four, disjunct stands are in Hazard Canyon within Montaña del Oro State Park south of the LOHCP Area (USFWS 2013a). Of the three occurrences within the LOHCP Area, one is located in the Broderson site and the other two are within the Bayview Unit the Morro Dunes Ecological Reserve. A census of the three sites within the LOHCP in April 2016 found 22 individual plants (Occurrence 6) and 23 individual plants (Occurrence 4) in the two occurrences within the Bayview Unit; however, no Indian Knob mountainbalm plants were observed in the Broderson Unit (Occurrence 1; USFWS 2016). Though the populations range wide have not been

comprehensively censused, they are estimated to total fewer than 600 plants, with most of those (~500) occurring within the Indian Knob occurrence approximately 13 miles east of Los Osos (USFWS 2013a). Indian Knob mountainbalm occurs on sandy soils derived from marine sandstone at Indian Knob and Pleistocene older and partly cemented aeolian deposits in the Los Osos Valley (i.e., Baywood fine sand). In both areas, Indian Knob mountainbalm occurs in vegetation characterized as a mosaic of chaparral and oak woodland. Within these communities, the distribution of Indian Knob mountainbalm is very limited; however, the microhabitat characteristics of the endangered shrub have not yet been examined. Observations at the Bayview Unit of the Morro Dunes Ecological Reserve indicates that remaining individuals are found in gaps along eroding trails within the otherwise contiguous canopy comprised primarily of Morro manzanita and coast live oak (J. McGraw, pers. obs.). More research is needed to determine the habitat characteristics required for persistence of IKM within the Los Osos region.

B.3.4 Biology

B.3.4.1 Morphology

Indian Knob mountainbalm is a tall (2-4 m) erect, evergreen shrub with diffuse branches. Its sticky stems support 5-9 cm long, narrow (2-4 mm wide) linear leaves with rolled margins that have a sticky upper surfaces and dense white hairs on their lower surfaces. Indian Knob mountainbalm produces lavender to whitish yellow tubular flowers that are 11-15 mm long and sparsely hairy. Its fruits are narrow capsules that produce small (ca. 0.4 mm long), brown seeds (Wells 1962, Hickman 1993).

While Indian Knob mountainbalm has an inflorescence that is morphologically similar to that of *Eriodictyon californicum*, the endangered shrub has rolled leaves that do not resemble that of its more widespread congener. Instead, the leaves are similar to that of Lompoc yerba santa (*Eriodictyon capitatum*), which has a very different inflorescence. Despite these morphological similarities, Indian Knob mountainbalm is not thought to be a hybrid of the two other species (Wells 1962), with which it does not co-occur.

B.3.4.2 Phenology

Indian Knob mountainbalm flowers in early summer (June-July) and develops fruit in late summer and early fall. There is no available information about other aspects of the species phenology. As with other shrubs in California's Mediterranean climate, seeds of Indian Knob mountainbalm likely germinate with the onset of the rains between October and December, though this has not been documented.

B.3.4.3 Life History

Indian Knob mountainbalm is a polycarpic perennial shrub. Based on observations of slow-growing lichens attached to its stems, IKM is thought to be long-lived (USFWS 1998a), though no estimates for its life span are available. The small size of colonies suggests current individuals are survivors of once larger populations; however, there is no information about historic population densities. The age or size of shrubs at the onset of reproduction is currently unknown.

B.3.4.4 Vegetative Reproduction

Indian Knob mountainbalm appears to be able to establish additional ramets (i.e., clones) from root sprouts (Wells 1962). This form of vegetative reproduction has important implications for population persistence by influencing regeneration following disturbance, and genetic diversity. Following fire, IKM may be able to re-establish from below-ground tissues that remain. Removal of aboveground parts combined with changes in abiotic and biotic conditions following fire may increase the rate at which new ramets ('clones') are produced from the root structures of current individuals.

Because it can spread vegetatively, multiple plants observed within a given occurrence may be part of the same genet or genetically unique individual. If this is the case, and if IKM is self-incompatible, then uniclonal patches may not be able to regenerate from seed, at least not substantially so, unless viable seed remains within the seed bank. Clumped plant distributions can result not only from clones developing from common root structures, but also limited seed dispersal and higher rates of establishment and survival in appropriate habitat conditions, which tend to be spatially autocorrelated (i.e., clumped). As a result, it is not possible to determine whether individual ramets observed within remaining stands are genetically distinct individuals, without perhaps destructively examining their underground structures.

Vegetative reproduction of IKM also has potentially importance for the genetic diversity and resulting persistence of the species. If IKM requires fire to reproduce sexually, the remaining small populations are comprised of one or a few genets that have survived in the absence of fire, and there is no viable seed bank, then the populations may have gone through narrow genetic bottlenecks. Such reductions in genetic diversity might reduce future population viability, even following successful management to increase establishment and thus population abundance.

There is no information available about the factors which influence vegetative reproduction in the species, such as the age or stage of the parent plant, the habitat conditions, or role of disturbances such as fire in initiating formation of a new ramet. Based on observations of high density, vigorous stands along road cuts at Indian Knob, Wells (1962) hypothesizes that the species is disturbance-dependent for its regeneration, though does not specify whether establishment in disturbed areas occurs exclusively from seed.

B.3.4.5 Sexual Reproduction

Reproduction

Indian Knob mountainbalm plants are perfect flowers (i.e., they feature both stamens and a pistil). It is not known whether these flowers can self-pollinate. It is also not known whether the species is self-incompatible; that is, if the ovary of a given individual plant cannot produce viable seed when fertilized by pollen from the same plant. Self-incompatibility has been documented for the narrow-leaved congener endemic to Santa Barbara County, Lompoc yerba santa (*Eriodictyon capitatum*) (Elam 1995).

Pollination Biology

There is no specific information available about the pollination biology of IKM. The recovery plan for the species reports that "a variety of non-specialist, potentially pollinating insects have been recovered

visiting the flowers of this species"; however, there is no additional information about the insects, the study, or the observers (USFWS 1998a).

Seed and Seedling Biology

Due to their low weight (0.2 mg), IKM seeds are hypothesized to be wind dispersed (Wells 1962). Based on its association in fire-prone chaparral communities, its ability to regenerate from belowground structures following fire, its low abundance or perhaps absence of seedling and juveniles within remaining stands, and its high abundance along roadsides and other disturbed areas (Wells 1962), it is hypothesized that Indian Knob mountainbalm requires disturbance, specifically fire, to stimulate seed germination and/or create habitat conditions required for seedling establishment. Research is needed to determine the regeneration niche of Indian Knob mountainbalm and the potential role of fire and fire surrogates in facilitating recruitment within these aging populations.

John Chesnut, a biologist from the Los Osos region, is quoted in the recovery plan as indicating that IKM exhibit that low seed set (USFWS 1998a); however, there is no information about the nature of the observations. Low seed set is consistent with self-incompatibility in small populations comprised of one or just a few genets (as described below). Low seed set can also result from insufficient pollinator visitation, which can be problematic in small populations of plants that require specialist pollinators.

There is no information available about IKM seed predation, seed viability, seed dormancy, seed germination, or seed bank dynamics.

B.3.5 Threats

B.3.5.1 Habitat Loss

Indian Knob mountainbalm is threatened by habitat loss. Though its original distribution within the Los Osos Valley is unknown, the species' populations very likely have been reduced due to habitat destruction, which has reduced the areal extent of central maritime chaparral communities (Tyler et al. 2000). Habitat conversion for development and agriculture has also fragmented remaining habitat patches, thus reducing the size of remaining populations and increasing their extinction risks due to environmental stochasticity (e.g., wildfire, drought, disease), Allee effects (reductions in population growth due to insufficient population size), and reduced fitness due to inbreeding depression.

Within protected habitat, IKM populations are threatened by fire exclusion, exotic species, recreation, and perhaps a wildfire.

B.3.5.2 Fire Exclusion

The widespread exclusion of fire has likely reduced the distribution and population abundance of IKM and may have contributed to the likely extirpation of two of the three occurrences within the LOHCP Area (USFWS 2013a). Remaining occurrences are restricted to gaps within otherwise contiguous shrub cover and consist of a low number of individuals (USFWS 1998a, 2013), many of which may be senescent as indicated by sparse leaves confined to branch tips that were observed even during Wells initial description of the species (Wells 1962). As a natural part of the disturbance region in the region, fire is likely required to facilitate both sexual and vegetative reproduction of IKM. In the absence of fire, canopy gap closure may occur, thus creating unsuitable conditions for remaining plants, many of which

may be susceptible to mortality due to disease, herbivory, or senescence. Suppression of naturally occurring wildfire and avoidance of prescription fire as a management tool due to proximity of development may cause the extirpation of the remaining stands.

B.3.5.3 Exotic Plants

Exotic plant species may threaten the persistence of IKM directly through competition, and indirectly, by altering abiotic conditions, rendering them unsuitable for the species. Large, shade-producing trees including eucalyptus (*Eucalyptus* spp.) and introduced conifers such as Monterey pine (*Pinus radiata)* and Monterey cypress (*Callitropsis macrocarpa*) reduce light availability for IKM, which is likely adapted to the open canopy conditions characteristic of early successional chaparral. These trees may also compete with seedling and adult IKM for soil resources, including water which can be scarce in the sandy soils.

Iceplants, including *Carpobrotus* spp. and *Conicosia pugioniformis,* are widespread through the coastal sage scrub communities in the Los Osos area and occur in canopy gaps with the Morro manzanita chaparral. Following wildfire or prescription burn, these species can aggressively invade and form dense mats that might compete with small, slowing growing IKM seedlings, thus precluding successful stand regeneration (D'Antonio 1990a, 1993, D'Antonio et al. 1993).

Like the iceplant species, veldt grass (Ehrharta calycina) may spread following fire and compete with IKM seedlings, reducing their establishment. In addition, the perennial grass will increase the density of fine fuel and, in doing so, might increase the frequency of fire, thus extirpating IKM. Annual grasses including red brome (Bromus madritensis ssp. rubens), ripgut brome (Bromus diandrus), and wild oats (Avena spp.) similarly threaten IKM populations, both by competing with seedlings for scarce soil resources and initiating a deleterious grass-fire cycle that can convert maritime chaparral to degraded grassland (D'Antonio and Vitousek 1992, Brooks 1999).

B.3.5.4 Recreation

The Indian Knob mountainbalm stand within the Bayview Unit of the Morro Dunes Ecological Reserve is located along a trail. In the absence of fire, the chronic disturbance due to recreational use may maintain the open canopy conditions required for IKM persistence within the otherwise closed-canopy central maritime chaparral and coast live oak woodlands. However, recreation can negatively impact remaining individuals through direct trampling and through soil compaction, which may preclude vegetative reproduction from roots. Due to the low density and senescence of remaining individuals, it is important that all potential threats be addressed to preclude population extirpations and ultimate extinction.

B.3.5.5 Wildfire

A large wildfire may threaten persistence of IKM if conditions of the fire reduce regeneration from seed and/or suckers. There is no current evidence to suggest the species is susceptible to decline as a result of fire; however, given the small geographic range and low density of remaining populations, a conservative approach to management should include prevention of wildfire.

B.4 Morro Bay Kangaroo Rat (*Dipodomys heermanni morroensis*)

B.4.1 Conservation Status and Planning

The Morro bay kangaroo rat (*Dipodomys heermanni morroensis*) is federally and state-listed endangered species (USFWS 1970) and is also a California fully protected species (CDFW 2016). The USFWS released a Draft Revised Recovery Plan for the Morro Bay Kangaroo Rat (USFWS 1999). The USFWS also designated critical habitat for the Morro Bay kangaroo rat (USFWS 1977).

B.4.1.1 Recovery Plan

The objective of the draft revised recovery plan for Morro Bay kangaroo rat is to down list the species to threatened; the limited amount of remaining historic habitat will likely preclude delisting. The down listing criterion is to have effective genetic population size of 500, which equals approximately 2,000 individuals. Actions needed to achieve this include:

1. Establish a captive breeding program with 100 individuals removed from the wild;
2. Secure, manage, and improve habitat for all available areas of historic habitat; and
3. Reintroduce captive-bred individuals into the restored habitat.

These actions reflect the fact that the species has not been detected since 1991 (USFWS 1999) and has not been observed in the wild since 1986 (USFWS 2011b).

B.4.1.2 Critical Habitat

In 1977, the USFWS designated critical habitat for Morro Bay kangaroo rat within a single 689-acre unit that includes the southern portion of the Morro Bay sand spit and adjacent habitat west of Pecho Valley Road (Figure 4-3); specifically, the southern half of section 14 and portions of Sections 23 and 24 west of Pecho Valley Road in T30S R10E of the Mount Diablo Base and Meridian.

Of the 672 acres contained within parcels (the remainder is outside of the parcel GIS database), 629 acres (94%) of the critical habitat area is protected within the Morro Dunes Ecological Reserve and the northern portion of Montaña de Oro State Park, much of which is designated as part of the Morro Dunes Natural Preserve (Figure 4-3).

B.4.2 Description and Taxonomy

A member of the gopher family (Heteromyidae), Morro Bay kangaroo rat is a small rodent with external cheek pouches, large hind legs, relatively small front legs, a long tail, and a large head. It is one of nine subspecies of Heermann's kangaroo rat (*Dipodomys heermanni*); when compared with the other subspecies, Morro Bay kangaroo rat is small and more darkly colored (USFWS 1999).

B.4.3 Historic Distribution

The Morro Bay kangaroo rat is endemic to the Baywood fine sands ecosystem centered on the community of Los Osos in coastal San Luis Obispo County. Its range does not overlap that of the other nine subspecies of *D. heermanni*, the nearest of which occurs in eastern San Luis Obispo County (USFWS 1999).

In 1948, Morro Bay kangaroo rats were thought to occupy a 4.8 square-mile area, within which 2.2 square miles provided suitable habitat; the remaining area featured dense trees, thick chaparral, or were developed (Stewart 1958). By 1971, Morro Bay kangaroo rat was known from just six localities totaling 183 acres on the current perimeter of the community of Los Osos (Congdon 1971, and Congdon and Roest 1975). In 1989, the total area occupied by Morro Bay kangaroo rat was estimated to be 37 acres distributed within what is now the Bayview Unit of the Morro Dunes Ecological Reserve. The species was last observed there in 1990 and 1991 (USFWS 1999).

B.4.4 Habitat

Within the Baywood fine sands ecosystem, Morro Bay kangaroo rat habitat includes compacted sandy soils with slopes of less than 15 degrees, supporting a range of vegetation types (Gambs and Holland 1988). Morro Bay kangaroo rats are believed to have occupied a large portion of the area currently or historically covered by the coastal sage scrub on the older and more stabilized dunes. Within this community, Morro Bay kangaroo rat was preferentially observed in early successional areas characterized by lower plant species diversity, scattered areas of bare ground, greater cover of wedge-leaf ceanothus (*Ceanothus cuneatus*), deerweed (*Acmispon glaber*), and wedgeleaf horkelia (*Horkelia cuneata*), lower cover of yarrow (*Achillea millefolium*), iceplant (*Carpobrotus spp*.), California aster (*Corethrogyne filaginifolia*), and dudleya (*Dudleya caespitosa*), and moderately sparse cover of California sagebrush (*Artemesia californica*), black sage (*Salvia mellifera*), mock heater (*Ericameria ericoides*), and dune lupine (*Lupinus chamissonis;* USFWS 1999).

B.4.5 Activity and Behavior

Morro Bay kangaroo rats inhabit burrow systems that they use for nesting, escape, and caching seeds, their primary food source. They are largely solitary and share burrows only for purposes of mating or rearing pups. Nocturnal, they emerge from underground burrows immediately after dusk and then periodically throughout the night until one to two hours before dawn. Morro Bay kangaroo rats breed between March and August (Gambs and Holland 1988). They remain fairly close to their main burrows and rarely disperse. Observed dispersal distances have been less than 1,500 feet (USFWS 1999).

B.4.6 Feeding

The Morro Bay kangaroo rat primarily forages by shuffling its front feet through the sand in search of seeds; the species also grabs foliage, flowers, or fruits directly from plants. Food items are either eaten or placed into the cheek pouches, from which materials are either horded in the burrow or hidden in small surface-pit- caches.

B.4.7 Threats

Declines in Morro Bay kangaroo rat have been attributed to two primary factors: habitat loss due to development within the Los Osos and Baywood Park communities, and fire exclusion, which converts early-successional coastal sage scrub habitat to later successional communities that lack the preferred food plants and perhaps other important structural components of their habitat. Mowing, grading, off-road vehicles, equestrians, trail use, and invasive exotic species also degrade habitat. Predation by domestic and feral cats and dogs, fragmentation of larger populations into small subpopulations, and

perhaps inbreeding depression may have also contributed to the decline in the Morro Bay kangaroo rat (USFWS 1999). Morro Bay kangaroo rat may also be susceptible to mortality caused by rodenticides.

B.4.8 Results of Recent Surveys

Morro Bay kangaroo rat has not been detected during surveys conducted since 2004 (Table B-1). These surveys, which have included visual surveys for sign (e.g., tail drags marks, foot prints, and droppings), live trapping, and use of scent-detection dogs, have been conducted within the species historic range on public lands as well as private lands where access has been permitted. The species may persist in unsurveyed, privately held parcels, at densities below detectable levels, or perhaps in sandy soil areas east and south of the LOHCP Area (Villablanca 2009, USFWS 2011a).

Table B-0-1: Recent surveys for Morro Bay Kangaroo rat in the LOHCP Area

Survey	Methods	Location(s)	Results
Pre-Project Surveys for the Los Osos Wastewater Treatment Plant (Villablanca 2004)	Habitat Assessment and Pedestrian Transect (Visual) Survey	Broderson and Midtown Sites	Suitable habitat is present at Broderson but not Midtown (but see Villablanca 2010); no sign of MBKR detected at either site
Protocol Surveys for MBKR (Villablanca 2009)	Phased Approach: Habitat Assessment, then Visual Survey if habitat assessment positive, and the Live Trapping where visual survey positive.	Montaña de Oro State Park, Morro Dunes Ecological Reserve, Los Osos Oaks Preserve, Morro Bay State Park, and four private lands	Suitable habitat present, though fragmented and degraded; no MBKR observed in 948 trap night effort at 7 sites
Midtown Assessment and Survey (Villablanca 2010)	Habitat Assessment and Pedestrian Transect (Visual) Survey	Midtown	Suitable habitat present (previous assessment that habitat not suitable was revised) but no MBKR sign detected
Recovery Surveys (USFWS 2011c)	Live Trapping	Morro Bay State Park near Santa Ysabel, and Montaña de Oro State Park and Pecho Unit of the Morro Dunes Ecological Reserve	No MBKR observed in 1,668 trap nights
Scent-Detection Dog Searches (USFWS 2016)	Searches by scent-detection dogs trained to detect Lompoc kangaroo rat (*Dipodomys heermanni arenae*)	Montaña de Oro State Park, Morro Bay State Park, and the Morro Dunes Ecological Reserve	Two 'alerts' by scent dogs during the three-day search. Bait stations with cameras subsequently set at alert sites. No MBKR were detected in the belt/camera stations, which were operated for 12 non-consecutive weeks.

Appendix C Profiles of Additional Listed Species in the LOHCP Area

C.1 California red-legged frog (*Rana draytonii*)

C.1.1 Conservation Status and Planning

The California red-legged frog (*Rana draytonii*) is a federally listed endangered species (USFW 1996) and designated as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW 2016). The US Fish and Wildlife Service (USFWS) completed a recovery plan for the endangered frog in 2002 (USFWS 2002). The recovery plan identifies the Estero Bay area near Morro Bay as a core area because it may serve as a source population, and it is important for maintaining connectivity (USFWS 2002).

In 2010, the USFWS designated final critical habitat for the species, which includes 1,636,609 acres in 27 California counties (USFWS 2010b). This includes an 116,515-acre area (SLO #3) that encompasses the foothills north of San Luis Obispo; this unit extends to the eastern portion of Morro Bay just north of the LOHCP Area.

Within the area of designated critical habitat, the primary constituent elements of California red-legged frog are (USFWS 2010b):

1. **Aquatic Breeding Habitat:** natural or manmade still or slow-moving water bodies that become inundated with water during winter months and hold water for a minimum of 20 weeks;
2. **Aquatic Non-Breeding Habitat:** water bodies as described above that hold water for a duration long enough to complete its aquatic life cycle and provide shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult;
3. **Upland Habitat:** upland areas surrounding aquatic breeding and non-breeding habitat and riparian habitat up to a distance of 1 mile; and
4. **Dispersal Habitat:** Accessible upland or riparian habitat occupied or previously occupied that is located within 1 mile of each other.

C.1.2 Distribution

The California red-legged frog is endemic to California and Baja California, where the species' known elevation range is between sea level and approximately 5,200 feet (USFWS 2002). In California, California red-legged frog occurs along the Coast Range Mountains from Mendocino County to the California/Mexico border, in parts of the Cascade Range, and along the western Sierra Nevada foothills between Shasta and Fresno counties (Shaffer et al. 2004). It is believed to have been extirpated from approximately 70% of its range, including the Transverse and Peninsular ranges in the southern portion of California (USFWS 2002).

The central coast from San Francisco to Santa Barbara County supports the greatest number of drainages occupied by California red-legged frog (CNDDB 2016). In San Luis Obispo County, California red-legged frogs are found in streams, stock ponds, dune ponds, and springs on the coastal plain and western slopes of the Santa Lucia Range from San Carpoforo Creek in the north to the Santa Maria River in the south. The species has been observed in 30 streams (USFWS 2002) in San Luis Obispo County,

including Pico, Little Pico, Toro, San Simeon, Santa Rosa, Chorro, and Arroyo Grande creeks (Jennings et al. 1992, USFWS 1996).

There are no known occurrences of California red-legged frog within the LOHCP Area (CNDDB 2016); however, there are several records in surrounding areas including one approximately 0.50-mile north of the LOHCP Plan Area in Morro Bay State Park, just east of South Bay Boulevard. The second nearest occurrence is located on private property approximately 0.55-mile east of the LOHCP Plan Area associated with Warden Lake.

C.1.3 Habitat

The California red-legged frog inhabits ponds (including livestock ponds), marshes, springs, streams, and reservoirs as well as adjacent upland habitats (Hayes and Jennings 1988). The species preferentially occurs in deep pools with dense stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha* spp.); however, all life stages (eggs, larvae, juveniles, and adults) have been found in ephemeral drainages, and in ponds that do not have vegetation (Rathburn et al. 1993, USFWS 2002). Adults utilize dense, shrubby, or emergent riparian vegetation closely associated with deep (>2.25 feet), still or slow-moving water (Hayes and Jennings 1988). Red-legged frogs require cold-water pond habitats (including stream pools) with emergent and submergent vegetation (Storer 1925).

Aquatic habitat lacking non-native predators including fish and bull frogs (*Lithobates catesbeianus*) and featuring aquatic and riparian vegetation provides the best, long-term habitat for California red-legged frog. The species appears to be closely tied to small drainage areas and their intermittent water flow as opposed to large drainage areas and their perennial water flow; this may reflect restricted access by aquatic predators (Hayes and Jennings 1988).

California red-legged frog also occurs in uplands adjacent to breeding habitat, and along intermittent drainages connecting wetlands, which they may use for seasonal migration and dispersal. Juveniles may also disperse locally between July and September (USFWS 2000). Adult migration away from breeding habitat occurs primarily at night during wet periods within the non-breeding season (e.g., November to April; Fellers and Kleeman 2007). Movements ranging from 0.25 to over 2 miles are known to occur without regard to topography or vegetation type, including through a diversity of intact and degraded habitats such as agricultural lands (Bulger et al. 2003, Fellars and Kleeman 2007). They can be found living more than 1.8 miles from breeding habitat (USFWS 2000).

C.1.4 Biology

C.1.4.1 Morphology

The California red-legged frog is a 2 to 5.25-inch long, reddish brown to gray frog that features many poorly defined dark specks and blotches, which are absent on the back and top of its head. It features a light stripe on its jaw, folds on its back and sides, and only partially webbed toes; its underside is yellow with red on the lower abdomen and hind legs. Females are larger than males, which have enlarged forearms and swollen thumbs (USFW 1996).

C.1.4.2 Daily Activity

Although the species may hibernate in inland areas (Storer 1925), California red-legged frogs along the coast are rarely inactive (Jennings et al. 1992). They may aestivate in small-mammal burrows and moist leaf litter, where they have been found up to 100 feet from water in adjacent dense riparian vegetation for up to 77 days (Rathburn et al. 1993). Adults are largely nocturnal, whereas juveniles can be active either diurnally or nocturnally.

C.1.4.3 Diet

California red-legged frogs have a variable diet that includes primarily invertebrates, although larger frogs can consume Pacific tree frogs and California mice, which can constitute over half of the prey mass. Juveniles feed during both day and night, but adults and sub-adults feed primarily at night (Hayes and Tennant 1985).

C.1.4.4 Reproduction

California red-legged frogs breed from November through April, with earlier breeding records occurring in southern localities (Storer 1925). During a one-to-three-week period typically between late December and early April, females lay their loose, oval, floating clusters of about 2,000-5,000 eggs in still water (Storer 1925). Egg masses are generally attached to vertical emergent vegetation near the surface of the water (Hayes and Miyamoto 1984). Eggs hatch in 6-14 days, and metamorphosis occurs 3.5 to 7 months after hatching (Storer 1925, Jennings and Hayes 1990).

Developing eggs and embryos of this taxon are unable to survive salinities of >4.5 0/00 (Hayes and Jennings 1988). Larvae require cold water (<65 °F) to develop properly (Jennings 1988); and likely experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings et al. 1992). Two years after metamorphosis, males reach sexual maturity, while females require three years to attain sexual maturity (Jennings and Hayes 1985).

C.1.4.5 Survivorship

Predation by introduced fishes (Jennings 1988, Moyle et al. 1986, Hayes and Jennings 1986), bullfrogs (Jennings and Hayes 1985, Hayes and Jennings 1986), and crayfish, as well as disease, and parasites (Lefcort and Blaustein 1995) all have been known to affect California red-legged frogs. The species generally inhabits areas with dense vegetation, which limits use entry by other predators, such as birds and raccoons (*Procyon lotor*). Survival rates for California red-legged frogs from hatching to metamorphosis range from one to less than five percent for frogs co-occurring with bullfrogs and 30 to 40 percent for those without bullfrogs (USFWS 2000). Adults live 8 to 10 years (USFWS 2000, Jennings et al. 1992).

C.1.5 Threats

California red-legged frogs are threatened by habitat loss and degradation due to over-collecting, pesticides, herbicides, reservoir construction, stream channels development, urbanization, overgrazing, and drought (USFWS 2002). They are also impacted by competition with and predation by introduced species, particular bullfrogs and fish (Moyle 1976, USFWS 2002); like other California ranids, they evolved under conditions of limited fish predation since California possesses only a small number of

native fish species that prey on vertebrates (Moyle 1976). California red-legged frogs can also be infected by diseases including chytridiomycosis—a disease caused by chytrid fungi, which causes deformations and mortality (USFWS 2002).

C.2 California black rail (*Laterallus jamaicensis coturniculus*)

C.2.1 Conservation Status

California black rail (*Laterallus jamaicensis coturniculus*: Rallidae) is a fully protected species that is also listed as threatened by the State of California (CDFW 2016).

C.2.2 Distribution

Historically, the breeding range of California black rail extended from Tomales Bay north of the San Francisco Bay area (including Sacramento/San Joaquin Delta) south along California's coast to northern Baja California; the species also occurred inland in San Bernardino and Riverside counties, the Salton Sea, and along lower Colorado River north of Yuma in Arizona and California (Zeiner et al. 1990). Presently, most individuals are found in the northern reaches of the San Francisco Bay estuary (including San Pablo and Suisun bays) and associated rivers; additional small, fragmented subpopulations persist at Tomales Bay, Bolinas Lagoon, Morro Bay, and in southeastern California and western Arizona (Evens et al. 1991).

Adults are largely non-migratory, although adults and juveniles have been observed as far as 20 miles from breeding habitat (Eddleman et al. 1994). The California population apparently is resident, though individuals are occasional observed away from wetlands in late summer and autumn, suggesting some post-breeding movement (Zeiner et al. 1990).

Within the LOHCP Plan Area, the California black rail has been recorded in three areas (CNDDB 2016):

- Sweet Springs Nature Preserve;
- the salt marsh habitat located between Los Osos Creek and the Elfin Forest approximately 0.25-mile west of South Bay Boulevard; and
- Los Osos Creek approximately 0.25-mile southeast of South Bay Boulevard.

The species likely inhabits additional suitable habitat along the edge of Morro Bay and Los Osos Creek.

C.2.3 Habitat

The California black rail primarily inhabits the upper zones of saline emergent wetlands and brackish fresh emergent wetlands. It is most commonly observed in tidal emergent wetlands in the immediate vicinity of tidal sloughs, which feature pickleweed (*Salicornia* spp.), bulrushes (*Bolboschoenus* spp. and *Schoenoplectus* spp.) and cattails *(Typha* spp.), though California black rail may take cover in upper wetlands and adjoining uplands during extremely high tides (Zeiner et al. 1990).

C.2.4 Biology

The California black rail is a small, blackish rail with a small, black bill and a chestnut-colored nape. Largely diurnal, the species primarily vocalizes at dusk and to a lesser extent at night. It forages on the ground primarily for insects and secondarily on crustaceans and aquatic plant seeds (Ehrlich et. al. 1988). Their primary predators are herons and domestic cats (Zeiner et al. 1990).

The California black rail breeds between March and June. Nests are deep, loose cups located in or along the edge of marshes, usually on a mat of grass concealed by dense vegetation. Clutch sizes in this single-brooded species average six and range between three and eight (Zeiner et al. 1990). Both sexes incubate the eggs for approximately 16-20 days; young are precocial (Ehrlich et. al. 1988).

C.2.5 Threats

California black rail are endangered primarily as a result of loss of coastal wetlands and inland freshwater marshes (Ehrlich et. al 1988), as well as incompatible water-management practices for agriculture and salt production in coastal. Additional threats may include marsh subsidence due to groundwater removal, diking of salt marshes, water level fluctuation, wildfires, grazing, and cultivation, and the spread of non-native predators including domestic cats (Eddleman et al. 1994).

C.3 California seablite (*Suaeda californica*)

C.3.1 Conservation Status

California seablite (*Suaeda californica*: Chenopodiaceae) is a federally listed endangered species (USFWS 1994) and is ranked as most threatened and endangered according to the California Rare Plant Ranking (List 1B.1; CNPS 2016). The species was addressed in the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013b).

C.3.2 Distribution

California seablite is endemic to central coastal California where it historically occurred in two disjunct locations: San Francisco Bay and Morro Bay and nearby Cayucos. It was extirpated from the San Francisco Bay, though was reintroduced into four areas between 1999 and 2008 (USFWS 2013b). Today, the species is known from three reintroduction locations along San Francisco Bay, four estuarine beach locations near Cayucos, and seven areas on the Morro Bay shoreline, including two areas within the LOHCP Area:

1. Along the peninsula of Baywood Park, and
2. And along the bay between the sand spit to the west, and Sweet Springs Preserve, to the east (CNDDB 2016).

The species also occurs along the sand spit, immediately west and north of the LOHCP Area (CNDDB 2016).

C.3.3 Habitat

California seablite is found in a narrow zone in the upper edge of tidal marsh at the ecotone between salt marsh and the adjacent coastal sage scrub (USFWS 2010a). There it occurs within coarse, well-drained marsh substrates on sandy wave-built berms or ridges along marsh banks, and on estuarine beaches (USFWS 2013b).

In the Los Osos Area, California seablite co-occurs with salt grass (*Distichlis spicata*), saltbush (*Atriplex* spp.) pickleweed (*Salicornia virginica*), alkali-heath (*Frankenia salina*), fleshy jaumea (*Jaumea carnosa*), and the federally endangered salt marsh bird's beak (*Cordylanthus maritimus* ssp. *maritimus*; USFWS 2010a). In estuarine beach habitat near Cayucos, California seablite occurs with many of the same species as well as sea rocket (*Cakile maritima*), beach-bur (*Ambrosia chamissonis*), beach heliotrope (*Heliotropium curassavicum*), and sand verbena (*Abronia* spp.; USFWS 2010a).

C.3.4 Biology

California seablite is a succulent-leaved perennial plant in the goosefoot family (Chenopodiaceae). The species blooms July through October (CNPS 2016). Though the plant spreads laterally, reproduction appears to be entirely sexual; plants do not reproduce vegetatively. Isolated plants have been observed to produce viable seed, suggesting the species is self-compatible to at least a certain degree (USFWS 2010a). The hard-coated seeds are enclosed in fleshy calyces that are remain attached after dehiscence and may promote dispersal (USFWS 2010a).

California seablite seedlings have been observed in drift-lines and vegetation gaps along the high-tide line in Morro Bay. Plants reach reproductive maturity in as little as one year (USFWS 2010a). Though the life span is unknown, 10-year-old plants were observed in stabilized habitat within Morro Bay State Park (USFWS 2010a).

C.3.5 Threats

The Morro Bay occurrences of California seablite are threatened by shoreline development, storm erosion, recreational activity on tidal flats, and nonnative plants including ice plant (*Carpobrotus edulis*; USFWS 2010a, 2013). California seablite is also threatened by sea-level rise, especially where populations abut development or other conditions that might preclude landward migration of wetland habitat (USFWS 2013b).

C.4 Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*)

C.4.1 Conservation Status

Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*) is listed as endangered under both the California and federal endangered species acts (USFWS 1978, CDFW 2016); the taxon's name at the time of the species' listing was *Cordylanthus maritimus* ssp. *maritimus*. Salt marsh bird's beak is ranked as moderately threated (List 1B.2) according to the California Rare Plant Ranking system (CNPS 2016). A Recovery Plan was prepared for salt marsh bird's beak in 1984 (USFWS 1984); the species' recovery is also addressed in the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013b).

C.4.2 Distribution

Historically, salt marsh bird's-beak was widespread in coastal salt marshes from Morro Bay in San Luis Obispo County to San Diego County and northern Baja California, Mexico. Currently, the species is known from seven coastal salt marshes between San Diego County and San Luis Obispo County (USFWS 2009), including the southern shore of Morro Bay in the LOHCP Area. There it has been recorded in three, disjunct patches, two of which are west of Cuesta-by-the-Sea, and the other that is just east of it (CNDDB 2016).

The Consortium of California Herbaria database features five specimens of salt marsh bird's-beak that were collected in the Morro Bay region between 1973 and 2000; of these, three were collected from within the LOHCP Area (CCH 2014):

- two from the Sweet Springs Nature Preserve, and
- one in Cuesta-by-the-Sea northwest of the intersection of Pecho Valley Road and Binscarth Road along the margin of Morro Bay.

The other two specimens were collected outside of the LOHCP Area along the margin of Morro Bay: one on the east side of the Morro Bay Sand Spit and the other west of the terminus of Howard Street (CCH 2014).

C.4.3 Habitat

Salt marsh bird's-beak grows in the upper portions of coastal and brackish marshes, in the region generally above most tidal flows and subject only to high tides; the clay and silt soils in these areas are drier than lower-elevation areas, particularly during the summer drought. Its distribution appears to be tied to areas that receive inflows of fresh water, which may influence germination (USFWS 2009). Co-occurring species include pickleweed, salt grass, seaheath (*Frankenia* spp.), saltbush, and California seablite (USFWS 2009).

C.4.4 Biology

Salt marsh bird's-beak is an annual with densely hairy grey-green leaves that are tinged purple. The branched plants grow up 16 inches tall and feature spiked inflorescences. The flowers, which are bee-pollinated, have yellow-tipped upper petals and purple lower petals. The species flowers between May and October; each capsule (fruit) produces 15-40 seeds (Baldwin et al. 2012).

As with other members of the broom rape family (Orobanchaceae), salt marsh bird's beak is a hemiparasite; it features green tissue and can produce sugars through photosynthesis yet obtains at least some water and dissolved nutrients from the roots of their host plants. In laboratory trials, salt marsh bird's beak parasitized saltgrass, pickleweed, fleshy jaumea, and other species; these as well as other species may serve as hosts (USFWS 2009).

This short-lived annual germinates in March and April and flowers between May and October; some plants have been observed to senesce as early as July (USFWS 2009). Flowers are self-compatible and pollinated by bees. Seeds are buoyant and can float for up to 50 days, perhaps enabling long-distance dispersal (USFWS 2009).

C.4.5 Threats

Salt marsh bird's-beak has been endangered primarily due to habitat loss, resulting from development and agricultural conversion, which contributed to the loss of over 90 percent of coastal salt marshes and tidal freshwater marsh (Callaway et al. 2007). In remaining habitat, salt marsh bird's-beak is threatened by channelization and water diversions as well as other factors that affect hydrology, including freshwater inflow, such as climate change. Notably, sea-level rise can alter tidal flows in ways that impact coastal marshes supporting salt marsh bird's-beak and its host plants (USFWS 2009). The species may also be impacted by factors that convert or degrade upland habitat supporting native pollinators including bees. Several non-native competitors are displacing salt marsh bird's beak from their habitat, including sea lavender and several exotic grasses. Finally, salt marsh bird's-beak is also vulnerable to impacts resulting from loss of genetic variation, which is very low (USFWS 2009).

C.5 Marsh sandwort (*Arenaria paludicola*)

C.5.1 Conservation Status

Marsh sandwort (*Arenaria paludicola*) is listed as endangered under both the California and federal endangered species acts (USWS 1993, CDFW 2016,); it is ranked as seriously threatened (List 1B.1) according to the California Rare Plant Ranking system (CNPS 2016). The USFWS finalized a recovery plan for the species in 1998 (USFWS 1998b).

C.5.2 Distribution

Marsh sandwort has been documented along the Pacific coast from Washington to southern California (CCH 2007 and CASH 2007); however, it is believed to have been extirpated from Washington and there are no known collections from Oregon (CASH 2007, OSUH 2007, Oregon Plant Atlas 2007).

Though historically known from numerous locations throughout coastal California, at the time of listing in 1993, marsh sandwort was known to be extant in only one area: Black Lake Canyon in southwestern San Luis Obispo County, where it has since become extirpated. In 1998, marsh sandwort was rediscovered at Osos Flaco Lake in southern San Luis Obispo County; this is the only known wild population for this species (USFWS 2014).

Within the LOHCP Area, marsh sandwort occurs in a single location, where it was planted into the northeast marshy portion of the within Sweet Springs Nature Preserve (USFWS 1998b; CNDDB 2016).

C.5.3 Habitat

A coastal species, marsh sandwort historically inhabited marshes and other perennially mesic areas including streams and creeks (USFWS 2008). It can grow in saturated acidic bog soils and soils that are sandy with a high organic content (USFWS 2014).

C.5.4 Biology

Marsh sandwort is a perennial herb in the pink family (Caryophyllaceae). Between May and August, it produces small, solitary, white flowers on long stalks that arise from the leaf axils. Fruits, which are capsules, contain 15-20 seeds (USFWS 1998b).

C.5.5 Threats

Marsh sandwort is threatened by loss of coastal wetland habitat, as well habitat degradation due to altered hydrologic conditions, sedimentation, and competition from exotic plants. Additionally, its small populations, including those resulting from reintroductions, may face reduced fitness due to pollinator deficiencies, excessive inbreeding, and loss of genetic diversity.

C.6 Steelhead (*Oncorhynchus mykiss irideus*)

C.6.1 Conservation Status

The South-Central California Coast Distinct Population Segment (DPS) of steelhead (steelhead), or coastal rainbow trout (*Oncorhynchus mykiss irideus*: Salmonidae) is a federally-threatened species (USFWS 2005) that is also designated as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW 2016). The National Marine Fisheries Service (NMFS) published a recovery plan for this species in December 2013 (NMFS 2013). In 1996, the California Department of Fish and Game (Wildlife) developed a Steelhead Restoration and Management Plan for California (CDFW 1996).

In addition, NMFS has designed critical habitat for steelhead (NMFS 2005); this includes a total of 1,240 stream miles and three square miles of estuarine habitat. The Estero Bay Hydrologic Unit, which contains critical habitat within the Los Osos Hydrologic Subarea, is one of five hydrologic units identified for the South Central California Coast Steelhead DPS. The extent of the Los Osos Hydrologic Subarea is described in the Final Rule as being: Outlet(s) = Los Osos Creek (Lat. 35.3379, Long. –120.8273) upstream to endpoint(s) in: Los Osos Creek (35.2718, –120.7627; NMFS 2005), approximately 4 miles southeast of the LOHCP Area.

The primary constituent elements of critical habitat for steelhead are those sites and habitat components that support one or more life stages, including:

- **Freshwater spawning sites** with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development;
- **Freshwater rearing sites** with: (i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; (ii) Water quality and forage supporting juvenile development; and (iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- **Freshwater migration corridors** free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

- **Estuarine areas** free of obstruction and excessive predation with: (i) Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; (ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and (iii) Juvenile and adult forage including aquatic invertebrates and fishes, supporting growth and maturation.

C.6.2 Distribution

Steelhead, the anadromous form of the species *Oncorhynchus mykiss*, which also includes inland rainbow trout, historically occupied streams along the west coast of North America. The South-Central California Coast DPS extends from the Pajaro River at the border of Santa Cruz and Monterey counties, south to Arroyo Grande Creek in southern San Luis Obispo County. Streams further north and south support steelhead within the Central California Coast DPS and the Southern California Coast DPS, respectively.

Within the LOHCP Area, steelhead historically occurred in Los Osos Creek, which flows on the eastern perimeter of the Plan Area. In the recovery plan, Los Osos Creek has been identified as a Core 2 population; such populations and Core 1 populations are the focus of the recovery plan (NMFS 2013). Steelhead may be present in reaches of Los Osos Creek along the eastern perimeter of the LOHCP Area.

C.6.3 Habitat

Steelhead inhabit perennial coastal streams with clear, cool to cold, fast flowing water with high dissolved oxygen content and abundant gravels and riffles. Streams must contain spawning gravels of certain size and free of sediment, and cool, clean, and well-oxygenated water to allow egg incubation and development (NMFS 2013). Steelhead prefer habitat with relatively good water quality that has low suspended sediment and contamination loads, and minimal pollution levels (Leidy 2000). They require sufficient flows and habitat characteristics for spawning, rearing, and migration, such as shallow riffles for spawning and deep pools with well-developed cover for rearing (Leidy 2000).

C.6.4 Biology

C.6.4.1 Taxonomy

Steelhead are the anadromous (ocean going) form of rainbow trout. In California, steelhead is classified as the coastal subspecies, *Oncorhynchus mykiss irideus* (Behnke 1992). Steelhead populations have been divided into Evolutionarily Significant Units and Distinct Population Segments. The ESA defines a "species" to include any distinct population segment of any species of vertebrate fish or wildlife. For Pacific salmon, NOAA Fisheries Service considers an evolutionarily significant unit, or "ESU," a "species" under the ESA. For Pacific steelhead, NOAA has delineated distinct population segments (DPSs) for consideration as "species" under the ESA (NMFS 2011). Within the LOHCP Plan Area is the South-Central California Coast Steelhead DPS.

C.6.4.2 Morphology

Besides having a larger size at spawning, steelhead are nearly indistinguishable from the resident rainbow trout that also live in the same streams in which they spawn (Moyle 1976). They are usually

silver with black spots on the back; they have an adipose fin, dorsal fin, and a slightly forked tail and a pink to red lateral band (Moyle 2002). They also have pinkish colored cheeks, an iridescent blue to nearly brown back, and silver, white, or yellowish sides and belly. Adults that have returned from the ocean can reach approximately 23 inches in length (Leidy 2000). Freshwater juveniles or smolts range between 5-10 inches in length (Moyle 2002).

C.6.4.3 Diet

Juvenile steelhead feed on aquatic insects and their larvae, snails, amphipods, opossum shrimp, and small fish (Moyle 1976). Adults may also feed on newly emergent fry (Leidy 2000). Steelhead usually do not eat when migrating upstream and therefore lose body weight (Pauley and Bortz 1986). In the ocean, steelhead are drift feeders (Leidy 2000).

C.6.4.4 Reproduction

Following the first substantial rainfall in fall and winter, steelhead migrate to freshwater habitat where they spawn between December and April (Leidy 2000). Steelhead spawn in beds constructed by the female over a gravel and cobble substrate, where females lay eggs that are then fertilized by the males. Eggs incubate for approximately 3 to 4 weeks, and then hatched fry rear within the gravel interstices for an additional 2 to 3 weeks. Emergent fry rear at the stream margins near overhanging vegetation. Juveniles (smolts), after rearing for 1 to 3 years within freshwater and post-spawning adults migrate out to the ocean from March to July, depending on stream flows. Steelhead will migrate upstream after 1-4 growing seasons at sea (Burgner et al. 1992). After spawning, steelhead may return to the ocean and spawn the following year (Leidy 2000).

C.6.5 Threats

Steelhead are threatened by a variety of factors that have altered their habitat and affected populations directly; these include barriers to migration, water diversions, flow fluctuations, sub-optimal water temperatures for incubation and juvenile rearing, sedimentation of spawning habitat, and low summer flows for emigration (Leidy 2000). Land development, dams, and degradation of estuaries have also decreased steelhead juvenile rearing areas.

In San Luis Obispo County, streams and riparian corridors have been modified to increase conveyance for flood control, minimize bank erosion, and increase areas available for development and agricultural uses. These activities often change in the natural channel geometry (i.e., loss of complexity, meanders are lost) in ways that can reduce the ability of the habitat to support steelhead. Large woody debris (tree trunks, large limbs) is considered important for steelhead and other anadromous fish because it provides overhead cover, creates calm or lower velocity waters for resting, and creates greater habitat complexity. Large woody debris is typically removed from streams because it can create flooding hazards, blocks flow through culverts or damage culverts and bridges, and increases bank erosion.

Natural and man-made barriers in streams can prevent adult steelhead from reaching suitable spawning habitats causing the fish to breed in sub-optimal habitats where survival of the young is unlikely or creating traps where predators have easier access to concentrations of fish. Barriers can be caused by drop structures in streams or flood control channels, under–sized or poorly designed culverts and bridges, and under-grounding of streams.

Water quality and stream flows can also be affected by urbanization and cultivation; these factors may limit steelhead in Los Osos Creek (NMFS 2013).

C.7 White-tailed kite (*Elanus leucurus*)

C.7.1 Conservation Status

The white-tailed kite (*Elanus leucurus*: Accipitridae) has been designated a fully protected species by the California Department of Fish and Wildlife (CDFW 2016).

C.7.2 Distribution

The white-tailed kite is found year-round in California from the coast to the eastern edge of the Central Valley and the western edge of the Mojave Desert. White-tailed kites are resident through most of their breeding range in California, though may disperse in response to changes in prey abundance (Dunk and Cooper 1994). Globally, the species occurs in portions of Washington and Oregon, as well as Central America and South America.

There are no recorded occurrences of the white-tailed kite within the LOHCP Area (CNDDB 2016); the two nearest occurrences are located approximately 4.8 and 5.1 miles east of the LOHCP Area. However, a colony of white-tailed kites has been observed in the LOHCP Area near Eto Creek, north of Nipomo and east of South Bay Boulevard. The birds are winter resident, with occasional summer presence (J. Chesnut, pers. comm.). The Plan Area features suitable nesting and foraging habitat.

C.7.3 Habitat

White-tailed kite inhabits herbaceous and open stages of most lowland habitats with variable growth of trees, which they use for cover, and dense population of voles (*Microtis* spp.), which are their preferred prey (Waian and Stendell 1970). The species are rarely found away from agricultural areas and are often found in association with riparian areas.

C.7.4 Diet

The white-tailed kite primarily feeds during the day on voles and other small, diurnal mammals, though occasionally eats birds, insects, reptiles, and amphibians. It forages in grasslands, meadows, farmlands, emergent wetlands, and other habitats by soaring, gliding, and hovering within 100 ft. of the ground in search of prey.

C.7.5 Reproduction

The white-tailed kite breeds from February to October, with a peak from May to August. Nests are built near the top of a dense oak, willow, or other trees near open foraging areas; nests are constructed from loosely piled sticks and twigs that are lined with grass, straw, or small roots. Nest site availability can be limiting where prey availability is not (Dunk and Cooper 1994). The average clutch of this monogamous species is 4-5 eggs, with a range of 3-6. White-tailed kites roost communally in the non-breeding seasons (Waian and Stendell 1970).

C.7.6 Threats

White-tailed kites are threatened by conversion of natural and agricultural lands to urban uses, which reduces foraging and nesting habitat. Additionally, declines in the species have also been attributed to interspecific competition for nest sites, human disturbance at nests, and farming techniques that reduce prey populations (Dunk 1995). Other threats may include the robbing of nests by jays, crows, yellow-billed magpies, raccoons, and opossums and the predation by great horned owls.

C.8 Golden eagle (*Aquila chrysaetos*)

C.8.1 Conservation Status

Golden eagle (*Aquila chrysaetos*: Accipitridae) has been designated a fully protected species by the California Department of Fish and Wildlife (CDFW 2016). Golden eagle is also afforded protection by the federal Bald and Golden Eagle Protection Act.

C.8.2 Distribution

The golden eagle occurs year-round in all areas of California except the Sacramento and San Joaquin valleys, the Los Angeles Basin, the Mojave and Colorado desert regions, where it is found only during the winter, and in the coastal Klamath Mountains, where it does not occur (Zeiner et al. 1990). The known elevational range of this species extends from near sea level to approximately 11,500 feet (Grinnell and Miller 1944). Within California, golden eagles are mostly resident, but may move south during the winter, and north following the breeding season. Globally, the species has a holarctic distribution, and occurs as far south as North Africa, Arabia, and the Himalayas in the Old World, and as far south as Mexico in North America.

Within the LOHCP Area, suitable nesting habitat for golden eagle is present on the perimeter of the Plan Area; however, there are no records in this area. The nearest record of occurrence is approximately 10.2 miles northeast of the LOHCP along Eagle Creek south of the city of Atascadero (CNDDB 2016).

C.8.3 Habitat

Within California, golden eagles are most often associated with sage-juniper flats, deserts, grasslands, savannahs, and early successional stages of shrub habitats and forests on rolling hills (Zeiner et al. 1990). They are often found in areas with cliffs with overhanging ledges or near large trees, which they use for cover (Zeiner et al. 1990). Golden eagles are typically not found in heavily forested areas or on the immediate coast and are rarely detected in urban areas (Grinnell and Miller 1944, Garrett and Dunn 1981).

C.8.4 Diet

Golden eagles primarily prey upon rabbits, hares, and rodents but will periodically eat other mammals, as well as birds, reptiles, and carrion (Zeiner et. al, 1990). They forage during the day by soaring above open habitat, making low, quartering flights; golden eagles also occasionally search for pretty from a perch (Carnie 1954).

C.8.5 Reproduction

During their breeding season, which occurs between January through August, with peak activity between March and July (Beebe 1974), golden eagles nest on platform nests located on cliffs, large trees, or other tall landscape features, such as power transmission line towers, within otherwise open areas. Breeding pairs often show high site fidelity and may reuse nests from previous years (Kochert et al. 2002). Clutches usually consist of two eggs that are laid in early February to mid-March and require approximately six weeks of incubation (Beebe 1974).

C.8.6 Threats

Golden eagles are primarily threatened by habitat loss due to urban and agricultural land conversion. Pesticide and lead poisoning, as well as electrocution on powerlines, are also significant causes of mortality (DeLong 2004), while collisions with wind-turbine blades may be of concern in areas where such power generating structures are present (Hunt et al. 1997). Land management practices that affect prey abundance can also have effects on golden eagle populations. For example, conversion of shrublands to grassland may reduce rabbit abundance, which can have important effects of golden eagle demography (Knick and Dyer 1997).

Appendix D Priority Management and Restoration Issues

This appendix integrates the best available biological information to aid in the development of specific restoration and management programs and projects for the LOHCP Preserve System. The information will be used in the development of the LOHCP Preserve Adaptive Management and Monitoring Plan (AMMP) that will guide implementation of management and restoration projects.

This appendix addresses management of three main factors that can impact habitat within the Bayview fine sands ecosystem: exotic plant species, incompatible recreation, and fire.

D.1 Exotic Plant Species Management

Exotic plants have been identified as one of the current stresses to the sensitive species and communities of the Baywood fine sands (USFWS 1994, Tyler and Odion 1996, JSA 1997, USFWS 1998a, 1999). In addition, future invasions are likely to greatly impact this endangered system and influence the ability of the Los Osos Habitat Conservation Plan to attain its biological goals.

This section is intended to:

1. Outline the approaches to exotic plant management;
2. Identify the techniques currently available to treat exotic plant populations;
3. Describe the distribution, ecology, and impacts of exotic plant species presently within lands that are anticipated to be included within the LOHCP Preserve System.

This information will be used to develop the specific management strategies, targets, and techniques for exotic plant management within the LOHCP Preserve System AMMP, which will also be informed by a baseline inventory of exotic plants within the preserves conducted early during implementation of the LOHCP conservation program.

D.1.1 Introduction

Though the Baywood fine sands are relatively droughty and low in nutrients (USDA 1984), exotic plant species have successfully colonized the plant communities they support. Primarily originating in regions experiencing Mediterranean climates, these species are termed “exotic” because they were not present in the region prior to the arrival of Europeans in the 1700s; instead, their presence is due to direct or indirect effects of human activity.

Though exotic plants of the LOHCP Area vary in aspects of their ecology which influence their impacts, in general, they likely compete with populations of native plants and reduce the diversity of the plant communities. In doing so, they likely degrade habitat required by native animal species, including populations of sensitive species, including the four covered species. Certain types of exotic species, such as the perennial grasses, have the potential to further degrade habitat by altering ecosystem processes including disturbance regimes, and water and nutrient cycling (D'Antonio and Vitousek 1992, Haubensak 2001). The known and hypothesized impacts of exotic plant species presently found in the LOHCP Area are further discussed in Section D.1.5.

Exotic plant species will likely present a continuing stress and challenge for management in the LOHCP Preserve System. New exotic plants will likely invade the region as a result of additional introductions (Janzen 1986, Levine and D'Antonio 2003); in additions, alterations in conditions (e.g., climate change, nutrient deposition, fire) can create new opportunities for existing species in the region to invade habitat within the LOHCP Preserve System. Once exotic plants become established, the costs of eradication and control efforts can be high; hence prevention programs will be a critical component of LOHCP Preserve System Management.

Because exotic plants can have large negative impacts on the ecosystem, plant communities, and populations of the covered species and other rare plants and animals in the LOHCP Area, they will be actively managed to reduce their distribution and abundance, as well as prevent new introductions. This section outlines the general approaches to exotic plant management which are designed to facilitate the biological goals and objectives of the LOHCP (Section 5.1).

D.1.2 Exotic Plant Management Planning

During the first three years of implementation of the LOHCP, the LOHCP Preserve System AMMP will be developed. The plan will include an exotic plant management component that will:

1. Provide baseline data documenting the current distribution and abundance of each species;
2. Outline management strategies, targets, and techniques for exotic plant management;
3. Identify a coordinated program for exotic plant management, which includes a prioritized list of exotic plant control and eradication projects, timelines and budgets for project implementation, and a detailed program for exotic plant prevention.

The Exotic Plant Management component of the LOHCP Preserve System AMMP will be developed by inventorying the exotic plants, assessing the significance of their impacts, evaluating the feasibility of their control, and ranking exotic species and specific occurrences according to the urgency of management.

D.1.2.1 Inventorying Exotic Plants

Through a systematic survey of the LOHCP Preserve System, a qualified biologist will document the distribution of all exotic species. The occurrence of exotic plants adjacent to the Preserve System should also be recorded, as feasible. For purposes of the initial evaluation of species, relative abundance categories will be assigned to facilitate assessment of impact and likelihood of control. Ultimately, a quantitative sampling regime will be used to estimate density or percent cover, which can be provide baseline data for tracking changes through time and evaluating effectiveness of management. The resulting distribution and abundance data should be incorporated into the LOHCP Preserve System geographic information system (GIS).

D.1.2.2 Assessing Impact Significance

The significance of impact of each exotic species found within the LOHCP Preserve System will be assessed based on its current impacts and the potential for it to increase in impact at a later date (Hiebert and Stubbendieck 1993). Current impact determinations will consider the distribution, abundance, and known or likely effects on species (incl. sensitive species) and ecosystem processes

(e.g., succession, nutrient cycling, fire, etc.). Future impacts will be evaluated by assessing the species' reproductive ability, dispersal ability, habitat requirements, competitive ability, and known impacts in natural areas that might be similar in characteristics (e.g., soils, climate, vegetation structure, etc.) to those in the Baywood fine sand communities (e.g., Guadalupe-Nipomo Dunes).

Section D.1.5 outlines the type of information that will be incorporated in an impact assessment, which should be greatly expanded following the detailed assessment of the species distribution and abundance as part of the inventory.

D.1.2.3 Determining Feasibility of Management

For each exotic plant species, the feasibility of successful management will be evaluated. Specific management goals (prevention, eradication, and control) are discussed in the next section. In general, feasibility would be the function of four main factors:

Distribution: Narrowly distributed plants, including those limited to specific microhabitats and those that have only recently invaded, will be more feasible to manage than widespread plants.

Abundance: Plants which occur in low abundance (low population densities) may be easier to control than those that occur at high density (recognizing that impacts of exotic species can be greater at higher densities).

Biology: Several aspects of exotic species biology can reduce susceptibility to control, including presence of a seedbank, and ability to regenerate vegetatively (i.e., from stems, roots, and other structures).

Treatments: Several aspects of management treatments that will influence feasibility include (Hiebert and Stubbendieck 1993):

1. Whether effective treatments have been developed;
2. The cost of treatments; and
3. Collateral damage and potential for unintended negative impacts of treatments.

Feasibility of management will be based on a complete review of the most recent scientific literature and conversations with experienced land managers in the region.

D.1.2.4 Ranking Exotic Plants and Occurrences for Management

Based on their impact and management feasibility, exotic plant species will be ranked according to the urgency for management. A ranking system based on quantitative assessments of species impact and the management feasibility such as that developed for the National Park System (Hiebert and Stubbendieck 1993) could be used to objectively rank species; such an objective program can avoid inadvertent bias which could reduce effectiveness of the overall program.

Within the LOHCP Preserve System, habitat differs in ways that will influence the specific exotic plant management strategies, targets, and techniques. These include:

1. The species richness, distribution, and abundance of exotic plants present;

2. Exotic plant species and land use in areas adjacent to the preserve;
3. The structure and composition of the native communities, including the distribution and abundance of sensitive species; and
4. Other management projects to be implemented (i.e., recreation, fire, etc.).

D.1.2.5 Prioritize Exotic Plant Management Projects

Exotic plant management will likely consume a large portion of the budget allocated for monitoring and management within the LOHCP Preserve System. Though this is justified, given the current and potential future negative impacts of exotic plants, it is critical that the funds be used judiciously. One critical component of this is proper use of adaptive management methods to ensure that exotic plant projects are indeed effective. If project goals are not attained and/or the project does not appreciably advance the conservation goals of the LOHCP, future projects should be modified, as needed, or not conducted at all. The successful design and evaluation of projects can be facilitated by the scientific approaches to management.

Within the exotic plant management program, funds will not be sufficient to conduct all projects. An objective system of prioritizing exotic plant management will be established to facilitate the best use of funds. Within projects, cost-benefit analysis will be used to weigh to relative merits of different targets and techniques. A schedule of exotic plant management projects will be developed to reflect the priorities. Scheduling exotic plant management will also be important to address the crucial role in the season often plays in influencing treatment effects.

The priorities, schedules, and budgets will be subject to critical review by landowners and trustee agencies, and amendment per results of LOHCP management projects, availability of new information (e.g., science, new techniques), and new stresses and threats (within exotic plant management, new priorities in overall management).

D.1.3 Exotic Plant Management Goals and Approaches

Exotic plant management will follow carefully established goals, each with one or more specific, quantitative objectives. Outlined in the exotic plant component of the LOHCP Preserve System AMMP, these goals and objectives will be developed in consideration of the biological goals and objectives of the LOHCP (Section 5.1). Both long term and short-term goals will be developed and, as with all aspects of the LOHCP Preserve System management, an adaptive framework will be used to evaluate and promote goal attainment.

Three main types of goals for exotic plant management will be pursued: prevention, eradication, and control. The following sections identify the criteria that will be used to assign exotic plant species occurrences to one of each of these main treatment goals, based on the comprehensive assessment of exotic plants conducted as part of the baseline survey for exotic plants in the LOHCP Preserve System (Section E.7).

D.1.3.1 Prevent Exotic Plant Establishment

The communities of the Baywood fine sands will inevitably be subject to further invasion, as aggressive exotic plants continue to become established and spread within California, and as habitat conditions

change in ways that promote invasion. Given the strong negative impacts of exotic plants on species and communities, and the large effort required to control these species, the invasion of new exotic plants will be prevented if at all possible. The opportunity costs of focusing on eradication and control efforts to the deficit of prevention will be considered in overall exotic plant management prioritizations (described below).

New invasions will be prevented through implementation of an exotic plant prevention program that will:

1. Reduce or eliminate invasive exotic plant occurrences adjacent to the Preserves;
2. Limit introduction of foreign material into Preserves;
3. Conduct education and outreach;
4. Establish methods for early detection; and
5. Plan for early eradication.

Reduce Exotic Plants Adjacent to the Preserves

Though transportation and recreation can bring seed from long distances, most exotic plant introductions will result from short-distance dispersal from areas adjacent to the LOHCP Preserves. Targeted outreach and individual coordination with adjacent landowners can be used to reduce the likelihood that new invasive exotic plants will become established within the Preserve System.

Limit introduction of foreign material into Preserves

The following steps will reduce the likelihood that new exotic plants will be introduced into the Preserve System.

1. Restoration projects will use gravel, fill, mulch, straw, and propagated plants that are 'weed free', wherever possible (Tu et al. 2001).
2. Any vehicles will be washed prior to entering Preserves.
3. Recreational trails will be managed to minimize dispersal opportunities, including by:
    a. Not connecting Preserves areas to highly invaded habitats;
    b. Removing exotic plants from parking lots, staging areas, and trailheads;
    c. Encouraging visitors to monitor themselves and their stock for weed seed; and
    d. Requiring that equestrians use only weed-free hay when recreating in Preserves.

Education and Outreach

Outreach should be used to educate adjacent landowners and Preserve visitors about the detrimental impacts of exotic plants and the steps people can take to help prevent new invasions. Residential landowners adjacent to Preserves will be encouraged not to grow invasive species including jubata grass, iceplants, and eucalyptus.

Early Detection

The Preserve System will be examined annually to detect occurrences of new exotic species. Heightened vigilance will prevent establishment following events known to promote invasion including:

1. disturbances, such as fire, roads or trails creation, landslides, or restoration projects;
2. very wet years (e.g., El Niño years); and
3. soil amendment and fertilization, including application of herbicides.

Early Eradication

Any new exotic plant species detected within the LOHCP Preserve System will be eradicated during the first year following initial detection.

D.1.3.2 Exotic Plant Eradication

Complete elimination of an exotic species from the Preserve System will be the goal of management where doing so is feasible. Species that should be considered for eradication include:

1. recently invaded exotic plant species;
2. narrowly distributed exotic species; and
3. exotic species that occur at relatively low density.

Recent invasions

Most invasions begin with one or a few individuals in a single area. Removal efforts focused on such new invasions can be successful due to the limited geographic area and the low number of individuals requiring treatment. Moreover, recent invasions of species requiring more than one season of growth prior to reproduction (shrubs, trees, and many perennial herbs) can be successfully eradicated if removed before they have the opportunity to reproduce. This can be especially important for species that develop seedbanks (populations of dormant seed) or other belowground dormant structures (e.g., bulbs, tubers) that can be difficult to locate and remove.

Narrowly Distributed Species

All else being equal, species can be more easily eradicated if they occur in a smaller geographic area, where focused treatments can successfully remove every individual. Several exotic species have narrow distributions and can be eradicated, including:

1. Species that were deliberately planted (e.g., many tree species and ornamentals); and
2. Species that are restricted to narrow microhabitats within the Preserves (e.g., along roads or creeks, near structures, etc.).

Less Abundant Species

Small populations oftentimes comprised of just a few, sparsely distributed individuals can be more readily eradicated than large populations. Presumably, conditions are not conducive to their widespread

establishment; however, these species will be eradicated before they can build up potentially explosive seed banks or proliferate in response to changing conditions, such as a fire, drought, series of wet years, or global climate change.

D.1.3.3 Exotic Plant Control

Exotic plants that have strong impacts yet cannot feasibly be eradicated will be the subject of control efforts, which will be designed to reduce their current negative impacts and potential for future impacts on communities and covered species by:

1. preventing their spread;
2. reducing their abundance (e.g., density);
3. reducing their distribution; and
4. reducing their vigor.

The following guidelines will be followed to enhance effectiveness of exotic plant control projects:

1. remove individuals or isolated patches of plants which are geographically isolated from larger patches;
2. remove exotic plants along trails, which can act as corridors for invasion to intact habitat;
3. prevent the spread of populations by controlling patches at their perimeters, then working inward;
4. prevent the spread of wind-dispersed species including grasses and Asters, among others, by working from upwind (where the sources are) to downwind (where seeds are landing).

Depending on the species and community, exotic plant control will proceed via one or more approaches:

1. **Ecosystem-Level Approaches:** In these approaches, management efforts focus on controlling exotic plant species by addressing ecological processes that influence their distribution, abundance, and population performance. Such approaches may be the most cost-effective for controlling widespread and abundant exotic species over large spatial and temporal scales. Fire management, which includes both prescription burning and wildfire suppression, and grazing are two common ecosystem approaches.
2. **Functional Group Approaches:** Exotic plant species with similar ecologies can be targeted with similar methods, perhaps increasing efficiency over single species efforts. In the LOHCP Preserves, the same control methods might be used for various species of iceplants.
3. **Single-species approaches:** A single species approach will be used in cases where a species has large impacts and/or a unique ecology which requires specialized treatment, including in the case of veldt grass.

D.1.4 Exotic Plant Management Techniques

Numerous techniques have been developed to kill or damage exotic plants; these techniques are often combined to enhance their effectiveness (Bossard et al. 2000), sometimes synergistically so (Tu et al.

2001). This section describes physical, biological, and chemical techniques will be used as part of an integrated pest management strategy to manage exotic plants in the LOHCP Preserve System, by describing the basic technique, discussing its effective use, then evaluating the benefits and potential negative impacts of its use. During implementation of the LOHCP, the available scientific literature and expertise of invasive species biologists, weed scientists, and land managers in the region will be used to select the appropriate techniques for management.

D.1.4.1 Physical Control Methods

Exotic plant species can be physically controlled using manual and mechanical removal, fire, mulching, and soil solarization.

Manual and Mechanical Removal

A wide variety of techniques have been developed to remove plants or plant biomass by hand, with or without hand tools (manual removal), or using mechanized tools (mechanical removal). These include various types of cutting and girdling as well as pulling.

Cutting: Cutting exotic plants at their base using saws (manual or chain), machetes, loppers, brush cutters, weed whackers, mowers, and brush hogs (which twist off aboveground biomass) can sometimes effectively kill them. Many exotic species resprout when cut, such that physical treatments, such as stump grinding, or chemical treatments with herbicide, are required to kill them.

Girdling: An incision cut into the trunk of a tree around its circumference can sever water and nutrient transport conduits in the trunk, thus killing the tree. While left standing in many systems, girdled trees and shrubs should be removed as standing dead trees will continue to produce shade and litter and, once they fall, will negatively impact native plants directly, through crushing, and indirectly, by usurping space as the process of decomposition will be slow, leaving the dead tree on the soil surface for decades.

Pulling: Because cutting often allows plants to resprout, pulling exotic plants out by their roots is often more effective. The loose sand soil conditions in most areas of the LOHCP Preserve System will render it fairly easy to hand-pull seedlings as well as adults of many species. Pulling can be aided by weed wrenches and similar devices that feature a lever connected to a clamp which, when attached to the base of the plant, allows one to leverage the shrub out of the ground using one's weight. The disadvantage of pulling is that some species may be facilitated by the soil disturbances that results from removing the root mass from below the soil surface.

D.1.4.2 Fire

Fire can be used to control populations of fire-sensitive exotic plant species through two main mechanisms.

Blowtorches and flamethrowers: Flames can be used to kill exotic plant individuals or patches through incineration or heat-girdling. When used during wet weather, risk of fire through the process known as 'flaming' is greatly reduced (Tu et al. 2001).

Prescribed burning: Broadcast burning removes aboveground individuals, and for many species with dormant seed banks, either kills seeds or induces their germination, after which seedlings can be removed (Bossard et al. 2000). In fire management, aspects of the fire regime including seasonality and intensity of the burn, among other aspects, will influence fire impacts.

Oftentimes a single burn is not sufficient, but several consecutive burns are needed to control exotic plants. For example, an initial burn can be to kill aboveground individuals and stimulate germination from the seedbank, and a second (and sometimes third or fourth) burn used to kill the newly established seedlings.

Importantly, some exotic plants are promoted by fire, which stimulates seed germination, or creates open conditions that promote their establishment and growth (Bossard 2000). Thus, burning, especially in closed canopy communities, could inadvertently benefit exotic species (Section D.3.1.2).

D.1.4.3 Mulching

Litter or other cover on the soil surface that reduces light availability and thus photosynthesis can inhibit populations of many exotic plants. To prevent new seedling establishment or resprouting following removal of adult shrubs and trees, a variety of mulches including straw and hay, sawdust and wood chips, grass or other clippings (Tu et al. 2001).

Native plants and animals of the Baywood fine sands might also be inhibited by mulches, so mulches should not be widely applied within intact habitat but may be an effective way to control dense infestations of exotics in highly degraded areas lacking native populations. For example, in dense stands of eucalyptus (*Eucalyptus* spp.), which typically contain very low diversity and cover of native plant species, cut stumps could be covered with black plastic tarps to inhibit re-sprouting and thus killed trees. This approach, known as 'tarping', might be used to remove exotic plants in other degraded sites, but should not be used as a widespread treatment within intact habitat (Horowitz 2003).

D.1.4.4 Solarization

Increasing soil temperatures by placing clear plastic sheets over moist soils, causing a greenhouse effect, can kill many seeds and thus prevent their germination. As with mulching and tarping, this treatment will kill both native and exotic plant seeds and therefore should only be used in highly degraded areas.

D.1.4.5 Biological Control Methods

Biological control methods use the natural enemies of exotic plants to reduce their abundance or vigor and thus their negative impacts on native species. Three types of biological control include biocontrol, competition through restoration, and grazing (Bossard 2000).

Biocontrol

Biocontrol is the process by which natural enemies of target species including animals, fungi, and other microbes are released into the wild to predate upon or parasitize exotic plants. Prior to their release, biocontrol agents are rigorously tested to ensure that they do not negatively impact native species and must be approved for use by the USDA. This extensive process precludes the use of biocontrol agents on all but a few of the worst pest plants.

Competition through Restoration and Management

Native plants can compete with exotic plant species, thus reducing their performance and ultimately their populations. Typically, exotic plants are problematical because they are strong competitors for resources and thus 'out compete' native plants. Restoration techniques that 'tip the balance' (Corbin et al. 2004) towards native species might enhance native biodiversity. Such techniques can include: propagating and reseeding native species, reducing the availability of nutrients through carbon addition, and facilitating succession.

Planting and seeding native species: In highly degraded areas where native plant propagule supply is limited, control of exotic plant species may be facilitated by sowing or planting native plants in conjunction with exotic plant removal or other control techniques. A very conservative protocol for procuring, propagating, and out planting plant material must be adhered to in order to protect the genetic diversity of plants within the site. In general, sowing seeds and planting seedlings or cuttings of native species into intact, preserved habitat should be limited. Preserves should maintain native biodiversity and natural community structure, and management should simply counteract, where possible, the negative impacts of anthropogenic alterations to habitat, not engineer desired landscapes. Ecological research relies heavily on examination of natural distribution and abundance patterns of species and assemblages. Planting will reduce the ability of researchers to investigate the species and community ecology in the preserves.

Reducing soil nutrient availability: Many exotic plant species in the Baywood fine sands may require higher nitrogen availability. For example, rip gut brome (*Bromus diandrus*), is found in high density in the recently abandoned pea fields where soil nitrogen is likely higher than within intact habitat. Facilitating uptake of nitrogen by soil microbes including bacteria by adding carbon via sugar (e.g., sucrose) or sawdust has been shown to reduce plant-available soil nitrogen. Such restoration may return the competitive advantage to native plants that are adapted to the low availability of soil nutrients in the Baywood fine sands (Haubensak 2001, Corbin et al. 2004).

Succession: Many exotic plants in the communities of the Baywood fine sands are early successional species that require environmental conditions characteristic of post-disturbance environments, including high availability of light and soil resources. Over time, the natural successional trajectory in coastal sage scrub and Morro manzanita chaparral communities recovering from disturbance (e.g., clearing and tillage) will likely render conditions less suitable for these species. Unfortunately, succession will also reduce suitability of habitat for native early successional species, including sensitive plants and animals such as the Morro Bay kangaroo rat. Thus, widespread late successional conditions should not be a goal in preserve management, though succession might be effective in reducing some species including veldt grass, which observations suggest decreased in abundance in coastal sage scrub at Montaña de Oro State Park (M. Walgren, pers comm.).

Grazing

Recent efforts to decrease exotic plant abundance at large spatial scales in other systems have focused on the role of grazing animals. Livestock including goats, sheep, and cattle as well as chickens have been used to control exotic plants; however, the impacts of grazers on plant communities have been mixed. Grazing has been proven effective in enhancing diversity of native forbs in mesic grasslands (Hayes and Holl 2003); however, grazing has also been shown to facilitate, rather than reduce, populations of some

exotic plant species and increase the distribution of exotic plants by vectoring weed seed through animal droppings (Tu et al. 2001).

As with all management in the LOHCP Preserve System, techniques that match natural processes to which the native species are adapted are more likely to have beneficial effects. It is not known whether the native communities of the Baywood fine sands are evolved under a regime of native grazers (e.g., elk, antelope) and therefore might benefit from grazing to reduce exotic plants.

Grazing may degrade native communities by reducing populations of sensitive species and causing soil disturbance which can cause soil erosion and enhance invasion and spread of exotic species such as veldt grass and jubata grass. As a result of the strong potential for such negative impacts, grazing is only recommended as a method of removing dense infestations of exotic plants (and low native plant cover) in areas for which there is no other conceivable removal method. Grazing should avoid areas with populations of sensitive plants and animals, where soils remain intact (i.e., have not been mechanically disturbed), and where the topography is steep. In these cases, the smallest effective grazers (e.g., sheep and goats, not cattle) should be penned into the designated area and removed immediately following treatment.

D.1.4.6 Chemical Control Methods

In chemical control, herbicides are used to kill exotic plants or inhibit their growth. Herbicide use has been evaluated as a control technique for many exotic species that occur in LOHCP Preserve (Bossard et al. 2000), with some tests by State Parks staff having been conducted in the communities of the Baywood fine sands (M. Walgren, pers comm.).

The following herbicides were identified as appropriate for use as part of an integrated pest management strategy, to control exotic plant species in the Morro Dunes Ecological Reserve based on consultation with Joel Trumbo, California Department of Fish and Wildlife Senior Environmental Scientist (Lands Program, Wildlife Branch) who serves as a pest control advisor (J. Trumbo, pers. comm. 2018). The list was developed based on review of the exotic plant species subject to management (Section D.1.5), the special-status species and other sensitive resources in the reserve and broader LOHCP region, and the risk-assessment analysis prepared by the United States Forest Service (USFWS 2018).

- Glyphosate: non-specific herbicide recommended for annual herbs, grasses, perennials, and trees;
- Imazapyr: non-specific herbicide recommended for perennial herbs and trees;
- Triclopyr amine: broadleaf-specific herbicide recommended for annual and perennial broadleaf species, and trees;
- Triclopyr ester: broadleaf-specific herbicide recommended for trees and Himalaya blackberry;
- Aminopyralid: broadleaf-specific herbicide recommended for perennial herbs, especially asters, and trees;
- Chlorsulfuron: broadleaf-specific herbicide recommended for perennial broadleaf species, especially mustards;
- Fluazifop-p-butyl: grass-specific herbicide recommended for annual grasses; and
- Sethoxydim: grass-specific herbicide recommended for annual and perennial grasses.

These herbicides can be applied to trees using a cut stump, frill cut, or basal bark techniques, and foliar application for herbs, grasses, and vines.

Information about their use and risk-assessment analyses (except for triclopyr and triclopyr ester) are provided by the United States Forest Service (USFWS 2018). These pesticides are anticipated to be appropriate for upland habitats in other LOHCP Preserves. Additional herbicides developed during the anticipated 25-year period of LOHCP implementation should be evaluated for use based on analysis of their effectiveness at controlling exotic plants, risk to special-status species and other sensitive resources, and cost-effectiveness.

Potential negative impacts of herbicide use to control exotic plants in the LOHCP Preserve System include:

1. collateral damage to native species, including sensitive plants and animals;
2. facilitation of additional exotic plant invasions, due to disturbance and/or increase nutrient availability associated with the die-off and herbicides themselves;
3. contamination of groundwater due to the porous nature of the Baywood fine sand soil.

In general, the risks of herbicide use can be reduced by using one or more of the following precautions (Hoshovsky and Randall 2000):

1. selecting chemicals that are selective (kill only one or a few species), are non-toxic to animals, degrade rapidly under environmental conditions of the region, are immobilized on soil particles and therefore unlikely to reach groundwater, and are not easily volatilized; and
2. applying the herbicide so as to minimize inadvertent spread, including by spot treating the narrowest area possible, using a dye to determine where the application is going, and applying only in appropriate weather conditions (no rain, low wind).

Additional precautions that can be used in the LOHCP Preserve System include avoiding areas occupied by sensitive species and relocating sensitive species such as Morro shoulderband snail from the treatment area prior to herbicide application.

Like all potential management techniques, chemical control methods can have both positive and negative effects via direct and indirect mechanisms, all of which should be considered in evaluating the potential use of herbicides. Chemicals will be used to control exotic plant species through an integrated pest management approach and will be the follow the manufacturer's label.

D.1.5 Exotic Plant Species in the LOHCP Preserve System

This section outlines the current and potential future impacts of exotic plant species based on the current available information. This information will be updated and augmented based on the exotic plant inventory conducted early during implementation of the LOHCP (Section D.1.2.1).

Table D-1 lists the exotic plant species that are known or likely to occur in land anticipated to be included within the LOHCP Preserve System. Based on current information, proactive management is currently recommended for a subset of these (Table D-2). Table D-3 lists control techniques which may be effective in managing these aggressive exotic species.

D.1.5.1 Perennial Veldt Grass (*Ehrharta calycina*; Poaceae)

Distribution and Abundance

Perennial veldt grass is the most abundant and widespread exotic plant in land proposed for inclusion in the LOHCP Preserve System. It is found in all of the coastal sage scrub communities and occurs in disturbed areas, including along trails, in the central maritime chaparral communities. Though veldt grass is widespread, the species is generally absent from areas of dense canopy cover in central maritime chaparral and coast live oak woodland. Though patchily very abundant, veldt grass occurs very sparsely in some areas (i.e., <10% cover). The factors that limit its distribution and abundance are poorly understood.

Impacts

Perennial veldt grass invades coastal sage scrub and central maritime chaparral communities in areas of soil disturbance, including roads and trails, then establishes in gaps between shrubs. It attains high cover (>50%) in disturbed coastal sage scrub found on the Baywood fine sands, where it likely reduces the cover and species richness of native plants by competing for limiting soil resources. In addition, the dense thatch it produces may preclude native plant establishment. Perennial veldt grass is credited with transforming shrublands (e.g., central maritime chaparral and coastal sage scrub) into grasslands through the grass-fire cycle (Pickart 2000)—the process through grasses invade shrublands and promote frequent fire, through their highly flammable fuel, which then eliminates shrubs, resulting in type conversion (D'Antonio and Vitousek 1992)

Potential Future Impacts

Though perennial veldt grass is already relatively widespread and abundant, it too may increase in distribution and abundance in the absence of exotic plant management. Seedling establishment is facilitated by disturbances. Within central maritime chaparral, the species is primarily restricted to open, chronically disturbed areas including trails. Management designed to facilitate native shrub establishment, including fire and fire surrogates, as well as wildfire, could facilitate the spread of veldt grass into these relatively uninvaded communities.

In areas where perennial veldt grass is already abundant, its abundance may decrease through time. Many of these areas were disturbed as a result of agriculture (clearing and tillage) which facilitate the invasion and proliferation of perennial veldt grass. Though the species may slow the rate of shrub recolonization following disturbance, succession may ultimately create conditions which are unsuitable for perennial veldt grass persistence, including greater shrub canopy. This process of succession reducing veldt grass abundance (but not distribution) has been observed in the dune lupine community at Montaña de Oro State Park (Walgren 2004).

Proposed Treatments

The treatments proposed for perennial veldt grass control vary, depending on characteristics of the habitat area to be treated. In small, outlying patches consisting of a few sparsely distributed perennial veldt grass plants, plants should be pulled, with care given to reduce the amount of soil disturbance to the extent possible. Plants should be removed from the site using plastic bags in order to prevent seed

dispersal when plants are in fruit. Treated areas should be revisited to pull seedlings which may recruit (Nowell 2004).

Many areas anticipated to be included in the LOHCP Preserve System contain perennial veldt grass infestations which are large and dense. In these areas, manual removal will likely prove ineffective at controlling the invasive plant which instead will require chemical control. In larger areas where veldt comprises less than 90% of the relative cover, the grass specific herbicide Fusilade, mixed with a 0.5% no foam surfactant, should be applied to the leaves of plants during the active growth phase prior to seed head development (approximately November-April; Nowell 2004). Where veldt grass comprises more than 90% of the relative plant cover, and there are no sensitive plant species, veldt grass can be chemically controlled using a 2% solution of Roundup (glyphosate) broadcast sprayed over the treatment area.

D.1.5.2 Iceplants

Species

Land anticipated to be included within the LOHCP Preserve System supports two species of iceplant (species in the family Aizoaceae):

1. fig marigold (*Carpobrotus edulis*); and
2. round-leafed iceplant (*Conicosia pugioniformis*).

Sea fig (*Carpobrotus chilensis*) may also be present in the area.

Distribution and Abundance

Both round-leafed iceplant and fig marigold occur in gaps between shrubs within the coastal sage scrub and central maritime chaparral communities, where they are fairly widely distributed, due to their ability to colonize soil disturbances and gaps (Albert 2000, Albert and D'Antonio 2000).

Impacts

Owing to their rapid lateral growth (shoots can grow up to 1 m per year; D'Antonio 1990b), the long-lived perennial fig marigold can form large, impenetrable mats that compete with native seedlings (D'Antonio 1993) and reduce shrub growth (D'Antonio and Mahall 1991). Fig marigolds can also lower soil pH and increase soil organic matter (D'Antonio 1990a); in doing so, can increase the invasibility of sandy soils such as the Baywood fine sands (Albert 2000).

Though shorter-lived that fig marigold, round-leafed iceplant readily colonizes disturbances and gaps and grows very rapidly, allowing it to compete with native plants for space and resources. Round-leafed iceplant may similarly alter soil conditions and facilitate invasion, though this has not been examined (Albert and D'Antonio 2000).

Potential Future Impacts

In the absence of careful, targeted management efforts, iceplant species will likely increase in distribution and abundance. Individuals will persist within the gaps that are maintained in the open canopy conditions of the coastal scrub communities. In addition, fire management to maintain and

enhance native communities and populations of fire-adapted species will create opportunities for establishment (D'Antonio 1993, D'Antonio et al. 1993). Herbicides and die off associated with control can increase soil nutrient available and facilitate invasion. Thus, careful management of these two species will be essential to attaining the conservation goals of the LOHCP.

Proposed Treatments

Physical treatments are recommended for round leaved iceplant and small patches of fig marigold. Both species can be manually removed through pulling and cutting. Because remaining roots and pieces of branches can reestablish, care must be taken to completely remove the roots and all branches from the site. Follow up monitoring and treatment will be needed to remove new recruits and other exotic plants that invade the site.

Manual removal of fig marigold may be very time consuming and costly in the many areas of the Preserves where it has formed large patches. In these virtual monocultures, the application of glyphosate (i.e., Roundup) is recommended as a 2% solution of foliar spray. Since Morro shoulderband snail can inhabit ice plant mats, pre-treatment surveys should be used to locate, capture, and relocate to the nearest protected soil habitat outside of the treatment area to reduce take in the form of injury and mortality to individuals that could result from manual or chemical treatment of iceplants.

D.1.5.3 Jubata Grass (*Cortaderia jubata;* Poaceae)

Distribution and Abundance

Jubata grass presently has a narrow distribution and occurs at low abundance within land anticipated to be included in the LOHCP Preserve System. At the Bayview Unit of the Morro Dunes Ecological Reserve, jubata grass occurs in the Morro manzanita community in and around an area of extensive soil erosion associated with the old Broderson Road on the western edge of the reserve.

Current Impacts

An extremely large bunchgrass, jubata grass competes with native plants for space and soil resources.

Potential Future Impacts

In the absence of management, jubata grass will likely expand its distribution and abundance. The species produces up to 100,000 mature seeds per individual inflorescence, and windborne seed can disperse more than miles (DiTomaso 2000). The distribution and abundance of jubata grass within the natural communities of the LOHCP Preserve System is likely currently limited by the lack of appropriate conditions for seedling establishment, which appear to be created by disturbance. Such events that remove established biomass including activities associated with management, such as fire and other exotic plant removal efforts, may enhance the distribution and abundance of this plant.

Proposed Treatments

Pampas grass adults should be removed through cutting using a chain saw or weed eater. Seedlings should be removed through hand pulling or with a shovel. Manual removal may facilitate establishment

of seedlings or other exotic plants, necessitating that the site be monitored and follow up treatments be applied as needed.

D.1.5.4 Annual grasses

Species

Land anticipated to be included in the LOHCP Preserve System supports several species of annual grasses including:

1. oats (*Avena* spp.);
2. rip-gut brome (*Bromus diandrus*); and
3. red brome (*Bromus madritensis* ssp. *rubens*).

Distribution and Abundance

Annual grasses primarily occur at low abundance in a few localized habitats, including along trails and underneath isolated coast live oaks. The primary exception is the high-density populations of rip-gut brome that are found in a recently abandoned pea field in the northeastern portion of the Plan Area.

Impacts

Dense patches of annual grasses compete with native plants in the Baywood fine sands, especially native herbs, because their fibrous, shallow roots can take up limited soil resources. This competition can be greatest for native seedlings, which experience reduced establishment in dense patches of annual grasses.

Potential Future Impacts

Abiotic conditions in the Baywood fine sand communities including low soil moisture and nitrogen availability may restrict the distribution and abundance of annual grasses to specific microhabitats, or as in the case of the abandoned pea field, areas of greater nutrient availability. Any factor that might alter these conditions, including nitrogen deposition (Brooks 2003), a series of years with above average rainfall, or fire or other disturbance (Brooks 1999), could enhance the spread of these species. With increase abundance, these species would not only compete with native species on a larger spatial scale but could also increase the density of fine fuels in the dry season, and thus promote wildfire.

In other systems, fire has promoted establishment of annual grasses, including red brome (Brooks 1999)and cheat grass (*Bromus tectorum*; Young et al. 1987) which in turn have reduce establishment of perennial herb and shrub seedlings. The resulting dominance of annual grasses further promotes wildfire which again favors grasses, thus resulting in the type conversion of shrublands to grasslands (D'Antonio and Vitousek 1992).

Proposed Treatments

In areas where annual grasses occur in low abundance, manual removal through hand pulling is recommended. Care should be used to reduce the soil disturbance and thus potential to enhance the

spread of other exotic plants. Annual grasses should be pulled prior to setting seed during early spring (i.e., by April). All biomass should be removed from the site.

In areas where rip-gut brome or other annual grasses have become abundant, application of the monocot-specific herbicide Fusilade, with a 0.5% no foam surfactant can be applied during the growing season (January-March) but before seed head development.

D.1.5.5 Exotic Trees

Species

Non-indigenous tree species presently found within land anticipated to be included within the LOHCP Preserve System include:

1. Eucalyptus (*Eucalyptus camaldulensis* and *E. globulus*; Myrtaceae)
2. Monterey pine (*Pinus radiata*; Pinaceae)
3. Monterey cypress (*Hesperocyparis macrocarpa*; Cupressaceae)

Distribution and Abundance

Exotic trees occur with a very limited distribution at very low abundance, relative to other exotic plants. Of the tree species, *Eucalyptus* spp. are the most widespread. Monterey pine and Monterey cypress occur in only a few, isolated stands.

Current Impacts

The native communities of the Baywood fine sands are dominated by shrubs and herbs and contain only short statured trees such as coast live oaks (*Quercus agrifolia*). The exotic trees are much larger than the native trees; as a result, they compete with native plants for light and soil resources, and produce a dense layer of litter (leaves, bark, and small limbs). Eucalyptus bark, leaves, and roots also feature phenolic acids and volatile oils that have deleterious effects on other plants species (Sasikumar et al. 2002, Florentine and Fox 2003). Through these mechanisms, exotic trees reduce the diversity and cover of native plants, and alter habitat conditions for native animals, including Morro shoulderband snail which was negatively associated with eucalyptus (Walgren and Andreano 2012).In addition, the fuels they produce increases the risk of wildfire (Tyler and Odion 1996).

Potential Future Impacts

Originating in fire-prone communities, these species are adapted to fire, and produce high densities of seedlings following fire. As a result, they have the potential to spread during management designed to enhance the native communities (Section D.3; Tyler and Odion 1996, Tyler 1996). Even in the absence of fire, eucalyptus seedlings establish readily on the periphery of current groves, which have thus expanded over the past century and will likely continue to expand in the absence of management.

Proposed Treatments

Adult exotic trees should be removed through by cutting. To avoid soil disturbance and management costs, the stump and roots of large trees can be left intact. The stumps of species likely to resprout should be covered with thick black plastic tarps and/or a topical herbicide (e.g., Triclorpyr) to kill the tree. In many cases, removal of adult trees will facilitate establishment of seedlings, which should be removed with hand pulling. All tree biomass should be removed from the site. The site should be monitored to ensure other exotic plants such as iceplant and veldt grass to not invade the site.

D.1.5.6 Ornamental Plants

Species

A variety of ornamental plants have been deliberately planted in land anticipated to be included within the LOHCP Preserve System; specifically, adjacent to homes on the south side of Highland Drive in the Bayview Unit of the Morro Dunes Ecological Reserve. Species include exotic pines (*Pinus* sp.) and succulents (*Agave* spp.)

Current Impacts

Due to their very limited distribution and abundance, the impacts of the ornamental plants are likely limited. However, these species can compete with native plants and alter habitat for native animals; they may also promote wildfire.

Potential Future Impacts

While their narrow distribution and low abundance suggests that the ornamental plants may not be prone to spreading, changes in environmental conditions associated with disturbances (incl. fire and recreation), climate variation or change (e.g., El Nino years, greater precipitation), or other alterations associated with succession (soil development, etc.) might provide these species with opportunities to invade the natural community and displace native species.

Proposed Treatments

Ornamental plants will be targeted for removal through physical means, with the specific techniques varying depending on the habit of the plant. Trees and shrubs should be cut using a chain or hand saw. Herbs and succulents should similarly be cut or potentially pulled, with care given to avoiding soil disturbance associated with removing roots where possible. All biomass from these plants should be removed from the site. Follow up treatment may be required to kill or remove stump sprouts, seedlings, or other new recruits. However, physical mechanisms should successfully eradicate the ornamental plants of the LOHCP Preserve System.

D.1.5.7 Native Invaders

Plants native to California but not to the Bayview fine sands communities of Los Osos may also negatively impact communities and covered species of the LOHCP Preserve System. Though naturally occurring in California, such species might occur within the Los Osos communities solely due to

anthropogenic factors. As a result, native Baywood fine sand soil species are not adapted to competition with neither these species nor the habitat conditions they create.

Presently, it is not known whether there are any native invaders within land anticipated to be included within the LOHCP Preserve System. Such species will be documented during the exotic plant inventory, after which management will be designed and implemented to eradicate or control them, as appropriate.

Genetic erosion, or the loss of native genetic diversity, can result when non-local genes are introduced as a result of the translocation of plant materials. In the LOHCP Preserves, the threat of genetic erosion is most acute for the Morro manzanita, as species of the genus *Arctostaphylos* are known to readily hybridize. If manzanita species other than those which naturally occur in the Baywood fine sands (*Arctostaphylos cruzensis* and *A. tomentosa*) are transplanted into areas within or near the LOHCP Preserve System, they might hybridize with the *A. morroensis,* thus altering the genetic structure of the populations. This can reduce the fitness of native species by disrupting locally adapted gene complexes required for persistence in the unique environment. To prevent the risk of genetic erosion, landowners should be apprised of the potential impacts of planting manzanita species not native to the Los Osos region, as may be sold in local nurseries.

D.1.5.8 Exotic Plant Management Resources

Techniques available for exotic plant management efforts are continually being developed, evaluated, and refined. Specific treatments for exotic plant management projects will be developed based on the most up to date information available. Recent references available including Bossard et al. (2000), the *Weed Control Methods Handbook* (Tu et al. 2001) and the Weed Society of America's *Herbicide Handbook* (Weed Society of America 2002). Numerous organizations share their information regarding exotic plant management on the World Wide Web. These include: The Nature Conservancy Wildland Invasive Species Team (http://tncweeds.ucdavis.edu/about.html) and the California Invasive Plant Council (CalIPC.org). Searching the web for "exotic plant control" will bring these as well as well as hundreds of other websites containing invaluable information to inform exotic plant management including examples of weed control plans and methods of prioritizing exotic plants for control efforts, among others.

D.1.6 Techniques to Avoid Impacting Sensitive Species

Exotic plant management will be a crucial component of LOHCP Preserve System management. Indeed, when evaluating the conservation benefit of the LOHCP, the four scientists of the Scientific Advisory Committee cited effective control of exotic plant species as *the* main factor which will likely determine whether the biological goals and objectives for the Preserve System will be attained. Of particular concern is the control of veldt grass and iceplant species.

Though designed specifically to enhance habitat for sensitive species, many exotic plant management techniques have the potential to cause inadvertent, short-term negative impacts to sensitive species. Many types of physical, chemical, and biological techniques could cause short-term declines in plant and animal populations due to the impacts of trampling alone. Such impacts are not limited to exotic plant management; instead, many projects designed to enhance habitat have the potential to cause inadvertent negative effects.

As with all management projects, the goal of exotic plant management is to maximize the beneficial effects for the covered species, other sensitive species, and the natural communities, while reducing the potential for such inadvertent negative impacts due to management. The main technique that will be used to accomplish this goal is the pre-project survey, in which the area proposed for treatment is carefully examined for the presence of sensitive species. Depending on the project, the species, and the extent of the occurrence within the treatment area, sensitive plants and animals can be avoided or translocated (i.e., safely relocated to nearby suitable habitat out of harm's way).

In the absence of studies evaluating the impacts of herbicides on sensitive species, the resource agencies are understandably concerned about their potential negative effects, especially given the large areas of the LOHCP Preserve System which have become infested and merit treatment. Steps can be taken to prevent exposure of sensitive animals to the chemicals during treatment. Pre-project surveys can be used to determine whether sensitive species such are present. If they are and cannot be avoided or translocated, the occupied habitat can be treatment using non-chemical methods that are appropriate. These and perhaps other steps should be described in a memorandum of understanding or other formal agreement between land managers and agencies concerned about potential herbicide impacts, to allow their use in the LOHCP Preserve System.

Experienced resource managers and weed specialists have developed herbicide treatment protocols which are designed to reduce or prevent impacts to non-target plants. Using low-pressure backpack sprayers equipped with large droplet nozzles to spray only when winds are less than 10 miles per hour and ground moisture is minimal greatly reduces the potential for herbicides to land on non-target species (Nowell 2004) Monocot specific herbicides (e.g., Fusilade) can further reduce potential impacts to broad leaved plants when treating veldt grass or annual grasses.

There is growing consensus among experienced resource managers and weed specialists that veldt grass and iceplant species cannot be effectively controlled in over large areas such as the LOHCP Preserve System without the use of herbicides. In large infestations, physical techniques including cutting and hand pulling are regarded as ineffective or painstakingly slow at best. At worst, these methods have been found to increase the growth, distribution, and/or abundance of veldt grass and iceplant, owing their adaptations to grazing and disturbance (Sarafian 2004, Walgren 2004, and Nowell 2004).

Table D-1: Exotic plant species known or likely to occur within the LOHCP Preserve System

Species	Common name	Life form
Anthemis cotula	stinking chamomile	annual herb
Arundo donax	giant reed	perennial herb
Avena barbata	slender wild oats	annual grass
Avena fatua	common wild oats	annual grass
Brassica nigra	black mustard	large annual herb
Brassica tournefortii	Saharan mustard	large annual herb
Bromus diandrus	rip-gut brome	annual grass
Bromus madritensis ssp. *rubens*	red brome	annual grass
Cardaria draba	hoary cress	perennial herb
Carpobrotus chilensis	sea fig	succulent perennial herb
Carpobrotus edulis	fig marigold	succulent perennial herb
Chenopodium murale	sowbane	annual herb
Conicosia pugioniformis	round-leaved iceplant	succulent perennial herb
Conium maculatum	poison hemlock	perennial herb
Cortaderia jubata	jubata grass	large perennial grass
Cortaderia selloana	pampas grass	large perennial grass
Datura stromonium	jimsonweed	large annual herb
Delairea odorata		
Dipsacus fullonum	Fuller's teasel	biennial herb
Ehrharta calycina	veldt grass	perennial grass
Eucalyptus camaldulensis	Red River gum	tree
Eucalyptus camaldulensis	red gum	tree
Eucalyptus globulus	Tasmanian blue gum	tree
Foeniculum vulgare	fennel	large perennial herb
Helminthotheca echioides	bristly ox-tongue	annual/perennial herb
Hesperocyparis macrocarpa	Monterey cypress	tree
Malva neglecta	common or dwarf mallow	annual or perennial herb
Marubium vulgare	horehound	perennial herb
Melilotus spp.		annual/perennial herb
Myoporum laetum	lollypop tree	shrub/tree
Oxalis spp.	woodsorrel	perennial herb
Pennisetum clandestinum	kikuyu grass	perennial grass
Pinus radiata	Monterey pine	pine
Piptatherum miliaceum	millet mountain rice	perennial grass
Polygonum sp.	knotweed	herb
Polypogon sp.	beard grass	grass
Ricinus communis	castor bean	shrub
Rubus discolor	Himalayan blackberry	vine/shrub
Rumex acetosella	sheep sorrel	herb
Sonchus asper ssp. *asper*	prickly sow thistle	thistle
Tetragonia tetragonioides	New Zealand spinach	herb
Vicia spp.	vetch	herb/vine
Vinca major	periwinkle	ground-covering vine

Table D-2: Characteristics of invasive plant species currently found within the LOHCP Area

Life Form	Species	Common Name	CalIPC Rating[1]	Relative[2]			Initial Preserve System Strategy
				Distribution	Abundance	impact	
Trees	*Hesperocyparis macrocarpa*	Monterey pine	*Not rated*	narrow	low	low	eradication
	Eucalyptus camaldulensis	red gum	Limited	narrow	low	low	eradication
	Eucalyptus globulus	Tasmanian blue gum	Moderate	narrow-moderate	low	moderate	eradication
	Pinus radiata	Monterey pine	*Not rated*	narrow	low	low	eradication
iceplants	*Carpobrotus edulis*	fig marigold	High	moderate-high	moderate-high	moderate-high	control
	Conicosia pugioniformis	round-leaved iceplant	Limited	moderate-high	moderate-high	moderate-high	control
perennial grasses	*Cortaderia jubata*	jubata grass	High	narrow	low	low	eradication
	Ehrharta calycina	veldt grass	High	high	high	high	control
annual grasses	*Avena* spp.	wild oat	Moderate	narrow	low-moderate	low	control
	Bromus diandrus	rip gut brome	Moderate	moderate	low-moderate	moderate	control
	Bromus madritensis	fox tail brome	High	narrow	low-moderate	low	control

[1] California Invasive Plant Council (2016) Invasive Plant Inventory (2016)

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

[2] Relative ranking compared to other exotic plant species based on current distribution, abundance, and likely impacts

Table D-3: Exotic Plant Management Strategies and Techniques

Strategy	Plants	Management Techniques			References
		Physical	Biological	Chemical	
1.1: Eradicate from the Preserve System	Non-Indigenous Trees: *Eucalyptus* spp., *Hesperocyparis macrocarpa, Pinus radiata,* others	Adults: cut using chain saw, pile burn or remove biomass; apply a tarp or Seedlings: hand pull individually or mulch (tarp)	none	herbicide (e.g., Triclopyr) can prevent stump sprouting	Boyd 2000
	jubata grass (*Cortaderia jubata*)	Adults: cut (chain saw/weed eater); remove or burn biomass incl. inflorescences (prior to seed maturation) Seedlings: pulling, shoveling	increase in shrub/tree canopy due to succession	spot treatment, post emergence glyphosate or fluazifop-p (a graminicide)	DiTomaso 2000
1.2: Control (reduce abundance and distribution) within the Preserve System	round-leafed iceplant (*Conicosia pugioniformis*)	hand pulling or slicing taproot with tool; removal of biomass	none	glyphosate by foliar spray kills seedlings and mature plants	Albert and D'Antonio 2000
	fig marigold (*Carpobrotus edulis*)	hand pulling and removal biomass	none	glyphosate (2%) in mid-winter	Albert 2000
	European Annual grasses (*Bromus* spp., *Avena* spp.)	hand pulling (on small scale)	increase in shrub/tree canopy due to succession; grazing	glyphosate fluazifop-p	Boyd 2000
	Veldt grass (*Ehrharta calycina*): dense (>75% relative cover)	mechanical clearing followed by hand pulling of seedlings	sheep grazing; active revegetation	glyphosate (2%) in early spring fluazifop-p	Chesnut 1999, Pickardt 2000

D.2 Recreation Management

Many properties anticipated to be managed as part of the LOHCP Preserve System allow access for passive recreation, including hiking and horseback riding. When well-managed, such passive recreational uses can be compatible with the LOHCP biological goals and objectives (Section 5.1). Therefore, lands protected through implementation of the LOHCP may similarly allow recreational use.

However, observations of historical aerial images and current site conditions of several lands anticipated to be included in the LOHCP Preserve System suggest that historic uses, including more intensive historic unauthorized use by off-highway vehicles, as well as perhaps some current uses, have negatively impacted habitat by removing native plants, causing large-scale soil erosion, and promoting the invasion and spread of exotic plants. In doing so, recreation may reduce the amount of quality of habitat available to native plants and animals, and threaten populations of sensitive species, including the LOHCP covered species. By its very nature, even low-intensity forms of recreation, including hiking, can result in take of the covered species, including the Morro shoulderband snail; therefore, recreation within the LOHCP Preserve System is a covered activity of the LOHCP (Section 2.2).

This section integrates the best available biological information to:

1. evaluate the factors that influence recreation impacts in the Baywood fine sand communities;
2. describe the potential benefits and negative effects of different types of recreation; and
3. outline recommendations for managing recreation within the LOHCP Preserve System to enhance native biodiversity and facilitate persistence of the covered species.

This information can help inform development of the recreation management component of the LOHCP Preserve System AMMP, which will be prepared early during implementation of the LOHCP.

D.2.1 Potential Recreation Impacts

Authorized and unauthorized recreation on lands anticipated to be incorporated in the LOHCP Preserve System primarily consists of pedestrian use (hiking, running, and dog walking), equestrian use, and off-highway vehicle use (OHV). In addition, dune sliding occurs in Montaña de Oro State Park, just west of the LOHCP Area.

Recreation impacts natural habitat by three main mechanisms: removing biomass (i.e., killing animals, killing or reducing the cover of plants), causing soil erosion, and promoting exotic plant invasion. These impacts can directly and indirectly affect the covered species and communities negatively and positively, depending on the component of the system being evaluated and the temporal or spatial scale being addressed. As a result, it is not possible to state '*the* effect' of recreation. Instead, evaluating different types of recreation according to their specific characteristics can facilitate objective assessment of recreation impacts that should influence recreation management.

D.2.1.1 Characteristics of Recreation that Influence Impacts

Like all disturbances, recreation impacts communities and species in various ways which depend on the magnitude (intensity and severity), areal extent, shape, and return interval of use. The following assessment is based on observations and research from the Santa Cruz sandhills—an endemic

community restricted to sand soil outcrops that is subject the recreational use of concern for the persistence of endangered plants and animal species (McGraw 2004a, McGraw 2004b)

Magnitude

The magnitude of the disturbance (biomass removal) depends on two factors: 1) the intensity of the recreational activity, which measures the strength of the force (pressure, sheering) and 2) the severity of the disturbance, which measures the degree to which biomass is removed. The magnitude of disturbance caused by recreation appears to follow the general basic gradient: walking < horse riding<=mountain bicycling< OHV use.

Trails used solely by wildlife are typically narrow. Trails used infrequently by pedestrians are also typically narrow. More intense recreational use including horse riding, mountain biking, and OHV use tend to create wider trails. At the Bayview Unit of the Morro Dunes Ecological Reserve, a main east-west trail just south of and parallel to Highland Drive is greater than 2 m wide and exceeds 5 m in width in several locations. While pedestrian trails are rarely incised, trails used by equestrians, mountain bikes, and OHVs, are more likely to become incised due to the intensity of the force, and the alterations to drainage that result (described below).

Areal Extent

Wider trails disturb a greater area than narrow trails. Trail width appears to be related to disturbance intensity, as recreation causing greater force, loosens more soil, and causes greater erosion; this leads to use of the adjacent, previously undisturbed area, and thus widening of the trial. Single-track trails, as they are referred to by recreation planners, invariably become wider over time if there are no barriers (i.e., fences, woody vegetation) or symbolic fences lining the trail corridor.

Shape

The shape or spatial configuration of the disturbed area, specifically the perimeter to area ratio, influences recreation impacts on habitat by affecting recolonization following disturbance. Arenas have a low perimeter to area ratio compared to trails, and wider trails characteristic of higher intensity uses (equestrians, OHVs) have lower perimeter to area ratios than narrow trails. This ratio influences the rate of recolonization following disturbance by determining the disturbance plants (and then animals) must disperse from adjacent, undisturbed habitat. Seedbanks can facilitate recovery of disturbances; however, ongoing erosion and lack of plant cover on disturbances results can reduce seed supply over time, as was observed in the Santa Cruz sandhills (McGraw 2004b).

Return Interval

The time between successive disturbance events (i.e., recreational uses) determines the amount of time the system has to recover from the perturbation and therefore the impact of recreation. The same type of trampling will result in greater impacts at higher frequencies (shorter return intervals). Due to the erosive nature of the sandy Baywood fine sand soils, even low frequency use will likely denude trails.

Type

Unique characteristics of the different types of recreation also can influence their impacts. Due to their weight, the locomotion of horses can cause churn soil. This disturbance has been found to promote the invasion and spread of exotic plants, including veldt grass and ice plants (Walgren 2004). The tracks created by both mountain bikes and motorcycles can provide a conduit for water and, depending on the slope of the trail, the resulting drainage can cause substantial erosion which impacts adjacent habitat and necessitates higher maintenance costs. If not leashed and picked up after, dogs can impact wildlife including through their feces, which can spread disease.

D.2.1.2 Characteristics of Habitat that Influence Recreation Impacts

Recreation use impacts can vary depending on the habitat conditions where they occur, in ways that should be considered in planning recreational use within the LOHCP Preserve System.

Soil Conditions

The course texture of the Baywood fine sand soils found throughout much of the LOHCP Preserve System renders them inherently susceptible to erosion when disturbed. In areas of sparse plant cover, there is minimal root area to bind soil and as well as limited plant cover aboveground to intercept splash rain drops that can cause splash erosion. Direct trampling associated with recreation exacerbates soil erosion by removing plant cover and creating channels for storm water runoff, with the magnitude of these effects likely proportional to the intensity of the recreation. Once trails become incised, they channel runoff which, in turn, causes increased erosion. This positive feedback loop between recreation and erosion appears to have created the 5 m deep gully on the old Broderson Road located on the western edge of the Bayview Unit of the Morro Dunes Ecological Reserve.

Sensitive Species Distributions

Recreation may have greater impacts in the Baywood fine sand communities due to the populations sensitive species found in the habitats traversed by trails. In the absence of designated recreational trails at most sites, wildlife trails are often utilized for recreation. Recreation was observed to collapse burrows of the rare Santa Cruz Kangaroo in the Santa Cruz sandhills (Bean 2003), and might similarly affect burrows of the Morro Bay kangaroo rat (USFWS 1999), although no such burrows have been observed in recent decades. Though Morro shoulderband snails might not typically be found on recreation trails, which are denuded, their low vagility would make them susceptible to mortality by direct trampling, especially by fast-moving recreationalists.

Topography

Following biomass removal, wind, gravity, and water can move loosened sand particles and cause erosion. During high rainfall events, the permeable soil may saturate, causing water to flow overland, carrying the loosened soil with it. The extent of erosion is positively correlated with the slope of the terrain. Baywood fine sands can occur with a lope of up to 30% (USFWS 1994). Other soils in the LOHCP Preserve System, including the Santa Lucia Shaly Clay Loam, occur on slopes up to 75%, such as in the Bayview Unit of the Morro Dunes Ecological Reserve where erosion has been extensive.

Steep slopes enhance erosion by increasing the speed of water and thus its ability to transport sediment; as speed increases, the ability of water to dislodge and transport soil particles increases exponentially (McGraw 2004b). The result of such erosion is rilling and gullying of the trail, and deposition of potential deep sediment in alluvial fans where the slope becomes more gradual and water slows and thus infiltrates, leaving the sediment behind. The deposition buries and typically kills herbaceous plants, creating a disturbance that will be recolonized over time, provided deposition is not ongoing. In the area where the sediment originates, ongoing erosion will prevent new plant establishment and thus continue to erode.

Though erosion presents more of a concern on steeper slopes, even trails that follow the contour of the habitat can eventually become incised and channel water. If there is even the slightest grade, the run-off will cause erosion into adjacent habitat and require trail maintenance to avoid continued down cutting.

Vegetation

Vegetation can interact with soils and topography to influence the effects of recreational use on habitat, by determining the degree of biomass removal and subsequent erosion. Plant material including leaf litter and moss as well as dense herbaceous cover can cushion the force caused by low intensity recreation occurring at low to moderate frequency.

D.2.1.3 Potential Benefits of Recreation for the LOHCP Preserve System

Recreational access can increase public exposure to and appreciation of the Baywood fine sand communities and species; in doing so, it can facilitate conservation support and conservation action on their behalf. Public support of the LOHCP has resulted in part from community members motivated to preserve open space for recreation, which provides a way for many to experience the unique ecosystem. Thus, recreation will likely increase support for and effectiveness of the LOHCP. Land management entities may have additional reasons to allow recreation access, including that it is a key component of their mission or regulations governing management of the land, or a condition of the property's acquisition.

Like any disturbance, recreation can promote disturbance-adapted species and help maintain open habitat conditions required by early successional species. Like wildlife trails, recreational trails can feature populations of native herbs adapted to disturbance or the open habitat it creates. These species may be important components of habitat for sensitive animals, including the Morro Bay kangaroo rat.

D.2.2 Recreation Management Strategies

The following guidelines for recreation management are designed to minimize its negative impacts on the covered species and communities. All proposed recreation within the LOHCP Preserves must be consistent with the existing regulations and policies of the landowners. For the Morro Dunes Ecological Reserve, recreational use and other access must be consistent with Title 14 of the California Code of Regulations. The HCP cannot allow uses other than those allowed in Title 14, nor can it allow uses that are prohibited in the title.

D.2.2.1 Extent of Recreation

In many properties anticipated to be managed as part of the LOHCP Preserve System, *de facto* trail use has resulted in an extensive network of trails which have removed habitat required by the sensitive species and fragmented remaining habitat. A first step in recreation management will be to close all unauthorized trails. The following series of measures can be used to promote compliance with trail closures:

1. Post interpretive signs that provide the public with the rationale for trail closure, the location of trails designated for ongoing use, and the types of use allowed;
2. Create small impediments at the entrances to closed trails (e.g., fencing that will not obstruct wildlife movement);
3. Conduct targeted outreach through presentations to user groups, and on-the-ground interactions with visitors as part of trail patrols;
4. Erect more permanent barriers; and
5. Enlist the help of law enforcement officials, when applicable.

D.2.2.2 Types of Recreation

Recreation should be limited to trail use by hikers. Limited access for equestrians and leashed dogs can be provided in very limited instances with the approval of the resource agencies.

Mountain bike riding is not feasible in the area, due to the friable nature of the fine sand soil, in which tire tracks can lead channel water and lead to gullying. Off-highway vehicle use, which is illegal within protected lands in the LOHCP Area, creates high levels of disturbance and associated impacts and will impede attainment of the biological goals and objectives of the LOHCP Preserve System.

D.2.2.3 Trail Planning

Recreation management should be carefully planned to reduce its potential negative impacts. The following are some initial guidelines that should be considered.

Trail Location

The route of a trail for recreation should be carefully selected by a team of experts including scientists, erosion control specialists, trail designers, and others experienced in designing, constructing, and managing trails. Specific objectives of the trail design should include:

1. Minimizing impacts to sensitive species including the covered species;
2. Minimizing erosion and therefore costly maintenance;
3. Minimizing the potential for the trail to facilitate exotic plant invasion by avoiding linking areas infested by exotic species to relatively uninvaded habitat; and
4. Linking trails to established trails in areas adjacent to the preserve, where possible.

Existing trails that meet these criteria should be used rather than creating new trails, in order to avoid additional disturbance and unnecessary costs. Trails that do not meet these criteria should be either modified to do so or evaluated for closure and restoration.

New trails should be sited following completion of the detailed Preserve System inventory and baseline monitoring studies, which will establish the distribution and relative abundance of covered species. Trails should be located in areas that lack the covered species, where possible, in already degraded habitat. Within the area determined by the biologists to be *least* likely to have impacts, other members of the trail design team should determine a location that will minimize the need for maintenance to control erosion.

Trail Length

The length of trail located within the sensitive communities should be limited. Trails designed to traverse the Preserve, as to link trails on both sides, should do so in a narrow portion of the property. If the trail is designed to provide for interpretation, the length should be no more than one mile.

Trail Width

To limit the area of habitat within Preserves that is lost due to recreation, trails should be no more than 6 feet wide, with hiker only trails limited to 3 feet wide. Post-and-cable fencing should be placed along the edges of trails to prevent trail widening, which tends to occur in the sandy soils, especially where only sparse plant cover occurs adjacent to the trails (e.g., in coastal sage scrub).

Trail Substrate

Permanent substrates such as boardwalks can prevent trail widening and incision while facilitating wheelchair access and should be installed, as funds allow, where equestrian use is prohibited. Artificial substrate such as rock (e.g., decomposed granite) and wood chips might be added to equestrian trails. Over time, these will likely become less effective due to displacement and decomposition and present some risk of introducing exotic plant species.

Interpretation

Trails in the LOHCP Preserve System should educate users about the uniqueness and rarity of the ecosystem, both to enhance their experience and to promote compliance with the recreational use regulations. Interpretive signs along the path or numbered posts which reference information contained in a brochure available at the trailhead can enhance the recreational experience for many visitors. Large format interpretive signs or “kiosks” posted at the trail entrance may similarly provide information and increase compliance with rules.

Trail Patrols

To reduce the amount of management and monitoring funds needed for recreation management, a volunteer trail patrol group should be established to enhance compliance with the trail use provisions in the LOHCP Preserve System. The group could conduct one or more of the following tasks:

- Conduct outreach to the public through presentations to user groups (e.g., trail riding groups);

- Patrol trails and conducts outreach to users; and
- Provide information about the use and the status of trails to land managers.

As discussed below, patrols be law enforcement officials, such as the County Sheriff, California Department of Fish and Wildlife Wardens, or others with the ability to issue citations, can enhance compliance with the recreation and other access provisions.

D.2.2.4 Trail Monitoring and Maintenance

Trails should be carefully monitored and maintained to ensure that their impacts are limited to the analysis provided in this document. The following are monitoring and maintenance recommendations to inform development of the recreation component of the LOHCP Preserve System AMMP.

Monitoring

Quarterly monitoring will be conducted to detect problems associated with trail use including:

1. Regulation compliance problems (including inappropriate uses);
2. Trail widening, incision, and erosion;
3. Creation of new (spur) trails; and
4. Invasion of exotic plants.

Maintenance

Spur trails should be closed, by obscuring their entrance with limbs or other natural coverings, and by posting signs, as needed. Erosion should be repaired, and exotic plants should be removed immediately. If one or more problems persist, and the trail fails to meet the goals of reducing impacts to the sensitive species and communities, modifications to the trail use will be needed, including limiting the types of use (e.g., hikers only) or closing the trail completely. If an alternative location could resolve the problems, the trail could be rerouted.

Enforcement

If persistent, unlawful trail use continues, enforcement action may be needed. The Department of Fish and Wildlife has law-enforcement personnel who can enforce regulations relating to recreation on their respective lands; likewise, the San Luis Obispo County Sheriff can enforce regulations on County-owned lands.

D.2.2.5 Regional Recreation Management

Recreational use should be examined at the regional level in order to enhance effectiveness of recreation management. Recreators may desire access to LOHCP Preserves to access other destinations where they recreate, including local State and Regional Parks, other open space preserves, and equestrian centers. Efforts to identify a few regional trails which can be carefully managed may limit impacts to a few isolated areas and facilitate the biological goals and objectives of the LOHCP Preserve System.

D.3 Fire Management

Fire is a natural ecosystem process in the Baywood fine sands ecosystem, and an important component of the disturbance regime in the upland communities therein. During the past century, fires have been actively suppressed in order to protect lives and property. This widespread fire exclusion will likely decrease native biodiversity and populations of covered species, by reducing or extirpating species that require fire or the habitat conditions it creates. On the other hand, fire has the potential to reduce populations of the covered species directly, by killing individuals, and indirectly, by promoting the invasion and spread of exotic plant species. Because of this conundrum, fire presents many important concerns for effective long-term management of the LOHCP Preserve System.

More information is needed about the factors that influence the effectiveness of fire as a management technique for attaining the biological goals and objectives of the LOHCP Preserve System. Filling these data gaps will require scientific examination of the fire ecology of the system prior to large scale implementation of fire management. In the intervening time, management efforts will be needed to reduce the threat of arson and wildfire, which have the potential to degrade habitat and threaten the persistence of sensitive species.

This section synthesizes the available scientific information relevant to fire management in this system, including empirical studies from the Baywood fine sand communities, empirical studies from ecologically similar systems, and current ecological theory. This information is used to:

1. Describe the known and potential positive and negative impacts of fire;
2. Recommend approaches to fire management for the LOHCP Preserve system; and
3. Recommend approaches for the fire management component of the LOHCP Preserve System AMMP to be developed early during implementation of the LOHCP.

D.3.1 Fire Ecology of the Baywood fine sand Communities

Fire is a component of the natural disturbance regime in central maritime chaparral communities in California, including the Morro manzanita chaparral communities (Tyler and Odion 1996, Tyler et al. 2000, Odion and Tyler 2003). Previous research in this and other maritime chaparral communities of the Central Coast suggests the following aspects of fire regime (Greenlee and Langenheim 1990, Tyler and Odion 1996, Odion and Tyler 2002):

1. Return interval (time between burns): 80-100 years;
2. Fire season: summer (when fuels are dry); and
3. Severity: complete stand replacement.

During periods of drought, fires may have naturally occurred during the winter as well.

Due to the differences in plant species and thus fuel availability, the plant communities of the Baywood fine sands may have experienced somewhat different fire regimes—characteristics of fire including type, severity, areal extent, and return interval (Sousa 1984). For example, the persistence of bare sand soil between shrubs in coastal sage scrub may reduce the frequency of ignition and fire spread rates when compared with the central maritime chaparral communities and perhaps oak woodlands, which feature

greater woody plant cover. More information is needed to identify potential differences in the fire ecology of these systems.

D.3.1.1 Potential Ecological Benefits of Fire

The native species of these communities are adapted to aspects of the fire regime, and many may require recurring fire for their persistence. It has been suggested that fire has been a dominant force in chaparral communities for the past two million years (Axelrod 1958). As a result of their long evolutionary history with fire, plant and animal species in the region have likely adapted to fire and the conditions it creates, as described below.

For many species, prescription fire may only be beneficial if it mimics critical aspects of the natural fire regime. These species may have evolved specific life history or other ecological traits as adaptations to particular aspects of fire, such as the seasonality of occurrence, the return interval, the severity, and the intensity, among other factors. As a result, deviations from the natural fire regime might reduce the effectiveness of prescribed fire and, in some cases, negatively impact the sensitive species and communities it is designed to enhance.

The following describes the known and hypothesized effects of fire.

Removes Established Vegetation, Litter, and Woody Debris

Fire is an agent of disturbance which removes established plant cover over large spatial scales. In addition to live plants, fire can consume leaf litter and woody debris that can build up on the soil surface between fires. In Morro manzanita chaparral, a prescription burn killed all live plants and consumed the dense litter accumulation, though burned shrub skeletons of Morro manzanita persisted (Tyler et al. 2000).

Facilitates Native Plant Establishment

Fire can facilitate native plant establishment by a variety of mechanisms, including:

1. reducing competition and allowing establishment of species that have been competitively excluded by the dominant shrubs and trees which can form a contiguous canopy during the course of succession;
2. reducing herbivory by small mammals that inhabit shrub canopies and can prevent seedling establishment; and
3. stimulating seed germination through the heat and/or the charate (chemical products of fire) (Keeley et al. 1985, Keeley and Keeley 1987, Swank and Oechel 1991, Tyler 1995, Baskin and Baskin 2001).

These effects of fire might facilitate success of the biological goals and objectives of the LOHCP Preserve System by: enhancing native plant species diversity, facilitating establishment of sensitive species, including Morro manzanita and Indian Knob mountainbalm, and increasing habitat quality for Morro Bay kangaroo rat, by enhancing populations of three hypothesized food plants *Acmispon glaber, Croton californicus,* and *Horkelia cuneata* (USFWS 1999)

Reduces Exotic Plant Abundance

In other systems, fire has been shown to reduce the abundance of exotic plant species (Smith and Knapp 2001, Bebawi and Campbell 2002, Alexander and D'Antonio 2003). Indeed, fire is often used as a control strategy for many invasive species in California (Hastings and DiTomaso 1996, Bossard et al. 2000, Bebawi and Campbell 2002), as discussed in Section D.1.4.2. By disproportionately reducing the abundance of exotic species, fire has been shown to facilitate populations of sensitive plants (Pavlik et al. 1993, McGraw 2004a).

It is not known whether the effects of fire on exotic plant abundance were examined in the prescription burn conducted to examine fire effects on Morro manzanita regeneration at Montaña de Oro State Park. Prior to the burn, veldt grass averaged 13% cover while red brome averaged less than 1% cover (Tyler et al. 2000). These data were derived from permanent plots which may have been sampled since the fire in 1998, though these data are not available.

Several exotic plant species presently found in the LOHCP Area including perennial veldt grass are facilitated by fire in other systems, leading to acute concern that fire will enhance their invasion and spread (Section D.3.1.2).

Alter Soil Conditions

Fire can reduce soil nutrients (Christensen 1977, Clark 1989, Johnson et al. 1998), organic matter (Perry 2000), and microorganisms in the soil (Clark 1989). By reducing soil fertility, fire resets the process of soil succession. This may prevent establishment of aggressive, exotic plants which might be able to invade the Baywood fine sands as they become more amenable to plant growth during the absence of fire.

In other maritime chaparral systems, fire has been shown to increase available nitrogen and phosphorus, which are important nutrients that limit plant growth. In doing so, it may enhance plant recolonization.

Fire also volatizes chemical compounds in soils, including those derived from the decomposition of plant litter and root exudates (Clark 1989). Many such compounds, including those from *Arctostaphylos* spp. are hypothesized to be allelochemicals—chemicals that inhibit the germination, establishment and/or growth of other plant species (Keeley et al. 1985). Though the pattern of plant distributions with respect to dominant woody vegetation including *Arctostaphylos* suggest that chemical compounds may restrict plant establishment, careful experiments would be required to implicate allelochemicals as the cause of these patterns.

Fire can also create hydrophobic polymers in the soil that reduce water infiltration, thus influencing soil moisture availability and plant growth. Fire severity, soil texture, and soil moisture influence the extent to which fire renders soils hydrophobic (Huffman et al. 2001, MacDonald and Huffman 2004).

D.3.1.2 Potential Negative Ecological Consequences of Fire

Fire may also have direct and indirect negative consequences for the covered species and communities of the Baywood fine sands. Not restricted to fire alone, these impacts likely also pertain to fire surrogates—disturbance treatments designed to simulate the effects of fire. Three potential negative impacts of fire are:

1. Facilitate exotic species invasion and spread;
2. Reduce sensitive species populations; and
3. Cause soil erosion.

Facilitate Exotic Species Invasion and Spread

Fire might promote the invasion and spread of exotic plant species into the communities of the Baywood fine sands. Like many of the native plant species that prescribed fire would be intended to facilitate, many exotic plants presently found in the LOHCP Preserve System establish readily following fire. These include including veldt grass, red brome, jubata grass, Eucalyptus, Monterey pine, Monterey cypress, and the two iceplant species, fig marigold and round-leaved iceplant (Bossard et al. 2000).

The risk of exotic plant spread following fire is most pronounced in the closed-canopy communities, including the Morro manzanita chaparral and the coast live oak woodland. In these areas, exotic plant species are primarily restricted to old road, trails, and gaps between shrubs adjacent to roads and trails; this distribution pattern suggests that they are limited by competition from dominant shrub and tree cover. As in other closed canopy communities, fire might promote expansion of exotic plants currently present at low abundance or in high light available microhabitats, and create opportunities for new species to invade (Zedler and Scheid 1988, Hobbs and Huenneke 1992, Haidinger and Keeley 1993).

Fire could also enhance the abundance of exotic plants where they are already disturbed within open canopy communities, such as coastal sage scrub. For example, veldt grass has been observed to resprout vigorously and releases seed into the burned area often the first spring after the fire (Walgren 2004

Cause soil erosion

Fire can increase soil erosion by removing established vegetation and other ground cover, including litter (Clark 1989). Water erosion can by increased as a result of a reduction in the roots binding the soil, increased erosive effects of rain drops landing directly on the loose sand soil lacking ground cover, and increased overland flow of water during high rainfall events. In some cases, fire can alter soil chemistry rendering it hydrophobic and thus resistant to infiltration, further exacerbating water erosion (Clark 1989). Wind and gravity can also cause erosion in the absence of dense vegetation cover following fire.

Erosion caused by water, wind, and gravity can uproot plants, bury plants in soil deposition, and inhibit new plant establishment on the thin soil that remains; these effects may be more pronounced on slopes. In the Bayview Unit of the Morro Dunes Ecological Reserve, recreation (and perhaps historical vehicle use) removed established vegetation on the old Broderson Road on the west end of the Preserve. Originating on the steep slopes (50-75%) to the south, soil erosion has led to the formation of a deep (>5 m) gully in the Baywood fine sand soils which support dense stands of Morro manzanita.

Reduce Covered Species Populations

Fire will kill individual plants and many animals and thus have immediate direct negative effects on many populations, including the covered species. However, for most species in these fire-prone communities, short-term population reductions will be offset by longer term population increases resulting from enhanced establishment and growth, in the case of plants, or greater survivorship and reproduction, in the case of animals. Presently, populations of Indian Knob mountainbalm and Morro

Bay kangaroo rat are precariously small, due in part to habitat destruction, fragmentation, and degradation (Appendix B); as a result, the population reductions might threaten their persistence. In addition, habitat fragmentation may restrict recolonization of the enhanced habitat by many of the animal species.

Current available information suggests that populations of Morro manzanita, Indian Knob mountainbalm, and Morro Bay kangaroo rat require fire to persist (USFWS 1994, Tyler and Odion 1996, USFWS 1999, Tyler et al. 2000). Management fires used to enhance populations of the two endangered plants would be located in senescent stands where removal of dense woody vegetation, including adults of the two sensitive species, would facilitate seedling establishment. Management burns could also be used to create the characteristics of habitat preferred by Morro Bay kangaroo rats, including open vegetation comprised of early successional subshrubs and perennial herbs thought to provide the seeds needed by the small mammals (i.e., *Croton, Horkelia,* and *Lotus*). Burns conducted in areas occupied by Morro Bay kangaroo rat might also kill individuals unable to escape the fire.

In contrast, fire provides no current known benefits for the threatened Morro shoulderband snail, which is killed by fire. Following arson in Morro Strand State Park, no live snails were not found in an where they were previously known to occur (Walgren 2003a). Based on evidence suggesting other historical colonization events (Walgren 2003a), Morro shoulderband snail may be able to recolonize the burned areas from adjacent unburned areas once habitat conditions are appropriate (Section B.1).Other sensitive species that might be negatively impacted by fire include Morro blue butterfly (*Icaricia icarioides moroensis*) and splitting yarn lichen (*Sulcaria isidifera*), which is endemic to the LOHCP Area.

By enhancing habitat conditions as described above, fire's positive effects may outweigh the direct negative effect and result in increased population size and greater likelihood of persistence. Aspects of the prescription burn including its location, size, shape, severity, seasonality, and return interval should be carefully planned to minimize direct negative impacts to the covered species and other sensitive species. As described in greater detail below, fires during the wet season, or fires which occur in stands which are too young in age may reduce populations of sensitive species, including Morro manzanita (Odion and Tyler 2002),

D.3.2 Fire Management

Effective fire management in the LOHCP Preserve System will require implementation of a carefully planned, cautious fire management program utilizing a scientifically rigorous approach to attain the conservation goals of the LOHCP. Selection of proposed treatment areas will be developed in coordination with the USFWS and CAL FIRE. Due to the risk of fire promoting the invasion and spread of exotic plant species, fire management and exotic plant management must be carefully coordinated. This section outlines guidelines for development of the fire management component of the LOHCP Preserve System AMMP, which will be prepared early during implementation of the LOHCP.

The LOHCP Preserve System AMMP will integrate the anticipated fuel reduction and fire hazard abatement treatments envisioned as part of implementation of the Los Osos Community Wildfire Protection Plan (CWPP; SLOCCFSC 2009). These treatments, which will be covered by the incidental take permit issued based on the LOHCP (Section 2.2.7), must be implemented following the avoidance and minimization measures (Section 5.2.4, Table 5-4). Within the LOHCP Preserve System, CWPP projects must be designed and implemented to ensure that they limit their short-term negative impacts on, and

maximize their ecological benefits for, the covered species and natural communities within the Baywood fine sands ecosystem.

D.3.2.1 Goals

Fire management in the LOHCP Preserve System will focus on two main goals:

1. Enhancing the covered species populations and native plant communities using fire and fire surrogates; and
2. Reducing the risk of wildfire which can degrade habitat, imperil the covered species, and threaten human communities.

Oftentimes, both goals might be facilitated by the same strategies and projects.

D.3.2.2 Methods

Two general approaches to fire management are the use of prescribed fire and fire surrogates.

Prescribed Fire

In prescription burning, fires are deliberately ignited, actively monitored and managed, and extinguished following a specific burn plan. The burn plan describes the management goals of the treatment, the treatment area, the constraints of burn treatments, and the plan for the burn, including thorough safety information. The burn plan also contains the burn prescription—a specific statement of the desired fire behavior, smoke production, and environmental conditions that are required for safe and effective execution of the treatment.

Prescription fire can be used in the LOHCP Preserve System to enhance populations and communities while simultaneously reducing the threat of wildfire. In 1998, a prescription burn was conducted in the Morro manzanita chaparral and adjacent coastal sage scrub communities at Montana de Oro State Park.

Fire Surrogates

Fire surrogates are management treatments designed to mimic fire by removing or reducing plant cover. Treatments can involve the use of mechanized equipment, including masticators, tractors, and bulldozers, or be conducted manually, using chainsaws or other equipment. Following removal, biomass can be laid flat and burned, piled and burned, chipped and left on site, or hauled away. The specific treatments for removing and dealing with the plant cover are often determined by the following:

1. Intended goals of the project (i.e., biological, fuel reduction, etc.);
2. Resulting conditions (i.e., all fuel removed vs. plant cover thinned);
3. Size of the area to be treated;
4. Budget for the project; and
5. Technical staff available to implement the project.

The extent to which various fire surrogates will be successful in enhancing population growth of native species and facilitating native community structure and composition is unknown; instead, experimental examination is required to evaluate the effectiveness of these treatments. Just as with prescribed fire, the specific characteristics of the fire surrogate techniques can likely greatly influence the management outcomes.

Treatment Characteristics

Based on the best available scientific information, the following aspects of fire management treatments are likely to maximally benefit native species and communities. Most mimic known or hypothesized aspects of the natural fire regime, to which the species are evolutionarily adapted. Though primarily devised in terms of prescription burning, many of these design elements could be applied to fire surrogates as well.

Seasonality

Fire management should ideally occur during the dry season (July to November), as this is the most likely natural burn season in the system (Langenheim and Greenlee 1983, Greenlee and Langenheim 1990). In other systems where their effects have been examined, wet-season burns have failed to regenerate stands of chaparral shrubs and promote fire-following herbaceous species, due in part to increased mortality caused by heat when seeds are moist (Parker 1987, Moreno and Oechel 1991). Morro manzanita seeds soaked in water for 24 hours germinated at significantly lower rates than dry seed when subjected to a simulated fire treatment (Tyler et al. 1998).

Implementing prescribed burns during the dry season in shrublands can be logistically very difficult owing to increased risk of fire escape. Burning in the fall, when air temperatures are lower, and humidity is higher, relative to the summer season, can reduce the risk of fire escape while oftentimes still affecting the goals of the prescribed burn for chaparral species.

The prescription fire at Montaña de Oro State Park to evaluate fire effects on Morro manzanita was conducted in early November 1998, under mild temperatures and moderate humidity 10 days following 1 cm of rainfall. Though establishment of Morro manzanita seedlings was lower than required to replace the stand, the researchers attributed the lack of sufficient germination to low seed availability, and not inappropriate fire conditions (Tyler et al. 2000, Odion and Tyler 2002).

Areal Extent

Fire management should focus on creating several small (e.g., one acre) patchy disturbances rather than a single large disturbance. Small fires are less likely to extirpate populations of sensitive species and increase opportunities for recolonization by both plants and animals (Simmons et al. 1995). In addition, the variability in species composition and fuel load between communities of the Baywood fine sands suggests that fire may have been naturally patchy. The central maritime chaparral communities have a dense canopy of shrubs including chamise (*Adenostoma fasciculatum*), which is known for its flammable fuel. In contrast, the shrub cover in coastal sage scrub is sparser and interspersed by bare ground and herbaceous plant cover, which is less likely to carry a fire. Historically, fires that originated in one community type may not have burned adjacent types, thereby creating a patchier disturbance.

Creating several small disturbances rather than conducting a single large fire can be less effective for two reasons. First, individual small disturbances may not be large enough to sustain sensitive species populations, such as Morro Bay kangaroo rats which might require relatively larger areas of contiguous, early successional habitat to sustain their populations. Second, the proximity of adjacent, unburned habitat may reduce the value of the burned habitat. For example, herbivory by small mammals that predate upon chaparral shrub seedlings, including Morro manzanita and perhaps Indian Knob mountainbalm, would be greater in small disturbance areas, owing to the proximity of mature shrubs that house the small mammals (Tyler and Odion 1996). Impacts of herbivory could also be unnaturally high in small fire treatments, because small mammal populations will have fewer seedlings to predate upon in small burns compared to large burns.

Some of the negative aspects of small, patchy burns can be mitigated, such as by using exclosures to protect target species (e.g., Morro manzanita, and Indian Knob mountainbalm) from unnaturally herbivory. Unless small burns are proven ineffective for attaining the biological goals and objectives of the Preserve System and the individual management projects, they will provide the preferred fire management approach in the LOHCP Preserve System.

Treatment Area Shape

Long, narrow disturbances may reduce their direct negative impacts to sensitive species, especially animals with low vagility (Simmons et al. 1995). Treatment areas with greater perimeter-to-area ratios can be more readily colonized as well. As described above, herbivore pressure and other negative edge effects could also be greater in such long, narrow disturbances.

Severity

Severity is a measure of the degree of disturbance impact; specifically, the extent to which biomass is removed. To enhance diversity, multiple treatment areas should be designed to have different levels of severity, such that different environmental conditions will result from the burn. Such patchiness can be promoted *within* each treatment area as well, by allowing areas that do not burn to remain unburned and/or creating patches that will resist burning in advance (Simmons et al. 1995).

Return Interval

Attaining the biological goals and objectives through the use of prescribed fire will require management with the appropriate return interval—the time between successive disturbances. In fire-adapted communities, aspects of the species biology, including their life history, have been shaped by their response to fires recurring with a range of frequencies. If the return interval is shortened or lengthened, fire may negatively impact even fire-adapted species.

Because it is difficult to accurately reconstruct the historical fire regime, determining the return interval for fire in the system is challenging. To further complicate things, the different communities of the Baywood fine sands likely burned at different frequencies, owing to differences in their plant species composition and thus fuels. Hypotheses for appropriate return intervals must be developed through research examining the available fire history, the composition of communities, the age structure of species populations, and consideration of ecologically similar systems. The hypothesized return intervals should then be tested using small-scale experiments to evaluate impacts on the species and communities.

Based on their research evaluating the effects of a fire in a 40-year-old stand of central maritime chaparral, Odion and Tyler (2002) concluded that the return interval was too short; the researchers attributed insufficient Morro manzanita seedling establishment to insufficient accumulation of viable seed since the last fire. As a result, a longer return interval, such as 80 years, is recommended for Morro manzanita chaparral (Odion and Tyler 2002). The other communities of the Baywood fine sands may have historically burned at different frequencies, however. Thus, future research and cautious fire management as outlined above is needed to avoid the potential negative impacts of burning too frequently or infrequently.

D.3.2.3 Evaluating Fire Management Alternatives

The negative impacts and logistical difficulties potentially associated with using fire necessitate careful consideration of alternatives to fire management. First, as discussed above, it may be possible to use mechanical or manual removal of plant material (i.e., dead material and live shrubs and trees) to attain the biological goals of management (i.e., enhancing chaparral plant species diversity, regenerating Morro manzanita, etc.) and to reduce the threat of wildfire. Even if proven effective through experimental trials, high implementation costs and degrading effects of soil disturbance caused by work crews might render such treatments infeasible for widespread use in the LOHCP Preserve System. Such techniques will require further evaluation.

Another alternative to fire management is simply “no management”. This approach is used in wildland areas throughout the region. Because the vegetation structure (i.e., fuels) and climate of the region predispose the system to natural wildfire and render it highly susceptible to human-induced fire, preventing fire within the LOCHP Preserve Systems will not likely be possible in the long term. The consequences of wildfire in the LOHCP Preserve System could be grave, as many of the potential negative impacts associated with fire could not be prevented.

1. Negative impacts to sensitive species:
    - Even moderate sized fires could extirpate important remaining populations.
    - The return interval could be too short for sufficient Morro manzanita regeneration.
    - The season could be inappropriate (i.e., wet season) for the life history of species.
2. Invasion of exotic plants:
    - Pre-treatment to remove exotic plants would not likely have occurred.
    - The wildfire might create a larger disturbance more susceptible infestation.
    - The wildfire might occur adjacent to a highly invaded area.

Thus, a more proactive approach to fire management will likely be essential to attaining the conservation goals of the LOHCP Preserve System and will be incorporated in the LOHCP Preserve Adaptive Management and Monitoring Plan.

Appendix E Biological Effectiveness Protocols

This section provides draft biological effectiveness monitoring protocols to evaluate progress of the LOHCP toward attaining the biological goals and objectives (Section 5.1). Specifically, these protocols are designed to examine the status and trends in populations of the covered species, and the distribution, structure, and species composition of the plant communities of the Baywood fine sands ecosystem. Monitoring protocols are also provided to track general habitat conditions and map populations of invasive plants within the Preserves and facilitate evaluation of the effectiveness of the LOHCP at achieving the Plan's biological goals and objectives (Section 5.1, Table 5-1).

Monitoring is an essential component of the adaptive management framework which will be used to promote long-term effectiveness of the LOHCP conservation program (Section 5.5). These draft protocols can be used to develop the monitoring component of the LOHCP Preserve Adaptive Management and Monitoring Plan early during implementation of the LOHCP to guide monitoring within lands managed as part of the LOHCP Preserve System (Section 5.3.3.2).

Many of the draft biological effectiveness monitoring studies are based on sampling, in which the state of the entire system of interest (i.e., community or population) is inferred based on statistical analysis of a random sample. Sampling can provide a cost effective and accurate means of detecting and tracking biologically meaningful changes. To be effective, sampling studies must be carefully planned and implemented considering valid sampling techniques, the biology of the species, and the monitoring goals and objectives. These protocols should be refined based on the biological inventory of the Preserve System, and then refined through implementation of a pilot study, as well as any new scientific information.

Each quantitative monitoring protocol contains five main elements:

1. Sampling Objectives: These specific objectives of the study, including the minimum detectable change, statistical power, and false-change error rate. Sampling objectives link specific aspects of the sampling design to the conservation objective(s) which they are designed to track.
2. Sampling Design: Other critical elements of the study, including the universe of interest (statistical population), the variables measured, the sample unit, the sample size and shape, the manner in which samples are allocated, whether samples are temporary or permanent, and the sample size.
3. Implementation: specific guidelines for implementing the study, including aspects of seasonality, duration, and frequency.
4. Analysis: the analyses and statistical tests appropriate for data collected.
5. Potential Modifications: A list of potential changes in the event that the monitoring protocol as drafted does not achieve the sampling objectives.

E.1 Plant Community Monitoring

Two proposed monitoring studies have been designed to track the ecosystem and community goals of the LOHCP (Table 5-1):

1. Areal mapping of the plant communities; and
2. Plant community structure and species composition sampling.

The plant community structure and species composition monitoring can also greatly inform work to monitor populations of the covered species, by quantifying important habitat conditions.

E.1.1 Areal Mapping of Plant Communities

This study is designed to track the distribution and extent of the different plant community (vegetation) types within the LOHCP Area. In spring 2004, plant communities within the LOHCP Area were delineated using a combination of aerial imagery interpretation and ground reconnaissance (J. Legato, pers. comm. 2004). As part of work to expand the Plan Area in the current LOHCP, the mapping was expanded through examination of high-resolution aerial imagery. The resulting GIS-based map reveals a mosaic of 23 different plant associations or 'series' (Section 3.1.5). These communities vary in their structure and species composition in ways that influence their use as habitat for the covered species.

E.1.1.1 Monitoring Objective

The objective of monitoring is to detect biologically meaningful shifts in the distribution and extent of the plant associations within lands managed as part of the LOHCP Preserve System.

E.1.1.2 Study Design

Using the same protocol as implemented to develop the GIS vegetation layer in 2004 (CMCA 2004), the distribution of plant communities will be mapped within the LOHCP Preserve System. Specifically, new high-resolution aerial imagery of the region should be used to delimit the boundaries of the series based on their described differences in structure and species composition, which are discernible based on their unique 'signature' in the imagery. Field-based verification should be conducted for at least 5% of the mapped patches, with areas of identified change being most important for ground truthing.

E.1.1.3 Implementation

Areal extent mapping should be conducted approximately every 10 years in perpetuity. This is the anticipated temporal scale during which changes in plant communities will occur, as a result of:

- natural dynamics, including new disturbances (e.g., fire and erosion) and succession;
- anthropogenic factors, including management and restoration projects (e.g., vegetation management) and recreational use; and
- climate change, which can cause shifts in plant community composition.

The precise timing of the monitoring may depend on the availability of new, high-resolution aerial imagery of the Preserve System.

Spatial analyses in geographic information system should be used to determine the location and extent of changes in plant community types. For each area where a shift is detected, the original aerial photographs should be examined to determine whether the putative change is due to mapping error

(i.e., the accuracy or precision with which communities are mapped) or represents an actual transition in plant community structure and species composition.

E.1.1.4 Analyses

Descriptive statistics can be used to examine the number of patches, the mean and total patch area, and the percent of each community type, which changed in the monitoring interval. Assembling a matrix depicting the percent change each community type to every other type will enable evaluation of trends due to succession, management, and climate change.

E.1.1.5 Potential Modifications

The monitoring protocol used to track this objective will be adjusted if biologically important differences between plant communities cannot be adequately distinguished through interpretation of vegetation signatures using aerial photographs. For example, if coastal sage scrub with high cover of veldt grass (*Ehrharta calycina*) is found to support lower diversity of herbaceous native plants or abundance of Morro shoulderband snail relative to uninvaded coastal sage scrub, then the communities should be split. If the two types of coastal sage scrub cannot be distinguished via examination of aerial photographs, then additional ground mapping may be required.

E.1.2 Plant Community Structure and Species Composition Monitoring

This study is designed to evaluate changes in the structure and species composition of the plant communities within the LOHCP Preserve System and detect changes in habitat conditions that should trigger management. It can be used to evaluate effectiveness of the community goals of the LOHCP, as well as help achieve the objectives for the covered species, by tracking the conditions of their habitat. The study details should be refined based on results of the pilot study.

E.1.2.1 Sampling Objectives

The objectives of the monitoring protocol are to have 90% power to detect 20% declines in habitat conditions relevant to long-term viability of the covered species, including the diversity and relative cover of exotic plants and the diversity and relative cover native plant species, with a 10% chance of indicating a statistically significant decline occurred when one did not.

E.1.2.2 Sampling Design

In this study, the percent cover of each plant species will be estimated visually using cover classes in permanent square quadrats (5 m x 5 m). In addition to plant cover, relevant habitat variables including the cover of litter, the cover of dead woody vegetation, and the amount of soil disturbance (e.g., percent of the quadrat disturbed by trails or animal diggings) will be estimated.

The quadrats will be located throughout the LOHCP Preserve System using a stratified-random sampling regime in which the main plant community types (i.e., coastal sage scrub, central maritime chaparral, etc.) are the strata within which the number of samples allocated to each community type is proportional to their acreage within the Preserve System. There are presently no current estimates for the mean or variability in diversity and relative plant cover within the community types, upon which the

initial sample size could be based. It is estimated that 100 quadrats in total, with at least 5 per stratum (community type) will be needed to attain the sampling objectives.

E.1.2.3 Implementation

Sampling should be conducted every five years when annual plant species are in flower (mid-March through mid-May). Because cover estimates can vary depending on the phenology of the system and the observer, sampling should occur during a 1 to2-week period during peak phenology each year, rather than during a consistent calendar time. Sampling should be conducted by the same observer or team of observers, which has standardized their visual estimates to the greatest degree possible.

E.1.2.4 Analyses

The species data will be used to calculate the following composite variables:

1. Cover and richness of exotic plants; and
2. Cover and richness of native plants.

Paired t-tests can be used to evaluate whether a decline of 20% has occurred in native plant cover and richness, or an increase of 20% has occurred in exotic plant cover and richness, between the current sample and the baseline. Least squares regression or route regression can be used to determine whether a significant decline in gamma richness (a measure among samples) has occurred over a minimum of a five sampling periods. Similar statistical tests can be used to evaluate changes in other relevant habitat variables, including litter cover and disturbance.

E.1.2.5 Potential Modifications

The proposed monitoring protocol should be modified to increase its efficiency for attaining the sampling objectives based on results of the pilot study and during the course of implementation, as necessary. The following are potential modifications that might promote success toward the sampling objectives.

1. Sampling Method: If high variability results from visual estimation of plant cover, line intercept or point intercept sampling may be used to estimate cover within the quadrats. In these methods, plant cover is estimated by sampling plants intersecting the length of a series of transect (line intercept) or specific points along transects (point intercept) traversing the quadrat. Because these methods will likely miss rare species, richness (number of plant species) should be counted within the entire quadrat.

2. Sample size: Increasing the number of quadrats will increase the statistical power and thus facilitate the sampling objectives. This must be weighed against other methods of reducing standard deviation, such as quadrat size and shape, and other sampling objectives, including maintaining low costs.

E.1.2.6 Thresholds

The thresholds to trigger remedial management for communities are a 20% decline in native diversity or cover, and a 20% increase in exotic diversity or cover compared to the baselines measured during initial sampling.

E.2 Morro Shoulderband Snail Population Monitoring

The proposed study is designed to detect declines in Morro shoulderband snail (MSS) distribution and abundance that exceed the designated threshold. Such declines should be evaluated along with the results of other monitoring studies, including monitoring of the plant communities, in order to evaluate the potential causes and determine the need for remedial habitat management. Details of the protocol should be refined based on results of an initial MSS inventory and pilot monitoring study.

E.2.1 Sampling Objectives

The objectives of the monitoring protocol are to have 90% power to detect 20% declines in frequency (a measure of distribution) and density (a measure of abundance) of MSS, with a 10% chance of indicating a statistically significant decline occurred when one has not.

E.2.2 Sampling Design

The density (number of individuals) of MSS will be measured in square permanent quadrats (5 m x 5 m) located within the LOHCP Preserve System using a stratified-random sampling regime in which the individual lands managed (i.e., the Preserves) are the strata in which an equal number of samples are randomly located. There are presently no density estimates for MSS, nor frequency estimates for this sized quadrat, upon which the initial sample size could be based. It is estimated that a minimum of 80 quadrats in total, with 10 per stratum (Preserve) will be needed to attain the sampling objectives.

Within each quadrat, the vegetation, litter, and top one inch of soil should be carefully searched for a specified period of time to standardize the level of effort; this approach is designed to avoid inadvertent bias (e.g., searching plots located in perceived 'good habitat' longer). The number of live snails in each class (juvenile, adult) should be recorded. The number of empty shells in each age class (Roth 1985) should also be recorded then removed from the quadrat so that they are not counted in future monitoring. If MSS searches are too destructive or time consuming in a 5 m x 5 m area, five to 10, 1 m x 1m quadrats randomly located (i.e., nested) within the larger quadrat could be subsampled.

E.2.3 Implementation

Sampling should be conducted during the rainy season (November-March) during or immediately following precipitation. All plots should be sampled within a 1-to-2-week period.

Pilot (Years 1 and 2): Sampling will be conducted following the identical protocol in the first two years, after which analyses of the data, including power analyses, will be used to determine whether the monitoring protocol attains the sampling objectives and, if not, develop necessary modifications.

First 10 Years Post-Pilot: Sampling will then be conducted every two years during the next 10 years of LOHCP implementation. At each sampling interval, data will be analyzed to determine whether declines in frequency and density exceed the threshold. Such declines will be evaluated in the context of other available information, including climate data, and results of other monitoring studies, to determine whether remedial management is necessary.

In Perpetuity: Once sampling has occurred using the same protocol five times, trend analysis will be used to detect significant declines in frequency or density over a minimum of five consecutive sampling intervals. Power analysis will again be required to determine whether the objectives of a trend analysis can be met with the sampling study. The frequency of sampling following the first ten years should be determined in consideration of the variability observed due to natural fluctuations, but an interval of 3 years is suggested preliminarily.

E.2.4 Analyses

Paired t-tests can be used to evaluate whether a decline of 20% has occurred between the current sample and the baseline. Significant declines in the frequency of occurrence between two intervals can be tested using a G-test. If more than one-time step is evaluated at the same time, repeated measures ANOVA to detect significant declines in density, and Cochrane's Q test to determine whether frequency has declined through time.

Over longer time intervals, least squares regression or route regression can be used to determine whether a significant decline in density or frequency exceeding the threshold (20%) has occurred over a minimum of a five sampling periods.

E.2.5 Potential Modifications

The proposed monitoring protocol should be modified to increase efficiency at attaining the sampling objectives based on results of the initial MSS inventory and the pilot study. The following are potential modifications that might promote success of the sampling objectives.

E.2.5.1 Narrowing the Universe of Interest

The present protocol calls for randomly locating samples within the Preserves, irrespective of habitat conditions. This is done to initially evaluate the community types in which the species occurs; it also renders monitoring results be generalizable throughout the Preserve System. If the initial inventory for MSS or future research reveals that the species do not occur within certain areas of the LOHCP Preserve System, such as specific community types, these areas could be excluded from the universe of interest; remaining samples could be relocated within the suitable habitat, increasing the precision of the estimates and likely statistical greater power. If sampling is limited to in the absence of conclusive evidence for the MSS restricted distribution, monitoring results will not necessarily be generalizable to the true universe of interest.

E.2.5.2 Quadrat Size and Shape

Quadrat size will be increased if the initial MSS frequency of occurrence is too low (<50%) or if the standard deviation of the difference between density in a given sampling interval is too high. Alternative quadrat shapes might be used to reduce these parameters; however, a square or perhaps circular

quadrat is recommended to reduce the variability due to MSS locomotion that would likely results from narrow, rectangular quadrats. Previous research found a correlation between the abundance of live MSS and their shells in 20m^2 quadrats (Adams et al. 2000), suggesting these 100m^2 should be effective in tracking occurrences.

E.2.5.3 Sample size

If the standard deviation of the difference between sample intervals is too high, an increase in sample size might also increase power and thus facilitate the sampling objectives. This must be weighed against other methods of reducing standard deviation (sample size) and other sampling objectives, including maintaining low costs.

E.2.6 Thresholds

The thresholds to trigger evaluation of remedial management for Morro shoulderband snail are: 1) 50% decline in distribution in any one Preserve, or 2) a 20% decline in distribution (frequency) or abundance (density) compared to the baseline measured in the LOHCP Preserve System as a whole.

E.3 Morro Manzanita Population Monitoring

Two complementary monitoring studies are recommended to track effectiveness of the LOHCP at achieving the biological goals and objectives for Morro manzanita:

1. Areal extent mapping of Morro manzanita, to track the species distribution and general abundance; and
2. Demographic monitoring of Morro manzanita, to evaluate plant performance including survivorship.

The following outlines general aspects of the monitoring studies, for which detailed protocols should be developed based on pilot studies conducted during initial implementation of the LOHCP.

E.3.1 Areal Extent Mapping of Morro Manzanita

Conducted as part of the areal mapping of plant communities (Section E.1.1), this protocol is designed to track the distribution and extent of the Morro manzanita within the LOHCP Area. The range-wide areal extent of Morro manzanita was mapped first on paper by Mullany (1990) and then updated and incorporated into a GIS by Tyler et al. (2000).

E.3.1.1 Monitoring Objective

The objective of this monitoring protocol is to detect declines in the distribution of Morro manzanita within the Preserve System that exceed 20% of the baseline acreage or result in extirpations from individual Preserve Areas.

E.3.1.2 Study Design

Following the methods of Mullany (1990) and Tyler et al. (2000), patches of habitat occupied by Morro manzanita will be delimited using GIS based on aerial image analysis and field verification, as necessary.

The distinctive shape (round or oval) and color (grey-green) of Morro manzanita canopy can be used to be distinguished the covered species from co-occurring shrubs and trees by a biologist or another trained observer. The polygons developed by Tyler et al. (2000) can be updated and used as a baseline for the distribution of Morro manzanita in the LOHCP Preserve System. New, high-resolution aerial photographs will be used to evaluate changes in the distribution of Morro manzanita through time.

E.3.1.3 Implementation

Areal extent mapping should be conducted approximately every 10 years in perpetuity, with the exact interval dependent upon the availability of new, high resolution aerial photographs of the LOHCP Area. This is the anticipated temporal scale during which changes in the distribution of the species are anticipated to result from:

1. natural dynamics, including new disturbances (e.g., fire and erosion) and succession;
2. anthropogenic factors, including management and restoration projects (e.g., vegetation management) and recreational use; and
3. climate change, which can cause mortality events directly or indirectly, by increasing vulnerability to pathogens.

Spatial analyses in GIS can be used to quantify changes in the acreage of habitat occupied by Morro manzanita. For each area in which a change is detected, the original aerial photographs and polygons should be examined to determine whether the change is due to mapping error (i.e., the accuracy or precision with which patch boundaries are delimited) or represents an actual change in the extent of this covered species.

E.3.1.4 Analyses

The percent change in the areal extent (acres) of Morro manzanita can be calculated simply as:

$[Acres_{(t)} - Acres_{(baseline)}]/Acres_{(baseline)}$.

where t represents the year in which subsequent mapping occurs and baseline represents the acreages mapped during the initial monitoring early during implementation of the LOHCP. Additional statistics will be used to describe the changes that are observed, in terms of the percentage change in the distribution by patch and by Preserve (individual property) to assess the extent to which changes are occurring range-wide or in discrete areas.

E.3.2 Demographic Monitoring of Morro manzanita

Demographic monitoring is designed to detect declines in survivorship of Morro manzanita, which may signal the need for management to promote population persistence.

E.3.2.1 Monitoring Objective

The objective of demographic monitoring is to track the survivorship of Morro manzanita individuals to detect increases in mortality that would signal the need for management to promote stand regeneration and thus avert the 'senescence risk' posed by fire suppression in the region.

E.3.2.2 Study Design

Monitoring will be used to evaluate the demographic performance of Morro manzanita located throughout the LOHCP Preserve System. A sample of individual shrubs will be chosen using a stratified-random sampling regime in in which an equal number of plants will be randomly chosen for monitoring in each LOHCP Preserve. At least 20 shrubs should be monitored in each Preserve where the species is located.

Each randomly chosen Morro manzanita individual will be permanently marked using a discrete, permanent identifier (e.g., numbered metal tag), and their location recorded in the GIS. At each monitoring event, plant canopy height, width, and percentage of dead cover will be recorded, along with any observations regarding the plant's condition, such as evidence of disease, desiccation stress, senescence, herbivory, or other factors that could influence performance. The community type, approximate stand age (based on historical aerial photographs), and any other factors hypothesized to influence performance will also be recorded for each individual.

E.3.2.3 Implementation

Demographic monitoring will be conducted early during the implementation of the LOHCP and at 10-year intervals. The interval can be shortened if observations suggest a decline in individual plant vigor or survivorship of the population that should be further evaluated for management.

E.3.2.4 Analyses

Morro manzanita survivorship, size (volume calculated using the formula for a cylinder), and percentage dead or damaged canopy will be tracked through time. Paired t-tests can be used to test for differences in size and canopy cover between sampling intervals. Logistic regression can be used to evaluate factors influencing survivorships, including community type, stand age, size, and percent dead foliage, among other factors measured for each individual during the study.

E.3.2.5 Thresholds

The thresholds to trigger remedial management for Morro manzanita are: 1) 1 50% decline in areal cover, canopy cover, or survivorship in any one Preserve, or 2) a 10% decline in distribution (areal extent), abundance (cover), or survivorship compared to the baselines measured in the Preserve System as a whole.

E.4 Indian Knob Mountainbalm Population Monitoring

Indian Knob mountainbalm population monitoring is designed to detect changes in the distribution, abundance, and demographic performance of Indian Knob mountainbalm. Details of the protocol should be refined based on results of the initial inventory of lands to be managed as part of the LOHCP Preserve System and then again based on results of the pilot study. If management projects are implemented to enhance Indian Knob mountainbalm populations, detailed experimental management project monitoring will also be used to evaluate the status of the narrowly distributed and rare plant.

Presently, Indian Knob mountainbalm has a very limited distribution and abundance in the LOHCP Area. Thus, census and demographic monitoring are proposed rather than sampling. If the distribution and/or

abundance are found to exceed a level for which the entire population can be efficaciously monitored, it may be necessary to conduct demographic monitoring on a sample of the population.

E.4.1 Monitoring Objective

The objectives of the monitoring protocol are to track changes in the areal extent, density, survivorship, and reproduction (flowering and seedling establishment) of Indian Knob mountainbalm to evaluate success of management designed to increase population abundance and distribution.

E.4.2 Study Design

Within each discrete patch (occurrence, colony) of Indian Knob mountainbalm located within the LOHCP Preserve System, the following will be conducted:

1. The perimeter of the patch will be delimited using a global positioning system (GPS) and the area of the resulting polygon calculated;
2. All individual plants (ramets) will be permanently marked with a unique identifier (e.g., numbered metal tag) and geolocated using a GPS; and
3. The life stage (seedling/juvenile/adult), and number of flowers produced by each adult plant will be recorded.

Additional information about individuals (e.g., height) or the habitat patch in which they occur (community, successional stage, disturbance, etc.) will also be recorded.

E.4.3 Implementation

Sampling will be conducted when Indian Knob mountainbalm is in flower, in approximately June and July. Demographic monitoring should be conducted at 5-year intervals and continue until the distribution and abundance of the species within the LOHCP Preserve System necessitates population sampling. It is anticipated that this will occur as a result of successful experimental management designed to enhance populations of this very rare plant.

E.4.4 Analyses

Census data should be analyzed using descriptive statistics to track changes in patch size, density, survival, and seedling establishment. Lefkovitch matrix models can be used to calculate the population growth rate based on survivorship and fecundity estimates, which can be used to generate population density protections based on current density values. These useful tools of demographic monitoring can also be used to determine the life history transitions (e.g., seedling survivorship to become a juvenile) are most influential on the population growth (e.g., seedling survivorship, etc.) through sensitivity analyses (Caswell 2000, Parker 2000).

Demographic models can continue to be used once sampling is initiated, at which time univariate statistical tests including paired t-tests can be used to determine whether the population has increased significantly compared to the baseline distribution and density established during the initial year of the study.

E.4.5 Thresholds

The threshold to trigger remedial management for Indian Knob mountainbalm is a 10% decline in areal extent or number of ramets compared to the baseline inventory.

E.5 Morro Bay Kangaroo Rat Monitoring

Because the distribution of Morro Ban kangaroo rat within the LOHCP Area is currently unknown (USFWS 2011b), a presence/absence survey for the species will be conducted as part of the initial inventory of all lands anticipated to be included within the LOHCP Preserve System. Additional private lands where the species is most likely to occur, based on occurrence of suitable habitat and historical sightings, will also be surveyed, if permission is granted by the landowners.

Results of the initial inventory will determine the approach to monitoring this covered species. If Morro Bay kangaroo rat not detected, presence/absence surveys will continue to be conducted at 5-year intervals. Once the species is detected, a monitoring protocol will be developed to monitor the population of this very rare animal. The details of this monitoring protocol will depend on the distribution and abundance of the species revealed through the presence/absence survey and will be developed in close coordination with the USFWS and CDFW.

The following initial protocol for the presence/absence survey is based on the Survey Protocol for the Morro Bay Kangaroo rat (USFWS and CDFW 1996). The details of the methods that will be used to inventory the preserve will be developed early during implementation of the LOHCP, in close coordination with the USFWS and CDFW.

Presence/absence survey will consist of two, tiered components:

- Visual surveys for diagnostic sign, including burrows, tail drag marks, dust bath sites, and surface seed pit caches; and
- Live trapping.

Positive identification of sign can be used to document presence of the species; however, for species present at very low abundance, there is a low probability of detecting sign. If potential sign of kangaroo rats is detected, such as a scat or burrow, tail drag, or other tracks, that resembles that of a kangaroo rat, then live trapping will be conducted when conditions are appropriate, as described below.

E.5.1 Visual Surveys

E.5.1.1 Monitoring Objectives

The objective of the visual survey is to detect known or potential sign of Morro Bay kangaroo rat within the LOHCP Area, including all lands managed as part of the LOHCP Preserve System, as well as other suitable and potentially occupied habitat.

E.5.1.2 Study Design

In the visual survey, a qualified biologist will traverse each Preserve using a series of transects that are close enough to allow comprehensive visual examination of the ground surface.

E.5.1.3 Implementation

Surveys will be conducted by a qualified biologist approved in advance by the USFWS and CDFW. As the timing of surveys can greatly influence the likelihood of detection, surveys will be conducted during the following time periods:

- between April 1 and June 30, or in March if weather conditions are warm and dry for three days prior to initiation of the visual survey;
- during the week preceding or the week following a new moon, when the species is expected to be generally more active;
- when conditions allow sign from daily activity of other small mammals to be visible; and
- during the morning or late afternoon, if there has been no wind, when shadows make tail drag easier to detect.

E.5.1.4 Reporting

Reports from visual surveys will document all relevant information, including:

- The survey area, providing a map and GPS coordinates;
- The survey dates and times;
- The weather and other abiotic conditions during the surveys that could influence activity, including temperature, wind speed, moon phase, and the preceding week's weather conditions;
- The number of person-hours per acre spent searching for sign; and
- A description of the results, including all species sign detected, including that of other species, as feasible.

E.5.2 Live Trapping

E.5.2.1 Monitoring Objectives

The objective of the live trapping is to definitively document the presence of Morro Bay kangaroo rat when potential sign is detected during visual surveys.

E.5.2.2 Study Design

Trapping will be conducted for a minimum of three nights. Traps will be located:

- in areas where sign was detected, including near active burrows, dust baths, or apparent runways, as well as other suitable habitat;
- at 10-to15-meter intervals along potential movement corridors, with at least two traps per station.

Traps will be baited with a mixture of food items including crimped oats, wild bird seed, applies, walnuts, and peanut butter, provided the latter does not attract ants. They will be opened and baited in the late afternoon and checked two to four hours after sunset and again at dawn, with a maximum interval of six hours between trap checks. Traps will be closed after then are checked a dawn.

If Morro Bay kangaroo rats are trapped, the biologist will notify the US Fish and Wildlife Service immediately. Any trapped Morro Bay kangaroo rats will be removed from the wild and placed in the captive breeding facilitate at UC Berkeley, unless the USFWS provides other authorization.

E.5.2.3 Implementation

Surveys will be conducted by a qualified biologist approved in advance by the USFWS and CDFW. As the timing of surveys can greatly influence the likelihood of detection, surveys will be conducted during the following time periods:

- during the week preceding or the week following a new moon; and
- during periods lacking increment weather (e.g., rain or high wind), and at least 3 days following inclement weather, when small mammals are less active.

E.5.2.4 Reporting

Reports from visual surveys and live trapping will document all relevant information, including:

- The trap numbers, locations, and number of nights operated (providing a map);
- The survey dates and times;
- The weather and other abiotic conditions during the surveys that could influence activity, including temperature, wind speed, moon phase, and the preceding week's weather conditions; and
- A description of the results, including all species observed in the traps.

E.6 General Habitat Condition Monitoring

This monitoring protocol will be used to evaluate habitat conditions within the LOHCP Preserve System, in order to detect new threats or impacts to habitat for the covered species. It is designed to complement the other monitoring protocols, by providing more general data collected across a broader area. Results of the study can be used to inform habitat maintenance activities as well as help interpret results of the community and species monitoring protocols, such as provide information about potential causes of declines in species diversity or increases in populations.

E.6.1 Monitoring Objective

The objective of the general habitat monitoring is to evaluate changes in the condition of the land within the LOHCP Preserves over time.

E.6.2 Study Design

In this study, observational data will be collected and photomonitoring will be conducted in each area managed as part of the LOHCP Preserve System. Large or heterogeneous Preserves will be subdivided into management units—contiguous areas featuring similar habitat conditions—for purposes of the assessment.

E.6.2.1 Qualitative Assessment of Habitat Conditions

In each area, observations will be made to assess the habitat conditions based on the factors that affect the covered species populations, which include:

- **native plant cover**: assess native plant cover to detect issues that might reduce it, including disease, senescence due to fire exclusion, trampling due to incompatible uses, or other factors that might necessitate management;
- **exotic plant species:** assess the general distribution and abundance of exotic plants to detect rapid spread or new invasions that necessitate management, including eradication of new species as part of an early detection-rapid response program for the Preserve System (Section D.1.3.2);
- **erosion**: assess condition of eroded areas being restored or managed, and identify new erosion issues early, so that they can be corrected before they damage habitat; and
- **use:** assess user compliance with the recreation provisions of each preserve, and identify habitat impacts associated with trespass, unauthorized uses, and vandalism.

For each factor, detailed qualitative observations will be recorded on data sheets designed to characterize habitat conditions and inform management treatments. The narrative descriptions will be used to assign numerical scores to facilitate tracking changes in each factor over time. Table E-1 identifies initial factors, criteria, and scores to illustrate the protocol.

These elements of the protocol will be refined through work to prepare the LOHCP Preserve System AMMP to ensure that they reflect the results of the Preserve System inventory and baseline monitoring, and address the factors affecting the covered species and their habitats. The final monitoring protocol will include performance criteria designed to trigger remedial actions in response to observed degradation of habitat conditions. For example, any Preserve receiving a score of 3 or less will be subject to remedial management actions to address the factor(s) degrading habitat.

E.6.2.2 Photomonitoring

In addition to the qualitative assessments, photomonitoring will be used to evaluate changes in habitat conditions over time. At each Preserve or management unit therein, permanent photomonitoring points will be established in locations that will complement observations that can be made through analysis of high-resolution aerial imagery, to collectively enable comprehensive examination of the habitat conditions. Photopoint locations will be established in areas that are prone to changes in habitat conditions, including areas of authorized and unauthorized uses and along boundaries of Preserves, as well as any highly sensitive habitat areas.

Photomonitoring points will be permanently monumented on the ground (e.g., using a stake) and their locations recorded using a resource-grade GPS. At each point, the general subject and view direction (azimuth) will be recorded for each photograph. The digital photographs will be stored in files that enable comparisons.

Table E-1: Habitat Condition Assessment Factors, Criteria, and Scores

Factors	Criteria	Score
Native Vegetation	Native plant cover intact	4
	Native plant cover reduced somewhat (up to 10%) as a result of factors that are subject to management	3
	Native plant cover reduced fairly substantially (up to 50%) as a result factors that are subject to management	2
	Native plant cover greatly reduced (>50%) as a result of factors that are subject to management	1
Exotic Plants	Exotic plants limited in distribution and cover (<5%)	4
	Exotic plants limited in distribution and only patchily abundant (5-15%)	3
	Exotic plants fairly widespread and patchily abundant	2
	Exotic plants dominate vegetation, at least in some areas	1
Erosion	No erosion or erosion causing no habitat impacts	4
	Limited erosion causing limited habitat impacts	3
	Moderate erosion causing moderate habitat impacts	2
	Severe erosion causing severe habitat impacts	1
Use	No habitat impacts caused by unauthorized uses.	4
	Limited habitat impacts caused by unauthorized uses	3
	Moderate habitat impacts caused by unauthorized uses	2
	Severe habitat impacts caused by unauthorized uses	1

E.6.3 Implementation

The general assessment of habitat conditions will be conducted annually during the spring (e.g., May), when annual plant growth is at its peak. Preserves or management units prone to habitat management issues, including unauthorized use and erosion, will be assessed at additional times during the year. These follow-up assessments will be timed to evaluate impacts; for example, areas of erosion will be examined in the winter rainy season, while areas prone to unauthorized uses might best be examined during the summer.

E.6.4 Reporting

Results of the qualitative monitoring will be presented in annual reports included as part of the overall LOHCP Annual Report. Tables and graphs will be used to depict changes in the factor scores over time in each preserve; mean scores will be used to characterize changes in habitat conditions across the Preserve System. The reports will identify management actions and other measures designed to address any negative habitat impacts; these recommendations will be integrated into the work plan for the Preserve System in the subsequent year.

E.7 Exotic Plant Species Mapping

This monitoring protocol is designed to track changes in the distribution and abundance of exotic plant species over time within the LOHCP Preserve System. Results will be used to evaluate effectiveness of exotic plant management efforts, as well update the prioritized list of future treatments. Importantly, project-specific monitoring will be necessary to evaluate the effectiveness of specific exotic plant control treatments (Section 5.4.2.2). To enable comparisons of the results as well as enhance cost-effectiveness of the monitoring program, this protocol will be conducted in conjunction with the plant community mapping (Section E.1.1).

E.7.1 Monitoring Objective

Track changes in the richness and relative abundance of exotic plant species within the LOHCP Preserve System that will be used to inform management to control, and eradicate species, where possible.

E.7.2 Study Design

Exotic plant species will be tracked within the Preserve System by characterizing their distribution and relative abundance within each of the plant community (vegetation) patches mapped in the Preserve System. This approach is recommended over mapping the areal extent of each exotic plant species independently for the following reasons:

1. Accurately mapping the thousands of individual polygons needed to depict individual patches of each exotic plant species in the LOHCP Preserve System and differentiating them according to their abundance (e.g., covered classes) as needed to evaluate changes would be extremely time consuming.
2. Mapping individual polygons depicting relatively homogenous cover for each species would be extremely difficult to replicate, thus precluding accurate evaluation of changes over time.

In contrast, plant community patches delineate areas of relatively homogeneous species composition. Using the existing polygons not only facilitates accurate and repeatable field mapping, but also enables examination of exotic plant distribution and abundance patterns with respect to the plant communities, which can be helpful in informing management.
During the initial mapping, many of the larger vegetation polygons will need to be split into two or more new patches in order to:

1. **Delineate relatively homogeneous areas:** Where the cover of one or more exotic plant species varies dramatically within a patch, the patch will be split to delimit relatively homogeneous patches of exotic plant cover.
2. **Subdivide large polygons into smaller areas to facilitate field evaluation**: Polygons that are too large for field examination will be divided into two or more areas in which cover could be accurately assessed.

Within each plant community patch (i.e., polygon), the abundance of each exotic plant species will be estimated using one of ten cover classes (Table E-2). These classes enable rapid and repeatable estimation of exotic plant abundance based on their absolute cover: the percent of the area of the polygon they occupy. The greater resolution in the lower portion of the range (<25%) enables detection of more subtle, yet biologically meaningful, changes in exotic abundance.

Table E-2: Exotic Plant Species Cover Classes

Cover Class	Range of Percent Cover (%)	Midpoint of Percent Cover Range (%)
0	0	0.0
1	<1	0.5
2	1-5	3.5
3	6-10	8.0
4	11-15	13.0
5	16-26	20.5
6	27-50	38.0
7	51-75	63.0
8	76-90	83.0
9	91-110	95.5

E.7.3 Implementation

Exotic plant mapping will be conducted during the spring when most plant species are in flower and annual plant species are at their peak.

It will be conducted every 5 years, in order to provide updated information needed to evaluate the effectiveness of the exotic plant management program and reprioritize species and treatment areas, where needed. General habitat condition monitoring (Section E.6) will be conducted annually to detect new invasions or other changes in exotic plant abundance on a shorter time frame, that merit more immediate management actions. Project-specific monitoring will be conducted to track effectiveness of specific exotic plant treatment projects (Section 5.4.2.2).

During initial implementation, and every ten years thereafter, this protocol will be implemented in conjunction with the areal extent mapping of communities. This will enable results of the two studies to be evaluated (e.g., examine communities that are more or less invaded), and also reduce overall monitoring costs.

E.7.4 Analysis

The abundance (cover class) of each exotic plant observed in each vegetation patch (polygon) will be entered into MS Excel using the midpoint of the range (Table E-2). This will enable the following quantitative analyses:

1. Exotic species abundance, frequency, and area: the mean cover, mean frequency (number of polygons), and total area occupied by each species;
2. Exotic species richness: the mean number of annual, perennial, and all exotic species;
3. Exotic species cover: the mean cover of annual, perennial, and all exotic species.

The data can be integrated into the GIS which can be used to produce maps illustrating exotic plant species distribution, cover, and richness patterns.

Appendix F Covered Animal Avoidance and Minimization Surveys

This section describes the pre-project surveys that must be conducted prior to implementation of covered activities within portions of the Los Osos Habitat Conservation Plan (LOHCP) area that have potential to support Morro Bay kangaroo rat (Figure 5-3), to ensure avoidance of this fully protected, endangered animal.

It also describes the process that must be used to capture and relocate Morro shoulderband snails out of harm's way prior to and during initial stages of covered activities in designated portions of the LOHCP Area (Figure 5-2), to minimize impacts of the covered activities on this species.

F.1 Morro Bay Kangaroo Rat Pre-Project Survey

In portions of the LOHCP Area (Figure 5-3), pre-project surveys must be conducted prior to implementation of covered activities to prevent impacts to the Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*). This species is not only federally and State endangered, it is also a State of California fully protected species; therefore, during implementation, steps must be taken to ensure the species is not present in these areas before they are disturbed by the covered activities.

The survey methods were developed by the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) based on the 1996 presence/absence survey protocol for Morro Bay kangaroo rat (MBKR) and modified to address current conditions and circumstances in the LOHCP.

This section identifies the following aspects of the surveys:

1. **Survey Areas:** Areas where pre-project surveys must be conducted prior to County issuance of certificates of inclusion under the LOHCP;
2. **Qualification**s: the qualifications and agency approval requirements for biologists conducting the surveys;
3. **Protocol:** the methods that will be used as part of a two-step process to evaluate presence/absence MBKR through a habitat assessment, and then conduct track plate/diagnostic surveys and live trapping, if warranted;
4. **Reporting**: requirements for reporting results of surveys; and
5. **Survey Results:** the length of time during which the survey results will be applicable to project permitting.

F.1.1 Survey Areas

Surveys will be required prior to implementation of covered activities within the area depicted in Figure 5-3. Biologists from the USFWS and the CDFW (the wildlife agencies) determined that MBKR has some likelihood of occurring in these areas, based on habitat conditions and historical observations. The survey must be completed prior to vegetation removal or any ground-disturbing activities in the mapped areas.

F.1.2 Survey Protocol

The survey consists of three elements which are conducted in two consecutive phases. The first phase consists of a visual survey. If the wildlife agencies determine results of the visual survey necessitate a more detailed evaluation of MBKR presence within the site, project proponents will be required to conduct the second phase of the protocol, which consists of two elements: track plate and camera stations, and live trapping.

F.1.3 Phase 1: Visual Survey

The first phase of the survey protocol consists of a visual survey to assess suitability of habitat for MBKR and also to look for sign. The following outlines the visual survey protocol.

- The visual survey shall occur between April 1 and August 31, with surveys conducted in the later portion of this season being preferable.
- The property shall be subject to a 100 percent visual examination by a biologist pre-approved by the wildlife agencies. The property shall be traversed in a series of transects close enough together so that all of the ground surface can be visually assessed. In open areas with short vegetation, transect spacing may be up to 10 m apart, while habitats with heavy shrub cover will require spacing as close as three meters. To avoid missing areas, transect routes may be temporarily marked.
- The biologist(s) will evaluate habitat for all types of diagnostic sign for kangaroo rats including burrows, tail drag marks, tracks, scat, dust baths, and surface seed pit caches. The biologist(s) shall thoroughly evaluate the soil surface to determine the likelihood of diagnostic sign being obliterated and thus hiding the presence of MBKR sign.
- Conditions during the visual surveys must allow sign from the daily activity of other small mammals and even tenebrionid beetles to be clearly evident. Visual surveys shall be conducted only during the morning or during late afternoon if there has been no wind; during these times, shadows make tail drag marks easier to detect.
- The wildlife agencies shall be notified immediately if scat considered to be potential sign of MBKR is observed. This scat shall be collected and submitted to CDFW for analysis to determine if it is that of MBKR.
- Areas where potential diagnostic sign is observed shall be mapped and the locations recorded with a global position system (GPS) so that track plate/camera stations may be placed in that location.

The results of the visual survey will be provided to the wildlife agencies within 10 working days of survey completion. for a written determination regarding the need for track plate/camera station and trapping surveys. The wildlife agencies will provide a written determination regarding the need for Phase 2 survey work within 30 days.

F.1.4 Phase 2: Track Plate/Camera Station and Live Trapping Survey

The following two elements of a phase 2 survey must be conducted if the wildlife agencies determine that a more thorough evaluation of MBKR presence is merited, following review of the report of the Visual Survey conducted as part of phase 1.

F.1.4.1 Track Plate/Camera Station Protocol

Track plate and camera station surveys will be conducted as follows:

- The track plate and camera station surveys shall be conducted between April 1 and August 31. It is preferable that this survey work be conducted during the latter portion of this designated season, rather than earlier.
- Track plate and camera stations will be located in the area where the potential sign was found during the habitat assessment. After stations are assigned to areas with potential sign, other stations shall be established in a grid pattern with distance between any two stations or a station and parcel boundary no greater than 200 feet. Should any selected sampling site fall outside of potential kangaroo rat/coastal sage scrub habitat (e.g., within horse paddocks, roads, or other areas of human habitation) the station shall be moved to the nearest location where suitable habitat is present. The location of each track plate/camera station shall be recorded using a GPS.
- Each track plate and camera station shall include a track plate which has been smoked or treated to detect small mammals, and a wildlife motion-detection camera suitable for the detection of kangaroo rats and other small mammals.
- Equipment shall be set up at sunset with data collected as soon after sunrise as practical. Equipment may be removed during the day to avoid vandalism or theft.
- Track plate and camera stations shall be deployed and checked each night for seven (7) days; the survey days shall be consecutive, except that track plate and camera stations shall not be deployed if weather and ground conditions are not appropriate for their use, such as during rain or high winds.

F.1.4.2 Live Trapping

Live trapping shall be conducted as outlined below.

- Unless otherwise approved in writing by the CDFW and the USFWS, trapping will be conducted between June 1 and August 31.
- Traps will be established at the location of each track plate/camera station, the locations of which shall again be recorded using a GPS.
- Trapping shall begin on the first afternoon when the weather and ground conditions are appropriate. Trap response is variable depending on extraneous factors such as weather conditions and availability of natural forage. To maximize trap response, trapping shall not be performed within three (3) days following inclement or extreme weather (e.g., rain, high winds) when animals are either less active or vulnerable to hypothermia.
- Trapping shall be conducted for a minimum of three consecutive nights. If traps are vandalized or otherwise inappropriately disturbed, trapping may need to be extended to compensate for any lost trapping opportunity.
- Traps shall be concentrated in areas with potential sign. At least one trap shall be placed at each active burrow or dust bath. Traps shall be placed near any tracks, particularly along apparent runways; this may mean 10 or more traps are located in a relatively tight cluster. Trap stations

shall also be set in evenly spaced intervals of 10 to 15 meters with two traps per station along potential movement corridors between areas exhibiting kangaroo rat sign. Where two traps are placed, one of the traps may be of mesh construction.

- Traps shall be baited with a mixture of food items such as crimped oats, wild bird seed, apples, walnuts, and peanut butter, provided that the peanut butter does not act as an ant attractant.
- Traps shall be opened and baited in late afternoon and checked approximately 2 to 4 hours after sunset and again at dawn. Traps may be checked once again during the night. No intervals between checks of any traps shall exceed six (6) hours. Traps shall be closed after they are checked at dawn.
- Unless otherwise notified by CDFW and the USFWS, any captured MBKR individuals will be documented with photos and hair samples collected for analysis by the wildlife agencies. The location of the capture will be recorded with a GPS. Animals will be released back to the wild at the trap location.

F.1.5 Surveyor Qualifications

Biologists must meet the qualifications outlined below and be approved by CDFW and USFWS (the wildlife agencies) prior to conducting surveys for MBKR. The County will maintain a list of biologists that the wildlife agencies have identified as qualified to perform MBKR surveys.

1. **Visual Assessments and Track Plate/Camera Station Surveys:** The visual assessments, track plates, and camera station work shall only be conducted by biologists with extensive, demonstrable experience with kangaroo rats (*Dipodomys* spp.).
2. **Live Trapping:** Trapping surveys can only be conducted by biologists with a federal recovery permit, issued pursuant section 10(a)(1)(A) of ESA, for Morro Ban kangaroo rat, and who have received authorization from the CDFW. Biologists in possession of a recovery permit for another species of listed kangaroo rat and/or demonstrable small mammal trapping experience that includes work with kangaroo rats may be considered by the wildlife agencies on their individual merit; however, such individuals must be approved, in advance, by both CDFW and the USFWS.

The same biologist shall conduct all of the elements deemed necessary to constitute a complete survey unless otherwise approved in advance and in writing by CDFW and the USFWS.

F.1.6 Reporting

Reports for the Phase 1 Visual Survey shall be submitted to the wildlife agencies within 10 working days following completion.

A final report shall be prepared following the completion of all elements of the survey to incorporate all survey results for the property. This final report shall be submitted within 15 working days of the completion of the Phase 2 surveys.

The report for will include the following information: the survey date(s) and time(s), survey location on a map, day and night time weather conditions including temperature and wind speed, moon phase, the preceding week's weather conditions, names of biologist(s), number of person-hours spent searching for

sign per hectare searched (i.e., survey effort), a copy of the field notes that list trap check times by date, photographs, and a description of the survey methods and results, including any capture location(s).

All reports should be submitted to the wildlife agencies at the addresses below:

Field Supervisor
U.S. Fish and Wildlife Service
Ventura Field Office
2493 Portola Road, Suite B
Ventura, California, 93003

Habitat Conservation Planning Branch
Department of Fish and Wildlife
1234 E. Shaw Avenue
Fresno, CA 93710

F.1.7 Survey Result

If the survey is conducted as described in this protocol and the results are negative, as no diagnostic sign is found and no MBKR are trapped, these negative results are considered valid for one year unless otherwise extended, in writing, by the wildlife agencies. If results indicate MBKR is present, the project proponent shall contact the CDFW and USFWS regarding how to proceed.

The wildlife agencies reserve the right to reject the results of Morro Bay kangaroo rat surveys as inadequate if: (1) specific methods described above are not implemented and prior written exception has not been obtained per for any requested modification or (2) survey methods used are inconsistent with this protocol.

F.2 Morro Shoulderband Snail Minimization Measure

This section describes the pre-project surveys that will be conducted to minimize take in the form of injury and mortality of Morro shoulderband snail (*Helminthoglypta walkeriana*; MSS, a federally threatened species, by ensuring that identified individuals are captured and moved out of harm's way into Preserve lands prior to site disturbance that would result from covered activities. The methods were developed by the USFWS to address current conditions and circumstances in the LOHCP.

F.2.1 Survey Areas

Surveys will be required in the portions of the LOHCP Area depicted in Figure 5-2. Biologists from the USFWS determined that larger numbers of MSS are expected to occur in these areas, based on habitat conditions, current and historical observations, and proximity to known occupied areas.

F.2.2 Morro Shoulderband Survey Methods

F.2.2.1 Search

Preconstruction surveys and minimization measures must be conducted in advance of ground-disturbance in the designated areas (Figure 5-2). A qualified biologist (Section F.2.3) will be present during site disturbance activities and initial grading and excavation including clearing of vegetation and stripping of the surface soil layer to monitor for the presence of MSS.

Surveys for MSS will also include cutting at ground level any native or exotic shrubs that are to be removed as part of site preparation to allow for careful inspection of branches and understory litter to detect any MSS individuals that may be present. Veldt grass (*Ehrharta calycina*) clumps will be carefully inspected and all iceplant species (*Carpobrotus* spp., *Conicosia* spp., and *Mesembryanthemum* spp.) will be removed and stems and duff carefully inspected for individual MSS as well as their egg masses. As vegetation is removed, it will not be stockpiled onsite but rather moved to an offsite location where there is no chance of its re-occupation by the species.

Measures shall be taken during vegetation removal, grading, and excavation to avoid trampling patches of iceplant or perennial veldt grass. The biologist will have the authority to order any reasonable measure necessary to avoid injury or mortality of MSS and stop any work or activity that is not in compliance with the conditions set forth in the ITP. The USFWS will be notified of any "stop work" order and this order will remain in effect until the issue has been resolved.

F.2.2.2 Relocation

Live MSS in any life stage that are encountered during these monitoring surveys will be captured and moved by the biologist to suitable habitat located within a LOHCP Preserve. The biologist will identify the most suitable receptor site and obtain consent from the receptor-site landowner or manager prior to relocating individuals to the site. To the extent possible, individuals should be relocated to suitable conserved habitat within the LOHCP Preserve closest to the capture site. Within the designated receptor site, MSS shall be placed in or near the center of a habitat patch to maximize chance of survival; habitat edges should be avoided.

Capture of individuals should be done carefully and with a light touch, will time in hand kept to the minimum time necessary. Between the point of capture and the receptor site, individuals should be placed in a protective, secure container that contains a layer of duff comprise of native leaf litter.

Individual MSS should be kept in the protective container for the minimum amount of time necessary to move them to the receptor site. In any case, individuals will not be kept in the container for more than an hour. During this period, the biologist must take measures to keep individuals out of the direct sunlight and situations of excessive heat.

Individuals MSS shall be gently transferred from their protective container to the base of a native shrub species with low-lying branches that can provide cover. The aperture (main opening of the MSS shell) should face the ground surface. The biologist shall gently cover the MSS with one to two inches of leaf litter (duff).

F.2.2.3 Construction Monitoring

Upon completion of site preparation and grading activities, the biologist will periodically visit the project site throughout the remainder of the project construction period. During periods of rain or heavy fog/dew, the biologist will conduct pre-activity surveys to ensure that no Morro shoulderband snails have migrated into the work area. Any MSS observed during this period shall be relocated as outlined in Section F.2.2.2. No construction work will be initiated until the biologist determines that the work area is clear of Morro shoulderband snails.

F.2.3 Surveyor Qualifications

Biologists who conduct surveys for Morro shoulderband snail shall be in possession of a valid section 10(a)(1)(A) recovery permit for the species that allows for the handling in association with species identification and capture or has been otherwise approved by the USFWS and CDFW. The County will maintain a list of biologists that the USFWS has identified as qualified to perform surveys for Morro shoulderband snail.

F.2.4 Reporting

Reports for monitoring and clearance surveys will be submitted to the USFWS and CDFW within 30 working days following completion and will include the following information: survey date(s) and time(s), parcel identification (street address and APN), names of biologist(s) and permit number(s), number of person-hours spent, number of individuals captured and relocated, location of the receptor site, any take that may have occurred during capture, and a copy of the field notes.

All reports should be sent to the wildlife agencies at the following addresses:

Field Supervisor
U.S. Fish and Wildlife Service
Ventura Field Office
2493 Portola Road, Suite B
Ventura, California 93003

Habitat Conservation Planning Branch
Department of Fish and Wildlife
1234 E. Shaw Avenue
Fresno, California 93710

Appendix G California Department of Fish and Wildlife Mitigation Policy Consistency Analysis and Morro Dunes Ecological Reserve Management Obligation Assessment

This appendix documents the results of an analysis that concluded that enrollment of the California Department of Fish and Wildlife's Morro Dunes Ecological Reserve is consistent with the CDFW *Policy for Mitigation on Public Owned, Department Owned, and Conserved Lands* (CDFW 2012), which is provided at the end of this appendix. For each of the guidelines within the CDFW mitigation policy, Table G-1 evaluates whether the use of the MDER is consistent.

This appendix also lists CDFW's management obligations for the MDER based on a review of the existing management plan for the reserve (CDFW 1982). At the time that the management plan was developed, the reserve consisted only of the 47.8-acre Pecho Parcel, located west of Pecho Valley Road. A plan has not yet been developed for the 230.9-acre Bayview Unit of the MDER.

The management recommendations in the plan, outlined in order of priority, were to:

1. Complete a flora and invertebrate survey by competent biologists;
2. Delineate the most important habitat areas for habitat enhancement for Morro Bay kangaroo rat;
3. Delineate the areas critical for protection of the banded dune snail (Morro shoulderband snail) and various endemic plants, so they can be left 'as is';
4. Conduct periodic monitoring of the efficacy of the management practices, including population sampling for the kangaroo rat; and
5. Meeting twice a year with the State Parks, the USFWS, and Cal Poly staff to review the progress of management and determine the course of future management efforts.

These existing recommendations, which represent the management obligation for the property (R. Stafford, pers. comm. 2016), could be greatly expanded upon to address management issues and threats to the covered species, and enhance and restore habitat at the site as part of the LOHCP Preserve System AMMP. Specifically, efforts to control exotic plants, address the impacts of historic land use including old roads, restore areas that have been denuded as a result of intense trail use, and conduct vegetation management to simulate the beneficial effects of fire and promote fire-adapted species, as outlined in Section 5.3.3 and discussed in greater detail in Appendix D, could restore or enhance the coastal sage scrub and maritime chaparral habitat in the MDER and in doing so, promote populations of the covered species all of which have current or historic occurrences within the site. Based on the framework for management and monitoring outlined in Appendix D, the Department believes that the enhanced management and restoration of the MDER proposed by the LOHCP is above and beyond CDFW's existing responsibility for management of the ecological reserve (R. Stafford, pers. comm. 2016).

Specific management and restoration activities and the methods of crediting them as mitigation in the LOHCP will be identified in the Preserve System AMMP, which will be developed during the first three years of Plan implementation (Section 5.3.3.2). The *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (McGraw 2002; Appendix M) outlines habitat restoration and monitoring strategies that the County and/or its Implementing Entity could take to begin to restore habitat in the MDER during the first three years of LOHCP implementation.

Table G-1: Consistency of Enrollment of the Morro Dunes Ecological Reserve in the LOHCP Preserve System with CDFW Mitigation Policy Guidelines

CDFW Mitigation Policy Guideline	Evaluation of Consistency of LOHCP with the Guideline
Mitigation is consistent with the current and future uses of the land including any encumbrances, easements, or public use values, as evaluated through a site visit and described in CDFW documents including: • Land management plan (LMP) for the property; • Any Conceptual Area Protection Plans (CAPP) or Land Acquisition Evaluations (LAE) written for the property; and • Easement; and • Titles.	Restoration and management of habitat within the MDER is consistent with the objectives for the reserve as outlined in the current LMP, which are: protection and enhancement of Morro Bay kangaroo rat habitat, protection of Morro shoulderband snail habitat, and protection of the endemic plants (CDFW 1982). Specifically, restoration projects will be designed to promote habitat for the covered species (MBKR, MSS, IKM, and MM) by addressing factors that degrade it, including exotic plants, erosion, and unnatural succession due to fire exclusion. There are no easements or provisions on the title for the properties that preclude their use as mitigation.
Mitigation is consistent with the purpose for which the land was acquired, and the funding source used for acquisition.	Restoration and management will promote the rare species and endemic communities that properties within the MDER were acquired to protect. CDFW confirmed that state funds used to purchase the property (Proposition 50 and state license plant funds) do not preclude their use as mitigation. Likewise, USFWS found that land purchased in part using federal threatened and endangered species program funds and Section 6 funds can be restored or managed as mitigation.
Mitigation will not preclude, diminish, or interfere with encumbrances, or the management plan for the property.	Restoration and management will promote the goals of the management of the property, which are: protection and enhancement of Morro Bay kangaroo rat habitat, protection of Morro shoulderband snail habitat, and protection of the endemic plants (CDFW 1982). There are no known encumbrances for the property for which restoration and management would interfere.
Mitigation maintains and or enhances the current ecological and public use values of the land. The entity proposing mitigation needs to provide documentation of how placing the mitigation on the land is going to maintain or enhance these values.	Restoration and management will promote the ecological goals for the property, as outlined above. The current LMP does not identify public use goals. Hiking and dog walking (on a leash of no more than 10 feet) are allowed under CDFW regulations that govern management of the reserve, while the California Code of Regulations, Title 14, Sections 550 and 630, prohibits bike riding, horseback riding,

Table G-1: Consistency of Enrollment of the Morro Dunes Ecological Reserve in the LOHCP Preserve System with CDFW Mitigation Policy Guidelines

CDFW Mitigation Policy Guideline	Evaluation of Consistency of LOHCP with the Guideline
	off-highway vehicle use, and camping. Compatible recreational use will be enhanced by efforts to restore habitat in areas where historic roads and trails that have become deeply incised and are impassible, while leaving more suitable trails in place.
The full cost of the mitigation is accounted for (this includes but is not limited to all capital improvements, restoration, enhancement, monitoring, long term management and maintenance and reimbursement for any CDFW staff time including enforcement, on all lands).	The LOHCP mitigation fees were calculated to fund the habitat restoration, management, and monitoring of the MDER. Fees will fund Implementing Entity staff or contractors who will implement the conservation activities in coordination with CDFW staff responsible for MDER management.
A Memorandum of Understanding (MOU) is in place prior to the project sponsors undertaking the project. The MOU will be developed in cooperation with the land manager, reviewed for statewide consistency by the CDFW's Lands Program in the Wildlife Branch and signed by the District Assistant Chief and the CDFW Regional Manager and the County. The MOU will define the mitigation purpose, permit requirements, agreement term, scope of work, schedule, management and/or maintenance requirements, monitoring, and responsibilities of the parties to the agreement.	The County and CDFW have developed a MOU to establish the terms and conditions upon which the CDFW will authorize the County to conduct habitat management, restoration, and monitoring activities on CDFW lands enrolled within the LOHCP Preserve System including the MDER (Appendix J). As required in the MOU, the County prepared the IAMMP, which will serve as the Mitigation Plan and describes the specific management and/or restoration actions that will be implemented and the monitoring that will be used to evaluate their effectiveness (McGraw 2020; Appendix M), consistent with the AMMP. The Mitigation Plan must be approved by the CDFW prior to issuance of the Special Use Permit (SUP) which will allow the LOHCP Implementing Entity access to CDFW lands to conduct the mitigation activities outlined in the Mitigation Plan.

California Department of Fish and Wildlife Policy for Mitigation on Publicly Owned, Department Owned, and Conserved Lands

The following pages contain the California Department of Fish and Wildlife Policy for Mitigation on Publicly Owned, Department Owned, and Conserved Lands (CDFW 2012).

Department of Fish and Game
DEPARTMENTAL BULLETIN

Number: 2012-02
Date Issued: March 1, 2012
Expires: Until Superseded

To: Department of Fish and Game Staff

Subject: POLICY FOR MITIGATION ON PUBLICLY OWNED, DEPARTMENT OWNED, AND CONSERVED LANDS

The Department of Fish and Game (Department) is often faced with development project proposals that seek to mitigate for impacts to fish and wildlife resources through restoration or enhancement of lands that are publicly owned or already protected for conservation or other purposes. There has been significant discussion within the Department about the appropriateness of locating such mitigation on Department and other conservation lands since the mid-1990s. Mitigation has been proposed for Department lands, Bureau of Land Management lands, and existing mitigation lands.

The appropriateness of such proposals has been considered by the Department's Lands Committee, Banking Policy Team, and Habitat Conservation Supervisors.
These discussions have resulted in issue papers that address the benefits and drawbacks of mitigating on already-protected conservation lands. Recent discussions have been in response to: 1) the regulated community seeking to restore or enhance habitat as mitigation on publicly owned and conserved lands, and 2) Department managers seeking to situate such mitigation on Department lands to enhance or restore degraded habitats, and provide a mechanism for funding long-term management and maintenance of these lands. This would be consistent with established management objectives for the particular site.

The policy statement below addresses those situations where the Department has regulatory or approval authority over the mitigation, and/or where the mitigation site is proposed on publicly owned, Department-owned, and conserved lands. This policy only addresses the use of Department-owned and conserved lands for mitigation in the form of restoration and enhancement. It is not appropriate to allow the use of Department-owned and conserved lands when mitigation requires the preservation or protection of additional acres of land.

POLICY STATEMENT

To assure that mitigation is implemented in a way that best serves California's fish and wildlife resources, the Department's policy for mitigation on publicly owned, Department owned and conserved lands is as follows:

> *Mitigation for impacts to fish and wildlife resources may occur on publicly owned, Department owned, and conserved lands if it has been determined by the Department that: 1) the mitigation is consistent with requirements of the law under which the mitigation is being sought; 2) its relative value as mitigation is equal to or greater than it would be if the same mitigation were*

> *situated on non-public or non-conserved lands; 3) it results in a clear and quantifiable improvement or positive change above that currently present or reasonably expected to exist under current conditions on the site; 4) the future uses of the land, including encumbrances or easements, will not preclude or diminish the mitigation; 5) the mitigation will not preclude, diminish or interfere with the funding or purpose of acquisition, encumbrances, or management plan for the property; and 6) it will not result in a net loss of existing conservation values.*

The Department has developed a flow chart (attached) to help evaluate whether proposed mitigation is consistent with the policy. The flow chart provides a step-wise process for Department staff to follow to make the determination.

IMPLEMENTATION GUIDANCE

The policy for mitigation on publicly owned, Department owned, and conserved lands applies when such mitigation results from an environmental document prepared pursuant to the California Environmental Quality Act (CEQA), a Lake or Streambed Alteration (LSA) Agreement issued pursuant to Fish and Game Code section 1600 *et seq.*, or a California Endangered Species Act (CESA) Incidental Take Permit (ITP) or Consistency Determination (CD) issued pursuant to Fish and Game Code sections 2081(b) and 2080.1 respectively.

CEQA Mitigation

The Department may have little or no discretionary approval authority over CEQA mitigation measures that do not take place on Department lands or do not require permitting by the Department. The Department may support such mitigation in those situations where mitigation is proposed on publicly owned or conserved lands, the Department's input is requested, and the proposed mitigation is consistent with this policy.

LSA Mitigation

For LSA mitigation the Department shall include reasonable measures necessary to protect the resources affected by the project or activity. Such protection is based on project and site specific conditions and may include habitat restoration, rehabilitation and/or protection on a temporary or permanent basis. Project proponents may request that mitigation requirements to restore or rehabilitate habitat occur on publicly owned or conserved lands, or the Department may determine that the fish and wildlife resources will be best served by placing the mitigation on publicly owned or conserved lands. In these cases, the mitigation may proceed if it is consistent with the policy.

CESA Mitigation

CESA requires, among other things, that the impacts of authorized take be minimized and fully mitigated, the measures required to meet this obligation shall be roughly proportional in extent to the impact, and that all required measures shall be capable of successful implementation (Fish and Game Code Section 2081(b)).

The Department has interpreted the loss and degradation of habitat to be prohibited under CESA if it results in the death of listed fish, wildlife or plants, and such mortality is a foreseeable and natural consequence of the habitat modifications.

Lands with habitats that may be rehabilitated, restored, or preserved and maintained to fully mitigate for the impacts of take must be protected through fee title, transfer or conservation easement to an appropriate conservation entity to ensure long term preservation and successful implementation of the mitigation.

The fish and wildlife resources or environments replaced or substituted for those impacted must be maintained in perpetuity. There may be cases where some impacts of the take are temporary such that the credit (offsetting value) would not need to be in perpetuity. If the fully mitigated standard can be met on conserved or publicly owned lands and the mitigation and land are protected in perpetuity, the mitigation may proceed if it is consistent with the policy.

Implementing Mitigation on Department Owned or Conserved Lands

For mitigation to occur on Department-owned or conserved lands the following guidelines should be met:

1. Mitigation is consistent with the current and future uses of the land including any encumbrances, easements or public use values.
    a. To find information on encumbrances, easements or public use values the following documents should be checked:
        i. Management plan for the property
        ii. Any Conceptual Area Protection Plans (CAPP) or Land Acquisition Evaluations (LAE) written for the property
        iii. Easements can be found on the California Natural Resources Agency website and at the County Recorders office. The Lands Program should also be checked.
        iv. Title search – this should be performed by the entity proposing the mitigation
        v. Site visits should be performed

2. Mitigation is consistent with the purpose for which the land was acquired and the funding source used for acquisition.

3. Mitigation will not preclude, diminish or interfere with encumbrances, or the management plan for the property.

4. Mitigation maintains and or enhances the current ecological and public use values of the land.

    a. Entity proposing the mitigation needs to provide documentation of how

placing the mitigation on the land is going to maintain or enhance the ecological and public use values of the land.

5. The full cost of the mitigation is accounted for (this includes but is not limited to all capital improvements, restoration, enhancement, monitoring, long term management and maintenance and reimbursement for any Department staff time including enforcement, on all lands).

6. A Memorandum of Understanding (MOU) is in place prior to the project sponsors undertaking the project. The MOU will be developed in cooperation with the land manager, reviewed for statewide consistency by the Department's Lands Program in the Wildlife Branch and signed by the District Assistant Chief and the Department Regional Manager, the land management agency or non-profit (if other than the Department), and the project sponsor. The MOU will define the mitigation purpose, permit requirements, agreement term, scope of work, schedule, management and/or maintenance requirements, monitoring, and responsibilities of the parties to the agreement.

CEQA compliance and all applicable state, federal and local permits shall be the responsibility of the project sponsor and shall be completed prior to the implementation of the mitigation project. Conditions of such permits will be followed by the project sponsor at all times.

Further information related to this policy may be found on the Department's Intranet at https://intranet.dfg.ca.gov/portal/ExploreDFG/Programs/Program30ManagementofDepartmentLands/tabid/388/Default.aspx.

signed original on file
Charlton H. Bonham
Director

Attachments: Definitions
Procedural Flow Chart

DEFINITIONS

When used in context of this policy, these terms have the following meaning:

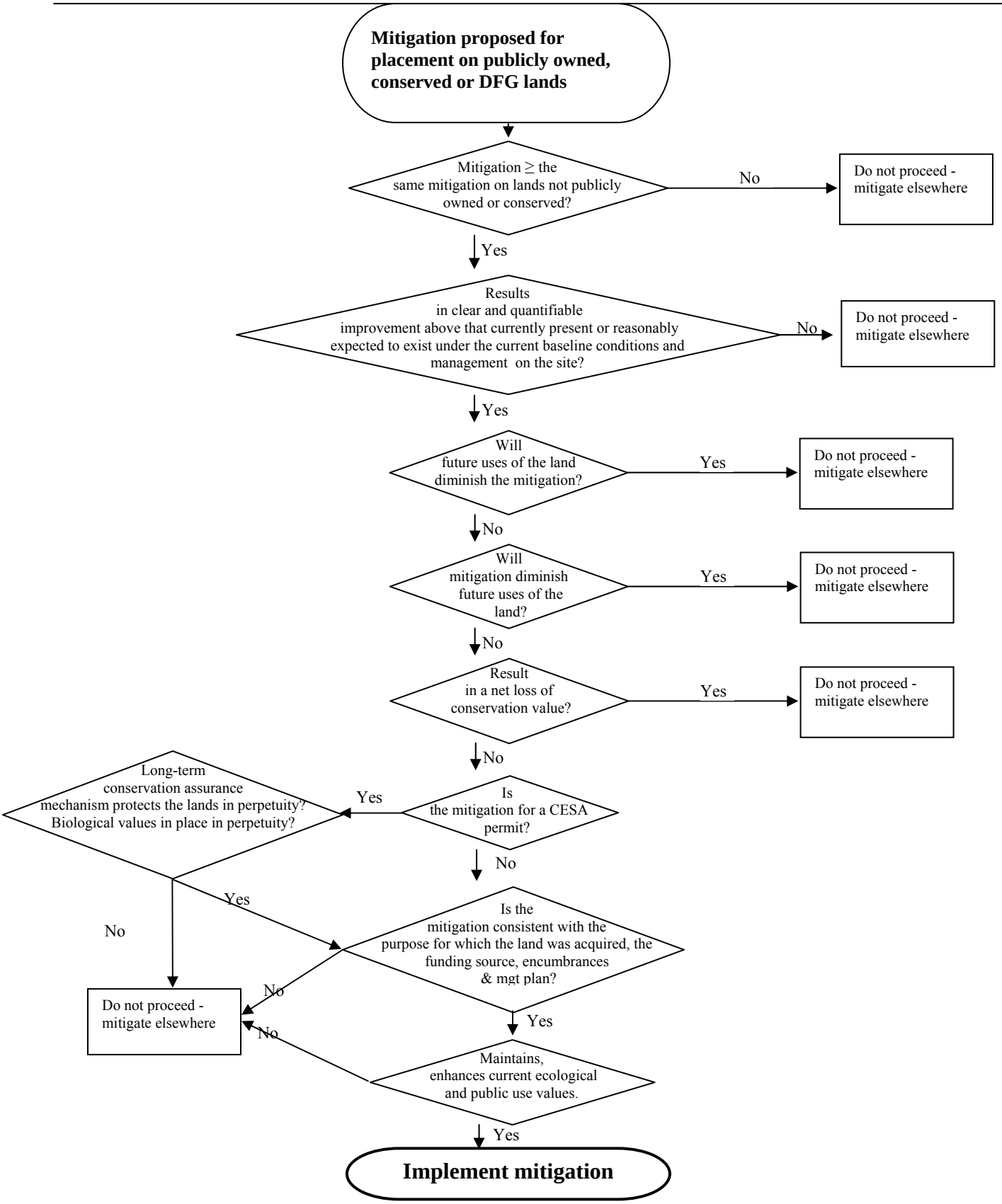
Conserved Lands: An interest in lands acquired by a tax-exempt nonprofit organization qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in California which has as its primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open-space condition; and lands over which a Conservation Easement as defined under Section 815.1 of the California Civil Code has been granted.

Department-Owned Lands: Lands owned in fee title by the California Department of Fish and Game or the Wildlife Conservation Board.

Publicly Owned Lands: Lands owned in fee title by a public agency, other than Department-Owned Lands. Land access, use and/or certain resource purposes on the lands are preserved for the public by a government agency with legal title or other interest which is required to maintain them for such specific use(s) or to meet diverse needs of the public.

Restore or Enhance: Create, re-establish, rehabilitate, or improve habitat that is not present, has been lost or is degraded, improve the ability of existing habitat to support fish and wildlife, change management to improve ability of a habitat to support target species or functions.

ATTACHMENT: Mitigation on Publicly Owned and Conserved Lands - Flow Chart



For Conserved and DFG lands:

1) Recover full cost of mitigation including environmental review and permitting, capital improvements, enhancement, restoration, enforcement, monitoring, long-term management, etc;
2) Develop implementing documents as required; and
3) Mitigator completes or funds CEQA and any necessary permitting for project implementation.

Appendix H Certificate of Inclusion

The United States Fish and Wildlife Service (USFWS) has issued to the County of San Luis Obispo (County as the Permittee) an incidental take permit (ITP) pursuant to Section 10(a)(1)(B) of the Federal Endangered Species Act (ESA). The ITP is issued for a term of 25 years and authorizes incidental take of certain species (Covered Species) (hereafter take coverage) within the area covered by the ITP. Under the ITP, the County is authorized to take the Covered Species incidental to certain activities (Covered Activities) as defined in the LOHCP, provided all of the terms and conditions of the ITP and the LOHCP are being met. In accordance with 50 CFR. § 13.25(d), County may extend take coverage granted to it to third parties, provided such third parties are under the County's direct control for purposes of implementing the requirements of, and complying with the terms and conditions of the ITP and LOHCP.

The ITP and LOHCP provide that the County may extend take coverage to third parties by executing a Certificate of Inclusion (COI) with such third parties. Through execution of this COI, the County extends take coverage under the ITP [*provide permit number*] to [*fill in name of project proponent*]. Take coverage is conferred only for the specific covered activities and area of the property identified in the agreement. Implementation of additional activities and impacts to additional areas of the property will require an additional certificate of inclusion.

You, _____, are the owner/operator of the property depicted on Exhibit 1 attached hereto and incorporated herein by this reference and desire to engage in _____, which is one of the Covered Activities under the ITP. By executing this COI, you consent to the County's direct control over your actions under the ITP and to its enforcement of compliance with the terms and conditions of the ITP and commit to implement all of the mitigation and take avoidance and minimization measures set forth in detail in Exhibit 2 to this Certificate of Inclusion. By executing this COI, you further acknowledge and consent to enforcement against you of all of the terms and conditions and applicable requirements of the ITP and LOHCP and consent to allow access to your property in accordance with any condition regarding such in the ITP, by the USFWS, the County, and/or the Implementing Entity, for purposes of monitoring your compliance with the ITP and LOHCP. If you fail to abide by the terms and conditions of the ITP and LOHCP in carrying out the Covered Activity, the take coverage granted to you through the COI will lapse and/or may be revoked and you may also be subject to civil and criminal liability under the ESA.

Take coverage extended to you under the ITP will become effective following execution of this COI by you and the County. In the event the Covered Activity is assumed by another, you agree to immediately notify the County. Any subsequent owner/operator will not be insulated from liability for incidental take until and unless such subsequent owner/operator and Implementing Entity execute a new COI. The County, as the sole Permittee, remains liable for compliance with all of the terms and conditions and applicable requirements of the ITP and LOHCP, including those implemented by [*name of owner/operator*] pursuant to this COI.

_____ _____

Name Signature

_____

Address

_____ _____

Telephone Number e-mail address

County Representative

_____ _____

Name Signature

_____

Title

_____

Date

Appendix I Template Conservation Easement

This appendix contains a template for conservation easements that would be used to permanently protect the conservation values of habitat protected as part of the LOHCP. It is designed to be used in the following three habitat protection scenarios that are envisioned to occur as part of the conservation strategy:

1. Private landowners grant easements to the Implementing Entity to protect habitat set-asides established when the landowners develop vacant land is inside the Priority Conservation Area;
2. Private landowners dedicate additional easements to the Implementing Entity to protect habitat inside the Priority Conservation Area; and
3. The County of San Luis Obispo grants an easement to the Implementing Entity to permanently protect land acquired in the Priority Conservation Area in fee title from willing sellers.

There are two separate conservation easement templates. The first is to be used when just a portion of a property is being covered by the easement (Section I.1). The second is to be used when the entire property is to be protected by the easement (Section I.2).

Details of the conservation easements will be developed as part of each habitat protection project, to ensure the conservation values of the land for the covered species are protected. Conservation easements will be subject to the review and approval by the USFWS (Section 6.2.2.2).

I.1 Conservation Easement Template for Protection of a Portion of a Property

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:

Name and Address of Grantee

With Copies to:
County of San Luis Obispo
Planning and Building Department
976 Osos Street
San Luis Obispo, CA 93408

Attn:

Add FWS addressees

Space Above Line for Recorder's Use Only

CONSERVATION EASEMENT DEED

THIS CONSERVATION EASEMENT DEED ("Conservation Easement") is made this _____ day of _____, 20____, by the County of San Luis Obispo ("County" or "Grantor"), in favor of the [Name of the Implementing Entity] ("Grantee"), with reference to the following facts:

R E C I T A L S

A. Grantor is the sole owner in fee simple of certain real property located in the County of San Luis Obispo, State of California, designated Assessor's Parcel Number _____ ("Property"). The Property is legally described in Exhibit "A" attached hereto and incorporated herein by this reference. Grantor intends to grant a conservation easement over a ____-acre portion of the Property which is the Property described in Exhibit "A" (the "Easement Area"). The Easement Area is legally described in Exhibit "B" attached hereto and incorporated herein by this reference.

B. The Easement Area possesses wildlife and habitat values of great importance to Grantee, the United States Fish and Wildlife Service (USFWS), and the people of the United States.

C. The Easement Area provides high quality habitat for [*list plant and/or animal species*] and contains [*list habitats; native and/or non-native, restored, created, enhanced, and/or preserved jurisdictional water of the United States including wetlands*]. Individually and collectively, these wildlife and habitat values comprise the "Conservation Values" of the Property. D. The Easement Area supports habitat required to be preserved and managed in perpetuity by Federal Endangered Species Act Incidental Take Permit TE -_____ ("Permit") as mitigation for certain impacts of development and associated infrastructure (collectively "County Projects") located in the County of San Luis Obispo, according to the Los Osos Habitat Conservation Plan ("LOHCP"), the terms of which are incorporated by reference into this Conservation Easement. Grantor, Grantee, and USFWS each has a copy of the LOHCP and Permit.

E. Grantee is the entity selected by the County to implement certain terms and conditions of the LOHCP. Grantee is authorized to hold this conservation easement pursuant to California Civil Code Section 815.3 and Government Code Section 65967. Specifically, Grantee is a tax-exempt nonprofit organization qualified under section 501(c)(3) of the Internal Revenue Code of 1986, as amended, and qualified to do business in California which has as its primary purpose the preservation, protection or enhancement of land in its natural, scenic, forested, or open space condition or use.

F. The United States Fish and Wildlife Service ("USFWS"), an agency within the United States Department of the Interior, has jurisdiction over the conservation, protection, restoration and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of these species within the United States pursuant to the Endangered Species Act, 16 U.S.C. 1531, *et seq.*, the Fish and Wildlife Coordination Act, 16 U.S.C. §§661-66c, the Fish and Wildlife Act of 1956, 16 U.S.C. §724(f), *et seq.*, and other provisions of federal law.

G. USFWS approved the Final LOHCP Preserve System Adaptive Management and Monitoring Plan ("Management Plan") for the Property, which provides the conservation requirements for and authorized activities within the Easement Area. The Management Plan is incorporated by this reference into this Conservation Easement as if fully set forth herein. A final, approved copy of the Management Plan, and any amendments thereto approved by the USFWS, along with additional specific requirements or modifications applicable to the Property, if any, approved in the future by the USFWS, will be kept on file at the addresses listed in Paragraph 12. If the Grantor, or any successors or assigns, require an official copy of the Management Plan, they may request a copy of the current Management Plan from the Agencies at the addresses listed in Paragraph 12.

COVENANTS, TERMS, CONDITIONS AND RESTRICTIONS

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and pursuant to California law, including Civil Code Section 815, *et seq*., Grantor hereby voluntarily grants and conveys to Grantee a conservation easement in perpetuity over the Easement Area under the terms and conditions set forth herein.

1. Purposes. The purposes of this Conservation Easement are to ensure the Easement Area will be retained forever in its natural, restored or enhanced condition consistent with the habitat protection requirements of the LOHCP, and Permit and to prevent any use of the Easement Area that will impair or interfere with the Conservation Values of the Easement Area. Grantor intends that this Conservation Easement will confine the use of the Easement Area to such activities that are consistent with those purposes, including, without limitation, those involving the preservation, restoration and enhancement of native species and their habitats. Grantor represents and warrants that there are no structures or improvements existing on the Property at the time this Conservation Easement is executed, except for any structures or improvements identified in the survey attached as Exhibit "C" and incorporated herein by this reference. Grantor further represents and warrants that to Grantor's knowledge there are no other previously granted easements existing on the Property that interfere or conflict with the purposes of this Conservation Easement as evidenced by the title report attached at Exhibit "D" and incorporated herein by this reference.

2. Grantee's Rights. To accomplish the purposes of this Conservation Easement, Grantor hereby grants and conveys the following rights to Grantee:

(a) For the purpose of restoring, enhancing or improving the health of the natural resources and habitats located on the Property, the right to enter the Property, along with Grantee's agents and contractors at reasonable times and upon not less than ten (10) days' prior notice, in order to and carry out management and restoration activities or to monitor the effects of the restoration activities, all in accordance with the Management Plan. Grantee's habitat management and restoration activities shall not unreasonably limit or interfere with Grantor's access to and use of the Property and shall be at Grantee's sole cost and expense and Grantor shall not be responsible for upkeep and maintenance of Grantee's restoration projects.

(b) To enter the Property, along with Grantee's agents and contractors, at reasonable times and upon not less than ten days' notice to conduct surveys of the covered species, to monitor the natural communities, or to evaluate the condition of other natural resources. Grantee's scientific research and monitoring activities shall not unreasonably limit or interfere with Grantor's use of the Property and shall be at Grantee's sole cost and expense.

(c) To preserve and protect the Conservation Values of the Easement Area;

(d) To enter upon the Easement Area at reasonable times in order to monitor compliance with and otherwise enforce the terms of this Conservation Easement, and for scientific research and interpretive purposes by Grantee or its designees, provided that Grantee shall not unreasonably interfere with Grantor's authorized use and quiet enjoyment of the Easement Area or the Property. Grantor shall provide Grantee access to the Easement Area by crossing the Property, if necessary;

(e) To prevent any activity on or use of the Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features of the Easement Area that may be damaged by any act, failure to act, or any use that is inconsistent with the purposes of this Conservation Easement;

(f) To require that all mineral, air and water rights as Grantee deems necessary to preserve, protect, and to sustain the biological resources and the Conservation Values of the Easement Area shall be put to beneficial use upon the Easement Area, consistent with the purposes of this Conservation Easement; and

(g) All present and future development rights appurtenant to, allocated, implied, reserved, or inherent in the Easement Area are hereby terminated and extinguished, and may not be used on or transferred to any portion of the Easement Area, nor any other property adjacent or otherwise.

3. Prohibited Uses. Any activity on or use of the Easement Area inconsistent with the purposes of this Conservation Easement is prohibited. Without limiting the generality of the foregoing, the following uses and activities by Grantor, Grantor's agents, and third parties, are expressly prohibited:

(a) Unseasonal watering; use of fertilizers, pesticides, biocides, herbicides or other agricultural chemicals; weed abatement activities; incompatible fire protection activities; and any and all other activities and uses which may adversely affect the purposes of this Conservation Easement, except as otherwise specifically provided in the Management Plan;

(b) Use of off-road vehicles and use of any other motorized vehicles except on existing roadways other than as otherwise specifically provided in the Management Plan;

(c) Agricultural activity of any kind, except that grazing is permitted if done in accordance with the Management Plan or other grazing or management plan approved by Grantee and USFWS;

(d) Recreational activities including, but not limited to, horseback riding, biking, hunting, or fishing, except as otherwise specifically provided in the Management Plan;

(e) Commercial or industrial uses;

(f) Any legal or de facto division, subdivision or partitioning of the Easement Area, including a request for a certificate of compliance pursuant to the Subdivision Map Act (California Government Code section 66499.35);

(g) Construction, reconstruction or placement of any building, billboard or sign, or any other structure or improvement of any kind, except as otherwise specifically provided in the Management Plan;

(h) Deposit or accumulation of soil, trash, ashes, refuse, waste, bio-solids, or any other materials;

(i) Planting, introduction, or dispersal of non-native or exotic plant or animal species;

(j) Filling, dumping, excavating, draining, dredging, mining, drilling, removing, or exploring for or extraction of minerals, loam, soil, sands, gravel, rocks or other material on or below the surface of the Easement Area, except as otherwise specifically provided in the Management Plan;

(k) Altering the surface or general topography of the Easement Area, including building of roads, except as otherwise specifically provided in the Management Plan;

(l) Removing, destroying, or cutting of trees, shrubs or other vegetation, except as required by law and in conformance with the Management Plan approved by Grantee and the USFWS for (1) fire breaks, (2) maintenance of existing foot trails or roads that are otherwise permitted under this Conservation Easement, (3) prevention or treatment of disease; or (4) utility line clearance for existing utilities;

(m) Manipulating, impounding or altering any natural water course, body of water or water circulation on the Easement Area, except as otherwise specifically provided in the Management Plan, and activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters; and

(n) Landscaping and hardscaping.(o) Without the prior written consent of Grantee and the USFWS, which Grantee and the USFWS each may withhold for any reason, transferring, encumbering, selling, leasing, or otherwise separating the mineral, air, or water rights for the Easement area; changing the place or purpose of use of the water rights; abandoning or allowing the abandonment of, by action or inaction, any water or water rights, ditch or ditch rights, spring rights, reservoir or storage rights, wells, ground water rights, or other rights in and to the use of water

historically used on or otherwise appurtenant to the Easement Area, including but not limited to: (1) riparian water rights; (2) appropriative water rights; (3) rights to waters which are secured under contract with any irrigation or water district, to the extent such waters are customarily applied to the Easement Area; and (4) any water from wells that are in existence or may be constructed in the future on the Easement Area; and

(p) Any activity or use that may violate or fail to comply with relevant federal, state, or local laws, regulations, or policies applicable to Grantor, the Easement Area, or the activity or use in question.

4. Grantor's Duties. Grantor shall undertake all reasonable actions to prevent unlawful entry and trespass by persons whose activities may degrade or harm the Conservation Values of the Easement Area or that are otherwise inconsistent with this Conservation Easement, including but not limited to posting signs prohibiting such unlawful entry and trespass. In addition, Grantor shall undertake all necessary actions to perfect the right of Grantee under Section 2 of this Conservation Easement, including but not limited to, Grantee's water rights, and all necessary actions to fulfill its responsibilities as identified in the USFWS Permit.

5. Reserved Rights. Grantor reserves to itself, and to its personal representatives, heirs, successors, and assigns, all rights accruing from its ownership of the Easement Area, including the right to engage in or to permit or invite others to engage in all uses of the Easement Area that are not expressly prohibited or limited by, and are consistent with the purposes of, this Conservation Easement. Notwithstanding anything set forth herein, in the event of any third-party claim against Grantor arising from the actions of Grantee or any of its employees, agents, contractors or representatives with respect to the Property, Grantor reserves any rights that Grantor may have at law or in equity to seek contribution or reimbursement from Grantee for such third-party claim.

6. Grantee's Remedies. If Grantee determines that a violation of the terms of this Conservation Easement has occurred or is threatened, Grantee shall give written notice to Grantor of such violation and demand in writing the cure of such violation. At the time of giving any such notice, Grantee shall give a copy of the notice to USFWS. If Grantor fails to cure the violation within fifteen (15) days after receipt of written notice and demand from Grantee, or if the cure reasonably requires more than fifteen (15) days to complete and Grantor fails to begin the cure within the fifteen (15)-day period or fails to continue diligently to complete the cure, Grantee may bring an action at law or in equity in a court of competent jurisdiction to enforce the terms of this Conservation Easement, to recover any damages to which Grantee may be entitled for violation of the terms of this Conservation Easement or for any injury to the Conservation Values of the Easement Area, to enjoin the violation, *ex parte* as necessary, by temporary or permanent injunction without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies, or for other equitable relief, including, but not limited to, the restoration of the Easement Area to the condition in which it existed prior to any such violation or injury. Without limiting Grantor's liability therefor, Grantee may apply any damages recovered to the cost of undertaking any corrective action on the Easement Area.

If Grantee, in its sole discretion, determines that circumstances require immediate action to prevent or mitigate damage to the Conservation Values of the Easement Area, Grantee may pursue its remedies under this Section 6 without waiting for the period provided for cure to expire, provided, however, that (a) Grantee shall use reasonable efforts to give Grantor notice thereof, which notice may be by email or telephone, and (b) Grantor shall have the right to have a representative present while Grantee is present on the Property. Grantee's rights under this section apply equally to

actual or threatened violations of the terms of this Conservation Easement. Grantor agrees that Grantee's remedies at law for any violation of the terms of this Conservation Easement are inadequate and that Grantee shall be entitled to the injunctive relief described in this section, both prohibitive and mandatory, in addition to such other relief to which Grantee may be entitled, including specific performance of the terms of this Conservation Easement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. Grantee's remedies described in this section shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity, including but not limited to, the remedies set forth in Civil Code Section 815, *et seq.*, inclusive. The failure of Grantee to discover a violation or to take immediate legal action shall not bar Grantee from taking such action at a later time.

If at any time in the future Grantor or any subsequent transferee uses or threatens to use the Easement Area for purposes inconsistent with this Conservation Easement then, notwithstanding Civil Code Section 815.7, the California Attorney General or any entity or individual with a justiciable interest in the preservation of this Conservation Easement has standing as interested parties in any proceeding affecting this Conservation Easement.

6.1. Costs of Enforcement. Any costs incurred by Grantee, where Grantee is the prevailing party, in enforcing the terms of this Conservation Easement against Grantor, including, but not limited to, costs of suit and attorneys' and experts' fees, and any costs of restoration necessitated by Grantor's negligence or breach of this Conservation Easement shall be borne by Grantor.

6.2. Discretion of Grantee. Enforcement of the terms of this Conservation Easement by Grantee shall be at the discretion of the enforcing party, and any forbearance by Grantee, to exercise their rights under this Conservation Easement in the event of any breach of any term of this Conservation Easement shall not be deemed or construed to be a waiver by Grantee, of such term or of any subsequent breach of the same or any other term of this Conservation Easement or of any of Grantee's rights under this Conservation Easement. No delay or omission by Grantee, in the exercise of any right or remedy shall impair such right or remedy or be construed as a waiver.

6.3. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Easement Area resulting from (i) any natural cause beyond Grantor's control, including, without limitation, fire not caused by Grantor, flood, storm, and earth movement, or any reasonable and prudent action taken by Grantor under emergency conditions to prevent, abate, or mitigate significant injury to the Easement Area resulting from such causes

7. Fence Installation and Maintenance. Grantor shall install fencing in accordance with the Management Plan to protect the Conservation Values of the Easement Area, including but not limited to wildlife corridors.

8. Access. This Conservation Easement does not convey a general right of access to the public or a general right of access to the Property. Grantor or its designees shall install signage at all likely points of entry informing persons of the nature and restrictions on the Easement Area. This Conservation Easement will allow for the Agencies' access to the Easement Area. Such access may be at specific locations if so designated in easements and reservations of rights recorded in the chain of title to the Property at the time of conveyance.

9. Costs and Liabilities. Grantor retains all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep, and maintenance of the Easement Area except as specifically required of the Grantee under the Management Plan. Grantor agrees that neither the Grantee nor the USFWS shall have a duty or responsibility for the operation, upkeep or maintenance of the Easement Area, except as specifically required of the Grantee under the Management Plan, or Property, the monitoring of hazardous conditions thereon, or the protection of Grantor, the public or any third parties from risks relating to conditions on the Easement Area or Property. Grantor and Grantee each remains solely responsible for obtaining any applicable governmental permits and approvals for any activity or use permitted by this Conservation Easement, including those required from the USFWS acting their regulatory capacities, and any activity or use shall be undertaken in accordance with all applicable federal, state, local and administrative agency statutes, ordinances, rules, regulations, orders and requirements.

9.1. Taxes; No Liens. Grantor shall pay before delinquency all taxes, assessments (general and specific), fees, and charges of whatever description levied on or assessed against the Easement Area or Property by competent authority (collectively "Taxes"), including any Taxes imposed upon, or incurred as a result of, this Conservation Easement, and shall furnish Grantee and the USFWS with satisfactory evidence of payment upon request. Grantor and Grantee shall each keep the Easement Area free from any liens (other than a security interest that is expressly subordinate to this Conservation Easement as provided in Section 14(k) and(l)), including those arising out of any obligations incurred by Grantor for any labor or materials furnished or alleged to have been furnished to or for Grantor at or for use on the Easement Area or Property.

9.2. Hold Harmless. Grantor shall hold harmless, protect, and indemnify Grantee and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each a "Grantee Indemnified Party" and, collectively, "Grantee's Indemnified Parties") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation, reasonable attorneys' fees and experts' fees), causes of action, claims, demands, orders, liens or judgments (each a "Claim" and, collectively, "Claims"), arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the Property, regardless of cause, except that this indemnification shall be inapplicable to Grantee's Indemnified Parties with respect to any Claim due solely to the negligence or willful misconduct of Grantee's Indemnified Parties; (2) the obligations specified in Sections 5, 10, and 10.1 and (3) the existence or administration of this Conservation Easement.

Grantor shall hold harmless, protect, and indemnify the USFWS, and their directors, officers, employees, agents, contractors and representatives, and the heirs, personal representatives, successors and assigns of each of them (each a "USFWS Indemnified Party" and, collectively, "USFWS Indemnified Parties") from and against any and all Claims arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the Property, regardless of cause; and (2) the existence or administration of this Conservation Easement. Provided, however, that this indemnification shall be inapplicable to a USFWS Indemnified Party with respect to any Claim due solely to the negligence or willful misconduct of that USFWS Indemnified Party. If any action or proceeding is brought against any of either USFWS Indemnified Parties by reason of any Claim to which the indemnification in this Section 10.22 applies, then Grantor shall, at the election of and upon written notice from the USFWS Indemnified Party, defend such action or proceeding by counsel

reasonably acceptable to the USFW Indemnified Party or reimburse the USFWS Indemnified Party for all charges incurred for services of the U.S. Department of Justice in defending the action or proceeding.

9.3. Extinguishment. If circumstances arise in the future that render the purposes of this Conservation Easement impossible to accomplish, this Conservation Easement can only be terminated or extinguished, in whole or in part, by judicial proceedings in a court of competent jurisdiction. Grantor shall provide written notice to Grantee and the USFWS at least forty-five (45) days prior to taking any action to extinguish this Conservation Easement and prior to extinguishment shall provide a conservation easement at an alternative site to Grantee, or another entity or organization authorized to acquire and hold conservation easements under California Civil Code section 815.3 (or any successor provision then applicable) or the laws of the United States, that has been approved in writing by the USFWS, or shall provide alternative mitigation acceptable to the USFWS and determined in writing by the USFWS to be adequate to mitigate for the impacts to the species covered under the Permit. No such extinguishment shall affect the value of Grantee's interest in the Easement Area, and if the Easement Area, or any interest therein, is sold, exchanged, or taken after such extinguishment, Grantee shall be entitled to receive its pro-rata share of the proceeds of such sale, exchange or taking. The amount of the compensation to which Grantee shall be entitled from any sale, exchange, or taking of all or any portion of the Property subsequent to such extinguishment shall be based on the respective fair market values of the interests of Grantee and Grantor extinguished as determined in the judicial extinguishment proceedings, and Grantee shall use any proceeds received in a manner determined in writing by the USFWS to be consistent with the purposes of this Conservation Easement and Grantor's mitigation obligations under the Permit

9.4. Condemnation. This Conservation Easement is a "conservation easement" as defined in California Code of Civil Procedure section 1240.055(a)(1) and constitutes "property appropriated to public use" as defined in California Code of Civil Procedure section 1240.055(a)(3). USFWS is a public entity that imposed conditions upon issuance of the Permit that were satisfied, in whole or in part, by the creation of this Conservation Easement, as described in California Code of Civil Procedure section 1240.055(a)(3). A person authorized to acquire property for public use by eminent domain shall seek to acquire the Easement Area, if at all, *only* as provided in California Code of Civil Procedure section 1240.055. The purposes of this Conservation Easement are presumed to be the best and most necessary public use as defined at California Code of Civil Procedure section 1240.680, notwithstanding California Code of Civil Procedure sections 1240.690 and 1240.700. If any person seeks to acquire the Easement Area for public use, Grantee shall immediately provide written notice to the USFWS and comply with all obligations of the holder of a conservation easement under California Code of Civil Procedure section 1240.055. Grantee shall use any proceeds received from condemnation of the Property in a manner determined by the USFWS in writing to be consistent with the purposes of this Conservation Easement and Grantor's mitigation obligations under the Permit. If the Conservation Easement is condemned, the net proceeds from the condemnation shall also be used in compliance with California Government Code section 65966(j).

10. Transfer of Easement. This Conservation Easement may only be assigned or transferred by Grantee with the prior written approval of the USFWS. Grantee may assign this Conservation Easement only to an entity or organization approved in advance in writing by Grantor and the USFWS that is authorized to acquire and hold conservation easements pursuant to California Civil Code section 815.3 ***and*** California Government Code section 65967 (and any successor or other provisions then applicable) or the laws of the United States. Grantee shall require the transferee to record the assignment in the county where the Property is located. The failure of Grantee to perform any act

provided in this Section 19 shall not impair the validity of this Conservation Easement or limit its enforcement in any way.

11. Transfer of Property. Grantor agrees to incorporate the terms of this Conservation Easement by reference in any deed or other legal instrument by which Grantor divests itself of any interest in all or any portion of the Easement Area, including, without limitation, a leasehold interest. Grantor agrees that the deed or other legal instrument shall also incorporate by reference applicable provisions of the Permit, and any amendments thereto, and the Management Plan and any amendment(s) to that document. Grantor agrees to give written notice to Grantee and the USFWS of the intent to transfer any interest at least thirty (60) days prior to the date of such transfer. Grantee or the USFWS shall have the right to prevent subsequent transfers in which prospective subsequent claimants or transferees are not given notice of the covenants, terms, conditions, and restrictions of this Conservation Easement, including the documents incorporated by reference in it. The failure of Grantor, Grantee, or the USFWS to perform any act provided in this section shall not impair the validity of this Conservation Easement or limit its enforceability in any way.

12. No Merger. The doctrine of merger is not intended, and shall not operate to extinguish this Conservation Easement if the Conservation Easement and the Easement Area become vested in the same party. If, despite this intent, the doctrine of merger applies to extinguish the Conservation Easement then, unless Grantor, Grantee, and the USFWS otherwise agree in writing, a replacement conservation easement or restrictive covenant containing the same protections embodied in this Conservation Easement shall promptly be recorded against the Easement Area by Grantee, or its successor in interest, in favor of a third party approved in writing by the USFWS to ensure that the mitigation obligations required under the Permit identified in Recital D, which include conservation of the Easement Area in perpetuity through execution and recordation of a conservation easement or equivalent legal mechanism, and the purposes of California Civil Code section 815, are fulfilled. Until such replacement conservation easement or equivalent legal mechanism is executed and recorded, Grantee or its successor in interest shall continue to protect the Easement Area in accordance with the terms of the original Conservation Easement. Any and all terms and conditions of this Conservation Easement shall be deemed covenants and restrictions upon the Easement Area, which shall run with the land according to California law and otherwise exist in perpetuity.

13. Covenant Running with the Land. This Conservation Easement and covenants contained herein (1) are imposed upon the Easement Area; (2) shall run with and against the same and shall be a charge and burden thereon for the benefit of Grantee, or any successor in interest, and the USFWS; and (3) are perpetual and irrevocable.

14. Notices. Any notice, demand, request, consent, approval, or communication that a party desires or is required to give to the other party shall be in writing with copies to the USFWS, and be served personally or sent by recognized overnight courier that guarantees next-day delivery or by first class mail, postage fully prepaid, addressed as follows:

To Grantor:
County of San Luis Obispo
Planning and Building Department
976 Osos Street
San Luis Obispo, CA 93408

Attn:
Telephone:
email:

With a copy to:

Attn:
Telephone:
email:

To Grantee:

To USFWS:
U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003
Attn: Field Supervisor
Telephone: 805-644-1766

or to such other address as either party shall designate by written notice to the other. Notice shall be deemed effective upon delivery in the case of personal delivery or delivery by overnight courier or, in the case of delivery by first class mail, five (5) days after deposit into the United States mail.

15. Amendment. This Conservation Easement may be amended by Grantor and Grantee only by mutual written agreement and subject to the prior written consent of the USFWS. Any such amendment shall be consistent with the purposes of this Conservation Easement, the requirements of the Permit, and California law governing conservation easements and shall not affect its perpetual duration. Any such amendment shall be recorded in the official records of San Luis Obispo County, State of California, and Grantee shall promptly provide a conformed copy of the recorded amendment to Grantor and the USFWS.

16. General Provisions.

(a) Controlling Law. The interpretation and performance of this Conservation Easement shall be governed by the laws of the State of California, disregarding the conflicts of law principles of such state.

(b) Liberal Construction. Despite any general rule of construction to the contrary, this Conservation Easement shall be liberally construed to affect the purposes of this Conservation Easement and the policy and purpose of Civil Code Section 815, *et seq*. If any provision in this instrument is found to be ambiguous, an interpretation consistent with the purposes of this Conservation Easement that would render the provision valid shall be favored over any interpretation that would render it invalid.

(c) Severability. If a court of competent jurisdiction voids or invalidates on its face any provision of this Conservation Easement, such action shall not affect the remainder of this Conservation Easement. If a court of competent jurisdiction voids or invalidates the application of any provision of this Conservation Easement to a person or circumstance, such action shall not affect the application of the provision to other persons or circumstances.

(d) Entire Agreement. This instrument, including the documents incorporated by reference in it, sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings, or agreements relating to the Conservation Easement. No alteration or variation of this instrument shall be valid or binding unless contained in an amendment in accordance with Section 13.

(e) No Forfeiture. Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.

(f) Successors. The covenants, terms, conditions, and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall constitute a servitude running in perpetuity with the Property.

(g) Termination of Rights and Obligations. A party's rights and obligations under this Conservation Easement terminate upon transfer of the party's interest in the Conservation Easement, Easement Area, or Property, except that liability for acts, omissions or breaches occurring prior to transfer shall survive transfer.

(h) Captions. The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon its construction or interpretation.

(i) Counterparts. The parties may execute this instrument in two or more counterparts, which shall in the aggregate be signed by all parties. Each counterpart shall be deemed an original instrument as against any Party who has signed it. In the event of any disparity between the counterparts produced, the recorded counterpart shall be controlling.

(j) No Hazardous Materials Liability.

(1) Except as disclosed in any Phase 1 report provided to Grantee prior to the recordation of this Conservation Easement, Grantor represents and warrants to Grantee and the that it has no knowledge or notice of any Hazardous Materials (defined below) or underground storage tanks existing, generated, treated, stored, used, released, disposed of, deposited or abandoned in, on, under, or from the Easement Area, or transported to or from or affecting the Easement Area.

(2) Without limiting the obligations of Grantor under Section 10.2 of this Conservation Easement, Grantor hereby releases and agrees to indemnify, protect and hold harmless Grantee's Indemnified Parties and USFWS Indemnified Parties (each as defined in Section 10.2 from and against any and all Claims (as defined in Section 10.2 arising from or connected with any Hazardous Materials or underground storage tanks present, alleged to be present, released in, from, or about, or otherwise associated with the Easement Area at any time, except that this release and indemnification shall be inapplicable to the Grantee's Indemnified Parties or the USFWS Indemnified Parties with respect to any Hazardous Materials placed, disposed, or released by Grantee's Indemnified Parties or the USFWS Indemnified Parties. This release and indemnification includes, without limitation, claims for (a) injury to or death of any person or physical damage to any property; and (b) the violation or alleged violation of, or other failure to comply with, any Environmental Laws (defined below). If any action or proceeding is brought against any the USFWS Indemnified Parties by reason of any such Claim, Grantor shall, at the election of and upon written notice from the USFWS Indemnified Party, defend such action or proceeding by counsel reasonably acceptable to the USFWS Indemnified Party or reimburse the USFWS Indemnified Party for all charges incurred for services of the U.S. Department of Justice in defending the action or proceeding.

(3) Despite any contrary provision of this Conservation Easement, the Parties do not intend this Conservation Easement to be, and this Conservation Easement shall not be, construed such that it creates in or gives to Grantee or the USFWS any of the following:

(A) The obligations or liability of an "owner" or "operator," as those terms are defined and used in Environmental Laws (defined below), including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. section 9601 *et seq*.; hereinafter, "CERCLA"); or

(B) The obligations or liabilities of a person described in 42 U.S.C. section 9607(a)(3) or (4); or

(C) The obligations of a responsible person under any applicable Environmental Laws; or

(D) The right or duty to investigate and remediate any Hazardous Materials associated with the Easement Area; or

(E) Any control over Grantor's ability to investigate, remove, remediate, or otherwise clean up any Hazardous Materials associated with the Easement Area.

(4) The term "Hazardous Materials" includes, without limitation, (a) material that is flammable, explosive or radioactive; (b) petroleum products, including by-products and fractions thereof; and (c) hazardous materials, hazardous wastes, hazardous or toxic substances, or related materials defined in CERCLA, the Resource Conservation and Recovery Act of 1976 (42 U.S.C. section 6901 *et seq*.; hereinafter "RCRA"); the Hazardous Materials Transportation Act (49 U.S.C. section 5101 *et seq*.; hereinafter "HTA"); the Hazardous Waste Control Law (California Health & Safety Code section 25100 *et seq*.; hereinafter "HCL"); the Carpenter-Presley-Tanner Hazardous Substance Account Act (California Health & Safety Code section 25300 *et seq*.; hereinafter "HSA"), and in the regulations adopted and publications promulgated pursuant to them, or any other applicable Environmental Laws now in effect or enacted after the date of this Conservation Easement.

(5) The term "Environmental Laws" includes, without limitation, CERCLA, RCRA, HTA, HCL, HSA, and any other federal, state, local or administrative agency statute, code, ordinance, rule, regulation, order or requirement relating to pollution, protection of human health or

safety, the environment or Hazardous Materials. Grantor represents, warrants, and covenants to Grantee and the USFWS that activities on and use of the Easement Area by Grantor, its agents, employees, invitees, and contractors will comply with all Environmental Laws. Grantee represents, warrants, and covenants to Grantor and the USFWS that activities upon and use of the Easement Area by Grantee, its agents, employees, invitees, and contractors will comply with all Environmental Laws.

(k) Warranty. Grantor represents and warrants that Grantor is the sole owner of fee simple title to the Easement Area; that the Easement Area is not subject to any other conservation easement; and that there are no outstanding mortgages, liens, encumbrances or other interests in the Easement Area (including, without limitation, water and mineral interests) that may conflict or are otherwise inconsistent with this Conservation Easement and which have not been expressly subordinated to this Conservation Easement by a written, recorded Subordination Agreement approved in writing by Grantee and the USFWS.

(l) Additional Easements. Grantor shall not grant any additional easements, rights of way or other interests in the Easement area (other than a security interest that is expressly subordinated to this Conservation Easement), or grant, transfer, abandon, or relinquish (each a "Transfer") any mineral, air, or water right or any water associated with the Easement Area, without first obtaining the written consent of Grantee and the USFWS. Grantee or the USFWS may withhold such consent if it determines that the proposed interest or transfer is inconsistent with the purposes of this Conservation Easement or will impair or interfere with the Conservation Values of the Easement Area. This Section 14(l) shall not limit the provisions of Sections 2(f) and 4(o) nor prohibit transfer of a fee or leasehold interest in the Easement Area that is subject to this Conservation Easement and complies with Section 12.

(m) Recording. Grantee shall record this Conservation Easement in the Official Records of San Luis Obispo County, California, and may re-record it at any time as Grantee deems necessary to preserve its rights in this Conservation Easement.

[Signature Page Follows]

IN WITNESS WHEREOF Grantor and Grantee have executed this Conservation Easement the day and year first above written.

GRANTOR:	GRANTEE:
BY: _____	BY: _____
NAME: _____ _____	NAME: _____
TITLE: _____	TITLE: _____

Approved as to form:

XXX
County of San Luis Obispo

I.2 Conservation Easement Template for an Entire Property

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:

Name and Address of Grantee

With Copies to:
County of San Luis Obispo
Planning and Building Department
976 Osos Street
San Luis Obispo, CA 93408

Attn:

Add FWS address

Space Above Line for Recorder's Use Only

CONSERVATION EASEMENT DEED

THIS CONSERVATION EASEMENT DEED ("Conservation Easement") is made this _____ day of _____, 20____, by the County of San Luis Obispo ("County" or "Grantor"), in favor of the [Name of the Implementing Entity] ("Grantee"), with reference to the following facts:

R E C I T A L S

A. Grantor is the sole owner in fee simple of certain real property containing approximately [insert number] acres of land, located in the County of San Luis Obispo, State of California, designated Assessor's Parcel Number _____ ("Property"). The Property is legally described in Exhibit "A" attached hereto and incorporated herein by this reference.

B. The Property is in an unimproved [OR a predominately unimproved] natural condition and possesses wildlife and habitat values of great importance to Grantee, the United States Fish and Wildlife Service (USFWS), and the people of the United States.

C. The Property provides high quality habitat for [*list plant and/or animal species*] and contains [*list habitats; native and/or non-native, restored, created, enhanced, and/or preserved jurisdictional water of the United States including wetlands*]. Individually and collectively, these wildlife and habitat values comprise the "Conservation Values" of the Property.

D. The Property supports habitat required to be preserved and managed in perpetuity by Federal Endangered Species Act Incidental Take Permit TE -_____("Permit") as mitigation for certain impacts of development and associated infrastructure (collectively "County Projects") located in the County of San Luis Obispo, according to the Los Osos Habitat Conservation Plan ("LOHCP") dated

____, the terms of which are incorporated by reference into this Conservation Easement. Grantor, Grantee, and USFWS each has a copy of the LOHCP and Permit.

E. Grantee is the entity selected by the County to implement certain terms and conditions of the LOHCP and MOU. Grantee is authorized to hold this conservation easement pursuant to California Civil Code Section 815.3 and Government Code Section 65967. Specifically, Grantee is a tax-exempt nonprofit organization qualified under section 501(c)(3) of the Internal Revenue Code of 1986, as amended, and qualified to do business in California which has as its primary purpose the preservation, protection or enhancement of land in its natural, scenic, forested, or open space condition or use.

F. The United States Fish and Wildlife Service ("USFWS"), an agency within the United States Department of the Interior, has jurisdiction over the conservation, protection, restoration and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of these species within the United States pursuant to the Endangered Species Act, 16 U.S.C. 1531, *et seq.*, the Fish and Wildlife Coordination Act, 16 U.S.C. §§661-66c, the Fish and Wildlife Act of 1956, 16 U.S.C. §724(f), *et seq.*, and other provisions of federal law.

G. USFWS approved the Final LOHCP Preserve System Adaptive Management and Monitoring Plan ("Management Plan") for the Property, which provides the conservation requirements for and authorized activities on the Property. The Management Plan is incorporated by this reference into this Conservation Easement as if fully set forth herein. A final, approved copy of the Management Plan, and any amendments thereto approved USFWS, along with additional specific requirements or modifications applicable to the Property, if any, approved in the future by the USFWS will be kept on file at the addresses listed in Paragraph 12. If the Grantor, or any successors or assigns, require an official copy of the Management Plan, they may request a copy of the current Management Plan from the USFWS at the addresses listed in Paragraph 12.

COVENANTS, TERMS, CONDITIONS AND RESTRICTIONS

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and pursuant to California law, including Civil Code Section 815, *et seq*., Grantor hereby voluntarily grants and conveys to Grantee a conservation easement in perpetuity over the Property under the terms and conditions set forth herein.

1. Purposes. The purposes of this Conservation Easement are to ensure the Property will be retained forever in its natural, restored or enhanced condition consistent with the habitat protection requirements of the LOHCP and Permit and to prevent any use of the Property that will impair or interfere with the Conservation Values of the Property. Grantor intends that this Conservation Easement will confine the use of the Property to such activities that are consistent with those purposes, including, without limitation, those involving the preservation, restoration and enhancement of native species and their habitats. Grantor represents and warrants that there are no structures or improvements existing on the Property at the time this Conservation Easement is executed, except for any structures or improvements identified in the survey attached as Exhibit "C" and incorporated herein by this reference. Grantor further represents and warrants that to Grantor's knowledge there are no other previously granted easements existing on the Property that interfere or conflict with the purposes of this Conservation Easement as evidenced by the title report attached at Exhibit "D" and incorporated herein by this reference.

2. Grantee's Rights. To accomplish the purposes of this Conservation Easement, Grantor hereby grants and conveys the following rights to Grantee:

(a) For the purpose of restoring, enhancing or improving the health of the natural resources and habitats located on the Property, the right to enter the Property, along with Grantee's agents and contractors at reasonable times and upon not less than ten (10) days' prior notice, in order to and carry out management and restoration activities or to monitor the effects of the restoration activities, all in accordance with the Management Plan. Grantee's habitat management and restoration activities shall not unreasonably limit or interfere with Grantor's access to and use of the Property and shall be at Grantee's sole cost and expense and Grantor shall not be responsible for upkeep and maintenance of Grantee's restoration projects.

(b) To enter the Property, along with Grantee's agents and contractors, at reasonable times and upon not less than ten days' notice to conduct surveys of the covered species, to monitor the natural communities, or to evaluate the condition of other natural resources. Grantee's scientific research and monitoring activities shall not unreasonably limit or interfere with Grantor's use of the Property and shall be at Grantee's sole cost and expense;

(c) To preserve and protect the Conservation Values of the Property;

(d) To enter upon the Property at reasonable times in order to monitor compliance with and otherwise enforce the terms of this Conservation Easement, and for scientific research and interpretive purposes by Grantee or its designees, provided that Grantee shall not unreasonably interfere with Grantor's authorized use and quiet enjoyment of the Property;

(e) To prevent any activity on or use of the Property that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features of the Property that may be damaged by any act, failure to act, or any use that is inconsistent with the purposes of this Conservation Easement;

(f) To require that all mineral, air and water rights as Grantee deems necessary to preserve, protect, and to sustain the biological resources and the Conservation Values of the Property shall be put to beneficial use upon the Property, consistent with the purposes of this Conservation Easement; and

(g) All present and future development rights appurtenant to, allocated, implied, reserved, or inherent in the Property are hereby terminated and extinguished, and may not be used on or transferred to any portion of the Property, nor any other property adjacent or otherwise.

3. Prohibited Uses. Any activity on or use of the Property inconsistent with the purposes of this Conservation Easement is prohibited. Without limiting the generality of the foregoing, the following uses and activities by Grantor, Grantor's agents, and third parties, are expressly prohibited:

(a) Unseasonal watering; use of fertilizers, pesticides, biocides, herbicides or other agricultural chemicals; weed abatement activities; incompatible fire protection activities; and any and all other activities and uses which may adversely affect the purposes of this Conservation Easement, except as otherwise specifically provided in the Management Plan;

(b) Use of off-road vehicles and use of any other motorized vehicles except on existing roadways other than as otherwise specifically provided in the Management Plan;

(c) Agricultural activity of any kind, except that grazing is permitted if done in accordance with the Management Plan or other grazing or management plan approved by Grantee and USFWS;

(d) Recreational activities including, but not limited to, horseback riding, biking, hunting, or fishing, except as otherwise specifically provided in the Management Plan;

(e) Commercial or industrial uses;

(f) Any legal or de facto division, subdivision or partitioning of the Property, including a request for a certificate of compliance pursuant to the Subdivision Map Act (California Government Code section 66499.35);

(g) Construction, reconstruction or placement of any building, billboard or sign, or any other structure or improvement of any kind, except as otherwise specifically provided in the Management Plan;

(h) Deposit or accumulation of soil, trash, ashes, refuse, waste, bio-solids, or any other materials;

(i) Planting, introduction, or dispersal of non-native or exotic plant or animal species;

(j) Filling, dumping, excavating, draining, dredging, mining, drilling, removing, or exploring for or extraction of minerals, loam, soil, sands, gravel, rocks or other material on or below the surface of the Property, except as otherwise specifically provided in the Management Plan;

(k) Altering the surface or general topography of the Property, including building of roads, except as otherwise specifically provided in the Management Plan;

(l) Removing, destroying, or cutting of trees, shrubs or other vegetation, except as required by law and in conformance with the Management Plan approved by Grantee and USFWS for (1) fire breaks, (2) maintenance of existing foot trails or roads that are otherwise permitted under this Conservation Easement, (3) prevention or treatment of disease; or (4) utility line clearance for existing utilities;

(m) Manipulating, impounding or altering any natural water course, body of water or water circulation on the Property, except as otherwise specifically provided in the Management Plan, and activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters; and

(n) Landscaping and hardscaping.

(o) Without the prior written consent of Grantee and USFWS, which Grantee and USFWS may withhold for any reason, transferring, encumbering, selling, leasing, or otherwise separating the mineral, air, or water rights for the Easement area; changing the place or purpose of use of the

water rights; abandoning or allowing the abandonment of, by action or inaction, any water or water rights, ditch or ditch rights, spring rights, reservoir or storage rights, wells, ground water rights, or other rights in and to the use of water historically used on or otherwise appurtenant to the Property, including but not limited to: (1) riparian water rights; (2) appropriative water rights; (3) rights to waters which are secured under contract with any irrigation or water district, to the extent such waters are customarily applied to the Property; and (4) any water from wells that are in existence or may be constructed in the future on the Property; and

(p) Any activity or use that may violate or fail to comply with relevant federal, state, or local laws, regulations, or policies applicable to Grantor, the Property, or the activity or use in question.

4. Grantor's Duties. Grantor shall undertake all reasonable actions to prevent unlawful entry and trespass by persons whose activities may degrade or harm the Conservation Values of the Property or that are otherwise inconsistent with this Conservation Easement, including but not limited to posting signs prohibiting such unlawful entry and trespass. In addition, Grantor shall undertake all necessary actions to perfect the right of Grantee under Section 2 of this Conservation Easement, including but not limited to, Grantee's water rights, and all necessary actions to fulfill its responsibilities as identified in the USFWS Permit.

5. Reserved Rights. Grantor reserves to itself, and to its personal representatives, heirs, successors, and assigns, all rights accruing from its ownership of the Property, including the right to engage in or to permit or invite others to engage in all uses of the Property that are not expressly prohibited or limited by, and are consistent with the purposes of, this Conservation Easement. Notwithstanding anything set forth herein, in the event of any third-party claim against Grantor arising from the actions of Grantee or any of its employees, agents, contractors or representatives with respect to the Property, Grantor reserves any rights that Grantor may have at law or in equity to seek contribution or reimbursement from Grantee for such third-party claim.

6. Grantee's Remedies. If Grantee determines that a violation of the terms of this Conservation Easement has occurred or is threatened, Grantee shall give written notice to Grantor of such violation and demand in writing the cure of such violation. At the time of giving any such notice, Grantee shall give a copy of the notice to USFWS. If Grantor fails to cure the violation within fifteen (15) days after receipt of written notice and demand from Grantee, or if the cure reasonably requires more than fifteen (15) days to complete and Grantor fails to begin the cure within the fifteen (15)-day period or fails to continue diligently to complete the cure, Grantee may bring an action at law or in equity in a court of competent jurisdiction to enforce the terms of this Conservation Easement, to recover any damages to which Grantee may be entitled for violation of the terms of this Conservation Easement or for any injury to the Conservation Values of the Property, to enjoin the violation, *ex parte* as necessary, by temporary or permanent injunction without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies, or for other equitable relief, including, but not limited to, the restoration of the Property to the condition in which it existed prior to any such violation or injury. Without limiting Grantor's liability therefor, Grantee may apply any damages recovered to the cost of undertaking any corrective action on the Property.

If Grantee, in its sole discretion, determines that circumstances require immediate action to prevent or mitigate damage to the Conservation Values of the Property, Grantee may pursue its remedies under this Section 6 without waiting for the period provided for cure to expire, provided, however, that (a) Grantee shall use reasonable efforts to give Grantor notice thereof, which notice may

be by email or telephone, and (b) Grantor shall have the right to have a representative present while Grantee is present on the Property. Grantee's rights under this section apply equally to actual or threatened violations of the terms of this Conservation Easement. Grantor agrees that Grantee's remedies at law for any violation of the terms of this Conservation Easement are inadequate and that Grantee shall be entitled to the injunctive relief described in this section, both prohibitive and mandatory, in addition to such other relief to which Grantee may be entitled, including specific performance of the terms of this Conservation Easement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. Grantee's remedies described in this section shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity, including but not limited to, the remedies set forth in Civil Code Section 815, *et seq.*, inclusive. The failure of Grantee to discover a violation or to take immediate legal action shall not bar Grantee from taking such action at a later time.

If at any time in the future Grantor or any subsequent transferee uses or threatens to use the Property for purposes inconsistent with this Conservation Easement then, notwithstanding Civil Code Section 815.7, the California Attorney General or any entity or individual with a justiciable interest in the preservation of this Conservation Easement has standing as interested parties in any proceeding affecting this Conservation Easement.

6.1. Costs of Enforcement. Any costs incurred by Grantee, where Grantee is the prevailing party, in enforcing the terms of this Conservation Easement against Grantor, including, but not limited to, costs of suit and attorneys' and experts' fees, and any costs of restoration necessitated by Grantor's negligence or breach of this Conservation Easement shall be borne by Grantor.

6.2. Discretion of Grantee. Enforcement of the terms of this Conservation Easement by Grantee shall be at the discretion of the enforcing party, and any forbearance by Grantee to exercise their rights under this Conservation Easement in the event of any breach of any term of this Conservation Easement shall not be deemed or construed to be a waiver by Grantee of such term or of any subsequent breach of the same or any other term of this Conservation Easement or of any of Grantee's rights under this Conservation Easement. No delay or omission by Grantee or USFWS in the exercise of any right or remedy shall impair such right or remedy or be construed as a waiver.

6.3. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Property resulting from (i) any natural cause beyond Grantor's control, including, without limitation, fire not caused by Grantor, flood, storm, and earth movement, or any reasonable and prudent action taken by Grantor under emergency conditions to prevent, abate, or mitigate significant injury to the Property resulting from such causes

7. Fence Installation and Maintenance. Grantor shall install fencing in accordance with the Management Plan to protect the Conservation Values of the Property, including but not limited to wildlife corridors.

8. Access. This Conservation Easement does not convey a general right of access to the public or a general right of access to the Property. Grantor or its designees shall install signage at all likely points of entry informing persons of the nature and restrictions on the Property. This Conservation Easement will allow for the USFWS access to the Property. Such access may be at specific locations if so

designated in easements and reservations of rights recorded in the chain of title to the Property at the time of conveyance.

9. Costs and Liabilities. Grantor retains all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep, and maintenance of the Property except as specifically required of the Grantee under the Management Plan. Grantor agrees that neither the Grantee nor USFWS shall have a duty or responsibility for the operation, upkeep or maintenance of the Property, except as specifically required of the Grantee under the Management Plan, or Property, the monitoring of hazardous conditions thereon, or the protection of Grantor, the public or any third parties from risks relating to conditions on the Property or Property. Grantor and Grantee each remains solely responsible for obtaining any applicable governmental permits and approvals for any activity or use permitted by this Conservation Easement, including those required from the USFWS acting its regulatory capacity, and any activity or use shall be undertaken in accordance with all applicable federal, state, local and administrative agency statutes, ordinances, rules, regulations, orders and requirements.

9.1. Taxes; No Liens. Grantor shall pay before delinquency all taxes, assessments (general and specific), fees, and charges of whatever description levied on or assessed against the Property or Property by competent authority (collectively "Taxes"), including any Taxes imposed upon, or incurred as a result of, this Conservation Easement, and shall furnish Grantee and USFWS with satisfactory evidence of payment upon request. Grantor and Grantee shall each keep the Property free from any liens (other than a security interest that is expressly subordinate to this Conservation Easement as provided in Section 17(k) and (l)), including those arising out of any obligations incurred by Grantor for any labor or materials furnished or alleged to have been furnished to or for Grantor at or for use on the Property or Property.

9.2. Hold Harmless. Grantor shall hold harmless, protect, and indemnify Grantee and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each a "Grantee Indemnified Party" and, collectively, "Grantee's Indemnified Parties") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation, reasonable attorneys' fees and experts' fees), causes of action, claims, demands, orders, liens or judgments (each a "Claim" and, collectively, "Claims"), arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the Property, regardless of cause, except that this indemnification shall be inapplicable to Grantee's Indemnified Parties with respect to any Claim due solely to the negligence or willful misconduct of Grantee's Indemnified Parties; (2) the obligations specified in Sections 5, 10, and 10.1**;** and (3) the existence or administration of this Conservation Easement.

Grantor shall hold harmless, protect, and indemnify the USFWS, and their directors, officers, employees, agents, contractors and representatives, and the heirs, personal representatives, successors and assigns of each of them (each a "USFWS Indemnified Party" and, collectively, "USFWS Indemnified Parties") from and against any and all Claims arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the Property, regardless of cause; and (2) the existence or administration of this Conservation Easement. Provided, however, that this indemnification shall be inapplicable to a USFWS Indemnified Party with respect to any Claim due solely to the negligence or willful misconduct of that USFWS-Indemnified Party. If any action or proceeding is brought against any USFWS Indemnified Parties by reason of any Claim to which

the indemnification in this Section 10,2 applies, then Grantor shall, at the election of and upon written notice from the USFWS Indemnified Party, defend such action or proceeding by counsel reasonably acceptable to the USFWS Indemnified Party or reimburse the USFWS Indemnified Party for all charges incurred for services of the U.S. Department of Justice in defending the action or proceeding

9.3. Extinguishment. If circumstances arise in the future that render the purposes of this Conservation Easement impossible to accomplish, this Conservation Easement can only be terminated or extinguished, in whole or in part, by judicial proceedings in a court of competent jurisdiction. Grantor shall provide written notice to Grantee and USFWS at least forty-five (45) days prior to taking any action to extinguish this Conservation Easement and prior to extinguishment shall provide a conservation easement at an alternative site to Grantee, or another entity or organization authorized to acquire and hold conservation easements under California Civil Code section 815.3 (or any successor provision then applicable) or the laws of the United States, that has been approved in writing by the USFWS, or shall provide alternative mitigation acceptable to the USFWS and determined in writing by USFWS to be adequate to mitigate for the impacts to the species covered under the Permit. No such extinguishment shall affect the value of Grantee's interest in the Property, and if the Property, or any interest therein, is sold, exchanged, or taken after such extinguishment, Grantee shall be entitled to receive its pro-rata share of the proceeds of such sale, exchange or taking. The amount of the compensation to which Grantee shall be entitled from any sale, exchange, or taking of all or any portion of the Property subsequent to such extinguishment shall be based on the respective fair market values of the interests of Grantee and Grantor extinguished as determined in the judicial extinguishment proceedings, and Grantee shall use any proceeds received in a manner determined in writing by USFWS to be consistent with the purposes of this Conservation Easement and Grantor's mitigation obligations under the Permit.

9.4. Condemnation. This Conservation Easement is a "conservation easement" as defined in California Code of Civil Procedure section 1240.055(a)(1) and constitutes "property appropriated to public use" as defined in California Code of Civil Procedure section 1240.055(a)(3). USFWS is a public entity that imposed conditions upon issuance of the Permit that were satisfied, in whole or in part, by the creation of this Conservation Easement, as described in California Code of Civil Procedure section 1240.055(a)(3). A person authorized to acquire property for public use by eminent domain shall seek to acquire the Property, if at all, *only* as provided in California Code of Civil Procedure section 1240.055. The purposes of this Conservation Easement are presumed to be the best and most necessary public use as defined at California Code of Civil Procedure section 1240.680, notwithstanding California Code of Civil Procedure sections 1240.690 and 1240.700. If any person seeks to acquire the Property for public use, Grantee shall immediately provide written notice to USFWS and comply with all obligations of the holder of a conservation easement under California Code of Civil Procedure section 1240.055. Grantee shall use any proceeds received from condemnation of the Property in a manner determined by USFWS in writing to be consistent with the purposes of this Conservation Easement and Grantor's mitigation obligations under the Permit. If the Conservation Easement is condemned, the net proceeds from the condemnation shall also be used in compliance with California Government Code section 65966(j).

10. Transfer of Easement. This Conservation Easement may only be assigned or transferred by Grantee with the prior written approval of USFWS. Grantee may assign this Conservation Easement only to an entity or organization approved in advance in writing by Grantor and USFWS that is authorized to acquire and hold conservation easements pursuant to California Civil Code section 815.3 ***and*** California Government Code section 65967 (and any successor or other provisions then applicable)

or the laws of the United States. Grantee shall require the transferee to record the assignment in the county where the Property is located. The failure of Grantee to perform any act provided in this Section 11 shall not impair the validity of this Conservation Easement or limit its enforcement in any way.

11. Transfer of Property. Grantor agrees to incorporate the terms of this Conservation Easement by reference in any deed or other legal instrument by which Grantor divests itself of any interest in all or any portion of the Property, including, without limitation, a leasehold interest. Grantor agrees that the deed or other legal instrument shall also incorporate by reference applicable provisions of the Permit, and any amendments thereto, and the Management Plan and any amendment(s) to that document. Grantor agrees to give written notice to Grantee and USFWS of the intent to transfer any interest at least thirty (60) days prior to the date of such transfer. Grantee or USFWS shall have the right to prevent subsequent transfers in which prospective subsequent claimants or transferees are not given notice of the covenants, terms, conditions, and restrictions of this Conservation Easement, including the documents incorporated by reference in it. The failure of Grantor, Grantee, or USFWS to perform any act provided in this section shall not impair the validity of this Conservation Easement or limit its enforceability in any way.

12. No Merger. The doctrine of merger is not intended, and shall not operate to extinguish this Conservation Easement if the Conservation Easement and the Property become vested in the same party. If, despite this intent, the doctrine of merger applies to extinguish the Conservation Easement then, unless Grantor, Grantee, and USFWS otherwise agree in writing, a replacement conservation easement or restrictive covenant containing the same protections embodied in this Conservation Easement shall promptly be recorded against the Property by Grantee, or its successor in interest, in favor of a third party approved in writing by USFWS to ensure that the mitigation obligations required under the Permit identified in Recital D, which include conservation of the Property in perpetuity through execution and recordation of a conservation easement or equivalent legal mechanism, and the purposes of California Civil Code section 815, are fulfilled. Until such replacement conservation easement or equivalent legal mechanism is executed and recorded, Grantee or its successor in interest shall continue to protect the Property in accordance with the terms of the original Conservation Easement. Any and all terms and conditions of this Conservation Easement shall be deemed covenants and restrictions upon the Property, which shall run with the land according to California law and otherwise exist in perpetuity.

13. Covenant Running with the Land. This Conservation Easement and covenants contained herein (1) are imposed upon the Property; (2) shall run with and against the same and shall be a charge and burden thereon for the benefit of Grantee, or any successor in interest, and the USFWS; and (3) are perpetual and irrevocable.

14. Notices. Any notice, demand, request, consent, approval, or communication that a party desires or is required to give to the other party shall be in writing with copies to USFWS, and be served personally or sent by recognized overnight courier that guarantees next-day delivery or by first class mail, postage fully prepaid, addressed as follows:

To Grantor:	County of San Luis Obispo Planning and Building Department 976 Osos Street San Luis Obispo, CA 93408 Attn: Telephone: email:
With a copy to:	 Attn: Telephone: email:
To Grantee:	
To USFWS:	U.S. Fish and Wildlife Service Ventura Fish and Wildlife Office 2493 Portola Road, Suite B Ventura, CA 93003 Attn: Field Supervisor Telephone: 805-644-1766

or to such other address as either party shall designate by written notice to the other. Notice shall be deemed effective upon delivery in the case of personal delivery or delivery by overnight courier or, in the case of delivery by first class mail, five (5) days after deposit into the United States mail.

15. Amendment. This Conservation Easement may be amended by Grantor and Grantee only by mutual written agreement and subject to the prior written consent of USFWS. Any such amendment shall be consistent with the purposes of this Conservation Easement, the requirements of the Permit, and California law governing conservation easements and shall not affect its perpetual duration. Any such amendment shall be recorded in the official records of San Luis Obispo County, State of California, and Grantee shall promptly provide a conformed copy of the recorded amendment to Grantor and USFWS.

16. General Provisions.

(a) Controlling Law. The interpretation and performance of this Conservation Easement shall be governed by the laws of the State of California, disregarding the conflicts of law principles of such state.

(b) Liberal Construction. Despite any general rule of construction to the contrary, this Conservation Easement shall be liberally construed to affect the purposes of this Conservation Easement and the policy and purpose of Civil Code Section 815, *et seq*. If any provision in this instrument is found to be ambiguous, an interpretation consistent with the purposes of this Conservation Easement that would render the provision valid shall be favored over any interpretation that would render it invalid.

(c) Severability. If a court of competent jurisdiction voids or invalidates on its face any provision of this Conservation Easement, such action shall not affect the remainder of this Conservation Easement. If a court of competent jurisdiction voids or invalidates the application of any provision of this Conservation Easement to a person or circumstance, such action shall not affect the application of the provision to other persons or circumstances.

(d) Entire Agreement. This instrument, including the documents incorporated by reference in it, sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings, or agreements relating to the Conservation Easement. No alteration or variation of this instrument shall be valid or binding unless contained in an amendment in accordance with Section 13.

(e) No Forfeiture. Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.

(f) Successors. The covenants, terms, conditions, and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall constitute a servitude running in perpetuity with the Property.

(g) Termination of Rights and Obligations. A party's rights and obligations under this Conservation Easement terminate upon transfer of the party's interest in the Conservation Easement, Property, or Property, except that liability for acts, omissions or breaches occurring prior to transfer shall survive transfer.

(h) Captions. The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon its construction or interpretation.

(i) Counterparts. The parties may execute this instrument in two or more counterparts, which shall in the aggregate be signed by all parties. Each counterpart shall be deemed an original instrument as against any Party who has signed it. In the event of any disparity between the counterparts produced, the recorded counterpart shall be controlling.

(j) No Hazardous Materials Liability.

(1) Except as disclosed in any Phase 1 report provided to Grantee prior to the recordation of this Conservation Easement, Grantor represents and warrants to Grantee and USFWS that it has no knowledge or notice of any Hazardous Materials (defined below) or underground storage tanks existing, generated, treated, stored, used, released, disposed of, deposited or abandoned in, on, under, or from the Property, or transported to or from or affecting the Property.

(2) Without limiting the obligations of Grantor under Section 10.2 of this Conservation Easement, Grantor hereby releases and agrees to indemnify, protect and hold harmless Grantee's Indemnified Parties and USFWS Indemnified Parties (each as defined in Section 10.2 from and against any and all Claims (as defined in Section 10.2 arising from or connected with any Hazardous Materials or underground storage tanks present, alleged to be present, released in, from, or about, or otherwise associated with the Property at any time, except that this release and indemnification shall be inapplicable to the Grantee's Indemnified Parties or the USFWS Indemnified Parties with respect to any Hazardous Materials placed, disposed, or released by Grantee's Indemnified Parties or USFWS Indemnified Parties. This release and indemnification includes, without limitation, Claims for (a) injury to or death of any person or physical damage to any property; and (b) the violation or alleged violation of, or other failure to comply with, any Environmental Laws (defined below). If any action or proceeding is brought against any the USFWS Indemnified Parties by reason of any such Claim, Grantor shall, at the election of and upon written notice from the USFWS Indemnified Party, defend such action or proceeding by counsel reasonably acceptable to the USFWS Indemnified Party or reimburse the USFWS Indemnified Party for all charges incurred for services of the U.S. Department of Justice in defending the action or proceeding.

(3) Despite any contrary provision of this Conservation Easement, the Parties do not intend this Conservation Easement to be, and this Conservation Easement shall not be, construed such that it creates in or gives to Grantee or USFWS any of the following:

(A) The obligations or liability of an "owner" or "operator," as those terms are defined and used in Environmental Laws (defined below), including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. section 9601 *et seq*.; hereinafter, "CERCLA"); or

(B) The obligations or liabilities of a person described in 42 U.S.C. section 9607(a)(3) or (4); or

(C) The obligations of a responsible person under any applicable Environmental Laws; or

(D) The right or duty to investigate and remediate any Hazardous Materials associated with the Property; or

(E) Any control over Grantor's ability to investigate, remove, remediate, or otherwise clean up any Hazardous Materials associated with the Property.

(4) The term "Hazardous Materials" includes, without limitation, (a) material that is flammable, explosive or radioactive; (b) petroleum products, including by-products and fractions thereof; and (c) hazardous materials, hazardous wastes, hazardous or toxic substances, or related materials defined in CERCLA, the Resource Conservation and Recovery Act of 1976 (42 U.S.C. section 6901 *et seq*.; hereinafter "RCRA"); the Hazardous Materials Transportation Act (49 U.S.C. section 5101 *et seq*.; hereinafter "HTA"); the Hazardous Waste Control Law (California Health & Safety Code section 25100 *et seq*.; hereinafter "HCL"); the Carpenter-Presley-Tanner Hazardous Substance Account Act (California Health & Safety Code section 25300 *et seq*.; hereinafter "HSA"), and in the regulations adopted and publications promulgated pursuant to them, or any other applicable Environmental Laws now in effect or enacted after the date of this Conservation Easement.

(5) The term "Environmental Laws" includes, without limitation, CERCLA, RCRA, HTA, HCL, HSA, and any other federal, state, local or administrative agency statute, code, ordinance, rule, regulation, order or requirement relating to pollution, protection of human health or

safety, the environment or Hazardous Materials. Grantor represents, warrants, and covenants to Grantee and USFWS that activities on and use of the Property by Grantor, its agents, employees, invitees, and contractors will comply with all Environmental Laws. Grantee represents, warrants, and covenants to Grantor and USFWS that activities upon and use of the Property by Grantee, its agents, employees, invitees, and contractors will comply with all Environmental Laws.

(k) Warranty. Grantor represents and warrants that Grantor is the sole owner of fee simple title to the Property; that the Property is not subject to any other conservation easement; and that there are no outstanding mortgages, liens, encumbrances or other interests in the Property (including, without limitation, water and mineral interests) that may conflict or are otherwise inconsistent with this Conservation Easement and which have not been expressly subordinated to this Conservation Easement by a written, recorded Subordination Agreement approved in writing by Grantee and USFWS.

(l) Additional Easements. Grantor shall not grant any additional easements, rights of way or other interests in the Property (other than a security interest that is expressly subordinated to this Conservation Easement), or grant, transfer, abandon, or relinquish (each a "Transfer") any mineral, air, or water right or any water associated with the Property, without first obtaining the written consent of Grantee and USFWS. Grantee or USFWS may withhold such consent if it determines that the proposed interest or transfer is inconsistent with the purposes of this Conservation Easement or will impair or interfere with the Conservation Values of the Property. This Section 14(l) shall not limit the provisions of Sections 2(f) and 4(o) nor prohibit transfer of a fee or leasehold interest in the Property that is subject to this Conservation Easement and complies with Section 12.

(m) Recording. Grantee shall record this Conservation Easement in the Official Records of San Luis Obispo County, California, and may re-record it at any time as Grantee deems necessary to preserve its rights in this Conservation Easement.

[Signature Page Follows]

IN WITNESS WHEREOF Grantor and Grantee have executed this Conservation Easement the day and year first above written.

GRANTOR:	GRANTEE:
BY: _____	BY: _____
NAME: _____ _____	NAME: _____
TITLE: _____	TITLE: _____

Approved as to form:

XXX
County of San Luis Obispo

STATE OF CALIFORNIA
COUNTY OF SAN LUIS OBISPO

On _____, before me, the undersigned, a Notary Public in and for said State, personally appeared _____ and _____, personally known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same in their authorized capacities and that by their signature on the instrument the persons, or the entity upon behalf of which the persons acted, executed the instrument.

Witness my hand and official seal.

Notary Public in and for
said County and State

STATE OF CALIFORNIA

COUNTY OF SAN LUIS OBISPO

On _____, before me, the undersigned, a Notary Public in and for said State, personally appeared _____ and _____, personally known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same in their authorized capacities and that by their signature on the instrument the persons, or the entity upon behalf of which the persons acted, executed the instrument.

Witness my hand and official seal.

Notary Public in and for
said County and State

Appendix J Memorandum of Understanding

This appendix contains the Memorandum of Understanding (MOU) signed by the County of San Luis Obispo (County) and the California Department of Fish and Wildlife (CDFW) which sets forth the terms by which the County may access and undertake certain habitat enhancement, restoration, monitoring, and management activities within the Morro Dunes Ecological Reserve.

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15 December 2020

MEMORANDUM OF UNDERSTANDING BETWEEN THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE AND THE COUNTY OF SAN LUIS OBISPO

This Memorandum of Understanding (MOU) is entered into by and between the California Department of Fish and Wildlife (Department) and the County of San Luis Obispo (County) and sets forth the terms by which the County may access and undertake certain habitat enhancement, restoration, monitoring, and management activities (Mitigation) actions within the Morro Dunes Ecological Reserve (Property).

RECITALS

A. The County proposes to utilize the Property for Mitigation described in the Los Osos Habitat Conservation Plan (HCP) to mitigate take/impacts resulting from HCP covered activities (Project) to Morro shoulderband snail (*Helminthoglypta walkeriana*), Morro manzanita (*Arctostaphylos morroensis)*, Indian Knob mountainbalm (*Eriodictyon altissimum*), and Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*), which are species listed pursuant to the federal Endangered Species Act.

B. The Department is owner in fee title to the Property in the community of Los Osos, within which all portions of the Property to be utilized by the County for Mitigation are included. The Property, which is composed of the Pecho and Bayview Units, is depicted on Exhibit A.

C. The Property is designated as an ecological reserve in California Code of Regulations, title 14, section 630, subdivision (b)(82), and is maintained for the primary purpose of developing a statewide program for protection of rare, threatened, or endangered native plants, wildlife, aquatic organisms, and specialized terrestrial or aquatic habitat types. As specified in California Code of Regulations, title 14, sections 550 and 630, certain uses within the Property are prohibited, including the removal of plants, bike riding, horseback riding, off-highway vehicle use, and camping. The County is dedicated to supplementing existing State resources to minimize the occurrence of these prohibited activities. Additional measures will include fencing, signage, physical barriers, and public outreach.

D. The Property is in an unimproved natural condition and possesses wildlife and habitat values of great importance to the Department and the people of the State of California. The Property provides high quality habitat for Morro shoulderband snail, Morro manzanita, Indian Knob mountainbalm and possibly Morro Bay kangaroo rat. The Property is also comprised of two sensitive vegetation communities – central maritime chaparral and

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coastal dune scrub. In addition, the Property supports habitat that is suitable for other wildlife species of special concern including California legless lizard (*Anniella pulchra*), Blainville's horned lizard (*Phyrnosoma blainvillii*), and Morro Bay blue butterfly (*Icaricia icarioides moroensis*).

E. The County wishes to enter upon the Property to conduct the activities necessary to mitigate for a portion of impacts related to the Project. The Project includes, but may not be limited to, the development of up to 701 vacant parcels in and adjacent to the community of Los Osos; capital improvement projects; facility operation and maintenance activities, conducted by the County, Los Osos Community Services District and two private water purveyors; road and trail creation and maintenance; park expansion and creation; and water system upgrades, operation, and maintenance.

F. The Department desires to accommodate the County's requested special use of the Property for the Purposes described in Section I of this MOU to the extent the Mitigation is compatible with the purposes and regulation of the Property and so long as the County bears the full cost of the Mitigation and associated long-term management and monitoring.

I. Purposes

A. The purpose of this MOU is to establish the terms and conditions upon which the Department would authorize the County to undertake Mitigation on the Property and is also intended to serve as the Cooperative Management Agreement between the County and Department required under the HCP for enrollment of the Property into the Los Osos HCP Preserve System (Purposes). The Department by this MOU seeks to ensure the Mitigation:

B. Is consistent and not in conflict with the current and future uses of the Property, including the protection of rare, threatened, or endangered native plants, wildlife, aquatic organisms, and specialized terrestrial or aquatic habitat types and any encumbrances, easements, or public use values;

C. is consistent with the purposes for which the Property was acquired, the funding sourced used for acquisition, and the regulations for the Property, including California Code of Regulations, title 14, sections 550, 550.5, and 630;

D. will maintain or enhance the current ecological and public use values of the Property; and

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E. will not preclude, diminish, or interfere with Property encumbrances or management of the Property, including the 1982 management plan for the Pecho Unit attached as Exhibit B.

II. TERM

A. Term. This MOU will become effective as of the date of last signature. It will remain in effect through December 31, 2025, unless terminated as provided for in this Section. This MOU may be extended by written mutual agreement for subsequent terms not to exceed five years each. The Parties to this MOU shall finalize a draft MOU for renewal on or before 90 days prior to the date of expiration of this MOU. Should the Parties fail to renew the MOU, and the MOU terminates upon the expiration date of this MOU, the County will remain responsible for all costs of the Mitigation under section III.F. and any requirement to reimburse the Department for restoration under section V.C.

B. Termination of MOU. The Department has the right to terminate this MOU in its sole discretion upon giving 90 days written notice of termination to the County as provided in Section V.I. below. If the Department or the County determines that a violation of a term of this MOU has occurred or is threatened, the Department or the County will give written notice of the violation to the other party as provided in Section V.I. below. The other party will have 30 days, or a longer period agreeable to the County and the Department, to cure the violation. If the violation is not timely cured, the notifying party may terminate the MOU by written notice.

III. HABITAT MANAGEMENT AND MONITORING

A. Mitigation Description. The Mitigation consists of the closure and restoration of trails, the control of nonnative plant species, long-term management, and monitoring as will be more fully described in a Mitigation Plan for the Property which will be developed consistent with subsection III.B., immediately below. The Mitigation will enhance and restore habitat with the goal of supporting populations of Morro shoulderband snail, Morro manzanita, Indian Knob mountainbalm, and Morro Bay kangaroo rat.

B. Mitigation Plan Development. The County, at its sole expense, will develop and provide the Department a draft Mitigation Plan for the Department's review and approval. The Mitigation Plan will identify individual Mitigation actions or distinct projects (each a Mitigation Action) that can be undertaken independently but contribute to the overall Mitigation. The Mitigation Plan must describe the specific management and/or restoration actions that will be implemented and the monitoring that will be used to evaluate their effectiveness, consistent with the Adaptive Management

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and Monitoring Plan (AMMP) for the Los Osos HCP Preserve System, which will be developed as outlined in Section 5.3.3 of the HCP

C. Department Approval of Mitigation Plan. The Mitigation Plan must be approved in writing by the Department prior to the Department's issuance of a Special Use Permit (SUP) to the County and the County's entry onto the Property to implement the Mitigation. The Department may authorize the County to enter the Property for investigative or planning efforts necessary to the development of the Mitigation Plan or to secure any required permits for the Mitigation.

D. Documentation. The County will provide the Department adequate documentation, subject to the review and approval of the Department, that the Mitigation will enhance current ecological values and maintain existing allowable public uses of the Property.

E. Property Modifications. The County must take only those Mitigation Actions on the Property necessary to implement the Mitigation as described in the Mitigation Plan, and as authorized under its Special Use Permit, and agrees to remove any and all facilities or other improvements that are not essential to the Mitigation Plan following completion of a Mitigation Action.

F. Mitigation Implementation, Management, and Monitoring. The County will be fully responsible for the costs, implementation, management, and monitoring of Mitigation. The County will designate an Implementing Entity acceptable to the Department, such as a land trust or conservancy, to implement, manage, and monitor the Mitigation.

G. Long-term Funding. The County must provide for the full cost of implementation of the Mitigation Plan on the Property, including all capital improvements, restoration, enhancement, monitoring, long-term management and maintenance, and reimbursement for any Department staff time, including enforcement. Any SUP issued for a Mitigation Action will ensure that the County provides for such costs.

H. Damage to the Mitigation Beyond the Department's Control. The Department will not be liable for or required to restore any damage to the Mitigation resulting from (i) any natural cause beyond the Department's control, including, without limitation, fire not caused by the Department, flood, storm, and earth movement, or any prudent action taken by the Department under emergency conditions to prevent, abate, or mitigate significant injury to the Property resulting from such causes; or (ii) acts by the County or third parties not under the control of the Department.

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I. Method of Habitat Protection. As an ecological reserve, the Property is protected pursuant to Fish and Game Code sections 1580 and 1764, and managed per California Code of Regulations, title 14, sections 550 and 630. In the event there is a change in the laws or regulations that remove protection for the Property, the Department, if feasible, will provide the County and the United States Fish and Wildlife Service (USFWS) no less than sixty (60) days advance notice before taking action to void or modify the protected status of the Property. In the event there is a change in law or regulation that removes protection for Property lands enhanced, restored, or managed by the County as part of the Conservation Program, the County will meet with the USFWS to identify alternative compensatory mitigation acceptable to the USFWS for any loss of mitigation value resulting from such a change in the Property's protected status.

J. **Site Visits and Enforcement.** Currently, Department Environmental Scientists conduct occasional site visits and Department Wardens conduct necessary law enforcement activities within the Property. The Department has a land management plan (LMP) that provides recommendations for management and monitoring of the Pecho Unit of the Property; however, the LMP and other management, restoration, or monitoring activities are currently only implemented within the Property as Department funds and other resources allow. For purposes of this MOU, the Department agrees to continue to conduct occasional site visits and necessary law enforcement activities, as funds and resources allow, to continue to manage the Property at the same level as prior to entering into this agreement. This maintenance of effort is designed to ensure that the habitat restoration, management, and monitoring conducted by the County on the Property is above and beyond that which is already being conducted by the Department and therefore can mitigate project impacts under the HCP.

IV. SPECIAL USE PERMIT

A. SUP Required. The County will apply for a Type 3 SUP for the Mitigation pursuant to California Code of Regulations, title 14, section 550.5, subdivision (d). The County and the Department recognize that separate Type 3 SUPs may be required for Mitigation Actions as appropriate given concerns related to implementation timing, location, and other specifics regarding the Mitigation that will be described in the Mitigation Plan.

B. SUP Fee. The County will pay the SUP fee, if applicable, specified at California Code of Regulations, title 14, section 730.

C. Release, Waiver, and Indemnity. To the maximum extent permitted by law, the County as a condition of the SUP will agree to waive all claims against the Department, its officers, agents, and employees for loss or damage

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caused by, arising out of, or in any way connected with the Mitigation or exercise of the SUP, and the County will agree to protect, save harmless, indemnify, and defend the Department, its officers, agents, employees, and contractors from any and all loss, damage, or liability, which may be suffered or incurred by the Department, its officers, agents, employees, or contractors, caused by, arising out of, or in any way connected with the exercise by the County of the rights granted in the SUP or for the Mitigation, except those arising out of the sole active negligence or willful misconduct of the Department. The County will further cause such indemnification and waiver of claims in favor of the Department to be inserted in each contract that the County executes for the provision of services in connection with the Mitigation.

D. Additional SUP Terms and Conditions. The Department may incorporate any or all of the terms and conditions of this MOU in the SUP. The Department may include additional terms and conditions in the SUP necessary to protect and maintain the Property in accordance with its purposes and corresponding regulations.

V. GENERAL TERMS AND CONDITIONS

A. Compliance with Laws. The County will be responsible for California Environmental Quality Act compliance and must obtain and maintain all state, federal, and local permits, licenses and approvals applicable to the Project. The County must comply with all current laws, ordinances, orders, rules, regulations and permits with respect to its use of the Properties pursuant to this Agreement.

B. As-Is Condition and Assumption of Risk. The County will accept the condition of the Property as-is with any and all defects or hazards, whether or not known or suspected, and acknowledges that the Department is under no obligation to provide any additional preparations or improvements to the Property prior to use by the County, and the County's use of the Property is entirely at its own risk. Prior to commencing a Mitigation Action on the Property, the County, or its Implementing Entity, and the Department shall do a walk-through of each area where the Mitigation Action will occur and document, in writing and/or pictures, any existing damage, defects or hazards in the work area (Baseline Condition) to ensure that both parties acknowledge the existing, baseline conditions of the area prior to mitigation work.

C. Restoration of Properties. If the County or its officers, employees, agents or contractors cause any damage to the Baseline Condition of the Property in connection with the implementation of this MOU or the Mitigation, the County must notify the Department of the damage within 48 hours and then fully restore the Property to its Baseline Condition in

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accordance with a restoration plan approved by the Department. If the County has not provided the Department with a restoration plan and a schedule for the restoration work acceptable to the Department within 60 calendar days from the date the Department received notice from the County, or from the date the Department notifies the County that the Baseline Condition was damaged, the Department will have the right, but not the obligation, to perform the necessary restoration and the County will be responsible for reimbursing the Department for any costs of such restoration. Upon receipt of the notice of restoration costs, the County will promptly reimburse the Department for the restoration costs incurred, plus an additional amount equal to the Department's then current rate for administrative overhead. The demand for payment by the Department will be prima facie evidence that the expense incurred was necessary and reasonable and that such expense was incurred by the Department on behalf of the County.

D. Advance Notification. Following receipt of its SUP, the County will give the Department 60 days advance notice of its anticipated Mitigation start, timing, and completion. The Department and the County will schedule the walk-through to establish the Baseline Condition at least 30 days prior to the start of any Mitigation Action. Any proposed changes to the schedule will be communicated promptly. Such notice shall be via email or telephone. The County will notify: California Department of Fish and Wildlife via email or telephone to the person specified in subsection I below.

E. No Grant. Nothing in this MOU will be construed as a grant of title or any interest in the Property.

F. No Admission of Liability. Nothing in this MOU or the SUP will be construed as an admission of liability by the Department of its responsibility as to any Hazardous Materials which may be found on the Property, nor, except as expressly provided in the SUP, as an admission of liability by the County as to any Hazardous Materials which may be found on the Property.

G. Access to Property. The County will have the right to use and access the Property for Mitigation as specified in the Mitigation Plan, AMMP, and SUP, but may be subject to reasonable use restrictions. The Department will continue to have the right to use and access the Property in its entirety and to grant use and access rights to third parties, where such use or access does not interfere with Mitigation.

H. Entire Understanding. This MOU constitutes the entire and integrated understanding of the County and the Department with respect to Mitigation on the Property by the County and may not be altered, modified or

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amended except in writing with the approval of the County and the Department.

I. Notices. All notices given in conjunction with this MOU, except the Advance Notice for entry specified in Section V.D., must be written, and will be effective upon personal delivery to the other party or, if by mail, three days after deposit in the U.S. Mail, first class postage prepaid to the applicable address stated below, or to such other address as the party may designate by written notice:

DEPARTMENT	Regional Manager, Central Region California Department of Fish and Wildlife 1234 East Shaw Avenue Fresno, CA 93710 reg4assistant@wildlife.ca.gov (559) 243-4005 ext. 151 With copies to: None specified.
County	Los Osos Habitat Conservation Plan Coordinator Department of Planning and Building County of San Luis Obispo County Government Center San Luis Obispo, CA 93408 planning@co.slo.ca.us (805)781-5600 With copies to: Planning Director (same address)

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15 December 2020

IN WITNESS WHEREOF, the parties have executed this MOU as of the date of last signature below.

COUNTY
County of San Luis Obispo

By: Trevor Keith
Planning Director

1/4/21
Date

DEPARTMENT
California Department of Fish and Wildlife

DocuSigned by:
FA83F09FE08945A...

By: Julie Vance
Regional Manager
Central Region

3/2/2021
Date

DocuSigned by:
13EFA6679DEB498...

By: Sheree Christensen
Assistant Chief
North Coast Law Enforcement District

3/2/2021
Date

Appendix K Public Comments on the LOHCP and Environmental Review Documents

This appendix contains the letters and emails that were received by the United States Fish and Wildlife Service (USFWS) and/or the County of San Luis Obispo (County) during the 45-day public comment period for the Los Osos Habitat Conservation Plan, which 45 began October 2, 2019, and concluded on November 18, 2019. The LOHCP review period overlapped with that of the LOHCP Environmental Impact Report and the LOHCP Environmental Assessment, which are the environmental review documents prepared by the County, which is the lead agency under the California Environmental Quality Act (CEQA), and the USFWS which is the lead agency for the National Environmental Policy Act (NEPA), respectively. As a consequence, some letters address multiple documents. For completeness, they are all included here.

Each letter was assigned a unique letter identifier (1-33); within each letter, separate comments were delineated using a line down the right margin (i.e., bracketed) and assigned a sequential number based on the letter number (e.g., comment 3.7 is the seventh comment in Letter 3). These designations added to the letter were used to track responses to the public comments, which are provided in Appendix L.

Letter 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

November 14, 2019

Leilani Takano
Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, California 93003

Subject: Draft Environmental Assessment for Los Osos Community-Wide Habitat Conservation Plan, San Luis Obispo County, California

Dear Ms. Takano:

The U.S. Environmental Protection Agency has reviewed the above-referenced document pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. The Draft Environmental Assessment analyzes the potential environmental impacts that would result from issuing an Incidental Take Permit to the county of San Luis Opispo to implement activities covered by the Los Oso Community-wide Habitat Conservation Plan. The EPA appreciates the opportunity to review the Draft Environmental Assessment and has identified areas for additional analysis and disclosure as the Fish and Wildlife Service is preparing the Final EA and considering preparation of a Finding of No Significant Impact. 1.1

Air Quality

The EPA recommends that the FWS quantify air emissions estimates from the LOHCP's covered activities. Although ITP issuance does not produce direct impacts, it does authorize potential future development which could lead to increases in regional emissions from criteria pollutants and air toxics that can affect human health. 1.2

The EPA also suggests that the Final EA include the following mitigation measures in Appendix D to further reduce emissions of air pollutants: 1.3

- For use of dust suppressants, consider both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate and operate water trucks for stabilization of surfaces under windy conditions.
- For fugitive dust source controls, the EPA recommends limiting the speed of earth-moving equipment to 10 miles per hour.
- Specify how impacts to sensitive receptors, such as children, the elderly, and the ill would be avoided. For example, locate construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.
- Develop a construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.

Potential Impacts to Water Quality and Quantity

The completion of Los Osos' wastewater treatment facility and the approval of LOHCP would allow for the development of 639 single-family residential and commercial/multifamily previously undeveloped parcels. Due to an anticipated increase in population growth from development of these parcels, the EPA recommends adding to the Final EA an analysis of the potential for aquifer drawdown or overdraft due to cumulative effects of past, present and future activities. The EPA also recommends that the Final EA disclose and discuss the cumulative impacts of water quality degradation of the Upper Aquifer and seawater intrusion of the Lower Aquifer. 1.4

The Draft EA states that the city will implement a mitigation measure to "eliminate pollutants from storm runoff prior to its drainage off-site, with smaller developments potentially exempted at the discretion of the County Public Works Department" (p. 45). This mitigation measure was approved in the Estero Area Plan in 2003 when development was limited and it could exempt any of the 579 undeveloped parcels for single-family residential development from stormwater requirements, including home additions and remodels, within the Urban Services Line. The EPA recommends that the Final EA stormwater mitigation measures include all sizes of development to further reduce construction-related runoff and non-point source pollution. 1.5

Consultation with Tribal Governments

The EPA recommends that the Final EA describes the outcome of tribal consultation between the FWS and each of the tribal governments within the project area, issues that were raised (if any), and how those issues were addressed. 1.6

The EPA appreciates the opportunity to review this Draft EA. When the Final EA/FONSI and/or other environmental analysis is released for public review, please send one copy to the address above (mail code: TIP-2). If you have any questions, please contact me at (415) 947-4167, or Sarah Samples at 415-972-3961/samples.sarah@epa.gov. 1.7

Sincerely,

Jean Prijatel, Manager
Environmental Review Branch

Letter 2

SLO COUNTY apcd | Air Pollution Control District
San Luis Obispo County

Via Email

November 18, 2019

Kerry Brown
San Luis Obispo County Department of Planning & Building
976 Osos Street, Room 300
San Luis Obispo, CA 93408
kbrown@co.slo.ca.us

SUBJECT: APCD Comments Regarding the Los Osos Habitat Conservation Plan – Draft EIR

Dear Ms. Brown:

Thank you for including the San Luis Obispo County Air Pollution Control District (APCD) in the environmental review process. We have completed our review of the Draft Environmental Impact Report (DEIR) for the Los Osos Habitat Conservation Plan (LOHCP). Implementation of the LOHCP would include the issuance of an incidental take permit (ITP) by the U.S. Fish & Wildlife Service to the county, which would cover the "take" (including harassment, injury, or mortality resulting from covered activities) of two animal species: the Morro Bay Kangaroo Rat and the Morro Shoulder Band Snail. In addition, the LOHCP covers two plant species: the Indian Knob Mountain Balm and the Morro Manzanita. The LOHCP includes measures to mitigate take of covered animal species and impacts to covered plant species. 2.1

The County would select an Implementing Entity (IE) (a non-profit conservation organization) that would contract with the County to implement most LOHCP components, including processing take/impact coverage applications, issuing Certificates of Inclusion (COIs) to landowners for covered activities, and implementing the LOHCP, including the conservation program, on behalf of the County. Covered activities would include private development and redevelopment, as well as capital improvement projects, conservation program activities, etc.

The following APCD comments are pertinent to this project.

Section 4.1.1. – Air Quality – Setting
Subsection *b. Air Pollutants of Primary Concern* states that the South Central Coast Air Basin is under the jurisdiction of the APCD. This is not accurate in that the South Central Coast Air Basin includes San Luis Obispo, Santa Barbara and Ventura Counties, while the jurisdiction of the APCD is only San Luis Obispo County. 2.2

Table 10, Current Federal and State Ambient Air Quality Standards, indicates the reporting years for the emissions data are 2016, 2017, and 2018. However, accompanying text on page 57 indicates the reporting years are 2015, 2016 and 2017. 2.3

Subsection *c. Regulatory Setting – Clean Air Plan* states that the APCD is required to prepare an air quality improvement plan for the South Coast Air Basin. This is inaccurate in that the APCD plan is only required to cover San Luis Obispo County. 2.4

Section 4.5.1. – Greenhouse Gas Emissions – Setting
Subsection *b. Regulatory Setting – State – Senate Bill 32* states that the SB 32 scoping plan is expected to be adopted in 2017. The updated scoping plan was, in fact, adopted by the California Air Resources Board on December 14, 2017. 2.5

Section 4.5.2. – Greenhouse Gas Emissions – Impact Analysis
Subsection *a. Methodology and Significance Thresholds – SLOAPCD GHG Thresholds* and *Impact GHG-1* in subsection *b. Project Impacts* cite the commercial/residential bright-line threshold and the efficiency threshold from the *APCD CEQA Air Quality Handbook* (April 2012). While the DEIR is not relying on compliance with these thresholds to determine the significance of GHG impacts from the project, it should be noted that these thresholds of significance were based on a gap analysis and demonstrated consistency with the Global Warming Solutions Act (AB 32) and the California Air Resources Board's Climate Change Scoping Plan in order to meet the state's 2020 GHG emissions goals. In 2015, the California Supreme Court issued an opinion in the *Center for Biological Diversity vs California Department of Fish and Wildlife* ("Newhall Ranch") which determined that AB 32 based thresholds derived from a gap analysis are invalid for projects with a planning horizon beyond 2020. **The APCD, therefore, does not recommend relying on the GHG thresholds in the CEQA Air Quality Handbook.** 2.6

The discussion in the DEIR of Impact GHG-1 states that the LOHCP would be consistent with the growth projections for population and VMT used in the county's EnergyWise Plan. It is important to note that the EnergyWise Plan was created with a planning threshold of 2020, and therefore may not meet the state's reduction goals for 2030 as required by SB 32 and the 2017 Scoping Plan. 2.7

Again, thank you for the opportunity to comment on this proposal. If you have any questions or comments, feel free to contact me at (805) 781-5912.

Sincerely,

Vince Kirkhuff

VINCE KIRKHUFF
Air Quality Specialist

VJK/jjh

cc: Jennifer Haddow, Rincon Consultants

Letter 3

Takano, Leilani <leilani_takano@fws.gov>

[EXTERNAL] comments on Los Osos Habitat Conservation Plan by a resident

1 message

Bill Amend <pof_b17@yahoo.com> Sun, Nov 17, 2019 at 4:46 PM
To: "julie_vanderwier@fws.gov" <julie_vanderwier@fws.gov>
Cc: "kbrown@co.slo.ca.us" <kbrown@co.slo.ca.us>, "Leilani_takano@fws.gov" <Leilani_takano@fws.gov>

I have owned and occupied a home on Rodman Drive in Los Osos for nine years and have been a frequent visitor to the area since 1975. I support adoption of the draft Los Osos Habitat Conservation Plan (LOHCP) as a preferred alternative the currently wholly unacceptable and burdensome system of having to submit separate mitigation and management plans for every individual project within the Plan area. 3.1

It is clear that the LOHCP has tried with some success to address the disparate priorities of habitat conservation with the diverse needs and preferences of the Los Osos residents. *However*, I feel that the issue of wildfire management has not been adequately addressed or ensured in the Plan. The LOHCP includes discussion of the *benefits* of some subsets of wildfires (based on frequency, acreage, time of year, etc.) for continued propagation of various species without an equivalent consideration of the hugely detrimental effect on the human population. The environmental impact report (EIR) describes mitigation applicable to fire threats. For example, see "MM HAZ-2 Fire Management Plan" on page 13 and 191 of the EIR. However, the EIR and the Plan itself it is devoid of enough details and assurances that mitigation effectiveness will be at all improved over the inadequate historical measures. Instead, the LOHCP and related EIR rely upon a Community Wildfire Protection Plan (CWPP) that has not yet been developed or at least not publicly vetted.

My property on Rodman Dr. adjoins wildlands on two sides (south and west). The adjacent wildlands include a large stand of nonnative trees (eucalyptus) that represent a significant fire hazard and, in the event of a tree falling, would result in blockage of the most direct egress path from the area and potential structural damage to nearby homes. I have seen at least two cycles of "fire mitigation" by Cal Fire adjacent to my property and note that they have been minimally effective at removing enough fuel to significantly impact wildfire threats. Most of the cut combustible fuel was simply abandoned in place and all large eucalyptus trees were left uncut. So-called fire threat "mitigation" in other locations of Los Osos was severely hampered by US Fish and Wildlife Service (USFWS) via their restrictions placed on the mitigation activities. Those limitations included the unacceptable and minimally effective practice of addressing fuel loads only within *50 feet* of residences, prohibition of using power tools, and removal only of dead and downed materials (per letter by US FWS dated April 12, 2018, reference number O8EVENOO-2018-CPA-0088). That 50-foot distance is significantly smaller than the 300-foot defensible distance recommended by Cal Fire. In addition, limiting the activity to removal of dead and downed materials by hand is unreasonably restrictive and inefficient, thus severely limiting the effectiveness of the "mitigation". Similar restrictions imposed on a future CWPP could render it largely ineffective. A CWPP rendered ineffective by unreasonable restrictions placed on it by USFWS, combined with the Plan's proposed *increase* in fire-prone open space acreage (with commensurate decrease in acreage allocated for residential and commercial development) could translate to an *increase* in threat of destructive wildfire for the community. This is particularly true when the increased probability of ignition as a result of unmonitored and uncontrolled activities of homeless who frequent the high fire hazard areas. 3.2

In summary, I support the adoption of the Plan because the alternative of having no plan continues to be unacceptable. However, the absence of a related CWPP and the lack of assurances of improved flexibility by USFWS that more appropriately balances public safety with habitat conservation when developing fire mitigation programs severely limit the attractiveness of the Plan overall. 3.3

Sincerely,

Bill Amend,

cell: 714 350-1838
e-mail: POF_B17@yahoo.com

Letter 4

Kerry Brown

From: Marcie Begleiter <mdbegleiter@gmail.com>
Sent: Monday, November 18, 2019 1:48 PM
To: Kerry Brown
Subject: [EXT]Comment on Draft LOHCP and EIR

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Dear Ms. Brown,

I attended the informational meeting regarding the EIR and LOHCP at Sea Pines on October 28th. Thank you for the presentation. I want to note that the **venue was not large enough** for the number of citizens eager to get the information - dozens came and left as there were not seats for them.

Also, given that the **comment period is 45 days, holding the informational meeting almost 30 days into that period was also is not the best plan** to get community response to these important documents.

Finally, did you know that your **email was incorrectly listed** on the contact slide? Again, not optimal for getting the response that this comment period was supposed to elicit.

Given these issues, **I strongly suggest that you expand the comment period, at least until mid-December** to give more time for interested community members to respond to the large amount of information in the draft reports. 4.1

All that aside, I have some serious concerns about the plan that encompasses the EIR and LOHCP. Protecting the greenspace is welcome and necessary to preserve the character of the town, but **the extent of development that is described in the report, at approximately 30% infill units by 2035 (15 years) is more than double the development rate of the state** in the past 10 years (9% from 2006 to 2016). Given that we need more housing, and affordable units at that, the upper end of this development plan is not within reasonable growth rates for a community of the size of Los Osos.

And that is **before we begin to take account of the environmental strain that such development will bring to the fragile landscape of Los Osos**. We are a town built on sand dunes, facing rising sea levels and salt water intrusion. The LOHCP-EIR_Public-Review-Draft report does take this into account on page 214:

" LOHCP-EIR_Public-Review-Draft_2019-0925

As noted in the Los Osos Community Plan, the community wishes to maintain its “small-town” atmosphere; rather than expanding the URL and USL, the community is focusing on infill development. A development constraint within Los Osos is the availability of resources. New growth must only occur when the community has sufficient capacity in its water supply and sewage disposal systems. In addition, new development should not be allowed to create significant impacts to the community’s road system, local schools, parks, or libraries. 4.2

Per the Draft EIR for the Los Osos Community Plan states that development under the Los Osos Community Plan could result in an additional 1,861 residential units and up to 364,000 square feet of commercial space, for a total of 8,182 residential units and 1,034,300 square feet of non- residential space (floor area) within the community within the 20-year plan horizon (by 2035)." **(NOTE - it is now 16 years, not twenty until 2035, and will be 15 by the time this plan instituted)**

The **data in this report is at least 5 years old**, taken from the 2014 origin of the draft, and therefore is not reliably applicable to today's situation in terms of climate change and water availability. For the sake of creating 4.3

a viable plan that takes into account realistic development for all the residents, current and future, I ask that you do the following: 4.4

1. **Keep the comment period open** until December 15

2. **Revise the data in these plans to reflect our current situation regarding sea level rise and salt water intrusion.** 4.5

3. **Revise the cap on developing residential units to be in line with state population growth, which would be 14% over the 15 years of the plan. This would allow for approximately 900 additional units by 2035.** 4.6

4 **Revise the plan to be more specific about necessary mitigation for water and other support systems** and make these hard and fast rules rather than soft recommendations. 4.7

Thank you for your time and attention to this input. Your service to the community is much appreciated. 4.8

Best,

Marcie Begleiter

Los Osos

--

Marcie Begleiter
2005 9th St. Suite E
Los Osos, CA 93402

Letter 5

Takano, Leilani <leilani_takano@fws.gov>

[EXTERNAL] Los Osos Draft HCP

1 message

Marcie Begleiter <[redacted]> Mon, Nov 18, 2019 at 9:01 PM
To: Leilani_takano@fws.gov

Dear Ms. Takano and Committee Members,

I attended the informational meeting regarding the EIR and LOHCP at Sea Pines on October 28th. Thank you for the presentation that night which was very informative and well organized.

I want to note that the **venue was not large enough** for the number of citizens eager to get the information - dozens came and left as there were not seats for them.

There is much interest in the community about the issues raised at the meeting and given that the **comment period is 45 days, holding the informational meeting almost 30 days into that period was also is not the best plan** to get community response to these important documents. 5.1

Given these issues, **I strongly suggest that you expand the comment period, at least until mid-December** to give more time for interested community members to respond to the large amount of information in the draft reports.

All that aside, I have some serious concerns about the plan that encompasses the EIR and LOHCP. Protecting the greenspace is welcome and necessary to preserve the character of the town, but **the extent of development that is described in the report, at approximately 30% infill units by 2035 (15 years) is more than double the development rate of the state** in the past 10 years (9% from 2006 to 2016). Given that we need more housing, and affordable units at that, the upper end of this development plan is not within reasonable growth rates for a community of the size of Los Osos.

And that is **before we begin to take account of the environmental strain that such development will bring to the fragile landscape of Los Osos**. We are a town built on sand dunes, facing rising sea levels and salt water intrusion. The LOHCP-EIR_Public-Review-Draft report does take this into account on page 214:

" LOHCP-EIR_Public-Review-Draft_2019-0925 5.2

As noted in the Los Osos Community Plan, the community wishes to maintain its “small-town” atmosphere; rather than expanding the URL and USL, the community is focusing on infill development. A development constraint within Los Osos is the availability of resources. New growth must only occur when the community has sufficient capacity in its water supply and sewage disposal systems. In addition, new development should not be allowed to create significant impacts to the community’s road system, local schools, parks, or libraries.

Per the Draft EIR for the Los Osos Community Plan states that development under the Los Osos Community Plan could result in an additional 1,861 residential units and up to 364,000 square feet of commercial space, for a total of 8,182 residential units and 1,034,300 square feet of non- residential space (floor area) within the community within the 20-year plan horizon (by 2035)." **(NOTE - it is now 16 years, not twenty until 2035, and will be 15 by the time this plan instituted)**

The **data in this report is at least 5 years old**, taken from the 2014 origin of the draft, and therefore is not reliably applicable to today's situation in terms of climate change and water availability. For the sake of creating a viable plan that takes into account realistic development for all the residents, current and future, I ask that you do the following: 5.3

1. **Keep the comment period open** until December 15 5.4

2. **Revise the data in these plans to reflect our current situation regarding sea level rise and salt water intrusion.** 5.5

3. **Revise the cap on developing residential units to be in line with state population growth, which would be 14% over the 15 years of the plan. This would allow for approximately 900 additional units by 2035.** 5.6

4 **Revise the plan to be more specific about necessary mitigation for water and other support systems** and make these hard and fast rules rather than soft recommendations. 5.7

Thank you for your time and attention to this input. Your service to the community is much appreciated. 5.8

Best,

Marcie Begleiter

Los Osos

Letter 6

Dear Kerry,

Comments on the LOHCP EIR public review draft

Where the LOp. 218 Lower-cost option for recreation: prescriptive rights for informal visitor parking and informal access to beach and informal small boat access to bay at 1st Street, 1300 block are endangered and need careful protection. 6.1

p. 243 Roadway segment, Rosina from Pine to Doris needs to be paved and county maintained. That route would provide a connection between Cuesta by the Sea and Monarch Grove School that bypasses the school-opening-time highly congested intersection at Pine and LOVR. Connecting Doris between Rosina and South Court would also help automobile traffic, but the route is a bicycle and pedestrian heavy route now, which would be less useful if cars were using that part of Doris at school opening and closing times. 6.2

Page 243 Ramona, 4th, and 9th: All these streets are no longer efficient for the traffic volume. We need to encourage pedestrian and bicycle use everywhere in town, but especially on these highly impacted streets, the <u>main</u> connectors between the Baywood commercial district and surrounding area and the Los Osos commercial area. I suggest making 7th street south of Ramona one way south to Nipomo and making 9th Street north of Nipomo one way north. One way traffic would provide enough already-paved surface on 7th and 9th to create ped and bicycle lanes. 6.3

P. 245. Proposed link 4 to 11 will create a major connector between Los Osos and Baywood, with traffic volume that might even surpass that currently found via 9th Street and Ramona since traffic will also move to this connector from Pine Street. The 1600 block of 4th Street already serves as a connector for traffic between the Baywood (Peninsula, residential, and commercial area) and the Los Osos commercial area. The chicane at Pismo and 4th Street would have to be reconfigured to move through traffic smoothly from 4th to 3rd, a designated connector street. (4th Street is a residential street north of the intersection of Pismo and 4th) 6.4

Sincerely, R. David Bowlus

Letter 7

Dear Kerry,

Comments on the LOHCP EIR public review draft

Where the LOp. 218 Lower-cost option for recreation: prescriptive rights for informal visitor parking and informal access to beach and informal small boat access to bay at 1st Street, 1300 block are endangered and need careful protection. 7.1

p. 243 Roadway segment, Rosina from Pine to Doris needs to be paved and county maintained. That route would provide a connection between Cuesta by the Sea and Monarch Grove School that bypasses the school-opening-time highly congested intersection at Pine and LOVR. Connecting Doris between Rosina and South Court would also help automobile traffic, but the route is a bicycle and pedestrian heavy route now, which would be less useful if cars were using that part of Doris at school opening and closing times. 7.2

Page 243 Ramona, 4th, and 9th: All these streets are no longer efficient for the traffic volume. We need to encourage pedestrian and bicycle use everywhere in town, but especially on these highly impacted streets, the main connectors between the Baywood commercial district and surrounding area and the Los Osos commercial area. I suggest making 7th street south of Ramona one way south to Nipomo and making 9th Street north of Nipomo one way north. One way traffic would provide enough already-paved surface on 7th and 9th to create ped and bicycle lanes. 7.3

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Sincerely, Beverly Boyd

Letter 8

CALIFORNIA
NATIVE PLANT SOCIETY

November 15, 2019

To: San Luis Obispo County Dept. of Planning & Building Dept.

RE: Comments on Los Osos HCP- DEIR

To Whom it May Concern:

The following represents the comments of the San Luis Obispo Chapter of CNPS. Our concerns are limited to the portions of the DEIR concerning mitigation of Morro manzanita, one of the four species covered by the HCP.

The DEIR states that the impacts to the manzanita are Less Than Significant with Mitigation (Impact Bio 1). However the DEIR makes no independent assessment of impacts to the manzanita, relying on the descriptions and conclusions of the HCP itself. CNPS has sent extensive comments on the Draft HCP to the Ventura office of USFWS in which we question the lack of specificity concerning the ability to mitigate losses, identify quantitatively areas of species 'take' and areas considered suitable for restoration or enhancement, and the failure to incorporate discussion on the development potential of large areas of core manzanita habitat under existing and proposed zoning and land use standards.

Rather than repeat these comments in response to this document, CNPS will simply append our comments to USFWS, which, we believe, questions the assertion that impacts to Morro manzanita can be mitigated. 8.1

However, this does not imply that CNPS would not agree with the conclusions of the DEIR regarding mitigation if such mitigation could be quantitatively demonstrated, and protection of core habitat in the vicinity of Cabrillo Estates were fully ensured.

We understand that the County may overlay this land with an SRA/ESHA designation, but such designation earlier by the Coastal Commission did not stop the County Board of Supervisors from approving a 40–lot subdivision on that land which was stopped only by appeal to the Coastal Commission. If the overlay still permits current RS (Residential suburban), the final EIR should define buildout potential under any proposed planning standards and implemented Coastal Plans.

CNPS would therefore request that our specific questions concerning Morro manzanita impacts be addressed in the final EIR, with particular attention paid to guarantees of protection for undeveloped land south and west of Cabrillo Estates and adjacent to Montana de Oro State Park.

As noted in our comments on the DHCP, we do not understand why acreages were listed with only the broadest indications of location. The simple use of the lot assessor's parcel numbers could have been listed in spreadsheet form, in which probable occupancy by any of the covered species was identified, enabling the reviewer to broadly validate acreage of species 'take'. This same method should have been used on proposed parcels on which recovery might take place. 8.2

Thank you for your consideration:

David H. Chipping

Conservation Chair, San Luis Obispo Chapter CNPS

(805) 528-0914 (dchippin@calpoly.edu)



Here follows our comments on the DHCP, as submitted to USFWS 8.3

CALIFORNIA
NATIVE PLANT SOCIETY

To:

Stephen P. Henry
Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003

INTRODUCTION

The San Luis Obispo Chapter of the California Native Plant Society appreciates the opportunity to offer comments on the County of San Luis Obispo **Draft Los Osos Habitat Conservation Plan** (DHCP), dated April, 2019, and released October, 2019. We understand that the DHCP has been prepared in accordance with Sections 9 and 10 of the federal Endangered Species Act (ESA) of 1973, as amended, which prohibits "take" of fish or wildlife species listed as endangered, and allows for the issuance of permits to authorize incidental take. The proposed action, issuance of an incidental take permit, is subject to compliance with the National Environmental Policy Act (NEPA) of 1969. Accordingly, the U.S. Fish and Wildlife Service (Ventura Office) has prepared a **draft environmental assessment** dated August 2019. Concurrent with the EA prepared by the USFWS, the County of San Luis Obispo has prepared a **draft Environmental Impact Report (EIR)** pursuant to the California Environmental Quality Act (CEQA). The comments below pertain to each of the above-listed documents, as specified below. 8.3 (cont'd)

The Mission of the California Native Plant Society is to increase understanding and appreciation of California's native plants and to conserve them and their natural habitats through education, science, advocacy, horticulture and land stewardship.

We have the following primary concerns:

(1) The DHCP presents confusing information relative to parcel numbers and locations that are actually developable today, compared to those that were considered developable under the 1988 Estero Plan. 8.4

(2) Section 4.3.1.3 assesses Net Impacts on Morro manzanita. The DHCP is unclear regarding the location of the 51.7 acres of Protected Habitat for Morro manzanita.

(3) Section 4.3.1.3 assesses Net Impacts on Morro manzanita. The DHCP is unclear regarding location of the 22.3 acres of Restorable Habitat for Morro manzanita. 8.5

(4) Section 4.3.1.3 assesses net impacts. The claim that Morro manzanita will have a 8:1 gain in habitat in a program that justifies 'take' is questionable.

(5) CNPS questions the assertion that part of the of the 22.3 acres planned for restoration of Morro manzanita can be restored "*by conducting fire management to promote regeneration of the populations, as needed*" due to the proximity of housing and the lack of any control-burn planning in this area by fire agencies. 8.6

(6) A significant portion of the core habitat for Morro Manzanita lies within the southern bounds of the DHCP and the limitations of current Rural Residential zoning. 8.7

(7) The DHCP does not address or balance conflicting land management requirements concerning the four covered species. 8.8

(8) The DHCP fails to recognize the Morro Manzanita-Coast Live Oak plant community series. 8.9

(9) The DHCP should resolve a potential issue concerning use of former Palisades Property (Now CDFW Reserve, Bayview Unit) and possibly other properties that have received encumbered state or federal funding 8.10

SPECIFIC ISSUES AS NOTED IN THE ABOVE NUMBERED LIST

(1) Section 2, Land Use and Covered Activities. The DHCP presents confusing information relative to parcel numbers and locations that are actually developable today, compared to those that were considered developable under the 1988 Estero Plan.

For example, Section 2.1.1, page 2-1, asserts that 705 acres, comprising 701 parcel are undeveloped or have limited improvements. It appears that Figure 2-1 shows the current inventory of parcels which have the potential for requiring take permi in yellow, and those in which development potential has been retired in green.

However, the DHCP does not provide any basis for a reviewer to evaluate impact claims and assumptions as listed in Tables 2-7 and 2-9. For example, Table 2-9 purports to show that 573 acres of Single Family Residential would be covered which would include 150.7 acres of actual impact. The DHCP, EA and EIR each should include a detailed map illustrating exactly where these parcels are located. How much is infill within the Urban Services Line, and how much is in the larger parcels outside of the USL? Also, the cited 131.4 acres of redevelopment within existing developed parcels provides no information on the parcel location and parcel subdivision potential. 8.11

A very simple solution that would improve the ability of reviewers to see where development is possible would be to use the current zoning map (Los_Osos_URL_LUC (https://www.slocounty.ca.gov/Departments/Planning-Building/Forms-Documents/Maps/Land-Use-Maps/Coastal-Zone-Maps/Estero-Planning-Area-Maps/Los-Osos-URL-Maps.aspx) in which all existing parcels are shown, together with the current zoning. Using this map as a basis, specific as-yet-undeveloped parcels could be identified, together with developed parcels that mig

be eligible for a second dwelling unit. Combine the map with a simple spreadsheet that identifies potential 'sender ' sites by Assessors Parcel Number, and the maximum development potential under current zoning for each parcel. The spreadsheet could then be combined with a list of which the four covered species would potentially need mitigation on each of the sites. CNPS assumes this has already been done in order to generate the acreage figures given in the DHCP.

The zoning map (Los_Osos_URL_LUC) does have some errors, such as the inclusion of the 'Butte Property' at the west end of Butte Drive as having development potential as residential suburban (now State Park) , the eucalyptus groves west of Inyo St. as single family residential (conserved as mitigation of tract development), the Palisades area and leachfield areas south of Highland Drive as single family residential (incorporated into CDFW reserve, and conserved and restored as mitigation), the 'Powell 3' lands east of the Junior High School (incorporated into Morro Bay State Park), the now-protected site west of the library zoned as commercial but now protected as a mitigation area, the eastern addition to Sweet Springs Preserve zones as single family residential, the properties south of the "Palisades" land acquisition, including the "Silva" purchase zones as rural residential and now within the CDFW reserve, and probably others. However it is this map that governs development, and should be the main basis for allocating resource take and mitigation.

8.11 (cont'd)

As it is very difficult to resolve impacts to specific areas within the DHCP from the contained maps and tables, a simple overlay of the current zoning map, irrespective of any errors (as listed above), would show the 'sending' potential of each lot, and also the potential 'receiving' potential of other lots.

Another issue is the build-out potential of larger lots incorporated within the Coastal Commission's ESHA designation. For example, larger lots east of 18th St and west of South Bay Blvd. are zoned single family residential, but have not been subdivided. If further subdivision of ESHA is not permitted, then the potential number of lots might be different from those recognized in the DHCP.

(2) Section 4.3.1.3, Net Impacts on Morro manzanita. The DHCP is unclear regarding the location of the 51.7 acres of habitat that would be protected through the conservation strategy.

The DHCP reflects that Morro manzanita is a federally Threatened species, and has a CNPS status of 1B.2. Section 4.3.1.1, page 4-17 of the DHCP, indicates that Central Maritime Chaparral, a rare natural community, occupies 798 acres within the DHC Plan area. It is estimated that 62 percent of this is within existing protected lands.

8.12

The habitat that would be protected through the conservation strategy, referred to on pages 4-18 and 19 of the DHCP,is appears to include lands already managed for species conservation, including those protected in the Greenbelt by actions of MEGA and others in the 1990s, and protected against planned development in those areas. This must be considered as part of the EXISTING total acreage for Morro manzanita,

and any losses would be mitigated by the protection of additional lands. It should not be considered as a gain in net protection. The DHCP should reflect mitigation against future species take, it should NOT consider land that currently protects species as mitigation against further species take, as there is no gain in the amount of protected land.

However, "Section 5.3.1.2 Priority Conservation Area" states: "*A key consideration in developing the habitat protection, restoration, and management measures is where they should take place; specifically, what land should be included in the LOHCP Preserve System to maximize the benefits for the covered species. Therefore, the LOHCP planning process evaluated habitat within the Plan Area for protection, restoration, and management. Properties that will ultimately be included in the LOHCP Preserve System will be determined during implementation of the plan by the Implementing Entity, which will work with willing landowners to acquire additional lands (Section 6.2.2)* ***and enroll existing protected lands in the Preserve System based on approval from the USFWS (Section 6.2.3).*** *"*

CNPS notes that Morro manzanita habitat within existing conservation areas is generally stable and not under serious threat requiring active management, except for a few areas with invasive plants. CNPS also notes that where the DHCP identifies potential but unoccupied manzanita habitat, it is likely to be in low shrubland plant associations more suitable for recovery actions for snail and K-rat. The DHCP does not provide a map or any other method for locating land with restoration potential and the capacity to increase manzanita population. An inference that such lands exist in sufficient quantities to mitigate losses is unsubstantiated.

8.12 (cont'd)

In addition, in Section 6.2.3.1, the DHCP states that habitat that can be enrolled in the DHCP should "*have management or restoration needs that are not the current responsibility of the landowner/manager and met by available resources.*" However the large manzanita habitat area east of the Broderson Drive extension and west of Bayview Heights Drive is under the management of the California Department of Fish and Wildlife, and was purchased with the express intent of protecting native species. It is incorporated into the Morro Dunes Ecological Reserve. Thus it seems it would not meet the enrollment criteria. The legal ability of this land to accept mitigation may also be limited by constraints imposed by the Wildlife Conservation Board in providing substantial funding to the purchase of this land.

So, if enrollment of existing protected lands will not function as sufficient mitigation, then acquisition of unprotected and critical manzanita habitat such as that south of Cabrillo Estates is probably the only serious option open to gaining sufficient Manzanita mitigation under the DHCP. It is important to gauge the ability of the DHCP to produce sufficient funding to protect these critical lands. It is regrettable that the DHCP does not address these lands in any specific manner, immersing them in an overall estimation of affected acreage. As the owner began the process of lot line adjustment on the land south, east and west of Cabrillo Estates which would have constrained development and protected the majority of the manzanita habitat, the possibility of using this technique together with use of conservation easements

should at least be mentioned as a possible option within the DHCP. Quantification of 'take' potential for development within the core manzanita habitat is clouded by the possible subdivision potential of existing lots under the current land zoning designations.

8.12 (cont'd)

(3) Section 4.3.1.3, Net Impacts on Morro manzanita. The DHCP is unclear regarding location of the 22.3 acres of Restorable Habitat that would be protected through the conservation strategy.

The proposed restoration of 22.3 acres of Morro manzanita habitat, referred to on page 4-19 of the DHCP, and included in Table 5-10 for the Morro Dunes Ecological Reserve, is quite vague in terms of location, and is questionable as to its need. Manzanita habitat has naturally been increasing into the lower slopes of the CDFW property, and there is no degradation in the mature stands besides what appears to be displacement of a later seral stage (oak) that overshades and kills manzanita due to light reduction.

While there has been erosion of trails on CDFW due to heavy horse traffic within manzanita habitat, the zones of disturbance are narrow but deeply incised. Horse riders have cut and trimmed manzanita along these trails to enable passage. Complete closure of these sections of trail might increase canopy cover, but offer little opportunity for restoration planting. Elsewhere, the loose sand along the horse trails in more open shrubland has resulted in invasion of veldt grass, which favors disturbed, sandy soils. Some restoration might be achieved by stopping horse traffic, but CDFW has not been inclined to take that step.

8.13

If the intention is to plant or establish manzanita into open sandy areas currently occupied by low shrubs, that would displace habitat for K-rat and snail, so this is unlikely to be done. The DHCP is therefore too vague, and should identify specifically what is considered to be a suitable receiver and recovery site, and exactly what mitigation is proposed.

Note that in a comment letter from UFWS to Mark Hutchinson, SLO County Planner in response to the preparation of a cancelled DHCP for the Los Osos Wastewater Plant, dated January 29, 2009, the Service noted: *Morro manzanita:This species of manzanita does not have a burl and, as such, is not a likely candidate for salvage and transplant as part of any mitigation strategy.*

(4) Section 4.3.1.3, Net Impacts on Morro manzanita. The claim that Morro manzanita will have a 8:1 gain in habitat in a program that justifies 'take' is questionable.

The 8:1 'advantage' to Morro manzanita from adoption of the HCP is highly questionable, as it can be demonstrated that existing habitat is stable and that land conversion to shrubland would be adverse to the requirements of covered animal species. Suitable lands for supposed restoration and gain in habitat have not been shown as being present. This false 8:1 figure is gained by including previously protected habitat and counting it as a net addition. This would not contribute to

8.14

species recovery. These numbers should be recalculated to reflect the comments above under item #2. This supposed gain in habitat forms the basis for one of the key conclusions of the impact assessments: namely, that implementation of the conservation program is anticipated to (1) mitigate the anticipated impacts to Morro manzanita, resulting in less than significant impacts under CEQA; and (2) offset impacts to Morro manzanita such that effects associated with the proposed action would not rise to a significant level under NEPA. Again, we question these conclusions based on the arguments presented in this comment letter.

8.14 (cont'd)

Part of the 8:1 seems to be derived from active management within mature Manzanita habitat , which is not needed, although it is possible that veldt grass removal from the northern and mid slope fringes of Morro Manzanita dominated shrubland would be of use. Such habitat would probably be more suitable for restoration of snail and K-rat habitat.

(5) Section 4.3.1.3, Net Impacts on Morro Manzanita. CNPS questions the assertion that part of the of the 22.3 acres planned for restoration of Morro manzanita can be restored "*by conducting fire management to promote regeneration of the populations, as needed*" due to the proximity of housing and the lack of any control-burn planning in this area by fire agencies.

The DHCP acknowledges on page 4-8 (fourth paragraph) that implementation of covered activities may exacerbate fire exclusion by further impeding the use of fire as a management tool; however, the DHCP on page 4-19 (second bullet) then states that it will be used in restoration of Morro manzanita habitat. This is an apparent contradiction that needs to be rectified.

In addition, Cal Fire plans to conduct fuel hazard abatement projects at the wildland-urban interface. In Section 2.2.7, page 2-19, fourth paragraph, The DHCP states "*CALFIRE estimates that approximately one-third of the total 89.4-acre treatment area would be retreated annually depending on site-specific conditions, the need for hazard abatement activities, and funding. A maximum distance of 50 feet from structures would be mowed in non-native grassland areas, with the shaded fuel breaks established to complete a total distance of 100 feet from structures. This 100-foot distance is considered the minimum strategically-effective distance necessary for hazard abatement. Mowing would likely be done every two to three years, with maintenance of established shaded fuel breaks occurring every three to four years after they are created. "*

8.15

Thus any structures built on manzanita-dominated slopes included within the southern edges of the DHCP area will be surrounded by extensive manzanita removal envelopes, together with services such as roads. Roads may be multiple due to policies against dead-ending roads without alternative wildfire escape routes. Such roads also have associated fire treatment areas. Regarding fire clearance, as noted in the DHCP on page 3-17, basal cutting manzanita kills the plant, which does not resprout from cut stump or stems, as it is an 'obligate seeder'.

(6) Section 4.3.1.1, Morro Manzanita, Impacts to Habitat. A significant portion of the core habitat for Morro Manzanita lies within the southern bounds of the DHCP and the limitations of current Residential Suburban zoning.

Developments of up to 40 lots were once proposed on the land above Cabrillo Estates (outside the Urban Services Line), and were approved by the Board of Supervisors until rejected by the Coastal Commission (1988 Vesting Tentative Tract Map 1873). The estimated impact acreage of 40 acres as indicated on page 4-17, first paragraph, and Table 4-5, page 4-44 of this DHCP for Morro manzanita habitat (Central Maritime Chaparral) could be seriously underestimated unless such subdivision is specifically prevented by the upcoming Los Osos Community Plan[1]. Figure 2-4 in the DHCP appears to show 6 parcels in this area and labels the Land Use as Residential Single Family (RSF) according to the Estero Area Plan (but gives no date for the plan). Figure 2-2 in the DHCP entitled "Land Use" shows this area as Residential Suburban, a subtype of Single Family Residential. 8.16

Does the DHCP assume that each of these lots would yield one home site, or would the lots yield as many sites as the residential suburban zoning allows?

(7) General Comment. The DHCP does not address or balance conflicting land management requirements concerning the four covered species.

The habitat needs of Morro Bay kangaroo rat (MBKR) and Morro manzanita are very different. Original core habitat areas for MBKR were the low shrublands in the lands south of Highland Drive (see Figure 1 attached to this letter at end of text), and the Army Road area south of Shark Inlet. Both of these areas were subject to areas of vegetation clearance for crops and for military exercises around WWII. This provided the very open country which appears critical to MBKR, and regrowth of vegetation would also explain much of the present MBKR scarcity. Thus large-scale clearances of existing shrubland might be seen as a positive for MBKR habitat and a negative for manzanita habitat. Given the greater weight that has historically been applied to animal protection relative to plant protection, this potential conflict should be addressed. 8.17

It is noted that this potential lack of balance is tangentially addressed in the EIR mitigations (e.g., MM Bio 1a) in that biological resource screenings must evaluate the Preserve system for suitable habitat and ensure "this approach would not result in conflicts with the needs of the covered species…" We believe this should be more thoroughly covered in the DHCP document.

8. Section 3.1.5.2.2, Page 3-7, The DHCP fails to recognize the Morro Manzanita-Coast Live Oak plant community series 8.18

Previous work (2009 DHCP) recognized five community series with a Morro Manzanita dominant. These are Morro Manzanita, Morro Manzanita- Wedgeleaf

[1] The Estero Area Plan Update, page 7-49, limits Residential Suburban land divisions to "one per five acres of gross site area."

Ceanothus, Morro Manzanita- Coast Live Oak, Morro Manzanita-California Sagebrush, and Morro Manzanita-Chamise. The 2019 DHCP , in Figure 3-4, and in text on pages 3-7 and 3-8, recognizes all but the Coast Live Oak series, but both vegetation maps from these studies label the area east, west and south of Cabrillo Estates as 'Morro manzanita' when significant portions are Morro Manzanita- Coast Live Oak. Mapping by Tyler and Odion (1996) in a report to CDFW (then CDFG) reported 50-75% manzanita cover west and south of Cabrillo Estates, and the same plus a large area of 75-100% cover to the east In these areas nearly all of the minority component is Coast Live Oak. As compensatory mitigation is essentially quantitative, it is important to have a better idea of the real numbers of plant individuals or amount of cover involved (see Figure 2 attached to this letter at end of text).

8.18 (cont'd)

CNPS believes that updated surveys should be conducted in the Morro manzanita habitat area using CNPS or other quantitative protocols to document cover values in the various associations present within the manzanita habitat area. The SLO Chapter has actually conducted several protocol surveys in this area using trained volunteers and has plans to conduct additional surveys in the near future. Some of our experts question the mapping of the habitat types in the Los Osos area given the National Vegetation Classification Standard (NVCS) adopted by the State of California (Sawyer, Keeler-Wolf and Evens, 2009; https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities).

(9) General Comment. The Final HCP should resolve a potential issue concerning use of former Palisades Property (Now CDFW Reserve, Bayview Unit) and possibly other properties that have received encumbered state or federal funding

The Morro Palisades Property, south of Highland, east of Broderson, and west of Bayview Hts Drive (a portion of the Bayview Unit, Morro Dunes Ecological Reserve, shown on Figure 2-3 of the DHCP), was purchased from The Morro Palisades Company in the year 2000 using funds that included a CalTrans EEMP grant, a State Budget line item, and a Wildlife Conservation Board (WCB) donation of $1.4 million. It is not unusual for WCB to condition such grants with certain deed restrictions. For example, a recent WCB grant contained the following language:

8.19

"The Property may not be used to satisfy any requirement or condition imposed by any permit, agreement, authorization or entitlement for use ("Mitigation"), including but not limited to any requirement to compensate for or otherwise offset impacts of an activity, without the written approval of the State acting through the Executive Director of WCB or its successor"

Therefore any lands purchased in the Los Osos greenbelt using restricted funds might potentially be restricted in terms of their use as mitigation space for species 'take' within the framework of the HCP.

Active management within mature Manzanita habitat is not needed, but it is possible that veldt grass removal from the northern and mid slope fringes of Morro Manzanita dominated shrubland would be of use.

8.19 (cont'd)

We thank you for the opportunity to participate in this important process. In summary, CNPS believes that the implementation of the DHCP will result in a net loss to existing populations of Morro manzanita, in addition to damage to a rare and endemic natural community, Morro manzanita chaparral, recognized by the CDFW as a global- and state-rare alliance that consists of fewer than 6 viable occurrences (Sawyer, Keeler-Wolf, and Evens, 2009).

8.20

Sincerely,



Conservation Chair:
San Luis Obispo Chapter, CNPS
1530 Bayview Heights Drive, Los Osos, CA 93402
(805) 528-0914 dchippin@calpoly.edu

Letter sent via email, November 22, 2019

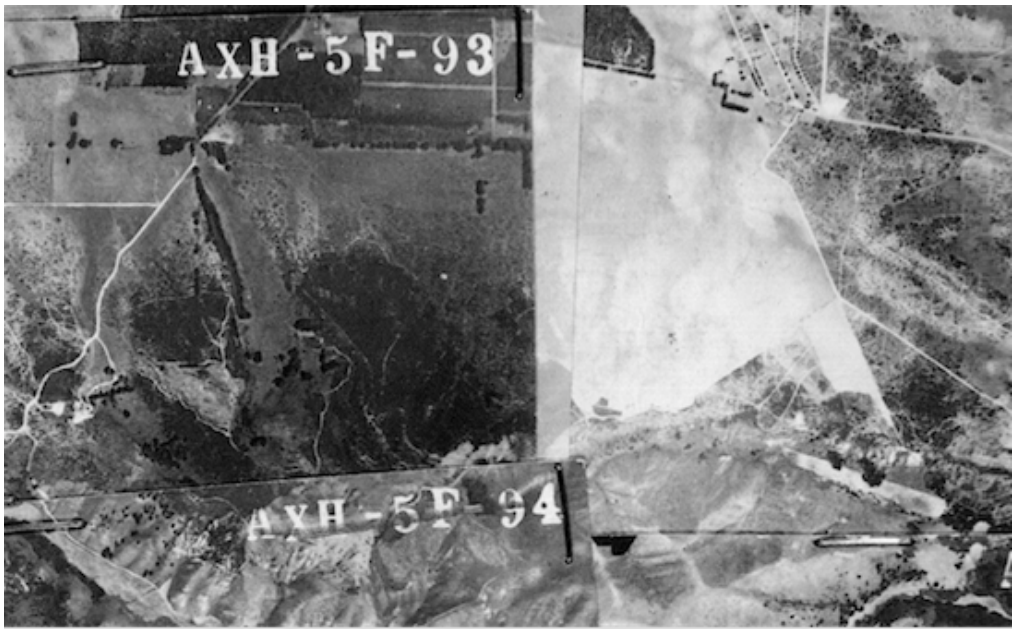


Figure 1: 1948 photos showing cleared land west of Bayview Heights Drive and Calle Cordoniz, and east of Broderson

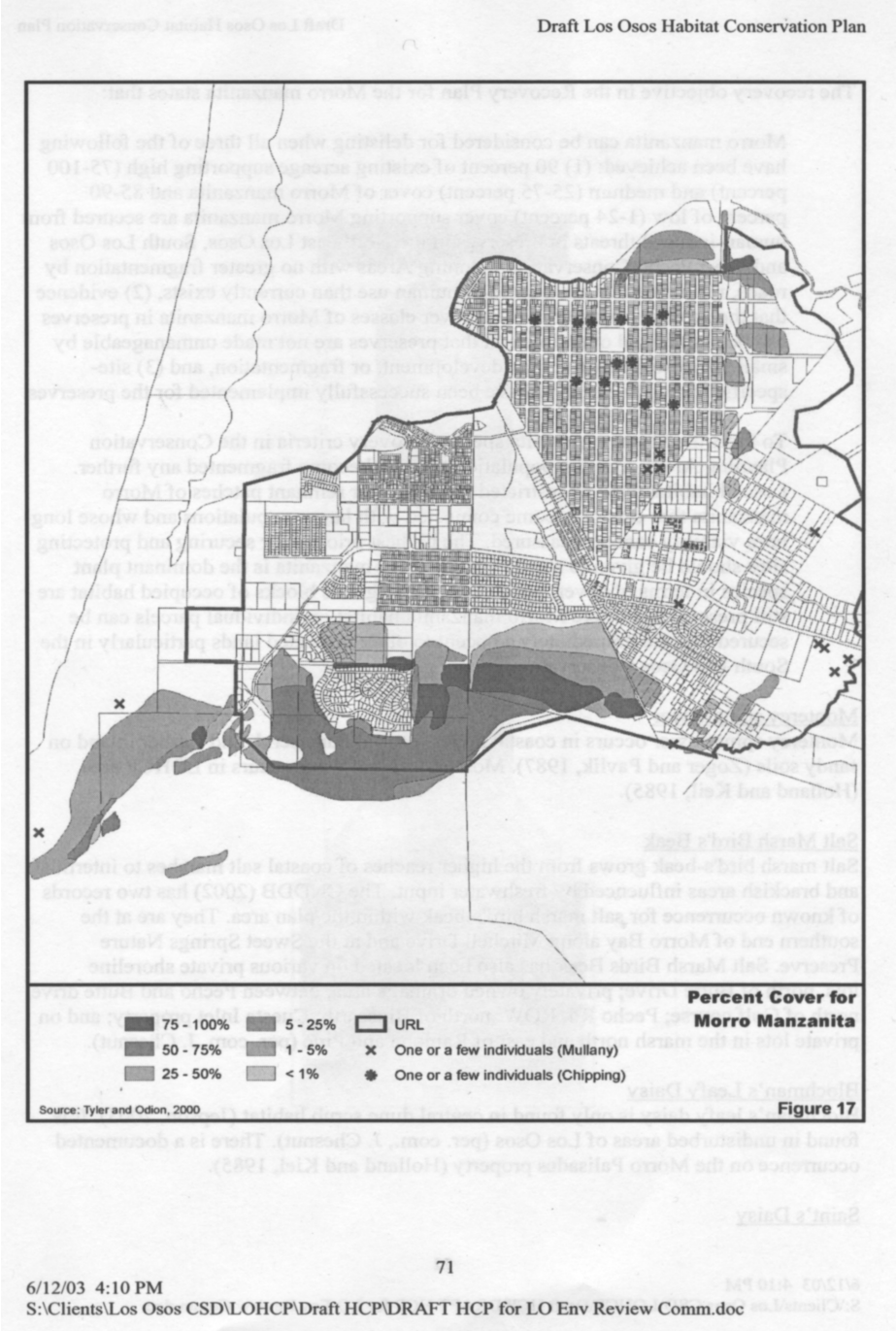


Figure 2: Manzanita habitat from the 2009 DHCP, derived from Tyler and Odion (2000)

Letter 9

Lisa Denker
1347 Pasadena Drive , Los Osos CA 93402

November 18, 2019

Ventura Fish and Wildlife Office

To: Ventura Fish and Wildlife Office and Planning& Building Kerry Brown,

Subject: Los Osos resident input for 2019 Habitat Conservation Plan for Los Osos.

We live on the Baywood Peninsula and are stewards of south facing shoreline property. Having lived here for over 25 years our family has seen a huge change in the wildlife of this special local, along with seeing first hand the growing stressors that are adding up to interfere with the shores seabird activity and birds of all types on our coastal dune shoreline. As the local community activity has grown here in Baywood Park along with more daily visitors, we have seen wildlife diminishing at a dramatic rate. When looking at the Habitat Conservation Plan, it seems void of acknowledgement that the Baywood Park peninsula shoreline is a habitat. On map Figure 6 - Vegetation Communities within the Plan Area, there is no acknowledgement of the true scope of shoreline intertidal habitat area that the Pickleweed grows in, it is not shown on the Baywood Peninsula at all. By not acknowledging the amount of Pickleweed / Saliconia virginica at all, along with the special plant community at the intertidal and high tide mark, the map graphic does not seem to be a true inventory of the array of rare special native plants in this highly impacted zone. Inventory is critical for knowing what we have - both plant and animal, so that it can be looked out for as good stewards into the future. For example, the extremely rare/almost extinct Suaeda Californica is a plant growing on the Baywood Peninsula, and it should be protected at all costs. Studies are being done planting it in the Bay Area for creating wildlife habitat as sea level rises. 9.1

The stressors are many, from human and dog foot traffic along the shores edge, noise, and from invasive plants like ice plant smothering out what grows here natively. By not showing the shores edge plant communities, the map makes it questionable as to whether “1.3 acres” is accurate. Just along the creek alone

looks to be many acres. Additionally, Map 7 Critical Habitat within the Plan Area, omits habitat on the bay shoreline of Los Osos that hosts sensitive natural communities.

9.1 (cont'd)

The question of how management will be done to deal with growing population impacts on the bay directly from human foot traffic is really something to work out. By minimizing erosion of human foot traffic, the plant communities can continue to live here, along with an invasive plant removal management system that is long overdue here on the Baywood peninsula. Also, limiting where to walk by use of paths and signage, installing trash cans at access lateral points, education of the leash ordinance and enforcement. The shoreline areas need to have an invasive plant removal programs(long over due), plus a replanting program where soil stabilization needed to prevent erosion, especially on the entire Baywood Peninsula which is over run by exotic ice plant/Carpobrotus Edulis and Conicosia Pugioniformis, plus Velt grass problem, and English Ivy/Hedera Helix(on north side of Baywood Peninsula surrounding the Audubon Outlook to the east and west.

9.2

Lastly, I think it is time to adopt two forward thinking impacts upon the bay. First become a pesticide free zone(At minimum, a no-RoundUp zone), and secondly abolish hunting on the Estero Bay. With smaller birds counts yearly, it just makes since to give them the retreat they need.

9.3

Sincerely yours,

Lisa Denker

Letter 10

Vanderwier, Julie <julie_vanderwier@fws.gov>

[EXTERNAL] Support for San Luis Obispo County Incidental Take Permit

1 message

James Gentilucci [redacted] Wed, Oct 9, 2019 at 11:34 AM

To: "julie_vanderwier@fws.gov" <julie_vanderwier@fws.gov>, [redacted]

Stephen P. Henry, Field Supervisor

Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service

2493 Portola Road, Suite B

Ventura, CA 93003

Dear Mr. Henry:

10.1

My wife and I have lived in Los Osos since 1980, and we own both our primary residence and an undeveloped building lot located within the current wastewater prohibition zone. We have been in touch with the Planning Department of San Luis Obispo County, and they told us to expect publication in the Federal Register of the Los Osos HCP sometime this summer/fall. We are please to learn that this has occurred, and your office is seeking input from community residents.

We are writing to share our **strong support** of the County's application for an incidental take permit (ITP) under section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et seq.). More than 30 years of conservation efforts and exceptional land use management have prepared Los Osos to move ahead with judicious use of land previously unavailable for development. We understand that now the community wastewater system is in place, the Los Osos Community Plan, which includes the HCP, and improvements to our water system must be resolved before the Community Plan can be adopted by the County Board of Supervisors. We are excited that once the remaining regulatory issues are resolved, the community can move ahead with much desired and long-awaited local improvements such as a dog park, a new library, home remodels/additions, and infill lot development.

The HCP submitted by the County is comprehensive in scope and represents countless hours of intense and thoughtful deliberations among local scientists, County planners, local residents, and government officials. Consequently, **we believe it to be the best way forward** for managed growth while protecting threatened/endangered species and the general environment of our of our beautiful community.

Kindly add our names to the **list of supporters** for the application.

Most sincerely

James Gentilucci, Ph.D.

Catherine Gentilucci, M.B.A.

[redacted]

Letter 11

From: Eve Gruntfest <evegruntfest@gmail.com>
Sent: Sunday, November 17, 2019 7:32 PM
To: Kerry Brown <kbrown@co.slo.ca.us>; Leilani_takano@fws.gov
Subject: [EXT]Re: Response to Los Osos HCP Draft Environmental Impact Report (DEIR)

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

November 18, 2019

Department of Planning & Building
Attn: Los Osos HCP/Kerry Brown
976 Osos Street, Room 300
San Luis Obispo, CA 93408

And US Fish and Wildlife Service

Via E-mail: kbrown@co.slo.ca.us and to Leilani Takano: Leilani_takano@fws.gov

Re: **Response to Los Osos HCP Draft Environmental Impact Report (DEIR)**

Dear Ms. Brown and Ms. Takano:

Here are my comments on the HCP. I have benefited by the careful reading of the plan by my neighbors and add these comments for your consideration.

1. I strongly support Alternative 1 but it must be modified to account for the necessary wildfire mitigation efforts my neighbors at the Wildland-Urban Interface are demanding. Everyone in Los Osos will benefit from the wildfire mitigation efforts There must be an alternative that allows for the essential wildfire mitigation efforts to protect our town in the Community Wildfire Protection Plan but at the same time does not authorize the addition of thousands of new residents to Los Osos. 11.1

2. I agree with what my neighbor Ellen Nelson has found:

Figure 5-1 is a map showing the Priority Conservation Areas and comparing this to Figure 4-1 which shows the Morro Shoulderband Snail Habitat it shows that the Los Osos Nature Corridor is glaringly the only significant area of Primary Habitat that is not also designated as a Priority Conservation Area. The intricate ecology of the central corridor of Los Osos - what I refer to as the Los Osos Nature Corridor - must be considered in more detail than it is the HCP Draft EIR. 11.2

Protected Natural areas and Open Space benefit not only the endangered and threatened species that live there, but everyone who enjoys living in Los Osos.

3. Open Space areas should not only be on the edges of Los Osos, but in the center of town where the majority of residents and visitors can appreciate the walkable benefits they provide. 11.3

4. I second the comments of my neighbor Jeanne Howland when she writes in her comments: 11.4

Included in the 266 acres of Alternative 2 are 177 acres of Morro Manzanita Habitat and 151 acres of Morro Shoulderband Snail habitat or potential habitat. The LOHCP DEIR does not identify where the 266

acres in Alternative 2 are located. Potentially 62+ total acres shown as “Morro Shores Mixed-Use Area” (Figure 7-30 in the Los Osos Community Plan) are included in the 266 acres of Alternative 2.

Including the Morro Shores Mixed-Use Area (62+ acres) [Area] in Alternative 2 allows for two specific areas of concern:

The Area is too large to be statistically or logically covered under an Incidental Take Permit. The Morro Shores Mixed-Use Area [62+ acres] at 23% of the total acreage under review in the Alternative 2 proposal, should be subject to its own EIR. An ITP single family should apply to home construction.

The Area is located across the street from the Sweet Springs Nature Preserve (owned by the Morro Coast Audubon Society) and next to land owned by the San Luis Land Conservancy. Clearly constructior and use of commercial complexes, apartment/condo buildings or even single family homes in such close proximity (directly across a two-lane street and adjacent) to these habitat treasures of Los Osos is incompatible on seven levels: 11.4 (cont'd)

1. reduced air quality by more inhabitants and motorists;
2. reduction of biological resources by elimination of acreage for endangered species;
3. reduction of cultural resources by desecration of documented historical native Chumash habitation lands and territory;
4. geology and soils degradation by disruption of historically undisturbed land;
5. reduction of water availability by allowing more people to move to Los Osos where water is a limited resource given the historically documented lack of available community water
6. increased noise by increased population living and shopping in this area;
7. increased transportation and traffic congestion in an area already identified as needing reconfiguration (4th St and Ramona intersection).

In the past Community comments to Draft Environmental Impact Reports have seemingly been ignored as indicated by lack of inclusion of the multi-organization (Surfrider, Santa Lucia Chapter of the Sierra Club, SLO Green Build, Terra Foundation, Los Osos Sustainability Group and Northern Chumash Tribal Council) 2008 work product presented to the San Luis Obispo County Board of Supervisors (at the request of then County Board of Supervisor Chairman Patterson) entitled: *Statement of Key Environmental Issues for the Collection System of the Los Osos Wastewater Treatment Project;* and, the January 30, 2009 response by the Surfrider Foundation to the Draft Environmental Impact Report for the Los Osos Wastewater Project. 11.5

Los Osos is included in the Morro Bay National Estuary. The DEIR does not currently include comments or findings related to this nationally designated area devoted to sensitive habitat. 11.6

I support the adoption and certification of Alternative 1 in this proposal. A map clearly showing the proposed Alternative 2 plan **must** be included in any final documentation. 11.7

According to CEQA Guidelines, if significant new information is added to the EIR in response to public comment, the County should prepare a revised Draft EIR prior to certification pursuant to *CEQA Guidelines* Section 15088.5(a)(4) and make sure that it has adequate public review. 11.8

Sincerely,

Eve Gruntfest

633 Ramona Ave Space 126

Los Osos, CA 93402

evegruntfest@gmail.com

Letter 12

November 11, 2019

Department of Planning & Building
Attn: Los Osos HCP/Kerry Brown
976 Osos Street, Room 300
San Luis Obispo, CA 93408

Via E-mail: kbrown@co.slo.ca.us

Re: **Response to Los Osos HCP Draft Environmental Impact Report (DEIR)**

Dear Ms. Brown:

The current web page for the San Luis Obispo County, Planning & Building Departments (posted in October 2019) states under the Los Osos Habitat Conservation Plan (HCP) summary:

"The County is seeking a programmatic incidental take (ITP) permit from the US Fish and Wildlife Service. The County, as the applicant, is requesting a permit term of **25 years** to authorize 'take' [as defined by California Department of Fish and Wildlife: to hunt, pursue, catch, capture or kill or attempt to do so] of covered species associated with covered activities in the HCP area, which is approximately 3,560 acres."

The covered activities in the HCP are:

- Commercial and residential development and redevelopment on privately-owned parcels;
- Public entity and private utility company facility and infrastructure development projects;
- Public entity and private utility company activities to operate and maintain, including repair and replace existing facilities; and
- Activities conducted to implement the Habitat Conservation Plan conservation strategy.

12.1

The SLO County summary further states that "the purpose of issuing a programmatic incidental take permit (ITP) is to allow the County to authorize the covered activities while conserving the covered species and their habitats. Adoption of the Habitat Conservation Plan and issuance of the incidental take permit(s) will facilitate a streamlined permitting process and also provide a cohesive conservation strategy managed by one entity with a single funding source. The Conservation strategy will focus on expansion, conservation, maintenance and enhancement of the Los Osos greenbelt."

"To mitigate the effects of the covered activities on the covered species, which could otherwise threaten their persistence, the County will be responsible for the implementation of the LOHCP conservation program – a conservation program designed to avoid, minimize and mitigate the impacts of the covered activities to the maximum extent practicable. Given the rarity of these narrowly endemic covered species, this regional plan is also designed to contribute to their recovery by arresting and reversing threats to survival to ensure long-term persistence."

In other words the SLO County Planning and Building Department proposes to implement conservation measures over 3,560 acres for a period of 25 years in the Los Osos defined area, by allowing hunting, pursuing, catching, capturing or killing federal and state protected species to streamline the permitting process. Further the "conservation program designed to avoid, minimize and mitigate the impacts of

12.2

the covered activities to the maximum extent practicable" and . . ."designed to contribute to their recovery by arresting and reversing threats to survival to ensure long-term persistence" **is not mentioned or included** in the Los Osos Habitat Conservation Plan EIR as currently presented.

12.2 (cont'd)

The Los Osos Habitat Conservation Plan (LOHCP) DEIR identifies two projected alternatives for approval and certification:

Alternative 1: No Project (Alternative required by CEQA). Under the No Project alternative the LOHCP would not be implemented.
Alternative 2: Reduced Take. The LOHCP would be implemented but the maximum amount of development covered under the LOHCP and associated ITP would be 266 acres which is 50 percent of the maximum amount under the proposed project.

Included in the 266 acres of Alternative 2 are 177 acres of Morro Manzanita Habitat and 151 acres of Morro Shoulderband Snail habitat or potential habitat. The LOHCP DEIR does not identify where the 266 acres in Alternative 2 are located. Potentially 62+ total acres shown as "Morro Shores Mixed-Use Area" (Figure 7-30 in the Los Osos Community Plan) are included in the 266 acres of Alternative 2.

Including the Morro Shores Mixed-Use Area (62+ acres) [Area] in Alternative 2 allows for two specific areas of concern:

12.3

1. The Area is too large to be statistically or logically covered under an Incidental Take Permit. The Morro Shores Mixed-Use Area [62+ acres] at 23% of the total acreage under review in the Alternative 2 proposal, should be subject to its own EIR. An ITP single family should apply to home construction.
2. The Area is located across the street from the Sweet Springs Nature Preserve (owned by the Morro Coast Audubon Society) and next to land owned by the San Luis Land Conservancy. Clearly construction and use of commercial complexes, apartment/condo buildings or even single family homes in such close proximity (directly across a two-lane street and adjacent) to these habitat treasures of Los Osos is incompatible on a number of levels:
    a. reduced air quality by more inhabitants and motorists;
    b. reduction of biological resources by elimination of acreage for endangered species;
    c. reduction of cultural resources by desecration of documented historical native Chumash habitation lands and territory;
    d. geology and soils degradation by disruption of historically undisturbed land;
    e. reduction of water availability by allowing more people to move to Los Osos where water is a limited resource given the historically documented lack of available community water;
    f. increased noise by increased population living and shopping in this area;
    g. increased transportation and traffic congestion in an area already identified as needing reconfiguration (4th St and Ramona intersection).

In the past Community comments to Draft Environmental Impact Reports have seemingly been ignored as indicated by lack of inclusion of the multi-organization (Surfrider, Santa Lucia Chapter of the Sierra Club, SLO Green Build, Terra Foundation, Los Osos Sustainability Group and Northern Chumash Tribal

12.4

Council) 2008 work product presented to the San Luis Obispo County Board of Supervisors (at the reques of then County Board of Supervisor Chairman Patterson) entitled: *Statement of Key Environmental Issue for the Collection System of the Los Osos Wastewater Treatment Project;* and, the January 30, 2009 response by the Surfrider Foundation to the Draft Environmental Impact Report for the Los Osos Wastewater Project.

12.4 (cont'd)

Another indication of past lack of due diligence by SLO County Planning and Building, is the current controversy in the poor air quality for Nipomo housing compromised by dust particulates blowing from the Nipomo sand dunes. It is abundantly clear that the San Luis Obispo County EIR that allowed for housing development adjacent to the Nipomo dunes was not properly investigated or researched. Now public access to the Nipomo dunes is threatened while a reasonable compromise is being investigated by County staff and the California Coastal Commission. A lack of thorough research, documentation and a rush to approve an EIR for development in order to allow –

> "Implementation of a programmatic, multi-species Habitat Conservation Plan, rather than a species-by-species or project-by-project approach, will maximize the benefits of conservation measures for covered species and eliminate potentially expensive and time-consuming efforts associated with processing individual incidental take permits for each project within the proposed Habitat Conservation Plan area";

12.5

as proposed by the SLO County in this Draft EIR, is a false avoidance of potentially expensive and time-consuming activities for land use and development in Los Osos' future.

Los Osos is included in the Morro Bay National Estuary. The DEIR does not currently include comments or findings related to this nationally designated area devoted to sensitive habitat.

12.6

I support the adoption and certification of Alternative 1 in this proposal. A map clearly showing the proposed Alternative 2 plan **must** be included in any final documentation.

12.7

According to CEAQ Guidelines, if significant new information is added to the EIR in response to public comment, which I believe will be the case given the information presented here, I would urge the County to recirculate a revised Draft EIR prior to certification pursuant to *CEQA Guidelines* Section 15088.5(a)(4).

12.8

I hope that the County will accept and respond to my comments in earnest.

Sincerely,

Jeanne Howland
633 Ramona Avenue, Space 127
Los Osos, CA 93401
805.235.7067
Jghowland58@hotmail.com

Letter 13

November 17, 2019

Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service
Attn: Stephen P. Henry, Field Supervisor
2493 Portola Road, Suite B
Ventura, CA 93003

Via E-mail: julie_vanderwier@fws.gov

Re: **Response to Los Osos HCP Draft Environmental Impact Report (DEIR)**

Dear Ms. Vanderwier:

The current web page for the San Luis Obispo County, Planning & Building Departments (posted in October 2019) states under the Los Osos Habitat Conservation Plan (HCP) summary:

"The County is seeking a programmatic incidental take (ITP) permit from the US Fish and Wildlife Service. The County, as the applicant, is requesting a permit term of **25 years** to authorize 'take' [as defined by California Department of Fish and Wildlife: to hunt, pursue, catch, capture or kill or attempt to do so] of covered species associated with covered activities in the HCP area, which is approximately 3,560 acres."

The covered activities in the HCP are:

- Commercial and residential development and redevelopment on privately-owned parcels;
- Public entity and private utility company facility and infrastructure development projects;
- Public entity and private utility company activities to operate and maintain, including repair and replace existing facilities; and
- Activities conducted to implement the Habitat Conservation Plan conservation strategy.

13.1

The SLO County summary further states that "the purpose of issuing a programmatic incidental take permit (ITP) is to allow the County to authorize the covered activities while conserving the covered species and their habitats. Adoption of the Habitat Conservation Plan and issuance of the incidental take permit(s) will facilitate a streamlined permitting process and also provide a cohesive conservation strategy managed by one entity with a single funding source. The Conservation strategy will focus on expansion, conservation, maintenance and enhancement of the Los Osos greenbelt."

"To mitigate the effects of the covered activities on the covered species, which could otherwise threaten their persistence, the County will be responsible for the implementation of the LOHCP conservation program – a conservation program designed to avoid, minimize and mitigate the impacts of the covered activities to the maximum extent practicable. Given the rarity of these narrowly endemic covered species, this regional plan is also designed to contribute to their recovery by arresting and reversing threats to survival to ensure long-term persistence."

In other words the SLO County Planning and Building Department proposes to implement conservation measures over 3,560 acres for a period of 25 years in the Los Osos defined area, by allowing hunting, pursuing, catching, capturing or killing federal and state protected species to streamline the permitting

13.2

process. Further the "conservation program designed to avoid, minimize and mitigate the impacts of the covered activities to the maximum extent practicable" and . . ."designed to contribute to their recovery by arresting and reversing threats to survival to ensure long-term persistence" **is not mentioned or included** in the Los Osos Habitat Conservation Plan EIR as currently presented.

13.2 (cont'd)

The Los Osos Habitat Conservation Plan (LOHCP) DEIR identifies two projected alternatives for approval and certification:

Alternative 1: No Project (Alternative required by CEQA). Under the No Project alternative the LOHCP would not be implemented.
Alternative 2: Reduced Take. The LOHCP would be implemented but the maximum amount of development covered under the LOHCP and associated ITP would be 266 acres which is 50 percent of the maximum amount under the proposed project.

Included in the 266 acres of Alternative 2 are 177 acres of Morro Manzanita Habitat and 151 acres of Morro Shoulderband Snail habitat or potential habitat. The LOHCP DEIR does not identify where the 266 acres in Alternative 2 are located. Potentially 62+ total acres shown as "Morro Shores Mixed-Use Area" (Figure 7-30 in the Los Osos Community Plan) are included in the 266 acres of Alternative 2.

Including the Morro Shores Mixed-Use Area (62+ acres) [Area] in Alternative 2 allows for two specific areas of concern:

13.3

1. The Area is too large to be statistically or logically covered under an Incidental Take Permit. The Morro Shores Mixed-Use Area [62+ acres] at 23% of the total acreage under review in the Alternative 2 proposal, should be subject to its own EIR. An ITP should apply to single family home construction not 62+ acres.
2. The Area is located across the street from the Sweet Springs Nature Preserve (owned by the Morro Coast Audubon Society) and next to land owned by the San Luis Land Conservancy. Clearly construction and use of commercial complexes, apartment/condo buildings or even single family homes in such close proximity (directly across a two-lane street and adjacent) to these habitat treasures of Los Osos is incompatible on a number of levels:
    a. reduced air quality by more inhabitants and motorists;
    b. reduction of biological resources by elimination of acreage for endangered species;
    c. reduction of cultural resources by desecration of documented historical native Chumash habitation lands and territory;
    d. geology and soils degradation by disruption of historically undisturbed land;
    e. reduction of water availability by allowing more people to move to Los Osos where water is a limited resource given the historically documented lack of available community water;
    f. increased noise by increased population living and servicing in this area;
    g. increased transportation and traffic congestion in an area already identified as needing reconfiguration (4th St. and Ramona intersection).

In the past Community comments to Draft Environmental Impact Reports have seemingly been ignored as indicated by lack of inclusion of the multi-organization (Surfrider, Santa Lucia Chapter of the Sierra

13.4

Club, SLO Green Build, Terra Foundation, Los Osos Sustainability Group and Northern Chumash Tribal Council) 2008 work product presented to the San Luis Obispo County Board of Supervisors (at the reques of then County Board of Supervisor Chairman Patterson) entitled: *Statement of Key Environmental Issues for the Collection System of the Los Osos Wastewater Treatment Project;* and, the January 30, 2009 response by the Surfrider Foundation to the Draft Environmental Impact Report for the Los Osos Wastewater Project.

13.4 (cont'd)

Another indication of past lack of due diligence by SLO County Planning and Building, is the current controversy in the poor air quality for Nipomo housing compromised by dust particulates blowing from the Nipomo sand dunes. It is abundantly clear that the San Luis Obispo County EIR that allowed for housing development adjacent to the Nipomo dunes was not properly investigated or researched. Now public access to the Nipomo dunes is threatened while a reasonable compromise is being investigated by County staff and the California Coastal Commission. A lack of thorough research, documentation and a rush to approve an EIR for development in order to allow –

> "Implementation of a programmatic, multi-species Habitat Conservation Plan, rather than a species-by-species or project-by-project approach, will maximize the benefits of conservation measures for covered species and eliminate potentially expensive and time-consuming efforts associated with processing individual incidental take permits for each project within the proposed Habitat Conservation Plan area";

13.5

as proposed by the SLO County in this Draft EIR, is a false avoidance of potentially expensive and time-consuming activities for land use and development in Los Osos' future.

Los Osos is included in the Morro Bay National Estuary. The DEIR does not currently include comments or findings related to this nationally designated area devoted to sensitive habitat. 13.6

I support the adoption and certification of Alternative 1 in this proposal. A map clearly showing the proposed Alternative 2 plan **must** be included in any final documentation. 13.7

According to CEQA Guidelines, if significant new information is added to the EIR in response to public comment, which I believe will be the case given the information presented here, I would urge the County to recirculate a revised Draft EIR prior to certification pursuant to *CEQA Guidelines* Section 15088.5(a)(4). 13.8

I hope that the County will accept and respond to my comments in earnest.

Sincerely,

Jeanne Howland
[redacted]

Letter 14

J. H. EDWARDS COMPANY
A REAL PROPERTY CONCERN
Specializing in Water Neutral Development

November 18, 2019

Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service
2493 Portola Road, Suite B, Ventura, CA 93003
Stephen P. Henry, Field Supervisor

Via: *Email:* julie_vanderwier@fws.gov.

RE: Los Osos Habitat Conservation Plan; Environmental Assessment and Receipt of Application; Community of Los Osos, San Luis Obispo County, California
FWS-R8-ES-2019-NO77

Dear Mr. Henry,

Please consider these comments as they relate to subject Habitat Conservation Plan and Draft Environmental Assessment.

The unincorporated coastal area of Los Osos/Baywood Park largely serves as a "bedroom" community to the city of San Luis Obispo. In July of 1998 the Land Conservancy of San Luis Obispo County had prepared the Baywood and Los Osos Conservation Plan. The goal of the Conservation Plan was to protect sensitive habitat including the scenic quality of the larger surrounding open space and achieve both of these resources goals through voluntary interaction between land owners and public agencies. Since 1998, hundreds of acres of open space and multi-species habitat protection lands have been acquired and assembled into a greenbelt. 14.1

The subject Los Osos Habitat Conservation Plan (LOHCP) refers to the greenbelt area as the Priority Conservation Area (PCA). Today there are approximately 950 acres of existing protected lands in the planning area. According to Table 5-5 on page 5-55 approximately 800 of the 950 acres lie in the PCA. While the acquisition of additional protected lands may be relevant, the fundamental component of the LOHCP is to create a management function to administer the PCA.

The completion of the community wastewater facility in 2016 has set the stage for additional development in Los Osos, subject to further requirements. However, moving forward, constraints to development remain in the form of water resource limitations and residential growth management under Title 26 of the County Codes. In San Luis Obispo County, residential growth is limited to 2.3% per year. Individual communities within the county are able to establish growth rates at less than 2.3%. In the case of Los Osos, it is highly likely that the community will establish a residential growth rate of 1% through the Estero Area Plan update (Community Plan) and amendments to Title 26. This would equate to a maximum of approximately 50 new residential units per year. Commercial development and the

associated demand in Los Osos is quite modest and not expected to experience any rapid expansion over the term of the ITP, especially given the limited available land.

With restricted residential growth in mind, it should be the goal of the LOHCP to mirror the projected development including redevelopment and public/private utility projects. The LOHCP must achieve a balance between the goals of the plan with social, environmental and economic limitations of the community. For example, the majority of the community is currently saddled by $180 million of debt for the 2016 wastewater project. The debt includes $80 million loans to the State Revolving Fund and USDA respectively, in addition to $20 million of bonded indebtedness going back to the Los Osos Community Services District wastewater project. Given the limitations and burdens currently facing the community, I respectfully submit the preferred alternative is Alternative 2: Reduced Take, as outlined in paragraph 8.2 on page 8-2. "Under the Reduced Take alternative, the total acres of habitat disturbed by the covered activities would be capped at 266 acres, …" Over the course of the 25-year Incidental Take Permit (ITP) this would allow for over 10 acres of habitat to be eliminated each year, which again appears to be more proximate to the rate and scope of activities requiring coverage under the ITP. 14.1 (cont'd)

In Table 2-9, on page 2-33, a summary of anticipated covered activity impacts is provided. I respectfully submit the acreage estimates are inflated given the scope and rate of projected activity. For instance, residential development in the PCA will be very limited at a 3:1 ratio of conservation to development area. A further example indicates if every vacant single-family residential lot (6,000 sq. ft. average x 500 = 69 acres) were to be developed over the next 25 years, which is highly unlikely, the total impacts would affect less than 80 acres, as shown below. Yet, in Table 2-9, on page 2-33, the total area anticipated is over 150 acres. This is excessive. Likewise, existing developed parcels with redevelopment potential are anticipated to impact over 155 acres under the Proposed Plan (Alternative 4), which simply is not realistic in terms of timing and scope of redevelopment. Lastly, public and private utility projects include activities that are not likely to ever happen such as a 10-acre park or 3.5 acre aquatic center. There is a modest Los Osos public library expansion anticipated for the community that may be covered by the ITP and one new community expansion water well, which may or may not, require an ITP. 14.2

Realistic anticipated covered activities and impacts in acres under Alternative 2 should be as follows: 14.3

1. Private Land Development	
a. Single-Family Residential	80 acres
b. Multi-Family and Commercial	40 acres
2. Redevelopment	70 acres
3. Public/Private Utility Projects	65 acres
	255 acres

The LOHCP goes to considerable length to minimize the efficacy and appropriateness of Alternative 2, citing degradation due to invasive species, incompatible fire management and recreational uses and loss of "economies of scale" associated with the management effort. Most of the statements and arguments are conclusory and lack substantive support for the assertion. In the unlikely event, the Reduced Take cap of 266 acres was exceeded by projects or activities, they would have the ability to process individual HCP's as we have for the past 20 years or amend the subject ITP. Finally, if the arguments against Alternative 2 Reduced Take were accurate, few of the successes related to greenbelt formation and habitat management in Los Osos would have been realized since 1998. Additionally, the Draft Environmental Assessment provides a brief discussion of the Reduced Take Alternative under paragraph 2.3 on page 10. The discussion seems to agree that Alternative 2 (Reduced Take) "would allow for development within the 1,584-acre septic tank discharge prohibition zone." "As with the proposed action, issuance of an ITP under the Reduced Take Alternative would streamline compliance with the ESA for development within the 266-acre area and facilitate coordinated habitat restoration, management, and protection efforts with implementation of a Preserve System that is commensurate with the reduced level of Take." 14.4

In conclusion, Alternative 4: Proposed Plan which includes 532 acres of land projected to be impacted by covered activities; is overly excessive and overshoots the foreseeable needs of the community and the associated activities, which would require coverage under an ITP. Therefore Alternative 2 is the preferred alternative. The cost of this alternative is likely to be closer to the $10 million estimate projected in the February 2005 draft LOHCP. The implementation of Alternative 2 over the next 25 years, would likely lead to the delisting of the Morro shoulderband snail and provide permanent protection for the great majority of Morro manzanita habitat. 14.5

On a housekeeping note, I take considerable issue with Figure 5-3 Morro Bay Kangaroo Rat Avoidance Area on page 5-70. The map includes islands of undeveloped infill properties within the Urban Services Line (USL). Any K-Rat surveys or other requirements should be confined to the PCA. Secondly, Figure 4-2 Morro Manzanita Habitat, page 4-46. The map of Potential Biological Impacts/Take Assessments for the Morro Manzanita is inaccurate. The figure shows extensive Morro Manzanita habitat east of South Bay Blvd. which is simply not accurate. The Morro Manzanita are included in the Maritime Chaparral which typically occupy the North facing slopes primarily along the southern fringe of the community and a small area in the Elfin Forrest. Please eliminate all properties within the USL from any K-rat surveys or restrictions and correct the mapping of Morro Manzanita habitat. 14.6

Please feel free to contact me with any questions you may have.

Sincerely,

Jeff Edwards

Jeff Edwards

J. H. EDWARDS COMPANY
A REAL PROPERTY CONCERN
Specializing in Water Neutral Development

Letter 15

November 19, 2019

County of San Luis Obispo
Planning and Building Department
976 Osos Street, Room 300
San Luis Obispo, CA 93408
Attention: Kerry Brown/Project Manager, Sr. Planner

Via Email: kbrown@co.slo.ca.us

RE: Los Osos Habitat Conservation Plan Draft Environmental Impact Report
SCH#2013091071 September 2019/Rincon Consultants, Inc.

Dear Ms. Brown,

The following comments are related to the Draft Environmental Impact Report (DEIR) for the proposed Los Osos Habitat Conservation Plan (LOHCP).

As you know, the LOHCP contains four alternatives. They are Alternative 1: No Take. Alternative 2: Reduced Take. Alternative 3: Greater Mitigation Requirement and Alternative 4: Proposed Plan. Unfortunately, the DEIR only refers to Alternatives 1, the No Take Alternative & Alternative 2, the Reduced Take Alternative. Another confusing aspect is taken from the Draft Environmental Assessment (DEA) in that under paragraph 2.3 Reduced Take Alternative, on page 10, it states "…the County proposes to reduce the total acres of habitat used as a surrogate for Take resulting from covered activities to 266 acres, which represents 50 percent of that for the Proposed Action." The DEIR refers to Alternative 2: Reduced Take on a number of occasions but fails to adequately compare Alternative 2 with the proposed project. In fact; what analysis there is, beginning with paragraph 6.2.2 Impact Analysis on page 267 of the DEIR repeats the same statement 11 times. The Reduced Project Alternative…is "similar to the proposed project". 15.1

Alternative 2: Reduced Take would allow 266 acres in the plan area to be developed, while the proposed project would allow for up to 532 acres of land to be developed within the Plan Area. It is highly unlikely, for the foreseeable future, i.e. 25 years that more than 266 acres of land would be impacted in the Plan Area given a broad range of development limitations. These limitations include, water resources, coastal habitat protection, cultural resource protection and most importantly residential growth management under Title 25 of the County Codes. 15.2

As a result, I agree with the County of San Luis Obispo and urge approval of Alternative 2: Reduced Take. Over the course of the 25-year Incidental Take Permit (ITP) this would allow for over 10 acres of habitat to be eliminated each year, which again appears to be more proximate to the rate and scope of activities requiring coverage under the ITP. Moreover, with regard to the DEIR I respectfully submit Alternative 2 is the environmentally superior alternative. In this instance, less is more. It is common sense, that the impacts from the community buildout of 266 acres would have less environmental impacts than the development of 532 acres over the same time frame.

An argument supporting the proposed plan is that if the 266 acres were to be exceeded, individual project proponents would have to file their own HCP's and obtain ITP's as needed. If in the unlikely event the acreage threshold was exceeded, individual applications could be processed just as they have over the past 20-years. If arguments against Alternative 2 Reduced Take were accurate, few of the successes related to greenbelt formation and habitat management in Los Osos would have been realized since 1998.

15.2
(cont'd)

The DEIR cannot determine the Environmentally Superior Alternative without a full analysis comparing the proposed project with Alternative 2: Reduced Take. Please complete an analysis for Alternative 2 including any reasons Alternative 2 should be considered but rejected.

It is the view of this commenter that Alternative 2 for the LOHCP is the Environmentally Superior Alternative. This may be confirmed with the proper analysis.

Please feel free to contact me with any questions you may have.

Sincerely,

Jeff Edwards

Jeff Edwards

Letter 16

November 17, 2019

Mr. Stephen P. Henry
Field Supervisor
U. S. Fish and Wildlife Service
2493 Portola Road-Suite B
Ventura, CA 93003

RE: Los Osos Habitat Conservation Plan-Los Osos, CA

Dear Mr. Henry:

Following are some of my comments regarding the proposed draft HCP for the Los Osos community.

1. The draft HCP and EA and EA-Appendices total 621 pages. These are documents that have been secretly in process for 10 years with no prior release or indication of the substance of the plan. When published in the Federal Register, we are then given 45 days to review the 621 pages and consult with planners, private consultants and various staff to try and form an opinion of the contents. I believe this restrictive time frame is patently unfair and unjust. 16.1
2. I own 3 vacant parcels in Los Osos that are affected by the outcome of the HCP. For two of them on the periphery, it is understandable to want a survey for the K-Rat (even though no one has seen one in well over 20 years), only because of the parcel's locations adjacent to other large open parcels. For the parcel that I own in the urban area on Pine, it is bordered by development on all sides. As an urban parcel, it makes no sense to require K-Rat surveys. Please amend the draft HCP to remove the requirement for K-Rat surveys on urban in-fill parcels within the USL. 16.2
3. One of the parcels I own is outside of the USL and is just under 5 acres. Limiting a maximum disturbance envelope to 30,000 SF is an extreme and unjust taking of property relative to the parcel size. For a parcel of this size a more appropriate disturbance envelope would be in the order of 1.5 acres with 3 acres of conservation space as a maximum. Please review this area of the plan. 16.3
4. This same 4.7 acre parcel was purchased in December, 2016 at $100,000 as an open, arm's length, market transaction. This comp sale was not included in the analysis of land value for mitigation. At this value, the mitigation costs are approximately half of those 16.4

defined in the plan. Why was this recent comparable ignored in favor of other higher cost parcels? 16.4 (cont'd)

5. The entire plan seems to be geared toward punitive, required mitigation by remaining vacant parcel owners, regardless of whether there are actual takings. Although this approach may be convenient in requiring mitigation from everyone seeking to develop, it may be contrary to law and to FWS guidance. I have attached to my letter the Department of Interior—FWS memo of April 26, 2018 that spells out the triggers for a taking. This memo clarifies that habitat modification in and of itself is not a taking, unless it is likely to result in the actual killing or injury of wildlife. Many of the vacant parcels in Los Osos would fall into this category. Please include a copy of this memo in the final version of the HCP. 16.5

Thank you for considering the points I have raised.

Respectfully submitted,

R.E. KIRK

[redacted]

Attachment: Department of Interior—FWS memo of April 26, 2018

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

In Reply Refer To:
FWS/AES/067974

APR 2 6 2018

Memorandum

To: Regional Directors 1-8

From: Principal Deputy Director

Subject: Guidance on trigger for an incidental take permit under section 10 (a)(1)(B) of the Endangered Species Act where occupied habitat or potentially occupied habitat is being modified.

The U.S. Fish and Wildlife Service (Service) Field and Regional personnel often provide critical technical assistance to private parties who may take actions affecting listed species, and who may decide to invest significant resources to prepare an incidental take permit application pursuant to ESA Section 10(a)(1)(B). It is vital that Service staff apply correct and consistent interpretations of ESA statutory and regulatory provisions.

It is also vital that Service staff recognize that whether to apply for a section 10(a)(1)(B) permit is a decision of the applicant. Service staff can and should advise non-federal parties on the law, our regulations and guidance, and the potential for take of listed species incidental to their activities, but it is not appropriate to use mandatory language (e.g., a permit is "required") in the course of that communication. The HCP process is applicant driven, and that includes the threshold determination of whether to develop an HCP and apply for a permit. That threshold determination ultimately rests with the project proponent. Project proponents can take Service input into account and proceed in a number of ways, based upon their own risk assessment. They may proceed (at their own risk) as planned without a permit, modify their project and proceed without a permit, or prepare and submit a permit application. The biological, legal, and economic risk assessment regarding whether to seek a permit belongs with the private party determining how to proceed[1].

After consultation with the Solicitor's Office, I am providing guidance on how one determines whether a project is likely to result in "take" of a listed species as it relates to habitat modification. Further, I am requiring that : 1) the Assistant Director – Ecological Services post this memorandum and the attached questionnaire on the Headquarters Endangered Species web page; and 2) that Service regional and field staff include direction to that web site

[1] However, once a project proponent has decided to apply for a permit, the structure and scope of the HCP and associated permit are subject to negotiation between the permittee and the Service.

(www.fws.gov/endangered/esa-library/pdf/Guidance-on-When-to-Seek-an-Incidental-Take-Permit.pdf) when project proponents seek information about whether their action needs an incidental take permit under section 10 (a)(1)(B). By operating in a consistent manner, with clear standards, we can reduce conflict, minimize public frustration and increase government efficiency.

Simply put, as set out below, a section 10 (a)(1)(B) incidental take permit is only needed in situations where a non-federal project is likely to result in "take" of a listed species of fish or wildlife. That is, the requirement for an incidental take permit, as set forth in section 10 (a)(1)(B) of the ESA and its accompanying regulations, is only activated when non-Federal activities are likely to result in the take of listed wildlife.[2] As discussed in more detail below, habitat modification, in and of itself, does not necessarily constitute take. Chapter 3 of the Fish and Wildlife Service's Habitat Conservation Plan Handbook (Handbook) sets out the pre-application process and plainly states that if take is not anticipated then an incidental take permit is not needed. Further, it explains that an incidental take permit is only needed if a non-federal party's activity is "in an area where ESA-listed species are known to occur and where their activity or activities are reasonably certain to result in incidental take." The Handbook clarifies that the standard for determining if activities are likely to result in incidental take is whether that take is "reasonably certain to occur." In addition, the Handbook directs that the Service should avoid "processing applications submitted purely 'as insurance' when take of ESA –listed species is not anticipated." (*See Handbook, Chapter 3 "Phase 1:Pre-Application")*

An essential component of analysis needed to determine whether an incidental take permit (ITP) is needed is an understanding of what constitutes take under the ESA. The ESA defines "take" as: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct. 16 U.S. C. 1542(b). The ESA's take definition has been supplemented by the Service with regulatory definitions of the terms "harm" and "harass".

The terms "harm" and "harass" have been redefined several times. In July 1975, the Service proposed "harass" to be defined as an act that "either actually or potentially harms wildlife by killing or injuring it, or by annoying it to such an extent as to cause serious disruption in essential behavior patterns, such as feeding, breeding, or sheltering. Significant environment modification or degradation which has such effects is included in the meaning of harass." 40 F.R. 28712 (July 8, 1975). After notice and comment on the proposed definition, the Service reworked the definition of harass (as well as the definition of harm) and redefined the Service's regulatory definition of "harass" as follows: "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding feeding or sheltering." 50 C.F.R. §17.3.

[2] Listed plants are not included in the ESA's prohibition on take of listed species.

The preamble to the final rule explicitly stated that the Service moved the concept of environmental modification or degradation from "harass" to the term "harm." 40 F.R. 44412 (Sept. 26, 1975). Specifically, the preamble explained that the "concept of environmental damage being considered a 'taking' has been retained, but it now found in a new definition of 'harm.'" In addition, the Service chose to modify the definition of "harass" by "restricting its application to acts or omissions which are done 'intentionally or negligently.'" The preamble explained that this change – to have "harass" only apply to intentional or negligent actions – was made as otherwise under the proposed language, harass would have "applied to any action, regardless of intent or negligence." Harass, therefore, is not a form of take permitted under section 10(a)(1)(B), which applies to taking "incidental to, but not the purpose of, the carrying out of an otherwise lawful activity."

Take in the form of "harm" is particularly significant and relevant to section 10 ITPs because it can be manifested in the form of habitat modification, a common component of non-Federal activities. As discussed above, the term "harm" has also been redefined several times, always with the intention to clarify that "harm" relates to activities that are likely to result in the actual death or injury of listed species. In 1975, the Secretary issued a regulation that defined "harm" to mean an act that "actually injures or kills wildlife, including acts which annoy it to such an extent as to significantly disrupt essential behavior patterns, which include but are not limited to, breeding, feeding or sheltering," and which include "significant environmental modification or degradation which has such effects." This regulation's preamble noted that "harm" was "expressly limited to those actions causing actual death or injury to a protected species of fish and/or wildlife. The actual consequences of such an action upon a listed species is paramount." *See*, 40 F.R. 44,413 (Sept. 26, 1975).

In 1981, the Secretary established the current regulatory definition of "harm" because of concerns that the prior regulatory definition was being interpreted to bar habitat modification even when there was no resulting injury to species. The regulatory definition of "harm" was modified to read: "Harm in the definition of 'take' in the Act means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering." 50 C.F.R. §17.3. Some commenters on the rule asserted that habitat modification alone could be a "take" under section 9; the Service's response in the preamble was that "in the opinion of the Service Congress expressed no such intent." Further, the preamble explained that the use of the word "actually" clarifies that a "standard of actual adverse effects applies to section 9 taking" and that it was clear that "habitat modification or degradation, standing alone, is not a taking pursuant to section 9." It went on to emphasize that "modification must be *significant*, must *significantly impair essential* behavior patterns, and must result in *actual* injury" (emphasis in original). Finally, the preamble discussed the specific choice to use the word "impair" rather than "disrupt" in the phrase "significantly impair essential behavior patterns" to "limit harm to situations where a behavioral pattern was adversely affected

and not simply disturbed on a temporary basis with no consequent injury to the protected species." *See*, 46 FR 54,748 (Nov. 4, 1981).

The validity of the regulatory definition of "harm" as applied to habitat modification faced a facial challenge, which eventually reached the Supreme Court in *Babbitt v. Sweet Home Chapter of Communities For a Greater Oregon*, 515 U.S. 687, 115 S. Ct. 2407 (1995). The Supreme Court upheld the regulatory definition of "harm" and emphasized that while "harm" could result from habitat modification "every term in the regulation's definition of 'harm' is subservient to the phrase 'an act which actually kills or injures.'"

After the Supreme Court's decision, the 9th Circuit also analyzed the definition of "harm" and agreed that harming a species may be indirectly caused by habitat modification but concluded that habitat modification in and of itself does not constitute harm unless it "actually kills or injures wildlife." *Defenders of Wildlife v. Bernal*, 204 F.3d 920 (9th Cir. 1999). The *Bernal* court highlighted the Supreme Court's emphasis that every term in the definition of harm is "subservient to the phrase 'an act which actually kills or injures wildlife.'" In a later case, the 9th Circuit again tackled the definition of "harm" and held that, while the harm could be prospective, the "mere potential for harm, however, is insufficient."[3] *Arizona Cattle Growers' Association v. Fish and Wildlife Service*, 273 F.3d 1229 (9th Cir.2001). The *Arizona Cattle Growers'* Court opined that without evidence that a take would likely occur, a finding of take based on habitat modification alone would impose conditions on otherwise lawful use of land and such an action by the Service would be arbitrary and capricious.

The law is clear, then, that in order to find that habitat modification constitutes a taking of listed species under the definition of "harm", all aspects of the harm definition must be triggered. The questions that should be asked before a determination is made that an action involving habitat modification is likely to result in take are:

1. Is the modification of habitat significant?
2. If so, does that modification also significantly impair an essential behavior pattern of a listed species?
3. And, is the significant modification of the habitat, with a significant impairment of an essential behavior pattern, likely to result in the actual killing or injury of wildlife?

All three components of the definition are necessary to meet the regulatory definition of "harm" as a form of take through habitat modification under section 9, with the "actual killing or injury of wildlife" as the most significant component of the definition.

In summary, potential applicants should be advised that an ITP is only needed when an activity (or the results of the activity) is likely to result in the take of listed wildlife and that it is the

[3] The impact on a species may be prospective but it still must hit all the components of the definition of "harm" and must be reasonably certain to occur.

potential applicant's decision whether to apply for an ITP. If an applicant seeks technical assistance from the Service, a careful examination of what constitutes take (using guidance from this document, the attached questionnaire, and the HCP Handbook) should be central to the discussion as to whether an ITP is needed. Further, it should be noted that habitat modification, in and of itself, does not constitute take unless all three components of the definition of "harm" are met.

Please ensure that each non-Federal party who seeks information about a section 10(a)(1)(B) permit is directed to this memorandum and questionnaire as posted on the Service's Endangered Species webpage (www.fws.gov/endangered/esa-library/pdf/Guidance-on-When-to-Seek-an-Incidental-Take-Permit.pdf).

QUESTIONNAIRE FOR POTENTIAL APPLICANTS FOR INCIDENTAL TAKE AUTHORIZATION UNDER SECTION 10(a)(1)(B) of the ENDANGERED SPECIES ACT

Respond to these questions to help decide if you need an Endangered Species Act (ESA) permit:

1. Keeping in mind that the ESA does not apply to take of plants incidental to otherwise lawful activities, are there ESA listed species present in the area where your activity will occur or will they be present at some point in the duration of your activity?

   Yes? Then proceed to question 2.

   No? Then you do not need a permit.

2. Is it likely that any of these listed species will be exposed to your activities (or the results of your activity) during any of the various phases of your activity (construction, operation, maintenance, etc.)?

   Yes? Then proceed to question 3.

   No? Then you do not need a permit.

Review questions 3, 4, 5, and 6 to determine if the exposure from your activity to the listed species constitutes prohibited "take" under the ESA. A permit under section 10 (a)(1)(B) of the ESA does not cover purposeful take. As you review the questions below remember that only take that is "incidental" to an otherwise lawful action can be covered under an incidental take permit.

3. If your activity overlaps with the listed species at some point of its duration, will that exposure likely result in any of the following actions to the listed species: pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting or attempting to engage in any such conduct? Keep in mind that some of these definitions most likely only apply to purposeful take (e.g. hunting, shooting).

   Yes to incidental take? Then you likely need a permit.

No? Then proceed to question 4.

4. Is your activity likely to harass a listed species? To answer this question ask whether your activity, through an intentional or negligent act or omission, is likely to annoy the listed species to such an extent as to cause **an injury** to the species by **significantly disrupting normal behavior patterns (e. g.** breeding, feeding or sheltering, etc.)?

   Yes? This take is not permitted as it is not "incidental."

   No? Then proceed to question 5.

5. Is your activity likely to result in an act that actually injures or kills a listed species?

   Yes? Then you likely need a permit.

   No? Then proceed to question 6.

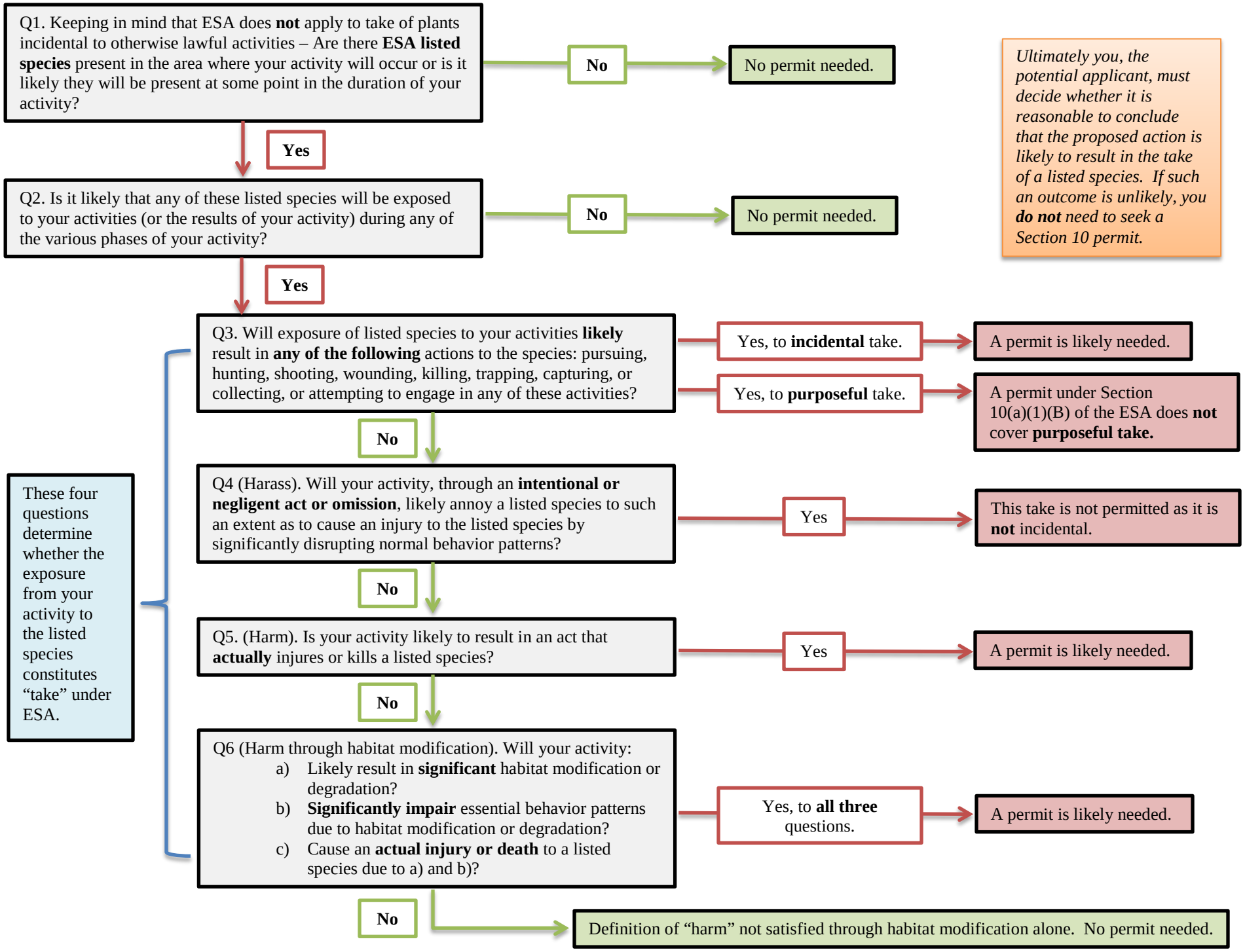
6. Is your activity likely to harm a listed species through habitat modification? To answer this question, ask:
   a. Is my activity likely to result in **significant** habitat modification or degradation?
   b. Will that modification or degradation **significantly impair** essential behavior patterns, including breeding, feeding, or sheltering?
   c. As a result of a. and b. above, is it likely there will be **an actual injury or death** to a listed species?

   Yes to all three questions? Then you can anticipate take through habitat modification and likely will need a permit.

   No? Then you have not satisfied the definition of "harm" through habitat modification.

Ultimately you, as a potential applicant, must decide whether it is reasonable to conclude that the proposed action is likely to result in the take of a listed species. If such an outcome is unlikely, you do not need to seek a section 10 permit.

Guidance on Determining Need for ITP under ESA Section 10(a)(1)(B)



Letter 17

/anderwier, Julie <julie_vanderwier@fws.gov>

[EXTERNAL] Los Osos Habitat Conservation Plan

1 message

Roxanne Lee <[redacted]> Fri, Nov 15, 2019 at 9:30 AM
To: julie_vanderwier@fws.gov

Dear Ms. Vanderwier,

As a resident of Los Osos, I would like to submit comments re: The Los Osos Habitat Conservation Plan (LOHCP). **The proposed land use and development identified in the LPHCP should maintain the rural character of Los Osos**. Specific comments re: the LOHCP include the following: 17.1

- Figure 2-2 Land Use Map: The undeveloped area along LOVR between Palisades St. and Broderson St. should be classified as open space or recreation. It is currently designated as a mix of commercial, office professional, and residential single family. However, commercial and office land uses should be clustered east along LOVR, where there are already existing commercial/office uses, e.g., there are already vacant commercial properties adjacent to Grocery Outlet, Chase Bank, and the US Postal Office. Don't sprawl these commercial uses; especially if there are already plenty of vacant commercial lots. Densify where they already exist to preserve the rural character of Los Osos. Single family residential should be set back from LOVR to make space for a large regional park that connects to the existing community park. There are no large regional parks that are walking distance for residents in Los Osos. The National Recreation and Parks Association states that importance of having easily accessible recreational parks of small, medium, and regional parks. The area along LOVR is the perfect location for a larger central regional park. It would also conserve important habitat area along LOVR and maintain the rural character. While there is Montana Del Oro State Park, it requires driving. The regional park could include to following facilities that currently have not been sited: aquatic center and library. 17.2
- Figure 2-3 Existing Protected Lands: Notice how there are minimal protected lands within Los Osos. The undeveloped area along LOVR between Palisades St. and Broderson St. would make the perfect central gathering area and regional park for Los Osos. 17.3
- Table 4-1: Take/Impacts Assessment Methods for Anticipated Covered Activities within the LOHCP Area:
    - Activity Items #1 and 2: New Park in Los Osos (10-acre) The new park location should be along LOVR to create a large regional park that includes the aquatic center and library. We need large grassy areas with large-shade trees for family barbecues/parties, outdoor amphitheater for events, native plant / water conservation demonstration garden, multiuse fields (e.g., soccer, kickball, disc sports), outdoor courts (basketball, pickleball, tennis), etc. The existing community park has picnic areas adjacent to LOVR, but they are loud and noisy from traffic. The park would act as the central community gathering area. It would also be safe location for families to walk to the library without high traffic volumes. 17.4
    - Activity Item: Bike Lanes: More bike lanes! There needs to be a designated bike lane with cones or fencing between Los Osos and Morro Bay. This would be great for families and tourists. 17.5

Thank you,
Roxanne Lee

Letter 18

From: Patrick McGibney <patindi@aol.com>
Sent: Tuesday, December 3, 2019 5:23 PM
To: Takano, Leilani <leilani_takano@fws.gov>; Kerry Brown <kbrown@co.slo.ca.us>
Subject: [EXT]Add'l comments LOHCP

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Dear Ms. Takano and Ms. Brown,

These are the additional comments I spoke to Ms. Takano about in our request for an extension to the Comment period for the LOHCP. These comments are being submitted by the Los Osos Sustainability Group, which I sit on the Board of. Please review these comments and consider them part of our comments submitted on November 18, 2019.

Thank you.
Sincerely,
Patrick McGibney
Los Osos Sustainability Group.

We would like to add two changes/clarifications to our comments submitted on November 18, 2019.

18.1

We point out in our letter that the LOHCP EIR's omission and treatment of cumulative impacts justify selecting a "No Project" alternative--and we cite a few examples of potential impacts from the LOWWP and Basin Plan programs. We want to clarify that the impacts we cite are not the only cumulative impacts that should be addressed. A reasonable range of impacts including cumulative impacts from the three projects, LOWWP, Basin Plan, and HCP, are required to be addressed under CEQA. We note that "adaptive management" is recommended to address some impacts of the LOWWP and BP. CEQA requires that impacts must be analyzed to determine the adequacy of adaptive measures, and the measures must be feasible and time-specific. We understand that additional conservation, recycled water reuse, and shifts in pumping, also cut backs in pumping, have been proposed as adaptive measures. We think all of these may be infeasible and/or ineffective in that the LOWWP CDP requires conservation and recycled water use to be maximized within the LOWWP service area and high levels of both are already in place; the ability to shift pumping is limited by limited wells, piping, and interconnections between purveyors; and there may be legal constraints on stopping pumping. Effective adaptive programs further require good preplanning, e.g., modeling climate change scenarios and devising specific contingency plans.

18.2

We would also like to clarify our statement that the current EAP should be kept in place assumes the current restrictions on building imposed by the Coastal Commission are kept in place.

Thank you for adding these clarifications to our comments. 18.3

Statement in earlier letter:

"A third reason to support the No Project Alternative for the Los Osos Habitat Conservation Plan is the need to leave the Estero Area Plan (EAP) in place until it can be shown that the Los Osos Ground Water Basin can provide a sustainable water source for planned development."

On Nov 14, 2019, at 3:40 PM, Takano, Leilani <leilani_takano@fws.gov> wrote:

Hello Mr. McGibney,

As discussed today, we are not able to extend our 45-day comment period on the Notice of Availability for the Los Osos HCP and Environmental Assessment. However, we encourage you to submit your comments as close to the November 18th deadline as possible. We may be able to address your comments received after November 18, but cannot guarantee this. As discussed, our office will work with SLO County to address the public comments on their HCP in the coming weeks, so the sooner you can provide us with your comments the better the chances are that we will have the opportunity and time to consider them in our decision process.

Please let me know if you have any additional questions or concerns. We appreciate you reaching out to us regarding this matter.

Best regards,
Leilani

Leilani Takano
Assistant Field Supervisor
North Coast Division
Ventura Fish and Wildlife Office
US Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, California 93003
Tel: (805) 677-3330

On Wed, Nov 13, 2019 at 5:18 PM Patrick McGibney <patindi@aol.com> wrote:

Greetings Steve and Leilani. Kerry Brown with San Luis Planning suggested contacting you in requesting an extension to the Los Osos Habitat Conservation Plan. This is an important document and the Community just recently found out about it on the social media site Nextdoor. Ms. Brown only sent a comment notice to the few on her email list and now will post on Nextdoor but the Community still only has until 11-18-19 to comment. Would you please give us at lest an additional two weeks to study and comment.

Sincerely,
Patrick McGibney
Los Osos Sustainability Group.

Letter 19

Kerry Brown

From: Rebecca McFarland <backbaybeck@icloud.com>
Sent: Monday, November 18, 2019 4:52 PM
To: Kerry Brown
Subject: [EXT]Los Osos HCP

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Dear Ms. Brown,

I would like to submit the following comments on the Los Osos Habitat Conservation Plan:

1. As a citizen living adjacent to the Morro Dunes Ecological Reserve, I am greatly concerned with the lack of plan and oversight to patrol and maintain the area. There is abundant dead plant life ready to burn right up behind people's property lines. Dead Brush was trimmed to 50 feet recently, but left in large mounds at the 50 ft line. Just from Broderson to Ravenna there are 26. If this is the sort of maintenance we can look forward to it is unacceptable in our new age of year-round-fire season. From what I have been told. Fish and Wildlife have no monies to patrol or maintain the property. For us neighbors on Highland, fire is our greatest fear and now with homeless camping out in the reserve our concerns are even greater. 19.1

2. While we are on the topic of homelessness, I think that part of the plan should be looking to the growth of our homeless population in our area. An area of the town should be set aside for facilities to deal with this and proper services should be in place to keep this population from further affecting our conservation areas. This would include trash and hazardous bio waste removal to include human feces and used hypodermic needles. 19.2

3. Wildfire is a concern of everyone in our town. We currently do not have enough fire staff or equipment to fight a large wildfire in our area. Plans to "bulldoze" in the reserve area if a fire should start would be hampered by the fact that the bulldozers are parked at the SLO airport. 19.3

4. In Figure 16 a new road is shown from Travis in Cabrillo Estates to Bayview Heights. I am hoping this is in error as it would pass right through some of the habitat to be conserved. In addition a Highland Dr. is shown to continue to Pecho - there are homes there now, so it seems to be drawn in error. 19.4

5. I am in serious doubt that retrofitting and water recycling will ever conserve enough water to provide sufficient water supply for the buildout show in this Community Plan. Are we not still in Stage III Drought in Los Osos? 19.5

Sincerely,

Rebecca McFarland
2455 Broderson Ave.
Los Osos, CA 93402
(805) 440-6643

Letter 20

To: Kerry Brown, Environmental Coordinator,
Department of Planning and Building
976 Osos Street, Room 300, SLO, CA 93408-2040

LOHCP DEIR: Executive Summary, page 1

"Although the primary purpose of the LOHCP is to streamline the permitting of covered activities by providing a program for the protection and enhancement of habitat for listed species impacted by such activities, adoption of the LOHCP and issuance of an ITP would commit the County to a course of action that could adversely impact the environment"

20.1

COMMENT 1: Streamlining the permit process is detrimental to habitat, species, the Los Osos Groundwater Basin and the Community of Los Osos. It does not provide a program for protection and enhancement.

The Los Osos Groundwater Basin has been in overdraft for decades causing, as of yet, an irreversible flow of seawater intrusion. As a result, streamflow has decreased, impacting habitat and species, and water quality has been dramatically degraded to the point where many choose to drink bottled water instead of from the tap. The following points of concern have been taken directly from the LOHCP. Because of these concerns it is recommended that alternative 1 be implemented. All **BOLD** highlights have been added for emphasis.

LOHCP DEIR: Project Impacts, page 203

20.2

HWQ-6 THE PROJECT MAY AFFECT THE QUANTITY OF AVAILABLE SURFACE OR GROUNDWATER. . .

The Los Osos Groundwater Basin is the sole source of water supply for the Los Osos area and the LOHCP would result in impacts to groundwater supplies. A number of the covered activities listed in the LOHCP (e.g., residential and commercial development, parks, libraries, aquatic center) would increase water demand in the Plan Area. **As a result, groundwater resources for the Los Osos area may not be sufficient to meet future demand** as currently planned by the EAP. **According to the Basin Plan for the Los Osos Groundwater Basin, the Basin has been found to be in a state of overdraft and is at a Level of Severity III** (i.e., the amount of consumption has reached the dependable water supply) (County et al. 2015).
Covered activities, including expedited residential, commercial, and infrastructure development, would have the potential to impact surface water and groundwater quality. Activities that disturb soil or require the use of fuel or other hazardous materials at work sites could introduce pollutants to the environment that could be carried in stormwater runoff to surface waters or percolate through to groundwater. Ground disturbance can result in accelerated soil erosion, which can increase sediment delivery to surface waters and degrade water quality. Activities in or near streams and other water features could loosen and mobilize bed and bank materials, which could result in suspended sediment in the receiving waters. Construction activities could require vehicle fuels, lubricants, adhesives, waterproofing compounds, and hydraulic fluid for vehicles and equipment and could also require concrete, epoxy, paints, and/or asphalt paving. Specific hazardous material use at individual project sites would vary and would depend upon the type, size, and location of the project. The discharge of pollutants into waterbodies could degrade water quality and affect beneficial uses of the downstream waterbodies.

20.2 (cont'd)

Comment 2: The LO Ground Basin is in overdraft. It is the sole source of water for the community. There is no other dependable water supply and it may not be sufficient to meet future demand.

LOHCP DEIR 4.7 Hydrology and Water Quality
Page 193

Surface Water Resources:
The most significant sources of recharge for the Basin are direct percolation of precipitation and percolation of surface runoff. The primary stream overlying the Basin is Los Osos Creek and its tributaries, including Willow Creek and Warden Creek. Los Osos Creek originates in the Irish Hills to the

20.3

south of the Basin, flows through Clark Valley into the Basin area, and then northeast and then northwest into Morro Bay. **Water flow in Los Osos Creek is highly variable** by season, due to topographic features and soils that do not hold significant quantities of water.

Comment 3: The LOHCP does not factor in climate change or the droughts that are predicted to come. Many habitats and species are dependent on surface waters for survival; surface water is tied to groundwater recharge.

20.3 (cont'd)

LOHCP DEIR: Water Quality, page 194

Water quality standards for surface waterbodies in the vicinity of Los Osos are developed by the Central Coast RWQCB in order to fulfill designated beneficial uses. **Waterbodies which fail to meet these standards supporting their beneficial uses are listed as impaired**, and a Total Maximum Daily Load (TMDL) may be required to allocate the maximum pollutant load the waterbody may receive while still meeting its water quality standards. **Los Osos Creek and other surface waterbodies near the Plan Area are listed on the 2014/2016 California 303(d) list as impaired** with an Integrated Report category of 5, indicating water quality standards are not met and a TMDL is required but not yet completed for at least one of the pollutants being listed for the segment (SWRCB 2018).

Table 23 summarizes existing impairments and TMDLs for reaches of Los Osos Creek in the vicinity of the Plan Area, as well as Warden Creek and Morro Bay.

20.4

LOHCP DEIR: Water – Los Osos, page 197

2. Alternative Water Sources. Supplementary water, such as reclaimed sewage effluent and water from existing impoundments, should be used to prevent overdraft of groundwater. New impoundments for recharging underground basins should be carefully considered along with other alternatives.

Comment 4: There are no “new impoundments” to be used for recharge. Reclaimed sewage effluent has been sold (through contract agreement) to agricultural interests and others. There is no data to support the claim that it could be used to prevent overdraft of the groundwater basin.

LOHCP DEIR: Project Impacts
Environmental Impact Analysis
Hydrology and Water Quality, page 199

IMPACT HWQ-1
Approval and implementation of the LOHCP and issuance of the programmatic ITP would allow the County to authorize take coverage for covered activities, including new development and remodels, capital improvement projects, and facilities operations and maintenance activities, **which may accelerate the rate at which the covered activities could occur.** County Resource Management System:

The current RMS 2016-2018 Resources Summary Report recommends that the Los Osos Valley Groundwater Basin be identified as having a "Level of Severity III" ranking, which indicates that **water demand projected over 15 years would equal or exceed the estimated dependable supply (County 2019c)**.

Comment 5: As stated throughout both the LOCP and the LOHCP, the LOS Osos water basin is in overdraft, approval and implementation of the LOCHP could accelerate the development of the project area. Safeguards must be in place before habitat is lost and species displaced due to development.

20.5

(HWQ-1 mitigations, p. 204). The mitigations proposed for potentially significant impacts cited in HWQ-1 include use of recycled water and water conservation offsets. First, since impacts are unknown, not adequately identified, and/or have an unknown severity; adequate mitigation cannot be assumed. Further, all recycled water from the LOWWP is used now and reserved in the future for mitigating LOWWP impacts. Any remaining conservation potential in inside the LOWWP is supposed to go to mitigating for the LOWWP and any conservation potential outside the service area should be used to mitigate for seawater intrusion. We note that even the County Conservation ordinance that currently allows limited development outside of the LOWWP service area has very limited retrofit potential due to current high level of conservation within the Los Osos area, and the conservation ordinance, itself, causes potentially significant impacts to the

20.6

Basin and dependent resources (despite a 2:1 offset ratio) by hardening demand at a higher level than is possible without the ordinance.

20.6 (cont'd)

Comment 6: The LOHCP is part of the LOCP. The LOCP has 4 Alternatives; alternative 3 ties development to a sustainable water supply:

Los Osos Community Plan EIR, page ES-4

Alternative 3: Reduced Development Based on Water Availability
This alternative assumes a development pattern and policy framework similar to that proposed under the LOCP, except that **growth would be restricted by water availability.** This scenario is based on restrictions set forth in a key proposed LOCP policy related to the 2015 Los Osos Groundwater Basin Plan.

Alternative 4 "address potentially significant impacts [to habitat and species] previously identified with respect to implementation of the proposed LOCP.

20.7

Alternative 4: Mitigated Project
This alternative assumes the same development pattern, buildout potential and policy framework as under the proposed LOCP, except that it includes the policy-related mitigation measures prescribed to **address potentially significant impacts previously identified with respect to implementation of the proposed LOCP.**

Comment 7: Alternatives 3 and 4 must first be combined into one alternative and adopted as the preferred alternative to the LOCP before adoption of the LOHCP. Until that time, it is recommended that alternative 1 (No Project) be adopted as the preferred alternative for the LOHCP.

Alternatives:
As required by Section 15126(d) of the CEQA Guidelines, this EIR examines a range of reasonable alternatives to the project that could feasibly achieve similar objectives. This includes the following two alternatives:

Alternative 1 (No Project). Under the No Project Alternative, the LOHCP would not be implemented. Activities would continue in a manner consistent with current practices. Project proponents would be required to prepare individual ITP applications, including HCPs.

20.7 (cont'd)

Lastly: The California Coastal Commission recognized potentially significant on-going adverse impacts to resources within the Los Osos area resulting from the Los Osos Wastewater Project (LOWWP). The impacts included potential adverse impacts to the Basin (seawater intrusion), to sensitive habitat from a reduction in ground water flows, and to sensitive habitat on sites affected by project operations.

To address the impacts, the Coastal Commission required the County of SLO to implement several mitigation measures and programs, including a "Habitat Management Plan" for the Broderson and Midtown sites intended to protect resources "in perpetuity," and a monitoring and adaptive management program to protect habitat potentially harmed by a reduction in ground water flows, including springs, wetlands, and riparian habitat along Morro Bay Estuary and in the vicinity of Willow Creek, Eto Creek, and Los Osos Creek. Special Condition 5 of the CDP provides a CDP "Basin Plan" that requires groundwater-related mitigation programs "…designed to maximize the long-term ground and surface water and related resource (including wetlands, streams, creeks, and lakes, riparian corridors, marshes, etc.) health and sustainability, including with respect to offsetting seawater intrusion as much as possible, within the Los Osos Groundwater Basin." (see CDP 9/7/2010, pp. 90-95).

20.8

The EIR should include the Coastal Commission findings and CPD requirements in related sections, including but not limited to Section 4.7.1 (b) Hydrology and Water Quality—Regulatory Setting (pp. 194-197), previous habitat conservation plans (e.g., Table 7, p. 49), and sections relating to water quality and water quantity impacts and mitigations (e.g., Section 4.7.2, Impact HWQ-6, pp. 203 & 204).

The LOHCP EIR should also include the LOWWP in the section entitled " Los Osos Cumulative Projects" and address the potential cumulative impacts of the LOWWP and HCP throughout the EIR, including the impacts of potential additional development in combination with the possibility that sustaining sensitive habitat will require using water from the Basin or recycled water over an extended period of time.

The County of SLO may consider some of the actions of the Los Osos Basin Management Committee (BMC), such as the annual monitoring reports to satisfy some or all of the groundwater-related mitigations required by the CDP. However, the Basin Plan Annual Monitoring Reports for 2016 – 2018 do not refer to or address key requirements, such as the monitoring of groundwater flows to sensitive habitat and related adaptive management programs. Further, the Los Osos Basin Plan and related County conservation and development programs and policies do not "maximize the long-term ground and surface water and related resource …health and sustainability…" of the Basin consistent with the CDP.



20.8
(cont'd)

Patrick McGibney
Los Osos, California 93402

Letter 21

Takano, Leilani <leilani_takano@fws.gov>

[EXTERNAL] LO HCP -Comments

1 message

Emily Miggins <emiggins@gmail.com> Sun, Nov 17, 2019 at 6:52 PM
To: Leilani_takano@fws.gov, kbrown@co.slo.ca.us
Cc: Julie Vanderwier <julie_vanderwier@fws.gov>

Here are my my comments to you HCP.

Thank you, and my invite to "tour the land with LO FSC stands open.

Thank you!

21.1

Using recommendations of CALFIRE Community Wildfire Protection Plan: e.g. Defensible Space recommendations in Wildland Urban Interface to homes/structures CALFIRE has recommended 300' clearance to homes and structures from brush.

• What will State, Federal and County agencies due to improve fire hazard mitigation in the Wildland-Urban Intermix? (Wildland-urban intermix areas are those where housing and vegetation intermingle. In the Intermix, wildland vegetation is continuous and greater than 50% of the land area is vegetated with combustible fuels. The wildland fire risk associated with Intermix areas includes vegetation-to-house fire spread or ember intrusion.)

21.2

CDFW is failing citizens of Los Osos now, it does nothing to maintain the lands it owns as a state agency. I worked very hard to bring the first ever FSC funding to trim down your out of control Chaparral at my property line. Your agencies are ignoring us the citizens and FSC and CALFIRE, we need fuel breaks from your land-immediately.

o CALFIRE would like a fuel break 300' from residential and commercial building from wild-land to fight fire, I think this should happen as fire is imminent in coastal chaparral. 21.3

• For example, how will CDFW, maintain and fund the interface of Morro Dunes Ecological Reserve (MDER where covered species live (ESA) and State Responsibility Areas (SRAs) where homes are less than 25' from unmaintained chaparral and CDFW and County public lands and chaparral is right next to LO homes? 21.4

o I suggest all agencies publish a plan to take care of their lands and mitigate fire risk, make it transparent to the public. 21.5

• How will the County and State Agencies enforce year over year fuel reduction activities such as he CSD/CALFIRE annual weed abatement notifications and citing landowners? Will enforceable code be created?
o Would your agencies publish a task matrix for the public?

• Will legitimate fuel reduction activities be funded and accomplished year over year in public wild lands and parks? 21.6
o Please answer this question, I think you should be open and honest, California Chaparral is burning. Please publish your schedule of maintenance and mitigation activities on public land.

• Will a schedule of annual maintenance and creation of defensible space be published? Such as mitigation tasks of dead brush reduction and removal on public land (e.g. MDER/Los Osos Oaks Preserve/MDO/Elfin Forest and Broderson Trail surrounding LO?
o How will this annual necessary be accomplished? How will you be transparent and honest with citizens and tax payers?

• Will there be a published budget to fund these hazardous mitigation activities in the WUI on public lands year over year? Fire Safe Council cannot be the soul source of funding of these actives- not by a long shot. What is the State's budget for maintaining mitigation activities on public land. Current you are failing (County,State and even the Fed in protecting citizens and endangered ecosystems and its species.
o Please publish the schedule of planned activities and how they are funded, the public clearly need to task manage your agencies.

21.6
(cont'd)

• Will county and CDFW fund new signage and rules in public areas such as: "no fires, no camping, no smoking etc. hours of operation of these public lands- sun up/sundown?
o clearly right now from county to state, our public lands are mismanaged. We need more patrol immediately. I live it every day. It is my backyard in MDER: Homeless encampments with fires, routine fireworks being set off, motorized bikes and horses and their rifer daily. Your agencies fail the species and the humans who live here routinely by not managing the land.

• Will Sheriff and CDFW patrol our public lands to enforce rules? How frequently?
o We the citizens always hear how underfunded CDFW and SO are to meet the demand of patrol for public lands, I suggest you publish a staffing budget and provide better protection of People Planet and our investments as citizens.

• Will county and CDFW and CA State Parks publish a clear matrix/timeline and due dates to accomplish these signage and hazard prevention tasks? How will they be accomplished? How will these activities be funded?
o The public needs to understand how our tax payer monies are working to protect our wildlands and our CSD.We need to keep tabs on your agencies. {;ease be transparent and publish your goals and time lines so we may keep your agencies accountable.

Thank you!

Very disappointed in your non response to go hiking on a "tour" with FSC and myself.

Emily
--
Emily Elizabeth Miggins
mobile: 510.292.9078
Surf: https://www.linkedin.com/in/emilymiggins

Letter 22

Babak Naficy
1540 Marsh St, Suite 110
SLO, CA 93401
babaknaficy@sbcglobal.net

November 18, 2019

Kerri Brown,
Senior Planner
San Luis Obispo Planning Department
kbrown@co.slo.ca.us

RE: Los Osos HCP EIR

Dear Ms. Brown, I only very recently found out that the County has prepared an EIR for the Los Osos HCP which has been in the works for decades. I have not had adequate time to prepare comments. I therefore want to add my voice to the many San Luis Obispo residents who have asked the County to extend the comment deadline. I offer the following comments merely as my preliminary thoughts. I also request that in the future, the County notify of me of any proposed actions, meetings, and documents relative to the Los Osos HCP and Community Plan. 22.1

According to the EIR, the County will implement the following Avoidance and Minimization Measures (AMM)

ECOSYSTEM

AMM E1: Minimize habitat fragmentation and maintain connectivity between aquatic, riparian, and upland habitats by limiting the creation of barriers to species movement, maintaining corridors to connect remaining habitat for the covered species, clustering development, and minimizing length of driveways and other impervious surfaces. 22.2

COMMUNITY

AMM C1: Minimize loss and degradation of the natural communities of the Baywood fine sand, including coastal sage scrub, central maritime chaparral, and oak woodlands by minimizing the area of permanent and temporary habitat disturbance and by siting projects in already developed or degraded areas.

AMM C2: Restore all areas of temporary disturbance such as staging areas or areas adjacent to the project footprint, to pre-project conditions or ecologically-superior conditions for the covered species. Avoid installing plants identified as invasive by the California Invasive Plant

Council and include plants native to the Baywood Fine Sand communities from local sources (i.e., the LOHCP Plan Area).

AMM C3: Avoid use of herbicide and pesticides; where necessary, apply biocides as part ofintegrated pest management strategies, and following all local, state, and federal regulations.

AMM C4: Minimize impacts of vegetation management projects conducted for fire safety, including to create and maintain defensible space, by implementing the best management practices. The list of BMPs will be maintained by the County and reviewed periodically by the Service and CDFW, and will include specific fuel-reduction prescriptions designed to minimize impacts to the covered species.

AMM C5: Install temporary construction fencing to prevent disturbance outside of the designated footprint.

MORRO SHOULDERBAND SNAIL

AMM MSS-1: Avoid and minimize the impacts to Morro shoulder band snail to the maximum extent practical by locating projects away from known or likely occupied habitat, as well as suitable but unoccupied habitat.

AMM MSS-2: Prior to and during all ground-disturbing activities in designated parcels, a biologist approved by the Service shall capture and move all Morro shoulderband snails to suitable habitat away from the project impact area. (Refer to Section F.2 in Appendix F, Covered Animal Avoidance and Minimization Surveys, of the LOHCP for a more detailed description of the pre-project surveys that would be required to be conducted to minimize take of Morro shoulderband snail.)

22.2 (cont'd)

AMM MSS-3: Avoid introducing non-native snails, and the use of snail control applications, such as mulluscicide, beer, or salt.

MORRO BAY KANGAROO RAT

- **AMM MBKR-1:** Prior to ground-disturbing activities in habitat suitable for Morro Bay kangaroo rat, the project proponent will retain a CDFW- and Service-approved biologist to conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied. (Refer to Section F.1 in Appendix F, *Covered Animal Avoidance and Minimization Surveys*, of the LOHCP for a more detailed description of the pre-project surveys that would be required to be conducted to minimize take of Morro Bay kangaroo rat.)

INDIAN KNOB MOUNTAINBALM

- **AMM IKM-1:** Prior to ground-disturbing activities in habitat suitable for Indian Knob mountainbalm, the project proponent will retain a CDFW- and Service-approved biologist to conduct a survey for the species in the project area. If the species is present, the project proponent will work with the County, Service, and CDFW to develop a plan to ensure that no

impacts to this species occur during project implementation. If a plan cannot be developed, the project proponent will be required to obtain a permit from CDFW.

MORRO MANZANITA

- **AMM MM-1:** Avoid and minimize impacts of project activities on Morro manzanita by siting project disturbance envelopes at least 10 feet away from existing plants wherever possible.
- **AMM MM-2:** Avoid or minimize trimming or removing Morro manzanita when conducting vegetation management, including in association with required hazard abatement activities. (This AMM does not apply to projects to implement the conservation program of the LOHCP, where impacts to individuals may be needed to promote regeneration and maintain suitable habitat.)
- **AMM MM-3:** Avoid planting manzanita species (*Arctostaphylos* spp.) other than Morro manzanita.

Comments:

These AMMs are problematic and violate CEQA for a number of reasons. Most importantly, none of these measures are stated in concrete, mandatory terms, making it impossible to assess the extent to which these measures would be implemented or to enforce them if they are not being implemented.

22.2 (cont'd)

The County may argue that the AMMs are not mitigation measures and are instead should be considered components of the Project. This argument, however, would be without merit because the AMM are clearly intended to address the impacts associated with the development that would occur under the provisions of the HCP. As such, the AMMs must be considered mitigation measures because they do not meet core project objectives, which is to promote and allow private and commercial development and capital improvement projects. While the distinction between a mitigation measure and a project feature may not always be crystal clear (Lotus v. Dep't of Transportation (2014) 223 Cal. App. 4th 645, 656, fn. 8), the general rule is that measures whose only function is to "reduce or eliminate" one or more potentially significant impact on the environment are properly characterized as mitigation measures and are not properly considered as project feature. Id. . Lotus in part held that the EIR was defective because it incorporated the proposed mitigation measures into its description of the project when, in fact, the "avoidance, minimization and/or mitigation measures," were not "part of the project," but, rather, were "mitigation measures designed to reduce or eliminate the damage to the redwoods. Id. at 655-56.

AMMs that call for "minimization" of certain impacts (eg. habitat fragmentation, trimming or removing Morro manzanita) are impermissibly vague, as the EIR does not define a standard by which to decide whether any particular impact has been "minimized." This makes it impossible to gauge the effectiveness of such measures and the significance of residual impacts.

Likewise, it is not clear whether the directive to "avoid" pesticides and herbicides is mandatory and/or absolute. Does avoid mean use of such chemicals is strictly prohibited? If so, this must be made more clear. 22.3

Any mitigation measure that requires impact avoidance "whenever possible" is likewise impermissibly vague and therefore inadequate. 22.4

The term "maximum extent practical" in connection with shoulderband snail AMM is vague and unlawful. Who will decide what is practical? Does this phrase mean maximum extent relative to a particular project design, or can a project proposal be modified to maximize the protection for the snail? This issue is critical because an applicant for a commercial or residential project may propose a design that maximizes the footprint that destroys all suitable habitat. Would the County require a redesign of the project, or conclude that maintaining any snail habitat would be impractical? 22.5

Some measures, for example AMM MSS-2, propose capture and removal of individual animals to "suitable habitat away from the project impact area." This directive assumes without any explanation that "suitable habitat" that is currently not occupied, or is not occupied to carrying capacity, is available. If substantial evidence supports this assumption, please identify the evidence. If you don't agree that this type of mitigation measures assumes the availability of unoccupied suitable habitat, or of suitable habitat that is not occupied at carrying capacity, then please explain why this assumption is warranted. Finally, please provide analysis of the potential impact of the loss of occupied habitat, even if individual animals are successfully translocated. 22.6

Impermissible deferral of mitigation measuers

Although not adequately explained in the EIR, the LOHCP includes the following description of the proposed management plan for the restoration and management of the LOHCP Preserve System AMMP:

> Specific Habitat restoration and management activities will be identified in the LOHCP Preserve System AMMP, which will be developed during the first three years of Plan implementation (Sections 5.3.3.2 and 6.2.3.2). Criteria used to select and prioritize projects will include:
>
> 1. **Number of Plan Goals and Objectives Advanced:** Projects that can advance multiple biological goals and objectives of the Plan (Section 5.1, Table 5-1) will be prioritized over those that advance fewer goals. For example, projects that can restore habitat for multiple covered species, and connect existing protected habitat areas, will be prioritized over projects that might benefit just a single covered species.
>
> 2. **Likelihood of Success**: Projects with a high likelihood of being successful, in terms of advancing one or more Plan goals and objectives, will be prioritized over those that are experimental or otherwise have lower probability of success;
>
> 3. **Cost Effectiveness**: To maximize effective use funds at achieving the Plan's biological goals and objectives, projects that are lower cost will be prioritized over

22.7

projects that are higher cost, all else being equal (i.e., if they advance similar numbers of goals and objectives); and

4. Sustainability: Restoration and management projects that can have sustained benefits for the covered species, communities, and ecosystem will be prioritized over those that will require ongoing inputs, all else being equal.

Management and restoration projects will be required to meet specified success criteria before the acres of habitat benefited can be credited as mitigation and be used to offset the impacts of covered activities. **Success criteria will be developed in the LOHCP Preserve System AMMP and, as appropriate, in project specific plans (e.g., for detailed restoration projects).** The success criteria will reflect the specific functions or values that the project or strategy is designed to address and provide quantitative methods for objectively evaluating its benefits for the covered species, communities, and/or ecosystem, in order to clearly link the proposed work to the biological goals and objectives of the LOHCP (Section 5.1, Table 5-1). [HCP at p. 5-10, emphasis added]

22.7 (cont'd)

The EIR violates CEQA by impermissibly deferring the formulation of the management and restoration plans which form the heart of the proposed HCP. The HCP and EIR merely identify the criteria for choosing specific restoration activities, but defer the actual drafting of the restoration/management plan to the first three years of the Project implementation. Moreover, the EIR fails to identify any concrete "success criteria" by which to judge the effectiveness of restoration and/or management measures. The EIR and HCP's failure to include a management and restoration plan, coupled with the failure to identify success criteria (i.e. performance standards) renders the EIR defective as an informational document and violates the prohibition against impermissible deferral of mitigation measures. Put another way, owing to the absence of detailed management plan and performance criteria, it is impossible to gauge whether the implementation of the proposed HCP would result in a significant adverse impact on protected species.

More specifically, with regards to Morro shoulderband snail, the EIR explains that

…, implementation of the LOHCP would result in an estimated 301 acres of new and existing protected habitat (including potential habitat) for the Morro shoulderband snail that would be incorporated into the LOHCP Preserve System. Specific habitat to be included in the LOHCP and specific restoration and management activities to be implemented would be identified by the IE in conjunction with the agencies and conservation organizations responsible for the existing protected lands. Restoration and management activities would be detailed in the LOHCP Preserve System Adaptive Management Plan and may include activities such as vegetation management, exotic and non-native species eradication, erosion control, or removal of structures, infrastructure, and debris. The amount of habitat and potential habitat to be enhanced

22.8

through such activities is unknown, as the location of LOHCP Preserve System lands has yet to be identified.

The proposed deferral of the identification of the location of the LOHCP Preserve System lands, along with the deferral of the preparation of a management plan, amounts to unlawful deferral of mitigation measures. The EIR includes insufficient detail to enable the public and/or public decision-makers to evaluate the likelihood that the proposed mitigation measures would be successful. The EIR, moreover, is deficient in that it does not propose any meaningful performance standards by which to measure the success or failure of the proposed mitigation measure.

The EIR explains that the Morro shoulderband snail mitigation would include plans to "protect, restore, and/or manage in perpetuity approximately 54.7 acres of Morro shoulderband snail habitat and potential habitat that is currently unprotected, and thus, is subject to development and other land uses that could degrade such habitat. Of the 54.7 acres, approximately 5.5 acres of habitat would be restored; such restoration would include repair of areas that have been severely degraded by erosion or dense exotic plant infestations). The LOHCP Preserve System would also include protection, restoration, and/or management in perpetuity of 164.9 acres of Morro shoulderband snail habitat and potential habitat within existing protected lands" EIR p. 120. The terms "protect, restore and/or manage" has not been explained. Thus, based on this vague proposal, the County to could restore habitat, without managing it, or to protect habitat, without restoring it or managing it. The extent or success criteria for such effort is not delineated, making it possible for the county to manage property without any evidence that the restoration or management has resulted in a healthy snail population. As such, these proposed mitigation measures are unlawful. 22.8 (cont'd)

Based on the foregoing, the EIR'c contention that "implementation of the LOHCP is anticipated to have an overall beneficial impact on the Morro shoulderband snail" is not supported by substantial evidence.

Morro Kangaroo rat

The EIR claims the Project would not impact Morro Bay kangaroo rat (MBKR) habitat because "[i]n areas of suitable habitat for the species, covered activities would only be permitted under the LOHCP pending a negative visual assessment or, as needed, a negative presence/absence survey (refer to Section 5.2.1 of the LOHCP)." The term "visual assessment" is vague and unenforceable. Potentially suitable habitat should be surveyed for the MBKR according to US Fish and Wildlife protocol. "Visual assessment" by a biologist hired by the project proponent is not an adequate substitute for a protocol survey and would not amount to substantial evidence supporting a conclusion that the site is not occupied by the MBKR. 22.9

The EIR also claims that "as part of the compensatory mitigation component of the LOHCP conservation program, the IE would **work with** individual landowners to protect remaining private land with suitable habitat for the Morro Bay kangaroo rat as part of the LOHCP Preserve System." (EIR at p. 120, emphasis added.) The phrase "work with" is hopelessly vague and unenforceable, making it impossible to predict the extent to which the IE's efforts to "work with" any landowner would result in protected habitat. There is no indication, for example, as to the how or the extent to which landowners would be incentivized to protect MBKR habitat. As such, the promise to "work with" landowners to protect MBKR 22.10

habitat is essentially meaningless and does not amount to any substantial evidence that any MBKR habitat on private land would be protected above current levels.

22.10 (cont'd)

Mitigation Measures are unworkable and violate CEQA

BIO-1 (a) mitigation measures vaguely calls for informal and formal surveys for protected species prior to development activities. These measures, however, do not pass muster under CEQA because they are impermissibly vague. EIR 126-128. It is not clear, for example, what is meant by the claim that "[o]n a project-by-project basis, a preliminary biological resource screening shall be performed as part of the environmental review process to determine whether the project has any potential to impact biological resources other than covered species." What is meant by a preliminary biological resource screening? Does it mean a visual inspection, walking transects, aerial photography or? What is the "environmental review process" in this context? Would this review in the context of an Initial Study? What if the project is otherwise categorically exempt or does not require a discretionary approval? Who would be involved in the preliminary determination? Would there be public notice? Would notice go to other agencies? Would the public be notified? Would anyone other than the neighbors be notified?

22.11

BIO-1(c) provides that "if special-status plant species cannot be avoided and would be impacted by a project, the biologist must also evaluate whether population-level effects would occur, and if habitats preserved in the LOHCP Preserve System are suitable for the species and known to be occupied." This measure essentially turns any biologist hired by project applicant into an expert who can decide for example, if "population-level effects would occur." According to CEQA law, as a lead agency, the County may rely on the opinions of its own experts, but it is not clear whether in this instance the "biologist" referred to in BIO-1(c) would be considered a County expert?

22.12

The EIR does not analyze an adequate range of alternatives

The alternative considered in the EIR calls for a 50% reduction in development. Under this alternative, the EIR assumes development footprint of the Project would be reduced by half. The EIR does not offer any meaningful explanation for choosing a 50% reduction is the only alternative.

22.13

The EIR should consider an alternative reduced development alternative whereby development is reduced or eliminated in locations that are currently occupied by protected species or provide prime habitat for expansion of the range of these species. By so doing, the County could substantially reduce the overall impact on protected species by protecting the most valuable habitat while allowing some development in areas that are not occupied or do not provide suitable habitat.

Comments on the
Los Osos Habitat Conservation Plan

Letter 23

I am a resident of Los Osos and I would like to comment on the Los Osos Habitat Conservation Plan. I read the entire Plan, and I am very impressed with the thoroughness and detail and the work that went into it. I do however, have several concerns:

1) A general question and concern about the data going into the Plan:

   As we are all aware, climate change is real, and it is appropriate there is a section on Climate Change and its potential effects on the Plan. My concern is that the references cited in this section (and actually throughout the document) are all at least 9 years old. For example, you cite the IPCC report form 2007, shouldn't the more current report be used? Current indications seem to be that the effects of climate change are accelerating. 23.1
   Please see:
   a) How Fast are the Oceans Warming? L.Cheng, J. Abraham, Z.Hausfather, K.E.Trenberth – Science 11 Jan 2019: Vol. 363, Issue 6423, pp. 128-129.
   b) Increasing precipitation volatility in twenty-first-century California. Daniel L. Swain, Baird Langenbrunner, J. David Neelin, Alex Hall – Nature Climate Change 8, 427-433 (2018).

   Wouldn't it be practical to update your models and include more adaptive measures? Wouldn't it be practical to include more land in the Priority Conservation Areas? And more fees set aside to deal with the changes we now know will be coming faster than originally anticipated?

2) Concerns about Priority Conservation Areas only on the edges of the community:

   As far as I can determine, Priority Conservation Areas are parcels of land that should be included in the LOHCP Preserve System to maximize the benefits for the covered species. The LOHCP planning process evaluated habitat within the Plan Area for protection, restoration, and management. The specific properties that will ultimately be included in the LOHCP Preserve System will be determined during implementation of the plan by the Implementing Entity, which will work with willing landowners to acquire additional lands (Section 6.2.2) and enroll existing protected lands in the Preserve System based on approval from the USFWS (Section 6.2.3). 23.2

   I spent a lot of time studying the maps and it appears to me there may be an oversight or error in designating the Priority Conservation Areas. Figure 5-1 is a map showing the Priority Conservation Areas. When I compare this to Figure 4-1 which shows the Morro Shoulderband Snail Habitat, I note that there is a **significant** parcel in the center of town, that IS **Primary Morro Shoulderband Snail Habitat,** but it is NOT also designated as a Priority Conservation Area. I am not an expert in this kind of thing, but I am concerned that this area was somehow erroneously not included as a Primary Conservation area. I also understand that protected Natural areas and Open Space are of benefit to not only the endangered and threatened species that live there, but also to the community as a whole. Please consider including this open space area, in the center of Los Osos where all community members can enjoy it, as a Primary Conservation Area.

   Please note the area outlined in red on the maps below.

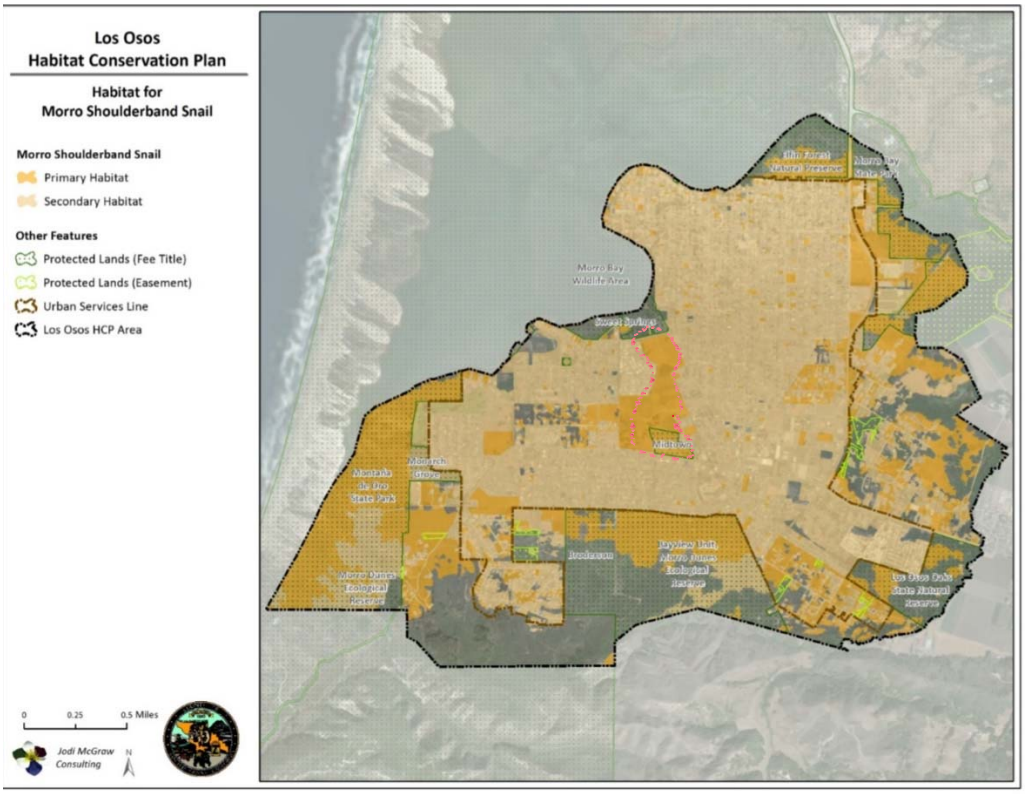


Figure 4-1: Morro Shoulderband Snail Habitat

Figure 4-1 Primary Morro Shoulderband Snail Habitat

23.2
(cont'd)



Figure 5-1: Priority Conservation Area

Priority Conservation Areas – note that they differ from figure 4-1 because the Primary Morro Shoulderband Snail habitat in the middle of the map (outlined in red) is not included. Surely this is a mistake?

3) Concerns about steep slopes in areas of Morro Manzanita Habitat that are not included as Protected Areas:

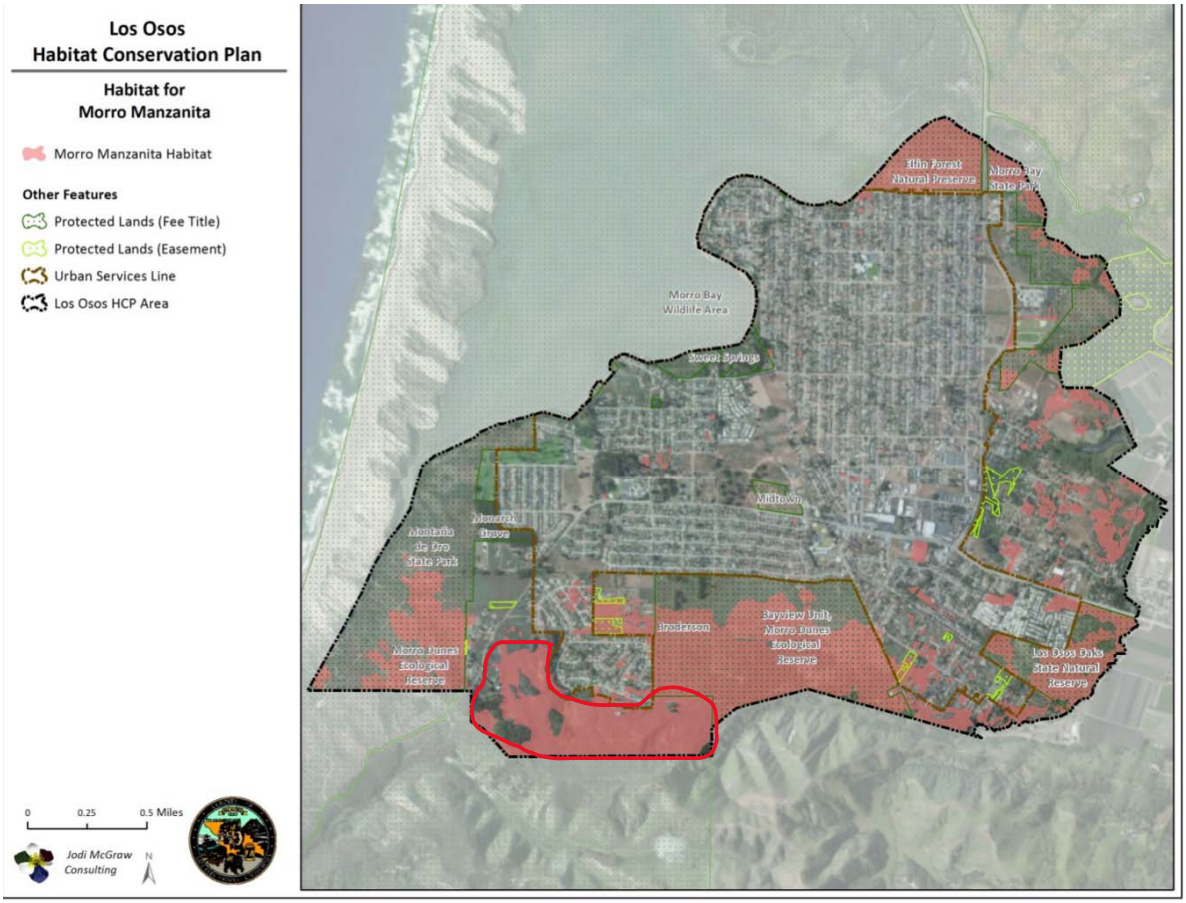


Figure 4-2: Morro Manzanita Habitat

23.3

Please note the substantial area along the southern edge of Los Osos which is designated as Morro Manzanita Habitat but is NOT also designated as "Protected Lands". I have hiked these areas frequently and note that these are generally steep slopes which contain a significant number of very large impressive stands of Morro Manzanita. It is stated on in section 4.1.2.2 of the Habitat Conservation Plan that Habitat Fragmentation can negatively impact covered species. It also states that the Plan includes "efforts to maintain habitat connectivity and protect large contiguous blocks of habitat that cone promote long-term viability of the covered species". If this is the case, these areas of Morro Manzanita habitat on the southern edge of Los Osos need to be protected from development under the Habitat Protection Plan.

I hope that you will consider the issues I have noted.

Thank you,
-ellen

Ellen Nelson
2249 Inyo St
Los Osos, CA 93402
970 218-8520

Letter 24

Takano, Leilani <leilani_takano@fws.gov>

[EXTERNAL] Fw: publc COMMENT on federal register

Jean Public [redacted] Wed, Oct 2, 2019 at 1:40 PM
To: "leilani_takano@fws.gov" <leilani_takano@fws.gov>, "foe@foe.org" <foe@foe.org>, "info@earthjustice.org" <info@earthjustice.org>, "info@pewtrusts.org" <info@pewtrusts.org>, "center@biologicaldiversity.org" <center@biologicaldiversity.org>

24.1

i oppose any murder or kililng or habitat loss for these endangered species that are under massive threat in the increased population of san luis obispo county where the sneaking central americans sneak into america and are using up land that does belong to the protected status and shoudl remain in the protected status. californai shows huge growth because of their allowing millions of illegal imimgrants flowing into that state so that no land is left for american citizens there anymore. the sneaking lawbreaking foreigners from central america are flooding into california causing loss of habitat and loss of land in all sites in california. clearly we need to clean up this illegal immigation problem so that land is not severely impacted by the millions that sneak into america. much of the building that is taking place and land loss that is taking place is due to foreigners flooding into california and taking up habitat. habitat is being lost. the animals are losing out., they have a right to life too. they should be protected as we detrmined years ago we wanted them protected. there has been no change in the population from that desire to protect these species. this plan should be shut down.it needs to be denied. this commetn is for the public record please receipt. jean publiee jean [redacted]

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[Federal Register Volume 84, Number 191 (Wednesday, October 2, 2019)]
[Notices]
[Pages 52528-52529]
From the Federal Register Online via the Government Publishing Office [www.gpo.gov]
[FR Doc No: 2019-21339]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[FWS-R8-ES-2019-N077; FXES11140800000-190-FF08EVEN00]

Los Osos Habitat Conservation Plan; Environmental Assessment and Receipt of Application; Community of Los Osos, San Luis Obispo County, California

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of availability; request for comments.

SUMMARY: We, the U.S. Fish and Wildlife Service, have received an application from the County of San Luis Obispo for an incidental take permit under the Endangered Species Act of 1973, as amended. The

permit, if issued, would authorize take of the federally endangered Morro shoulderband snail (Helminthoglypta walkeriana) and Morro Bay kangaroo rat (Dipodomys heermanni morroensis) and provide assurances for the federally endangered Indian Knob mountainbalm (Eriodictyon altissimum) and federally threatened Morro manzanita (Arctostaphylos morroensis). We invite public comment on the draft habitat conservation plan and a draft environmental assessment prepared in accordance with the National Environmental Policy Act of 1969, as amended.

DATES: We will receive public comments on the draft habitat conservation plan and draft environmental assessment until November 18, 2019.

ADDRESSES:

Obtaining Documents: You may download a copy of the draft HCP and draft EA at http://www.fws.gov/ventura/ or you may request copies of the documents by U.S. mail (below) or by phone (see FOR FURTHER INFORMATION CONTACT).

Submitting Written Comments: Please send your written comments using one of the following methods:

U.S. Mail: Stephen P. Henry, Field Supervisor, Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service, 2493 Portola Road, Suite B, Ventura, CA 93003.

Email: julie_vanderwier@fws.gov.

FOR FURTHER INFORMATION CONTACT: Leilani Takano, Assistant Field Supervisor, by phone at 805-677-3330, via the Federal Relay Service at 1-800-877-8339 for TTY assistance, or at the Ventura address (see ADDRESSES).

SUPPLEMENTARY INFORMATION: The County of San Luis Obispo (applicant) has applied to the U.S. Fish and Wildlife Service (Service) for an incidental take permit (ITP) under section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et seq.). The applicant is requesting an ITP with a 25-year term, for incidental take of two animal species likely to result from implementation of activities covered by the applicant's habitat conservation plan (HCP), and seeking assurances for two plant species. The permit, if issued, would authorize take of the federally endangered Morro shoulderband snail (Helminthoglypta walkeriana) and Morro Bay kangaroo rat (Dipodomys heermanni morroensis) and provide assurances for the federally endangered Indian Knob mountainbalm (Eriodictyon altissimum) and federally threatened Morro manzanita (Arctostaphylos morroensis). Pursuant to the National Environmental Policy Act of 1969, as amended (NEPA; 42 U.S.C. 4321 et seq.), we advise the public of the availability of the proposed HCP and our draft environmental assessment (EA).

Background

Section 9 of the ESA prohibits the take of fish or wildlife species listed as endangered; by regulation, the Service may extend the take prohibition to fish or wildlife species listed as threatened. ``Take'' is defined under the ESA to include the following activities: ``[T]o

harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct'' (16 U.S.C. 1532); however, under section 10(a)(1)(B) of the ESA, we may issue permits to authorize incidental take of listed species. The ESA defines ``incidental take'' as take that is incidental to, and not the purpose of, carrying out of an otherwise lawful activity. Regulations governing incidental take permits for threatened and endangered species are in the Code of Federal Regulations (CFR) at 50 CFR 17.32 and 17.22, respectively. Under the ESA, protections for federally listed plants differ from the protections afforded to federally listed animals. Issuance of an incidental take permit also must not jeopardize the existence of federally listed fish, wildlife, or plant species. The Permittee would receive assurances under our ``No Surprises'' regulations (50 CFR 17.22(b)(5)) and 17.32(b)(5)) regarding conservation activities for the Morro shoulderband snail, Morro Bay kangaroo rat, Indian Knob mountainbalm, and Morro manzanita.

The proposed HCP includes measures intended to avoid, minimize, and mitigate take of the Morro shoulderband snail and Morro Bay kangaroo rat and impacts to Indian Knob mountainbalm and Morro manzanita (covered species) expected to occur incidental to otherwise lawful covered activities.

The applicant is requesting coverage for incidental take and impacts resulting from the following categories of covered activities:

1. Private development (new construction, remodels, defensible space),
2. Capital improvement projects,
3. Facilities operation and maintenance projects,
4. Community wildfire protection plan, and
5. Conservation program.

Incidental take or impacts to the covered species resulting from the covered activities would be restricted to the 3,200-acre (ac) permit area, which includes the majority of Los Osos, an unincorporated community in western San Luis Obispo County. The permit area excludes all existing State park lands, with the exception of approximately 5 ac contiguous with Elfin Forest Reserve. Covered activities could result in the loss of up to 532 ac of habitat for the covered species present within the permit area.

The proposed conservation program includes species-specific avoidance and minimization measures and the establishment of a preserve system for the covered species. The preserve system would be subject to monitoring, management, and protection in perpetuity. The conservation program would remain in step with take/impacts, and the assembly of the preserve system would occur throughout the permit term.

National Environmental Policy Act Compliance

The EA analyzes the effects to the human environment for three project alternatives: No action, proposed action, and reduced take.

Under the No-Action alternative, the Service would not issue the ITP and

[[Page 52529]]

there would be no implementation of the HCP. Operation and maintenance

of existing infrastructure facilities would continue, as long as take of Morro shoulderband snail and Morro Bay kangaroo rat would not result from these activities. Any new development, including private development and capital improvement projects, with the potential to result in take of either animal species would need to seek authorization on an individual basis.

Under the Proposed Action alternative, the Service would issue the ITP and the County would implement the HCP that addresses the covered species and covered activities. The maximum extent of area affected would be 532 ac within the permit area.

Under the Reduced Take alternative, the Service would issue the ITP and the County would implement the HCP that addresses the proposed covered species and covered activities. While the permit area and permit term would remain the same, the maximum area affected would be 266 ac, which represents 50 percent of the maximum amount under the Proposed Action alternative. There would be a commensurate reduction in conservation actions.

Public Review

If you wish to comment on the draft HCP and draft EA, you may submit comments by one of the methods in ADDRESSES.

Any comments we receive will become part of the decision record associated with this action. Before including your address, phone number, email address, or other personal identifying information in your comment, please be aware that your entire comment--including your personal identifying information--may be made publicly available at any time. While you can request in your comment that we withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Authority

We provide this notice under section 10 of the ESA (16 U.S.C. 1531 et seq.) and NEPA regulations (40 CFR 1506.6).

Stephen P. Henry,
Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California.

[FR Doc. 2019-21339 Filed 10-1-19; 8:45 am]
BILLING CODE 4333-15-P

U.S. Government Publishing Office

Letter 25

Vanderwier, Julie <julie_vanderwier@fws.gov>

[EXTERNAL] San Luis Obispo HCP

1 message

Joey Racano <[redacted]> Thu, Oct 3, 2019 at 6:43 PM
Reply-To: Joey Racano <[redacted]>
To: "julie_vanderwier@fws.gov" <julie_vanderwier@fws.gov>
Cc: Sandra Brazil <[redacted]>

Ms Vanderwier,

25.1

The 'take' of Kangaroo Rats, Morro Shoulderband Dune Snails, Legless lizards, Silver Lupine, Manzanita etc, must not be allowed for any reason. Private development is not a good enough reason to ignore the protections these biological entities need under the ESA. Fire prevention is laughable when the wires that start fires aren't needed at all (solar panels on rooftops instead) and how about burying them if have them we must? Time to pay attention to 50 year old laws that were created to protect endangered species, and stop trying to mealy-mouth our way around them through the rampant corruption that is business as usual for SLO county.

Thank you,

Joey Racano
[redacted]

www.oceanoutfallgroup.com

writing: https://www.facebook.com/spiritpen

Letter 26

BISON CONNECT

Takano, Leilani <leilani_takano@fws.gov>

[EXTERNAL] Proposed additional thousands of people in Los Osos - especially around Morro Shores Mobil Home Park

1 message

Stephanie M. Raphael <[redacted]> Mon, Nov 18, 2019 at 3:34 PM
To: Leilani_Takano@fws.gov

Dear Mz. Nagano:

I am a resident of Morro Shores Mobile Home Park, [redacted]. I am also a senior citizen about to have my 78 birthday. I am very much against the proposed housing/multi apartment complexes that have been proposed for Los Osos and particularly in the areas around our Park. 26.1

First, of course, is the water issue. Despite having a rainy year last year, we are a community that is mostly in drought and mandated water restrictions. It's only been a year since people were being reported to the authorities for excessive water use. According to predictions, we are not going to have much rain this year. So, where are all these additional thousands of people going to get their water. There has been a mention of recycled water from the new Morro Bay sewer plant (if it ever gets built). Please! No thank you. 26.2

Second, the ecology of Los Osos is extremely fragile as I'm sure you are aware. Many of us have been working for years to help in this regard. A massive amount of construction would be a tremendous strain on the animals, insects and plants of this area. 26.3

Finally, there are many elderly living in Los Osos. All of us in Morro Shores Mobil Home Park are elderly. A few of us are in our 60s, but most of us are in or 70s, 80s and 90s. Our health is fragile and one of the reasons we live here is for quiet, clean air and a gentle life. We've paid for it. It would be a major strain on my health, for example, to have massive development here. My husband has COPD and already has trouble breathing. Our home is 15 feet from the open land that is in the proposed development and the dest raised would be terrible for both of us 26.4

While we realize that there must be growth, it should not be more than a few small buildings at a time here in Los Osos. We also need parks and green areas for ourselves and for the abundant wildlife here. 26.5

Thank you,

Stephanie Raphael

[redacted]

Letter 27

Takano, Leilani <leilani_takano@fws.gov>

[EXTERNAL] My comments on the Draft EIR

1 message

Deborah Ross <deb@drfilmdesign.com> Sat, Nov 16, 2019 at 3:26 PM
To: k.brown@slo.co.ca.ua
Cc: Leilani_takano@fws.gov

To Kerry Brown

I have a couple of serious concerns about the proposed EIR and it's impact on the LO Community Plan.

1) As quoted from the current draft EIR:
"With regard to water supply within Los Osos, the Draft EIR for the Los Osos Community Plan (County 2019a) determined impacts to water supply would be potentially significant, but mitigable, because development under the Community Plan would be limited to the sustainable capacity of the Groundwater Basin through the County's Growth Management Ordinance (County Municipal Code Title 26) and additional review standards tied to the Updated Basin Plan for the Los Osos Groundwater Basin (County et al. 2015). Implementation of the water supply mitigation measure from the Draft EIR for the Los Osos Community Plan would satisfy the requirement of the County to provide adequate groundwater supply to the community."

27.1

Problem: I simply don't see how the impacts to our general water supply will be "mitigable". Even if development IS limited to what has been predetermined by the County to be sustainable capacity, the assessment it is based upon is way out of date. The realities of climate change and salt water intrusion have severely altered the course of future sustainability projects. The damages will be far greater than previously acknowledged or understood. At this moment in time, we simply don't have the infrastructure (or the money to create it) required to provide water for such a huge population growth spike.
Solution: This needs to be taken into consideration BEFORE **ANY** NEW BUILDING PERMITS ARE CONSIDERED OR GRANTED. We need smart, sustainable, green *development standards in place as guard rails*, before thousands of new units are built and the population of Los Osos expands by more than 1/3 on top of our current population of @15K.

2) As quoted from the current draft EIR:
"CAL FIRE/San Luis Obispo County Fire - Draft Community Wildfire Protection Plan A CWPP serves as a mechanism for community input and identification of areas presenting high fire hazard risk as well as identification of fire hazards potential projects intended to mitigate such risk.
A CWPP must be collaboratively developed with input from interested parties, federal, state, and local agencies managing land within the County, as well as local government representatives. The CWPP for San Luis Obispo County is currently under development and, when complete, would
address fire protection planning efforts occurring in the County to minimize wildfire risk to communities, assets, firefighters, and the public. The CWPP presents the County's physical and social characteristics, identifies and evaluates landscape-scale fire hazard variables, utilizes Priority
Landscape data sets for evaluating wildfire risk, identifies measures for reducing structural ignitability, and identifies potential fuel reduction projects and techniques for minimizing wildfire risk."

27.2

Problem: As I understand it, the most recent CWPP hasn't been updated since 2013. It is in a relatively unfinished state, and wouldn't be useable for our community plan in this state. (https://www.wildfirelessons.net/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=927bc270-5fd8-48ab-aab5-68a1b8c09ca4). Additionally, many of the abatement tactics it discusses haven't even been undertaken in Los Osos up till this point in time (Wildfire Season 2019-20). There is still no proper fire line around the Urban Wilderness Interface, especially along Highland Ave. where dozens of 4' high piles of wood chips were left behind after a recent clearing of the area by Public Works. Shameful!!
Solution: The CWPP needs to be updated to current climate change predictions, a substantial budget must be created and set aside for this purpose, and the planners and community itself must begin **implementation and enforcement** of all the recommended tactics BEFORE **ANY** NEW BUILDING PERMITS ARE CONSIDERED OR GRANTED.

Thank you for your time!

Sincerely,
Deborah Ross and Robbie Conal
1347 6th Street, Los Osos 93402

Letter 28

NOV19 '19 11:20AM

November 18, 2019

TO: Environmental Coordinator, Department of Planning and Building,
976 Osos Street, Room 300, San Luis Obispo, CA 93408-2040

FROM: Sierra Club, Santa Lucia Chapter
Los Osos Sustainability Group

RE: SC and LOSG Comments on the Los Osos Habitat Conservation Plan Draft Environmental Impact Report LRP2011-00016

The Sierra Club and Los Osos Sustainability Group (LOSG) support the No Project Alternative for the Los Osos Habitat Conservation Plan. 28.1

The first reason for this and one of the most obvious shortcomings of the HCP DEIR is its reliance on the draft EIR of the Los Osos Community Plan as a set of mitigation measures for the impacts contemplated in the HCP. Per CEQA guidelines, a draft EIR does not constitute mitigation of environmental impacts. For the HCP DEIR to assert such mitigation based on the uncertified DEIR of another project is to engage in crystal ball gazing of a type not permitted by CEQA. This alone is reason enough to select the No Project Alternative. 28.2

The HCP relies on vague and unenforceable mitigation measures that make it impossible to analyze the extent to which target species would be protected. Moreover, the structure of the HCP, which puts the burden on the individual applicant to provide information to decide in the first place whether species occur on the site, creates perverse incentive for the landowner to destroy the habitat first, then claim that the site is not likely to include any species. 28.3

A second reason to opt for the No Project Alternative is the HCP DEIR's treatment of potential cumulative environmental impacts. The DEIR asserts that the fact that individual site studies will be done for all future projects will satisfy CEQA's requirement for an analysis of cumulative impacts. This appears to be a fundamental misunderstanding of the concept and category of cumulative impacts under CEQA. The absence of any analysis or mitigations for cumulative impacts in the HCP DEIR is a fatal flaw. 28.4

A third reason to support the No Project Alternative for the Los Osos Habitat Conservation Plan is the need to leave the Estero Area Plan (EAP) in place until it can be shown that the Los Osos Ground Water Basin can provide a sustainable water source for planned development. The HCP DEIR lacks the hard data necessary to make this case. This leaves the No Project Alternative as the only prudent course. 28.5

Although Annual Monitoring Reports from 2016 - 2018 issued by the Los Osos Basin Management Committee (BMC) have indicated some retreat of seawater intrusion at one location near the coast, the most recent monitoring data indicate that the seawater intrusion is moving back in at that location and is now threatening a part of the Basin not previously impacted. Further, the position of the seawater front as depicted in the 2017 and 2018 reports has uncertainties because a key data point (chloride levels in the lower aquifer portion of the Rosina Well) had to be estimated due to contamination by the upper aquifer portion of the well.

Moreover, potential adverse impacts on sensitive habitat due to reduced groundwater flows resulting from removing septic system flows are still uncertain. The 2018 Basin Plan and minutes of the June 2019 Basin Management Committee meeting indicate that a ground water mound is forming under the Broderson site but may not benefit the lower aquifer where seawater intrusion is occurring for 10 years or more. The mound apparently has not reached sensitive habitat along the estuary, and we are not aware of any records showing that LOWWP impacts on habitat, including along the estuary and in the vicinity of Willow, Eto, and Los Osos Creeks are being monitored or adaptively mitigated per Special Condition 5 (c, d) of the LOWWP Coastal Development Permit (CDP) as issued by the Coastal Commission. The HCP DEIR does not even mention the LOWWP CDP, even though several of the required CDP mitigation programs are ongoing. 28.6

The proposal in the HCP DEIR to move wells away from the ocean includes no analysis of the impacts of unspecified new well locations on a shallow aquifer and nearby creeks and riparian vegetation. The DEIR's lack of analysis or mitigation of the potential environmental impacts that may result from the relocation of these wells is impermissible under CEQA.

The HCP, in combination with the Los Community Plan update of the Estero Area Plan, provides strong incentives for unsustainable development adversely impacting the community and high-value area resources including the Basin and sensitive habitat that depends on the Basin. Growth inducements include financial incentives for developers, businesses, and the County (via development fees). Community members are incentivized by the opportunity to have attractive capital improvement projects (financed largely by development fees), reduced sewer costs, and the ability to build on existing lots and remodel and upgrade existing homes. Unsustainable growth is also encouraged by the large scope of the project. 28.7

Taken together, the strong incentives in the HCP and Community Plan update are likely to push Basin planning and decisions about further development toward a foregone conclusion that the Basin will support the development. This push is already evident, we believe, in Basin planning and could result in destruction of the sole water source for the community and coastal resources, with no other viable alternatives.

In comments submitted on the Basin plan over 2014-2016, herewith incorporated by reference, we've voiced our concerns to the Parties to the Basin Plan, the County, and the Coastal Commission regarding overly-optimistic assumptions in the Basin Plan based on the Plan's discussion of seawater intrusion and Basin conditions, as well as other expert input. The reliance of the HCP DEIR on assumptions and strategies that support further development rather than Basin sustainability is another critical flaw in the DEIR. 28.8

We will include a summary of our earlier Basin Plan comments with our comments on the Los Osos Community Plan, with recommendations we believe to be reasonable and necessary for sustainable Basin planning in light of the fact that the Los Osos Basin is relatively small, reduced in size by severe overdraft for over 30 years. We believe our recommendations are more consistent with Sustainable Groundwater Management Act planning than the current approach. 28.9

As noted, we cannot support approval of a Los Osos Habitat Conservation Plan and the Draft EIR because the Los Osos Community Plan update is the planning document that sets forth conditions for development, including water availability, on which the HCP relies. In addition to this reliance being premature, the current draft of the Los Osos Community Plan and Draft EIR are not sufficiently protective of the Basin due to the presence of the same flaw in the HCP DEIR: It does not require conclusive evidence showing that the Basin is a sustainable water source for current development and dependent resources before further development is allowed. 28.10

A request for extension of the deadline for submitting comments on the HCP DEIR was met by the extraordinary statement by the County, the lead agency, that such requests must be directed to the Department Fish and Wildlife. The deadline for public comments to be accepted on the HCP DEIR should be extended until after completion of the Los Osos Community Plan and certification of its EIR. Significant changes to the Los Osos Community Plan may make it possible to remedy the flaws in the HCP and its DEIR and may indicate a more limited set of HCP programs and/or implementation of a phased approach to the implementation of programs that protect and enhance area resources. 28.11

Until the Community Plan is amended to address these concerns and the HCP and its DEIR are amended consistent with those changes, we recommend the following regarding the HCP:

1. Delay completion and implementation of an HCP and EAP update until the Basin is shown with hard data over time to be a sustainable water source for both current development and natural resources. The data should show no sign of seawater intrusion on the western edge of the community and that water levels throughout the Basin are high enough to reverse seawater intrusion with a margin of safety. The data should also show adequate additional water in storage to support additional development with a margin of safety. A reasonable delay to be no less than ten years to allow time for the impacts of the LOWWP, Basin Plan 28.12

programs, and climate change effects on the Basin to be more fully understood. Hard data would include extensive direct water quality and water level sampling taken at production and test wells throughout Basin aquifers and areas, rather than data based on the current limited sampling sites, supplemented by modeling, extrapolations, projections, and various assumptions.

2. Encourage parties to the Basin Plan, responsible agencies, and other stakeholders in the Los Osos Basin to support Basin management strategies that take a more precautionary approach to preserving the resource.

28.12 (cont'd)

We look forward to supporting both a robust HCP and an EAP update that support further development and will protect coastal resources if and when, through the coordinated efforts of stakeholders, the Los Osos Basin proves to be a sustainable resource for present and future development and capable of protecting some of the most environmentally sensitive habitat in San Luis Obispo County.

Thank you for the opportunity to comment on these issues,

Andrew Christie
Santa Lucia Chapter of the Sierra Club

Keith Wimer
Los Osos Sustainability Group

From the Desk of Julie Tacker

Letter 29

November 18, 2019

Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service
2493 Portola Road, Suite B, Ventura, CA 93003
Stephen P. Henry, Field Supervisor

Via: *Email:* julie_vanderwier@fws.gov.

RE: Los Osos Habitat Conservation Plan, Community of Los Osos, San Luis Obispo County, California

Dear Mr. Henry,

Please find the enclosed focused comments on the Los Osos Habitat Conservation Plan; for the Community of Los Osos, San Luis Obispo County, California, generally referred to as LOHCP as it refers to the Morro Shoulderband snail in section 3.2.2.1.

As you are aware, the Morro Shoulderband Snail (*Helminthoglypta walkeriana*) is a species endemic to San Luis Obispo County. It was first identified in 1911 living in areas south of Cayucos. Since then its range has decreased considerably, due largely to habitat destruction and degradation. According to the U.S. Fish and Wildlife Service, "The Morro shoulderband snail is threatened principally by habitat destruction and degradation due to increasing development, invasion of non-native plant species (i.e. veldt grass), senescence of dune vegetation, and recreational use (e.g. off-road vehicle activity). Competition with the brown garden snail (Helix aspersa), molluscicides, and increased likelihood of extinction due to the small size and isolation of populations are potential threats." 29.1

As you are also aware, there has never been a study that quantifies MSS throughout the areas identified as "habitat". The LOHCP suggests "the current known range of Morro shoulderband snail is estimated to encompass approximately 7,700 acres (Roth and Tupen 2004). Most of the area is centered on Los Osos north of Hazard Canyon, west of Los Osos Creek, and south of Morro Bay; however, it also includes a narrow strip of coastal dunes north of Morro Bay in Morro Strand State Park (Roth and Tupen 2004, USFWS 2006). Within this geographic area, native habitat occupied by the species includes coastal sage scrub along the immediate coast, and coastal sage scrub and open central maritime chaparral communities on stabilized dunes further inland. Within these areas, Morro shoulderband snail is often found in areas featuring dense plant cover comprised of shrubs or mat-forming species (e.g., iceplant) where plant cover including branches is in contact with the ground (USFWS 1998). Individuals are typically patchily dispersed and observed

in clumps of coastal sage scrubs or clumps of veldt grass (SWCA 2014)." Given the lack of baseline data on the MSS and the fact that "Morro shoulderband snail is also often found in litter that accumulates on the soil surface, and under piles of rock, downed wood, or other debris (SWCA 2013). These microsites provide moist, sheltered environments of reduced desiccation stress that are required by the terrestrial mollusk (Roth 1985). The species is occasionally observed in shallow (less than ½ inch) depressions within the soil (Belt 2016)." MSS can and may thrive beyond the estimated 7,700 acres earlier identified as suitable habitat.

The LOHCP recognizes that there was a Five-Year Review of the MSS in 2006 and its recommendation was to down list the species. From the Service's Five-Year review: "Threats to the survival of the Morro shoulderband snail through habitat loss and degradation have been reduced considerably. The Service hopes to expand habitat maintenance into other areas essential for the snail using habitat conservation plans and additional regulatory mechanisms as applicable. Development is occurring in a planned fashion in areas that are less important for the survival of the snail. We developed a preserve design for the Morro shoulderband snail that should allow it to recover to the point that it no longer requires protection under the Act. Much of this preserve area is already protected. Therefore, many of the threats to the snail under Factor A have been partially controlled and, in some cases, eliminated; however, many of the management activities still need to be accomplished for this species to be considered for delisting (i.e., management implementation, vegetation maturation management)." This suggests management of the current lands under preservation is the primary focus for the health of the species.

29.1 (cont'd)

It appears there is no basis for the statement in the LOHCP; "Though the recommendation from the five-year review was that the species be down listed to 'threatened' (USFWS 2006), that status of Morro shoulderband snail remains 'endangered'." Since, "The down listing was based in part, on the findings of the most recent five-year review, which found the population appears stable and that species' threats have been reduced considerably, including through protection of large tracts of suitable habitat (USFWS 2006). "

The LOHCP arbitrarily states, "*However, there are no data indicating about population performance within existing protected lands. The reclassification would mean that Morro shoulderband snail is at risk of becoming endangered, rather than risk of becoming extinct."* The LOHCP cannot support this statement without the baseline quantity data and ongoing research necessary to qualify this statement. In fact, based on the studies done during the Los Osos Wastewater Project it appears the status of the species is healthy and well distributed in the urban area particularly.

The LOHCP fails to fully depict the extent to which species is threatened. Nor does it fully recognize the conservation efforts that have been ongoing in the community since 1994 when the species was listed. Conservation efforts began in 1997 with the preparation of

the Los Osos/Baywood Park Greentbelt Conservation Plan. Since that time, numerous land acquisitions have occurred further conserving and protecting the species in question. 29.1 (cont'd)

Over the last 20 years the Service has processed individual Low Effect HCP's and individual ITP's, fees have been collected. How much? What was the intent of those fees? Where has the money been spent? Additionally, during these 20 years it appears the species has thrived, while the proposed LOHCP comes at tremendous expense -- further burdening an already indebted community. 29.2

The LOHCP fails to fully explain why the MSS is listed as "endangered". The MSS should be down listed as least or delisted entirely. 29.3

Please feel free to contact me with any questions you may have.

Sincerely,



Julie Tacker

Letter 30

From: Marc Weber <mlwwriter@yahoo.com>
Sent: Sunday, November 17, 2019 7:42 PM
To: leilani_takano@fws.gov; Kerry Brown <kbrown@co.slo.ca.us>; julie_vanderwier_fws.gov <julie_vanderwier@fws.gov>
Subject: [EXT]Comment on the Los Osos HCP Draft Environmental Impact Report (DEIR)

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Re: **Response to Los Osos HCP Draft Environmental Impact Report (DEIR)**

To Whom It May Concern:

I believe more study is needed and should be added to the DEIR--in particular study of species-specific impacts on the ecology of the Morro Bay Estuary--because as it is currently written, not enough consideration is given to the areas directly adjacent to the current Audobon Society nature preserve called Sweet Springs on Ramona Avenue in Los Osos. 30.1

NOTE: Los Osos is included in the Morro Bay National Estuary so what happens in the interior of Los Osos is directly relevant to the Estuary but this DEIR primarily addresses impacts on the areas surrounding Los Osos, not INSIDE Los Osos. 30.2

I think, even if such further study is not allowed, consideration should be given to creating at least a narrow though still viable "nature corridor" within such "multi-family and commercial" development so that all the species that live in the area are not lost forever. 30.3

I suppose this means I support Alternative 2 if the DEIR is never going to be revised as I detailed above. 30.4

I would like to add that at least some open space should be designated in this interior area adjacent to Sweet Springs as many people even now use the trail through there on a daily basis. 30.5

Thank you all for your hard work in this regard.

Marc Weber
633 Ramona Avenue spc 126, Los Osos, CA 93402
mlweber@hotmail.com

Letter 31

Kerry Brown

From: Amber Wiehl <amberkabamber@gmail.com>
Sent: Monday, November 18, 2019 5:02 PM
To: Leilani_takano@fws.gov; Kerry Brown
Subject: [EXT]Re: Los Osos Habitat Conservation Plan

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Re: Los Osos Habitat Conservation Plan
I support the adoption of the Plan because the alternative of having no plan continues is unacceptable. But, the absence of a related CWPP and the lack of assurances of improved flexibility by USFWS that more appropriately balances public safety with habitat conservation when developing fire mitigation programs severely limit the attractiveness of the Plan overall. 31.1

Thank you,
Amber Wiehl

Letter 32

November 11, 2019

Dear Mr. Henry,

As a resident of Los Osos, I am writing to express my opposition to the Los Osos Habitat Conservation Plan which will add a potential eight thousand plus new residents and destroy highly valued open space within the interior of lower Los Osos. 32.1

This plan will destroy forever the habitat of many native species of animals and plants and will adversely affect our already strained, precious water supply. 32.2

I urge you to deny this ITP application which affects and negatively impacts the open space which is located at Los Osos Valley Road and Palisades avenue and beyond. 32.3

Thank you for your consideration.

Susan S. Wiest

[redacted]

Letter 33

Kerry Brown

From: Laurie Wright <lawrn@charter.net>
Sent: Thursday, November 14, 2019 3:12 PM
To: Kerry Brown
Subject: [EXT]Los Osos HCP

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Dear Ms/Mr Brown,

Please add my concerns to those that you have and will receive from concerned citizens of Los Osos regarding the proposed Habitat Conservation Plan. 33.1

I ask that before this plan gets approved, additional opportunities be given for public input and comment.

Respectfully,

Laurie Wright

2100 Pecho Road

Los Osos, CA 93402

Appendix L Responses to Public Comments on the LOHCP

This section provides responses to the written comments that were received by the County of San Luis Obispo (County) and the United States Fish and Wildlife Service (USFWS) on the Draft Los Osos Habitat Conservation Plan (LOHCP). For each comment, it provides the County response. Responses address the questions and issues raised by the commenters and indicate where and how the LOHCP was revised to address the comments.

The Draft LOHCP was circulated for a 45-day public review period that began October 2, 2019, and concluded on November 18, 2019. The LOHCP review period overlapped with that of the LOHCP Environmental Impact Report and the LOHCP Environmental Assessment, which are the environmental review documents prepared by the County, which is the lead agency under the California Environmental Quality Act (CEQA), and the USFWS which is the lead agency for the National Environmental Policy Act (NEPA), respectively.

Table L-1 lists the comment letters received by the County and the USFWS on the LOHCP and its two environmental review documents, which are provided in Appendix L. Each comment letter was assigned a unique letter identifier (1-33); within each letter, separate comments were delineated using a line down the right margin (i.e., bracketed) and assigned a sequential number based on the letter number (e.g., comment 3.7 is the seventh comment in Letter 3). The responses to comments are presented according to the letter number and specific comment number below.

This appendices primarily provides responses to comments on the LOHCP. Because some comments address the LOHCP and one or more of its environmental documents, this document references to the EIR and EA in the comments and responses to comments, which also reference the Los Osos Community Plan—the official plan for land use and transportation in Los Osos which informed planning in the LOHCP and analysis in the environmental review documents. Responses to comments that address aspects of the Draft EIR, Draft EA, or Los Osos Community Plan are included here for informational purposes only. Responses to comments addressing the EIR and EA can be found in the response to comments sections of the respective documents.

Table L-1: Comments Received on the LOHCP, Draft EIR, and/or Draft EA

Letter #	Commenter	Addressed in this Document
1	Jean Prijatel, Manager, Environmental Review Branch, United States Environmental Protection Agency, Region IX (commented on Draft EA)	No; see EA
2	Vince Kirkhuff, Air Quality Specialist, San Luis Obispo County Air Pollution Control District (commented on Draft EIR)	No; see EIR
3	Bill Amend, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses.
4	Marcie Begleiter, private citizen (first letter, addressed only to the County; commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses.
5	Marcie Begleiter, private citizen (second letter, addressed only to the Service; commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses.
6	R. David Bowlus, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses.
7	Beverly Boyd, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses.
8	David H. Chipping, Conservation Chair, California Native Plant Society, San Luis Obispo Chapter (commented on LOHCP, Draft EIR, and Draft EA)	Yes
9	Lisa Denker, private citizen (commented on LOHCP and Draft EIR)	Yes
10	James and Catherine Gentilucci, private citizens (commented on LOHCP)	Yes
11	Eve Gruntfest, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses.
12	Jeanne Howland, private citizen (first letter, addressed only to the County; commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
13	Jeanne Howland, private citizen (second letter, addressed only to the Service; commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
14	Jeff Edwards, J. H. Edwards Company, private company (first letter, addressed only to the Service; commented on LOHCP and Draft EA)	Yes
15	Jeff Edwards, J. H. Edwards Company, private company (second letter, addressed only to the County; commented on LOHCP and Draft EIR)	Yes

Table L-1: Comments Received on the LOHCP, Draft EIR, and/or Draft EA

Letter #	Commenter	Addressed in this Document
16	R.E. Kirk, private citizen (commented on LOHCP and Draft EA)	Yes
17	Roxanne Lee, private citizen (commented on LOHCP)	Yes
18	Patrick McGibney, Los Osos Sustainability Group, community organization (commented on LOHCP and Draft EIR; letter received after close of public review comment)	Yes
19	Rebecca McFarland, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
20	Patrick McGibney, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
21	Emily Miggins, private citizen (commented on LOHCP)	Yes
22	Babak Naficy, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
23	Ellen Nelson, private citizen (commented on LOHCP)	Yes
24	Jean Public, private citizen (commented on LOHCP)	Yes
25	Joey Racano, private citizen (commented on LOHCP)	Yes
26	Stephanie Raphael, private citizen (commented on LOHCP)	Yes; see EIR for additional responses
27	Deborah Ross and Robbie Conal, private citizens (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
28	Andrew Christie, Santa Lucia Chapter of the Sierra Club, and Keith Wimer, Los Osos Sustainability Group, community organizations (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
29	Julie Tacker, private citizen (commented on LOHCP)	Yes
30	Marc Weber, private citizen (commented on LOHCP and Draft EIR)	Yes; see EIR for additional responses
31	Amber Wiehl, private citizen (commented on LOHCP)	Yes
32	Susan Wiest, private citizen (commented on LOHCP)	Yes; see EIR for additional responses
33	Laurie Wright, private citizen (commented on LOHCP)	

L.1 Letter 1

COMMENTER: Jean Prijatel, Manager, Environmental Review Branch, United States Environmental Protection Agency, Region IX (commented on Draft EA)

DATE: November 14, 2019

Response 1.1

The commenter states appreciation for the opportunity to review the Draft EA. This comment is noted. This comment addresses the EA; refer to the Final EA for the response to this comment.

Response 1.2

The commenter recommends quantification of air pollutant emissions from the covered activities included in the LOHCP, as future development could lead to increases in regional emissions from criteria pollutants.

This comment addresses the EA; refer to the Final EA for the response to this comment.

Response 1.3

The commenter suggests adding several standard construction Best Management Practices (BMPs) related to air pollutant suppression during construction activities as mitigation measures in the Final EA. This comment addresses the EA; refer to the Final EA for the response to this comment.

Response 1.4

The commenter recommends adding an analysis in the Final EA of the potential for aquifer drawdown or overdraft due to implementation of cumulative projects.
This comment addresses the EA; refer to the Final EA for the response to this comment.

Response 1.5

The commenter recommends the stormwater mitigation measures be added to the Final EA to include all sizes of development, not just single-family residences.

This comment addresses the EA; refer to the Final EA for the response to this comment.

Response 1.6

The commenter recommends that the Final EA includes the outcome of tribal consultation between the Service and the tribal governments within the project area.

This comment addresses the EA; refer to the Final EA for the response to this comment.

Response 1.7

The commenter reiterates appreciation for the opportunity to review the Draft EA and requests a copy of the Final EA and FONSI.

This comment is noted; the Service will send the commenter a copy of the Final EA and FONSI, should it be adopted.

L.2 Letter 2

COMMENTER: Vince Kirkhuff, Air Quality Specialist, San Luis Obispo County Air Pollution Control District (commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 2.1

The commenter states appreciation for the opportunity to review the LOHCP and LOHCP Draft EIR. This comment is noted.

Response 2.2

The commenter states that the LOHCP EIR incorrectly states that the South Central Coast Air Basin is under the jurisdiction of the San Luis Obispo County Air Pollution Control District (SLOCAPCD).

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 2.3

The commenter states that Table 10, *Current Federal and State Ambient Air Quality Standards*, shows emissions data from 2016, 2017, and 2018; however, the text preceding Table 10 states the data are from 2015, 2016, and 2017.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 2.4

The commenter states that the LOHCP EIR inaccurately states that the SLOCAPCD is required to prepare an air quality improvement plan for the South Central Coast Air Basin.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 2.5

The commenter states that the LOHCP EIR inaccurately states that the Senate Bill (SB) 32 Scoping Plan is expected to be adopted in 2017.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 2.6

The commenter states that they do not recommend relying on the GHG thresholds in the SLOCAPCD's CEQA Air Quality Handbook.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 2.7

The commenter states that it is important to note that the EnergyWise Plan was created with a planning threshold of 2020, and therefore may not meet the state's reduction goals for 2030 as required by SB 32 and the 2017 Scoping Plan.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.3 Letter 3

COMMENTER: Bill Amend, private citizen (commented on LOHCP and Draft EIR)

DATE: November 17, 2019

Response 3.1

The commenter states support for the approval of the proposed project (i.e., implementation of the LOHCP). Support for the proposed project is noted and will be provided to the decision-makers.

Response 3.2

The commenter does not think the LOHCP adequately addresses wildfire management. The commenter says that wildfire management in the Los Osos area was historically and currently is inadequate, and that the EIR relies on a Community Wildfire Protection Plan (CWPP) that is not yet developed and/or publicly vetted.

The LOHCP includes as a covered activity vegetation management and related fire hazard abatement work implemented as part of the most recently adopted CWPP (SLOCCFSC 2009). The CWPP is designed to reduce the risk of wildfire by reducing fuels at the wildland urban interfaces. Covering the impacts of this activity will facilitate implementation of this work. The CWPP identifies areas that could be subject to a range of fuel reduction and fire hazard abatement treatments in and adjacent to Los Osos (Section 2.2.7, Figure 2-7). Anticipated treatments include removal of downed, dead, and/or diseased vegetation; creation of shaded fuel breaks; and mowing of non-native grassland. The CWPP would involve wildfire protection measures on 89.4 acres of the Plan Area in the wildland-urban interface (Figure 2-7). Such activities would result in long-term risk reduction associated with wildfire for the Plan Area.

The Interim Adaptive Management and Monitoring Plan for the LOHCP Preserve System (McGraw 2020) outlines recommendations for fuels reduction as part of the CWPP within the Bayview Unit of the Morro Dunes Ecological Reserve, which is the first preserve planned for inclusion in the LOHCP Preserve System during initial implementation. The fuels management recommendations in the IAMMP are designed to facilitate implementation of the fuel break in a way that will maximally benefit the covered species and protect other natural resources, while achieving the fuel reduction and associated fire safety objectives.

In addition, the USFWS and the California Department of Fish and Wildlife (CDFW) worked with CALFIRE to develop AMMs for the CWPP (Table 5-4). With implementation of the AMMs, activities under the CWPP would avoid take of Morro Bay kangaroo rat and impacts to Indian Knob mountainbalm, and is anticipated to result in negligible effects on Morro shoulderband snail and Morro manzanita.

The LOHCP also includes as a covered activity the creation of “defensible space” around private and public development structures. Defensible space is an area of reduced vegetation, which, in turn, would slow the spread of fire and enable firefighters to safely access structures. Defensible space should extend 100 feet from structures or to the property line, whichever is nearer. The first 30 feet from a structure should not contain flammable vegetation or woodpiles. Within the remaining 70 feet (or to the property line), vegetation should be reduced/minimized and spaced to reduce the speed and/or intensity of any fires (CAL FIRE 2020).

Response 3.3

The commenter summarizes their comments previously discussed in the comment letter. Refer to Responses 3.1 and 3.2.

L.4 Letter 4

COMMENTER: Marcie Begleiter, private citizen (first letter, addressed only to the County; commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 4.1

The commenter expresses dissatisfaction with the venue size for the public meeting held on October 28, 2019 for the LOHCP and Draft EIR, as well as the date of the meeting when considering the end date of the public review period for the Draft EIR. The commenter also states that the County's contact information presented at the meeting was incorrect and that the public review period should be extended.

These comments are noted, and the County apologizes for the inconveniences related to the public meeting. The County provided adequate public notices of completion and availability of the Draft EIR, and also provided a 45-day public review period for the Draft EIR, which is typical for an EIR of this complexity and complies with the public review requirements under CEQA. Accordingly, the County did not extend the public review period of the Draft EIR beyond November 20, 2019 (or November 18, 2019 for the LOHCP).

Response 4.2

The commenter expresses the need to protect open space and preserve the character of the community. The commenter also states that the LOHCP and Draft EIR describe extensive development under implementation of the LOHCP, stating approximately 30 percent infill units by 2035, which is more than double the rate of California from 2006 to 2016.

The County believes this comment is not on the LOHCP or the Draft EIR for the LOHCP, but rather the Draft EIR of the Los Osos Community Plan, which was released for public review on September 12, 2019. The Los Osos HCP does not direct land use; rather, it provides a comprehensive strategy for mitigating the impacts of the land use on the covered species and their habitats. The LOHCP EIR response to comments provides analysis related to the environmental impacts of development that would be permitted through the LOHCP.

Response 4.3

The commenters states that the data in the report is at least five years old. The County believes this comment is not on the LOHCP, but rather the latest (2015) Los Osos Community Plan (County 2015a), the Draft EIR for which was released for public review on September 12, 2019. With regard to the LOHCP, data and references used were the most up-to-date information available when the plan was prepared.

Response 4.4

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 4.5

The commenter requests updating the LOHCP with current data on sea level rise and saltwater intrusion. Sea level rise is discussed in Section 6.5.3 *Climate Change* of the LOHCP. The County does not believe additional changes to the LOHCP are needed to address this issue.

Response 4.6

The commenter requests changing the amount of development allowed under the LOHCP, similar to Comment 4.2. Refer to Response 4.2.

Response 4.7

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 4.8

The commenter thanks the County for its service to the community. The County appreciates such feedback.

L.5 Letter 5

COMMENTER: Marcie Begleiter, private citizen (second letter, addressed only to the Service; commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 5.1

The commenter expresses dissatisfaction with the venue size for the public meeting held on October 28, 2019 for the LOHCP and Draft EIR, as well as the date of the meeting when considering the end date of the public review period for the Draft EIR. The commenter also states that the public review period should be extended. This comment is similar to Comment 4.1; the commenter is referred to Response 4.1.

Response 5.2

The commenter expresses the need to protect open space and preserve the character of the community. The commenter also states that the LOHCP and Draft EIR describe extensive development under implementation of the LOHCP, stating approximately 30 percent infill units by 2035, which is more than double the rate of California from 2006 to 2016.

This comment is the same as Comment 4.2; the commenter is referred to Response 4.2. Additional analysis is not required under CEQA.

Response 5.3

The commenters states that the data in the report is at least five years old. This comment is the same as Comment 4.3; the commenter is referred to Response 4.3. Additional analysis is not required under CEQA.

Response 5.4

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 5.5

The commenter requests updating the LOHCP and Draft EIR with current data on sea level rise and saltwater intrusion. This comment is the same as Comment 4.5; the commenter is referred to Response 4.5.

Response 5.6

The commenter requests changing the amount of development allowed under the LOHCP, similar to Comment 4.2. This comment is the same as Comment 4.6; the commenter is referred to Response 4.2.

Response 5.7

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 5.8

The commenter thanks the County for its service to the community. The County appreciates such feedback.

L.6 Letter 6

COMMENTER: R. David Bowlus, private citizen (commented on LOHCP and Draft EIR)

DATE: November 17, 2019

Response 6.1

The commenter suggests that prescriptive rights for informal visitor parking, beach access, and small boat access continue to be allowed to the bay along the 1300 block of 1st Street.

The LOHCP covered activities are not likely to affect beach parking or access. The area is already developed, so there is only potential for some infill development of single-family residences and commercial development along 1st Street in Los Osos.

Response 6.2

The commenter states that Rosina Drive between Pine Avenue and Doris Avenue needs to be paved and maintained by the County.

This request is beyond the purview of the LOHCP which does not plan for public works and related projects. The LOHCP does include as covered activities capital improvement projects by the County Public Works Department (Section 2.2.5.3). Adoption of the LOHCP would streamline permitting for covered activities by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach to permitting, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area.

Response 6.3

The commenter states that traffic flow along Ramona Avenue, 4th Street, and 9th Street is inefficient based on current traffic volumes and suggests implementing some one-way roadway segments in Los Osos, as well as provide walkways and bicycle lanes.

As noted for Response 6.2, this topic is beyond the purview of the LOHCP, although the LOHCP does include as a covered activity capital improvement projects by the County Public Works Department (Section 2.2.5.3). Adoption of the LOHCP would streamline permitting for covered activities by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach to permitting, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area.

Response 6.4

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.7 Letter 7

COMMENTER: Beverly Boyd, private citizen (commented on LOHCP and Draft EIR)

DATE: November 17, 2019

Response 7.1

The commenter suggests that prescriptive rights for informal visitor parking, beach access, and small boat access continue to be allowed to the bay along the 1300 block of 1st Street. This comment is the same as Comment 6.1; the commenter is referred to Response 6.1.

Response 7.2

The commenter states that Rosina Drive between Pine Avenue and Doris Avenue needs to be paved and maintained by the County. This comment is the same as Comment 6.2; the commenter is referred to Response 6.2.

Response 7.3

The commenter states that traffic flow along Ramona Avenue, 4th Street, and 9th Street is inefficient based on current traffic volumes and suggests implementing some one-way roadway segments in Los Osos, as well as provide walkways and bicycle lanes. This comment is the same as Comment 6.3; the commenter is referred to Response 6.3.

Response 7.4

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.8 Letter 8

COMMENTER: David H. Chipping, Conservation Chair, California Native Plant Society, San Luis Obispo Chapter (commented on LOHCP, Draft EIR, and Draft EA)

DATE: November 15, 2019

Response 8.1

The commenter expresses concern regarding the LOHCP EIR's lack of independent assessment of impact to Morro manzanita, instead of relying on the assessment included in the LOHCP. The commenter also states that they have attached their comments on the LOHCP on the Service.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 8.2

The commenter states they do not understand why the locations and acreages of development under the LOHCP are not more definitive, so that the impacts from take of covered species is "validated."

The LOHCP is a programmatic plan designed to cover impacts associated with a range of activities that could be anticipated to occur over a 25-year permit term. It covers impacts to up to 532.0 acres (14.6 percent) of land within the Plan Area (Table 2-9). Although the exact numbers, sizes, and locations of the individual projects to be conducted under the LOHCP are currently unknown, impacts to vegetation communities and other biological resources were estimated under the impact assumptions per the type of covered activity (Table 4-1). Section 4 of the LOHCP provides a detailed discussion of potential impacts to covered species. The avoidance and minimization measures (AMMs) under the LOHCP would require pre-project surveys for covered species, as well as several other measures to minimize or avoid direct and indirect impacts to covered species and other special-status species, as outlined in Section 5.2. The negative impacts of covered activities on Morro manzanita would be offset by the beneficial impacts of implementation of the LOHCP conservation program from efforts to protect, restore, and manage habitat within the LOHCP Preserve System as described in Section 5.3.

Response 8.3

The commenter expresses appreciation for the opportunity to comment on the LOHCP. This comment is noted.

Response 8.4

This comment is a summary of Comment 8.11; refer to Response 8.11.

Response 8.5

This comment is a summary of Comments 8.12 through 8.14; refer to Responses 8.12 through 8.14.

Response 8.6

This comment is a summary of Comment 8.15; refer to Response 8.15.

Response 8.7

This comment is a summary of Comment 8.16; refer to Response 8.16.

Response 8.8

This comment is a summary of Comment 8.17; refer to Response 8.17.

Response 8.9

This comment is a summary of Comment 8.18; refer to Response 8.18.

Response 8.10

This comment is a summary of Comment 8.19; refer to Response 8.19.

Response 8.11

The commenter states parcel numbers and locations in the LOHCP are confusing when compared to those stated in the Estero Area Plan (EAP). The commenter also expresses a concern of buildout of larger parcels if subdivided.

Section 2 of the LOHCP provides tables and figures that illustrate the general location and total acreages of parcels in the Plan Area based on land use designations, development status, and size categories, which are collectively used to determine the amount of additional development that can occur on the parcels. There are too many parcels in the plan area to provide individual parcel data, as suggested by the commenter.

Table 2-6 and LOHCP identifies the maximum square feet of disturbance that can occur on each parcel based on its location and size. Parcels cannot be subdivided as part of the HCP; the LOHCP will only cover development on legal lots at the time the LOHCP is adopted and the ITP is issued or lots that have received prior subdivision approval by the County that remains valid.

Response 8.12

The commenter states that the LOHCP is “unclear” on the location of protected habitat for Morro manzanita. The commenter also expresses concern that potential future subdivision of larger parcels would “cloud” the quantification of take of Morro manzanita.

As the LOHCP is a programmatic plan, the exact numbers, sizes, and locations of the individual projects to be conducted under the LOHCP are currently unknown. The LOHCP estimates the impacts to vegetation communities and other biological resources using the impact assumptions per the type of covered activity as outlined in Table 4-1 of the LOHCP. As noted in the response to comment 8.11, the LOHCP does not allow subdivision and also caps the amount of disturbance on each parcel.

The commenter also questioned whether the Morro Dunes Ecological Reserve (MDER) meets the enrollment criteria for the LOHCP Preserve System. The commenter is referred to Appendix G of the LOHCP, which concludes that the MDER is eligible for inclusion in the LOHCP Preserve System for purposes of habitat enhancement and restoration.

The commenter also stated that existing protected lands should not be considered as a gain in net protection. Section 5.3.3.1 of the LOHCP describes how restoration and management of existing protected lands is counted toward mitigation only based on the additional benefits of the enhanced management and restoration for the covered species; such lands are not credited in terms of habitat protected. Section 5.3.3.2 describes how the existing protected lands will be managed based on an Adaptive Management and Monitoring Plan for the LOHCP Preserve System, which will identify the additional benefits of enhanced management and restoration on existing protected lands. Section 6.2.3.1 of the LOHCP describes how enrollment of such lands will require a maintenance of effort agreement between the LOHCP Implementing Entity and the landowner, to ensure that the current management and restoration activities that are being implemented by the landowner continue to ensure that the LOHCP mitigation has added benefits for the covered species.

Response 8.13

The commenter states that the LOHCP is "unclear" on the location of restorable habitat for Morro manzanita.

The LOHCP identifies a reserve system scenario, which includes protection and management of new habitat as well as restoration and enhanced management of existing protected lands, as describe in Section 5.3 of the LOHCP and illustrated in Tables 5-5, 5-9, and 5-10. Under this scenario, an estimated 22.3 acres of habitat for Morro Manzanita will be restored in existing protected lands, where an additional 188.6 acres would be managed in perpetuity; additionally, a total of 51.7 acres of habitat would be newly protected with 5.2 acres of that habitat being restored and the remaining 46.5 acres being managed. The newly protected habitat would be located primarily in the Priority Conservation Area, which is illustrated in Figure 5-1. The existing protected land to be restored and managed is anticipated to be largely within the Morro Dunes Ecological Reserve, as illustrated in Table 5-5.

The restoration and enhanced management will ultimately be identified in the Adaptive Management and Monitoring Plan (AMMP) for the LOHCP Preserve System, which will be developed during the first three years of LOHCP implementation, as described in Section 5.3.3.2. To guide interim management of the MDER, an Interim Adaptive Management and Monitoring Plan (IAMMP) has been developed (McGraw 2020). It provides for the restoration of Morro Manzanita habitat (i.e., central maritime chaparral) through two main activities: 1) control of veldt grass and co-occuring invasive plant species within 23 acres, and 2) restoring an estimated 4.3 acres of habitat degraded by *de facto* trails that have been created by recreational users throughout the Bayview Unit of the MDER. These initial restoration actions targeted for the Bayview Unit will restore and manage areas of central maritime chaparral that current support or are suitable for Morro manzanita.

Response 8.14

The commenter questions the LOHCP's claim that the 8:1-acre benefit of the plan for Morro manzanita, which he feels is predicated on counting existing protected lands as habitat or providing management that is not needed.

The commenter is referred to Section 5.8, *Benefits of the Conservation Program* which outlines the anticipated net benefits of the conservation program, based on the anticipated preserve system scenario, relative to impacts to the covered species and their habitat caused by the anticipated covered activities. The benefits for the covered species of including existing protected lands in the LOHCP Preserve System is derived from the additional benefits of enhanced habitat management and

restoration beyond what is currently occuring and required by the landowner; the 8:1 ratio of benefits to impacts for Morro Manzanita does not include the value of the existing habitat protection.

While it is true that mature Morro Manzanita habitat is relatively stable, areas of central maritime chaparral supporting Morro Manzanita have been invaded by veldt grass, jubata grass, ice plant, and other invasive plant species that degrade habitat. Morro manzanita habitat has also been degraded by proliferation of *de facto* trails which denuded habitat and cause erosion. Morro manzanita will benefit from efforts outlined in the IAMMP to restore unauthorized trails and control invasive plants at the Bayview Unit of the MDER. Morro manzanita will also benefit from future management as outlined in the AMMP, which is anticipated to include additional management of invasive plants, recreation, and also fire—a natural part of the central maritime chaparral community to which Morro manzanita is likely adapted, as described in Section B.2.

Even if the final acres of habitat that are subjected to enhanced management, restoration, and protection is lower than the anticipated in the plan, based on the assumptions about the project impacts (Table 4-1 and 4-4) and assumptions about the Preserve System (Tables 5-5 and 5-10), the LOHCP would likely result in net benefits to Morro manzanita. This is because impacts to Morro manzanita and central maritime chaparral due to implementation of the LOHCP would be relatively low. Most future development under the LOHCP would be inside the USL, which contains only scattered individuals of Morro manzanita. In addition, most habitat protection would occur in the Priority Conservation Area, which contains most of the Plan Area's central maritime chaparral.

Response 8.15

The commenter questions the LOHCP's assertion that part of the restoration of Morro manzanita habitat can be restored by conducting fire management to promote regeneration of populations of Morro manzanita.

While additional development in the LOHCP area will necessitate exclusion of wildfire, it will not prevent active fire management including prescribed fire. CAL FIRE and other land management entities including State Parks have worked effectively in this region and other regions with fire-adapted communities that occur near the wildland-urban interface to conduct fire management treatments, including prescribed fire; these treatments can reduce the risk of catastrophic wildfire while promoting populations of fire-adapted species such as Morro Manzanita. The AMMP developed for the LOHCP Preserve System will address these dual benefits of proactive fire management techniques as outlined in Section D. 3 *Fire Management* of the LOHCP.

Response 8.16

The commenter states that a "significant portion of the core habitat for Morro manzanita" occurs in the southern portion of the Plan Area. The commenter also expresses concern that potential future subdivision of larger parcels could result in underestimating the take of Morro manzanita.

The exact numbers, sizes, and locations of the individual projects to be implemented under the LOHCP are currently unknown. The LOHCP estimates the impacts to vegetation communities and other biological resources using impact assumptions developed based upon the type of covered activity as outlined in Tables 2-6 and 4-1. The LOHCP caps the amount of disturbance that can occur on each legal parcel, as illustrated in Table 2-6. Additionally, the LOHCP only allows development on existing legal lots

at the time the LOHCP is adopted and the ITP is permitted, unless the County has previously approved a subdivision and that approval remains valid.

Response 8.17

The commenter states that the LOHCP does not address conflicting land management requirements for the four covered species.

To develop the AMMP for the LOHCP Preserve System, biologists will conduct comprehensive habitat assessments and surveys for the covered species. The LOHCP management and restoration strategies will reflect the goal E3 of the LOHCP, which is to "Maintain and enhance the natural mosaic of Baywood fine sands communities and their varying successional stages, to provide a range of habitat conditions for the covered species and the broader assemblages of native plants and animals in the ecosystem." The IAMMP for the LOHCP Preserve System identifies 23 acres of habitat to be enhanced through control of veldt grass and co-occurring invasive plants, and an estimated 4.3 acres of habitat degraded by *de facto* trails that will be restored throughout the Bayview Unit of the MDER. These initial restoration measures as well as many other anticipated restoration and management measures outlined in Appendix D are anticipated to benefit all four covered species. Accordingly, the County respectfully disagrees with this comment. The LOHCP would not result in conflicting land management requirements for the four covered species.

Response 8.18

The commenter states that the LOHCP fails to recognize the Morro manzanita-coast live oak vegetation community and utilize data volunteers have collected to map Morro manzanita.

The 2019 LOHCP uses the same vegetation classifications as the 2005 Draft LOHCP. The areas where Morro manzanita-coast live oak are likely mapped in the 2019 LOHCP as either central maritime chaparral or coast live oak vegetation communities, both of which are considered to be habitat for Morro manzanita as illustrated in Table 4-4 of the LOHCP. The LOHCP calls for areal extent mapping and demographic monitoring of Morro Manzanita in the LOHCP Preserve system during development of the AMMP and when new preserves are added. The surveys that volunteers have conducted can be used to inform those efforts.

Response 8.19

The commenter states that the LOHCP should resolve a potential issue concerning some properties that received encumbered state or federal funding.

Table G-1 of the LOHCP outlines how, during the planning process, CDFW evaluated issues that would preclude its use for mitigation and confirmed that state funds used to purchase the property (from Proposition 50 and state license plate funds). The CDFW analysis concluded that funding sources do not preclude use of these properties for mitigation under the LOHCP.

Response 8.20

The commenter expresses appreciation for the opportunity to comment on the LOHCP. This comment is noted.

L.9 Letter 9

COMMENTER: Lisa Denker, private citizen (commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 9.1

The commenter states that the vegetation communities map shown on Figure 6 of the EIR and Figure 3-4 of the LOHCP does not accurately show the actual extent of pickleweed or other intertidal shoreline habitats within the Baywood Park peninsula.

The vegetation communities map for the Plan Area was compiled by qualified biologists. It is noted that the scale of the map is such that determining the location of the 1.3 acres of pickleweed community within the 3,643.8-acre Plan Area is difficult. As described in Section 2.3 of the LOHCP, if the proponent of a project along the coastline or other waterways wishes to conduct projects that would cause take/impacts to non-covered listed species, that project proponent would need to obtain separate permits to cover those impacts, in order to be eligible for coverage of their impacts to the LOHCP covered species through the LOHCP.

Response 9.2

The commenter expresses the need for open space management with the growing population in Los Osos. The commenter requests management includes invasive plant removal, use of paths and signage to limit off-trails foot traffic, installation of trash cans, and education and enforcement of dog leash laws, as well as revegetation to prevent soil erosion.

Sections 4.2, 5.3.3.1, and D.2 of the LOHCP discuss the potential indirect impacts of increased population on the covered species including via the mechanisms identified by the commenter.

The LOHCP covered activities include implementation of a conservation program. As described in Section 5.3.3, the conservation program will include restoration and management of habitat with the LOHCP Preserve System, which would be comprised of a network of protected lands that would be managed and monitored in perpetuity to mitigate the impacts of covered activities on covered species. Habitat management and restoration would be designed to address factors that are negatively impacting species populations and vegetation communities, including management of vegetation using manual and mechanical techniques and/or fire, eradication and control of exotic plants and non-native animals, erosion control in unnaturally denuded areas, demolition and removal of structures and other infrastructure, and removal of debris and hazardous material. In addition, lands within the LOHCP Preserve System will be subject to general land stewardship and management, which are also a covered activity under the plan. The general activities that would be required to maintain the LOHCP Preserve System include maintenance of existing facilities (e.g., fences, gates, roads, trails, irrigation systems); installation and maintenance of trails; development and maintenance of interpretive facilities (e.g., signs, kiosks, wildlife observation platforms); and creation and maintenance of parking lots, staging areas, picnic areas, and restrooms.

In addition, covered activities include capital improvement projects by the County Parks and Recreation Department. Anticipated capital improvement projects include, but are not limited to, a new approximately 3-acre aquatic center, a new approximately 1.5-acre boat ramp, 10 new multi-use trails

(totaling approximately 7.8 miles), 14 new coastal access points, and expansion of the boardwalk and placement of an approximately 5,000-foot-long fence in the Elfin Forest Natural Preserve. Maintenance of parks and open space would also be considered a covered activity under the LOHCP.

Response 9.3

The commenter suggests that Estero Bay be designated a "pesticide-free zone" and that hunting on the bay be abolished.

This request is beyond the purview of the LOHCP. Adoption of the LOHCP would not directly result in development in Los Osos, nor the use of pesticides or hunting on Estero Bay. Adoption of the LOHCP would streamline permitting for covered activities by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach to permitting, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area.

L.10 Letter 10

COMMENTER: James and Catherine Gentilucci, private citizens (commented on LOHCP)

DATE: October 9, 2019

Response 10.1

The commenter states support for the approval of the proposed project (i.e., implementation of the of the LOHCP). Support for the proposed project is noted and will be provided to the decision-makers.

L.11 Letter 11

COMMENTER: Eve Gruntfest, private citizen (commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 11.1

The commenter states support for the approval of Alternative 1 in the LOHCP EIR, the No Project Alternative, but wants Alternative 1 modified to include wildfire protection efforts that are not currently in place.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 11.2

The commenter states that the Los Osos Nature Corridor, shown on Figure 4-1 as primary habitat for Morro shoulderband snail just south of the area labeled "Sweet Springs," should be mapped on LOHCP Figure 5-1 as "Priority Conservation Area."

The LOHCP Preserve System is focused on protecting habitat on the perimeter of the Plan Area. As discussed in Section 5.3.1, land protection will be prioritized in this priority conservation area, which is illustrated in Figure 5-1, where additional habitat protection can:

protect relatively large areas of habitat, including by buffering and expanding existing protected habitat areas, in order to safeguard large areas that feature reduced perimeter-to-area ratios that are therefore more resistant to edge effects and can be effectively managed using techniques designed to promote diversity and long-term population persistence, including prescribed fire of fire surrogates; and

maintain and restore critical landscape linkages between significant habitat areas, including protected lands and other large areas of relatively intact habitat. Connecting habitat that might otherwise become isolated will facilitate gene flow (exchange of genetic material) between individuals in otherwise isolated habitat, and recolonization of sites where populations are extirpated.

Within this priority conservation area, the LOHCP is projected to include an estimated 219.6 acres of habitat and potential habitat for the Morro shoulderband snail as illustrated in Table 5-10. Specifically, the LOHCP is anticipated to protect, restore, and/or manage in perpetuity approximately 54.7 acres of Morro shoulderband snail habitat and potential habitat that is currently unprotected, and thus, is subject to development and other land uses that could degrade such habitat. Of the 54.7 acres, approximately 5.5 acres of habitat would be restored; such restoration would include repair of areas that have been severely degraded by erosion or dense exotic plant infestations. The LOHCP Preserve System would also include protection, restoration, and/or management in perpetuity of 164.9 acres of Morro shoulderband snail habitat and potential habitat within existing protected lands. Such existing protected lands feature some of the largest areas of remaining habitat, where additional restoration and management can promote species population sizes and viability. For these reasons, implementation of the LOHCP is anticipated to have an overall beneficial impact on the Morro shoulderband snail.

Proponents of projects outside of the priority conservation area will still need to implement all applicable avoidance and minimization measures (AMMs) to participate in the LOHCP. Figure 5-2 of the

LOHCP shows the proposed Morro shoulderband snail "Minimization Measure Areas," as well as currently protected land. As shown on this figure, the location which the commenter suggests should be mapped as "Priority Conservation Area" under the LOHCP is proposed to be a Morro shoulderband snail Minimization Measure Area. Figure 5-2, as well as Figure 4-1 and Figure 5-1, also shows a portion of that area as existing protected land.

As stated in Table 5-11, implementation of the LOHCP Conservation Program would require project proponents of covered activities in Morro shoulderband snail Minimization Measure Areas to implement AMM MSS-2, which requires a biologist approved by the Service to capture and move all Morro shoulderband snails to suitable habitat away from potential impact areas prior to and during all ground-disturbing activities in designated parcels. In addition, AMM E1 and AMMs C1 through C5 would help minimize short-term negative impacts of the LOHCP Conservation Program on Morro shoulderband snail.

Response 11.3

The commenter states that preserving the area referenced in Comment 11.2 in the center of the community as open space, not just the outskirts of the Plan Area, would be beneficial to biological resources, as well as humans living and visiting in Los Osos.

As noted above, the LOHCP conservation program is focused on lands the priority conservation area where habitat protection, restoration, and management are anticipated to maximize long-term benefits for the covered species. Isolated reserves within larger developed areas, as suggested by the comment, are more susceptible to edge effects from adjacent development and may not be able to support persisting populations over time. In contrast, investing conservation resources in the intact areas around the perimeter of the Plan Area will provide opportunities to buffer, restore, and manage existing protected lands, to promote protection of larger continuous areas of protected habitat that can promote population persistence.

Response 11.4

The commenter expresses concern that the potential development locations under Alternative 2, the Reduced Take Alternative, are not provided in the EIR or LOHCP, and concern that Alternative 2 would allow the "Morro Shores Mixed-Use Area," which is more than 62 acres in size, to utilize the ITP under the LOHCP.

The precise locations of the 266 acres that would be developed under Alternative 2 are currently unknown because individual landowners within the Plan Area would determine if and when they wish to develop under this alternative.

The area known as the Morro Shores Mixed-Use Area is the same area to which the commenter refers in Comments 11.2 and 11.3. As shown in Figure 2-4 of the LOHCP, the area is currently designated Residential Single Family and Residential Multifamily under the adopted Estero Area Plan. Under the latest (2015) Los Osos Community Plan, the land use designation of the area would be revised to "Multi-Land Use Category" and specifically would allow Residential Single Family, Residential Multifamily, and Commercial Service within the area. Although the owner of this area could utilize the ITP under the proposed project or Alternative 2, as the Morro Shores Mixed-Use Area could meet the requirements to be considered a covered activity under the LOHCP, the project proponent would still be required to comply with applicable federal, state, and local development laws and regulations, including compliance

with CEQA. If the project proponent of the Morro Shores Mixed-Use Area files an application to develop the property, the County would determine the appropriate level of CEQA documentation for the project and require completion of the CEQA process prior to approval of the project. Implementation of CEQA for the Morro Shores Mixed-Use Area would ensure that the County identifies, and mitigates as necessary, potential significant impacts to air quality, biological resources other than the covered species under the LOHCP, cultural resources, geology and soils, water supply, noise, and transportation.

Response 11.5

The commenter states that the County has previously ignored public comments on Draft EIRs.

The County has previously and will continue to comply with the requirements of CEQA regarding responses to comments on Draft EIRs, as well as the other legal requirements for CEQA compliance.

Response 11.6

The commenter states that the Draft EIR does not discuss that Morro Bay Estuary is a "nationally designated area."

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 11.7

The commenter states support for Alternative 1, the No Project Alternative. The commenter also requests a map showing development locations under Alternative 2, the Reduced Take Alternative.

Support for the No Project Alternative is noted and will be provided to the decision-makers. As noted in response to comment 11.4 above, the locations of the 266 acres that would be developed under Alternative 2 are currently unknown because individual landowners within the Plan Area would determine if and when they wish to develop under this alternative.

Response 11.8

The commenter states that the *CEQA Guidelines* require recirculation of a Draft EIR if significant new information is added to the EIR based on public comments.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.12 Letter 12

COMMENTER: Jeanne Howland, private citizen (first letter, addressed only to the County; commented on LOHCP and Draft EIR)

DATE: November 11, 2019

Response 12.1

The commenter provides a summary of the information presented on the County's webpage for the LOHCP (https://www.slocounty.ca.gov/Departments/Planning-Building/Active-Major-Projects/Los-Osos-Habitat-Conservation-Plan-(HCP).aspx [accessed December 2019]).

It is noted that the comment incorrectly defines take under the federal Endangered Species Act (ESA); this definition is not included on the County webpage for the LOHCP. The comment, instead, uses the California Endangered Species Act's (CESA) meaning of the term 'take.' Refer to pages 1, 30, and 34 of the Draft EIR for verbatim definitions of 'take' under ESA and CESA. As stated in the EIR:

Under ESA, the term 'take' means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C., §1532 (19)). Furthermore, the term 'harm' is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering" (16 U.S.C., §1532 (20); 50 C.F.R. §17.3).

Although two of the covered species in the LOHCP, Morro Bay kangaroo rat and Indian Knob mountainbalm are state-listed species in addition to being federally listed, the proposed project would avoid potential 'take' as defined by CESA for those species. Under CESA, the term 'take' means to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (Fish and Game Code [FGC] Section 86). Therefore, the LOHCP would not require issuance of a state ITP by the CDFW under FGC Section 2080.

Furthermore, it is noted that the comment does not quote the County's website verbatim, although the comment appears to infer such. Nonetheless, this comment generally copies the summary of the LOHCP and the proposed ITP.

Response 12.2

The commenter states that the LOHCP would allow hunting and other forms of killing of state and federally protected species in Los Osos for 25 years.

The LOHCP would not allow hunting of any species. Implementation of the LOHCP and issuance of an ITP under Section 10(a)(1)(B) of ESA from the USFWS to the County would allow take (as defined under ESA; refer to Response 12.1) of two federally listed animal species (the federally and state listed as endangered Morro Bay kangaroo rat and the federally listed as threatened Morro shoulderband snail), as well as impacts to two federally listed plant species (the federally and state listed as endangered Indian Knob mountainbalm and the federally listed as threatened Morro manzanita). The covered activities would avoid impacts to Morro Bay kangaroo rat individuals through incorporation of the AMMs included in Section 5.2.

Adoption of the LOHCP and issuance of an ITP by the USFWS would allow individual property owners/project proponents to implement a "covered activity" as outlined in Section 2.2 of the LOHCP. Covered activities include private and public developments, capital improvement projects, operation and maintenance of existing infrastructure such as roadways, drainage systems, water systems, parks, and open space, implementation of the CWPP, and implementation of the LOHCP conservation program (Section 2.2.8).

Participation in the implementation of the LOHCP and use of the ITP are voluntary. Individual project applicants that do not want to participate in implementation of the LOHCP can ensure compliance with federal, state, and local permitting requirements on a project-by-project basis. However, the purpose of the LOHCP is to streamline the permitting process, which would reduce the permitting timeline and costs to individual project applicants, while contributing to a more comprehensive conservation strategy for the covered species.

Expedited development under the LOHCP would have the potential to adversely affect special-status species and their habitats in the Plan Area. However, the LOHCP would also provide benefits to such species by protecting suitable habitat of appropriate size to support existing populations. The LOHCP would create opportunities to protect and improve habitats of greater quality and extent than the small-scale restoration efforts that are feasible for individual small development projects that would otherwise occur without implementation of the LOHCP. The larger size and contiguous nature of many of the lands proposed for inclusion in the LOHCP Preserve System would be superior to preservation of small noncontiguous parcels that would occur without the LOHCP. Protected lands would become part of the LOHCP Preserve System. Conservation of high-quality upland habitats, erosion control, and invasive species management in upland habitats would also provide benefits to species not covered by the LOHCP that occur in wetland and riparian habitats by reducing erosion, improving nutrient cycling, and limiting progress of invasive species recruitment into new areas. Furthermore, more contiguous habitat protection through the LOHCP Preserve System could result in greater gene flow, and thus, greater genetic diversity among populations of non-covered species.

As described in Section 5.2 of the LOHCP, the AMMs require pre-project surveys for covered species, as well as several other measures to minimize or avoid direct and indirect impacts to covered species and other special-status species. The negative impacts of covered activities on Morro shoulderband snail, Morro manzanita, and Indian Knob mountainbalm would be offset by the beneficial impacts of implementation of the LOHCP conservation program from efforts to protect, restore, and manage habitat within the LOHCP Preserve System. Additionally, the benefits of LOHCP conservation program to Morro Bay kangaroo rat habitat through habitat restoration and/or preservation would offset the adverse effects of covered activities on the Morro Bay kangaroo rat. Furthermore, take of individuals of Morro kangaroo rat, in any form, with the exception of habitat as part of specific restoration activities, will not be permitted under the LOHCP.

Response 12.3

The commenter summarizes the two alternatives included in the EIR and expresses concern that the potential development locations under Alternative 2, the Reduced Take Alternative, are not provided in the EIR, and concern that Alternative 2 would allow the "Morro Shores Mixed-Use Area," which is more than 62 acres in size, to utilize the ITP under the LOHCP.

Response 11.4 addresses this comment.

Response 12.4

The commenter states that the County has previously ignored public comments on Draft EIRs.

The County has previously and will continue to comply with the requirements of CEQA regarding responses to comments on Draft EIRs, as well as the other legal requirements for CEQA compliance.

Response 12.5

The commenter states that the County is rushing to approve the LOHCP and that the Draft EIR lacks thorough research and documentation in the County's effort to save time and money.

The County respectfully disagrees with this comment. Section 1.4, *Environmental Review Process*, in the EIR provides a summary of the County's and USFWS's good-faith efforts to notify agencies and the public of the proposed LOHCP and to conduct public scoping meetings to allow public participation prior to the initiation of preparation of the Draft EIR since September 2013. Since issuance of the Notice of Preparation (NOP) for a Draft EIR for the LOHCP, the County has continued to work with applicable federal, state, regional, and local agencies, as well as organizations and private citizens. The Draft EIR and the Final EIR were prepared in concert with environmental planners, land use planners, biologists, air quality/greenhouse gas specialists, noise specialists, archaeologists, historians, hazardous materials specialists, geologists, and hydrologists. The commenter is referred to Section 7.1, *Bibliography*, of the EIR for a complete list of documents referenced in the EIR. All these documents are included in the administrative record for the EIR and project; all documents that are not considered confidential are available to the public by the County upon request.

In addition, the commenter is referred to Section 15151, *Standards for Adequacy of an EIR*, of the *CEQA Guidelines*, which states:

An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure. (PRC Section 21083)

Response 12.6

The commenter states that the Draft EIR does not discuss that Morro Bay Estuary is a "nationally designated area."

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 12.7

The commenter states support for Alternative 1, the No Project Alternative. The commenter also requests a map showing development locations under Alternative 2, the Reduced Take Alternative.

Support for the No Project Alternative is noted and will be provided to the decision-makers. As outlined in response to comment 11.7, the precise locations of the 266 acres that would be developed under

Alternative 2 are currently unknown because individual landowners within the Plan Area would determine if and when they wish to develop under this alternative.

Response 12.8

The commenter noted that the *CEQA Guidelines* require recirculation of a Draft EIR if significant new information is added to the EIR based on public comments. The commenter also expresses belief that the LOHCP Draft EIR will need to be recirculated prior to certification of the Final EIR.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.13 Letter 13

COMMENTER: Jeanne Howland, private citizen (second letter, addressed only to the Service; commented on LOHCP and Draft EIR)

DATE: November 17, 2019

Response 13.1

The commenter provides a summary of the information presented on the County's webpage for the LOHCP (https://www.slocounty.ca.gov/Departments/Planning-Building/Active-Major-Projects/Los-Osos-Habitat-Conservation-Plan-(HCP).aspx [accessed December 2019]). This comment is the same as Comment 12.1; the commenter is referred to Response 12.1.

Response 13.2

The commenter states that the LOHCP would allow hunting and other forms of killing of state and federally protected species in Los Osos for 25 years. The commenter also states that the Draft EIR does not include a quoted sentence from the County's LOHCP webpage, which provides a brief summary of the LOHCP. This comment is the same as Comment 12.2; the commenter is referred to Response 12.2.

Response 13.3

The commenter summarizes the two alternatives included in the EIR and expresses concern that the potential development locations under Alternative 2, the Reduced Take Alternative, are not provided in the EIR, and concern that Alternative 2 would allow the "Morro Shores Mixed-Use Area," which is more than 62 acres in size, to utilize the ITP under the LOHCP. This comment is the same as Comment 12.3; the commenter is referred to Response 12.3.

Response 13.4

The commenter states that the County has previously ignored public comments on Draft EIRs. This comment is the same as Comment 12.4; the commenter is referred to Response 12.4.

Response 13.5

The commenter states that the County is rushing to approve the LOHCP and that the Draft EIR lacks thorough research and documentation in the County's effort to save time and money. This comment is the same as Comment 12.5; the commenter is referred to Response 12.5.

Response 13.6

The commenter states that the Draft EIR does not discuss that Morro Bay Estuary is a "nationally designated area." This comment is the same as Comment 12.6; the commenter is referred to Response 12.6.

Response 13.7

The commenter states support for Alternative 1, the No Project Alternative. The commenter also requests a map showing development locations under Alternative 2, the Reduced Take Alternative. This

comment is the same as Comment 12.7; the commenter is referred to Response 12.7. Additional analysis is not required under CEQA.

Response 13.8

The commenter that the *CEQA Guidelines* require recirculation of a Draft EIR if significant new information is added to the EIR based on public comments. The commenter also expresses belief that the LOHCP Draft EIR will need to be recirculated prior to certification of the Final EIR. This comment is the same as Comment 12.8; the commenter is referred to Response 12.8.

L.14 Letter 14

COMMENTER: Jeff Edwards, J. H. Edwards Company, private company (first letter, addressed only to the Service; commented on LOHCP and Draft EA)

DATE: November 18, 2019

Response 14.1

The commenter provides a summary of other previous conservation efforts for the Los Osos area, including approximately 950 acres of existing protected land in the area. The commenter also speculates Los Osos' future residential growth rate and discusses the outstanding monetary debt the community currently possesses due to the 2016 Los Osos Water Recycling Facility (LOWRF). These data are not presented in the LOHCP, the LOHCP Draft EIR, or the LOHCP Draft EA, and the County is unsure from where the commenter received such data.

The commenter also states the "preferred alternative" is Alternative 2, the Reduced Take Alternative. This comment is noted and will be provided to the decision-makers.

Response 14.2

The commenter states that development under the LOHCP is "overstated" in Table 2-9 of the LOHCP. The commenter speculates that each new single-family residence would disturb an average of 6,000 square feet. The commenter also states that the LOHCP's estimation of 155 acres of disturbance due to redevelopment is excessive, and that the public and private utility projects in Table 2-9 of the LOHCP include projects that likely will not occur.

The commenter is referred to Table 2-5, which shows the maximum disturbance envelope allowed for single-family residential development in Los Osos. As shown in the table, within the USL, property owners/project proponents can impact the entire residential parcel, regardless of parcel size, and outside the USL, the maximum disturbance envelope on single-family residential parcels is 30,000 square feet, regardless of parcel size. In addition, the County Planning and Building Department determined the anticipated number of parcels eligible for redevelopment, maximum disturbance footprints (average or range), and frequency (number of permits per year) for covered activities in Los Osos based on data from the community of Oceano, which never underwent the "discharge moratorium," as occurred in Los Osos.

The commenter is referred to Table 2-7 for the assumptions regarding redevelopment impact acreages under the LOHCP. As stated in the footnote of Table 2-7, estimated acreage of impacts by redevelopment of developed, privately held parcels are based on estimates projected by the County Planning and Building Department.

The commenter is referred to Table 2-8 for the assumptions regarding impact acreages related to anticipated public and private utility covered activities under the LOHCP. As stated in the footnotes of this table, although the County Parks has planned projects that could impact up to 65.6 acres, only about half of the projects are anticipated to be conducted during the term of the 25-year ITP. Table 2-9 uses the *anticipated* impacts (32.8 acres) from the County Parks' covered activities rather than the *planned* impacts (65.6 acres).

Regardless of how many square feet or acres each anticipated development or redevelopment project would disturb, the ITP issued by the Service to the County pursuant to the proposed LOHCP would expire when either the total amount of habitat disturbance authorized under the ITP is reached (532 acres), or 25 years have elapsed since issuance of the ITP, whichever occurs first, though the County can seek to extend the permit term, as outlined in Section 6.9.

Creation of the LOHCP Preserve System and active management of existing protected habitat for the benefit of covered species would be a net positive impact to sensitive species and/or their habitats (including covered species and non-covered species) where they co-occur with preserve areas, particularly those with similar habitat requirements. Implementation of the LOHCP would provide benefits to special-status plant and animal species and nesting birds by protecting habitat of suitable size to support existing populations of unique or special-status species. The LOHCP would create opportunities to protect and improve habitats of greater quality and extent than the small-scale restoration efforts that are feasible for individual small development projects. The larger size and contiguous nature of many of the lands proposed for inclusion in the Preserve System would be superior to preservation of small, disjunct parcels as would occur without the implementation of the programmatic LOHCP.

Response 14.3

The commenter provides suggested anticipated impact acreages under Alternative 2, the Reduced Take Alternative. The County is not aware of the nature of the analysis used to develop the estimate and will retain the acreages used in the LOHCP alternatives.

Response 14.4

The commenter states that the LOHCP "minimize[s] the efficacy and appropriateness of Alternative 2" and that arguments against Alternative 2 "lack substantive support." The commenter also quotes text from the Draft EA that describes Alternative 2.

The County respectfully disagrees with the statements of the commenter and stands behind the analysis presented in Section 8.2. As outlined therein, the conservation program for the LOHCP will leverage the impacts to the covered species that will occur predominantly within the USL to protect, restore, and manage habitat that is of higher conservation value for the covered species outside the USL, with an emphasis on habitat in the priority conservation area. Because of the net benefit to the covered species associated within the conservation program, increased take associated with the Proposed Plan (Alternative 4 in the LOHCP) is anticipated to have greater benefits to the covered species than the reduced take alternative (Alternative 2), which would result in inferior project-by-project mitigation after the cap on take is reached and project proponents are required to develop their own piecemeal mitigation. Moreover, the economies of scale associated with managing and restoring a greater area of habitat as would be supported by the proposed project have been shown in a study by the Center for Natural Lands Management, which found that the per-acre habitat management costs are greater in smaller preserves than larger preserves. Management of invasive plants, fire, and recreation will be more effective if performed at a larger scale than in a smaller area as unmanaged areas will have indirect effects on managed areas.

Response 14.5

The commenter states the "preferred alternative" is Alternative 2, the Reduced Take Alternative. The commenter speculates the cost of implementing Alternative 2. The commenter also speculates the implementation of Alternative 2 would result in the delisting of the Morro shoulderband snail.

The commenter's preference for Alternative 2 is noted and will be provided to the decision-makers. The anticipated cost of implementing Alternative 2 is not presented in the LOHCP, the LOHCP Draft EIR, or the LOHCP Draft EA. These documents also do not discuss the potential for Alternative 2 to result in the delisting of the Morro shoulderband snail. The County is unsure from where the commenter received such information.

Response 14.6

The commenter states that preconstruction surveys and other requirements for the Morro Bay kangaroo rat under the LOHCP should be confined to the Priority Conservation Area (PCA). The commenter also says the Figure 4-2, *Morro Manzanita Habitat*, in the LOHCP is inaccurate.

Because the Morro Bay kangaroo rat is a fully protected species and is critically endangered, pre-project surveys are necessary to avoid take of this species by implementation of covered activities in the LOHCP. The area for pre-project surveys incorporates all areas where the species has potential to occur, including larger parcels in the USL where the species may occur.

Covered activities would avoid impacts to Morro Bay kangaroo rat individuals through incorporation of the AMMs included in the LOHCP. Surveys would be conducted to evaluate presence of the Morro Bay kangaroo rat as described in Section 5.2.1, and to monitor the species as describe in Section 5.4. Prior to implementation of covered activities within potentially occupied habitat for the species, pre-project visual assessments and, if warranted, surveys would be conducted to evaluate whether the species is present as outlined in Section 5.2.1 and detailed in Section F.1. If the species is detected, all work would be required to stop immediately and the project proponents would need to contact the Service and CDFW to discuss project permitting. Take of individuals of Morro Bay kangaroo rat, in any form, with the exception of habitat as part of specific restoration activities, will not be permitted under the LOHCP.

The LOHCP includes AMM MBKR-1 which states, "Prior to ground-disturbing activities in habitat suitable for Morro Bay kangaroo rat (Figure 5-3), the project proponent will retain a CDFW- and USFWS-approved biologist to conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied." Section F.1 in Appendix F, *Covered Animal Avoidance and Minimization Surveys*, details the pre-project surveys that would be required to be conducted to minimize take of Morro Bay kangaroo rat.

The short-term, negative impacts of covered activities on Morro Bay kangaroo rat habitat would be offset by the long-term benefits resulting from protection, restoration, and management of suitable habitat for this species within the LOHCP Preserve System. Under the LOHCP, the LOHCP Preserve System would benefit 240 acres of coastal sage scrub, the preferred habitat of the Morro Bay kangaroo rat, and 110 acres of central maritime chaparral communities, which the Morro Bay kangaroo rat can utilize when in an early-successional state.

Figure 4-2 of the LOHCP shows the locations of suitable habitat for Morro manzanita based on the vegetation communities identified as habitat for Morro manzanita in LOHCP Table 4-4. It is not intended to illustrate the species distribution.

L.15 Letter 15

COMMENTER: Jeff Edwards, J. H. Edwards Company, private company (second letter, addressed only to the County; commented on LOHCP and Draft EIR)

DATE: November 19, 2019

Response 15.1

The commenter states that the Draft EIR does not contain Alternatives 3 and 4 included in Section 8 of the LOHCP. The commenter also states that the Draft EIR does not adequately compare Alternative 2 to the proposed project.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 15.2

The commenter expresses support for Alternative 2, the Reduced Take Alternative, and states that Alternative 2 is the environmentally superior alternative.

The commenter's support for Alternative 2 is noted and will be provided to the decision-makers. The County respectfully disagrees that Alternative 2 is the environmentally superior alternative.

L.16 Letter 16

COMMENTER: R.E. Kirk, private citizen (commented on LOHCP and Draft EA)

DATE: November 17, 2019

Response 16.1

The commenter states that the LOHCP and Draft EA have been "secretly" prepared over the past 10 years, and that the 45-day public review period for the Draft EA was not enough time for the public to provide comments.

The County respectfully disagrees with this comment. The commenter is referred to Section 1.4, *Environmental Review Process*, in the LOHCP EIR, which provides a summary of the County's and Service's good-faith efforts to notify agencies and the public of the proposed LOHCP and to conduct public scoping meetings to allow public participation prior to the initiation of preparation of the Draft EIR since September 2013. Since issuance of the Notice of Preparation (NOP) for a Draft EIR for the LOHCP, the County has continued to work with applicable federal, state, regional, and local agencies, as well as organizations and private citizens.

The County and the Service provided adequate public notices of completion and availability of the Draft EIR and Draft EA, respectively, and also each provided a 45-day public review period, which is typical for an EIR and an EA of this complexity and complies with the public review requirements under CEQA and NEPA. Accordingly, the County and the Service did not extend the public review periods of the Draft EIR and Draft EA, respectively.

Response 16.2

The commenter states that pre-project surveys for the Morro Bay kangaroo rat under the LOHCP should not be required for parcels currently surrounded by development.

Because the Morro Bay kangaroo rat is a fully protected species, for which take in the form of harm to individuals cannot be permitted, pre-project surveys are necessary to avoid take of this species by implementation of covered activities in the LOHCP. The area for pre-project surveys incorporates all areas where the species has potential to occur, including larger parcels in the USL where the species may occur.

Covered activities would avoid impacts to Morro Bay kangaroo rat individuals through incorporation of the AMMs included in the LOHCP. Take of individuals of Morro Bay kangaroo rat, in any form, with the exception of temporary impacts to habitat as part of specific restoration activities, will not be permitted under the LOHCP.

AMM MBKR-1 in the LOHCP states, "Prior to ground-disturbing activities in habitat suitable for Morro Bay kangaroo rat (Figure 5-3), the project proponent will retain a CDFW- and USFWS-approved biologist to conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied." Section F.1 in Appendix F, *Covered Animal Avoidance and Minimization Surveys*, describes the pre-project surveys that would be required to be conducted to minimize take of Morro Bay kangaroo rat.

Response 16.3

The commenter states that limiting the maximum disturbance envelope to 30,000 square feet on parcels outside the USL and just under five acres is "unjust" to property owners.

The County respectfully disagrees with this comment. The County believes the commenter is referring to privately-owned parcels designated as single-family residential and equal to or less than five acres. Participation in the implementation of the LOHCP and use of the ITP are voluntary. Individual project applicants that do not want to participate in implementation of the LOHCP can ensure compliance with federal, state, and local permitting requirements on a project-by-project basis. However, the purpose of the LOHCP is to streamline the permitting process, which would reduce the permitting timeline and costs to individual project applicants, while contributing to a more comprehensive conservation strategy for the covered species. Table 2-5 outlines the eligibility criteria for single-family residential development to be considered "covered activities."

Response 16.4

The Commenter states that a parcel purchased in December 2016 was excluded from the comparables used to estimate land costs for mitigation under the LOHCP.

The analysis of mitigation costs for the LOHCP was completed prior to the sale noted by the commenter, such that it was not included in the comparables used to calculate mitigation costs. Section 7.4 outlines the process of adaptive financial management that the County will use to make adjustments to the mitigation fees so that they cover the actual mitigation costs.

Response 16.5

The commenter states that the LOHCP is punitive against owners of vacant parcels and would require mitigation regardless of whether an individual project would result in take of a covered species. The commenter also attaches a memorandum from the Service's Principal Deputy Director dated April 26, 2018 that provides guidance on what actions would trigger the need for an ITP.

The County developed the LOHCP to streamline landowner compliance with ESA. The County's plan was developed to meet ESA regulations as described in Section 10; the LOHCP does not provide mitigation that is above and beyond that required in Section 10.

L.17 Letter 17

COMMENTER: Roxanne Lee, private citizen (commented on LOHCP)

DATE: November 15, 2019

Response 17.1

The commenter states that the proposed land use and development identified in the LOHCP should maintain the rural character of Los Osos.

The LOHCP does not propose any changes in land use designations. In addition, adoption of the LOHCP would not directly result in development in Los Osos, but rather, would result in a "streamlining" of the covered activities in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area. However, individual project proponents can voluntarily choose to not participate in the LOHCP, and can process any required ITPs individually.

Response 17.2

The commenter requests changes to Figure 2-2, the land use map in the LOHCP.

As stated in Response 17.1, the LOHCP does not propose any changes in land use designations. Figure 2-2 in the LOHCP shows the current land use designations in the Plan Area, based on the currently adopted Estero Area Plan (EAP; last updated in 2009; County of San Luis Obispo 2009).

The commenter is referred to the Draft EIR of the Los Osos Community Plan, which was released for public review by the County on September 12, 2019. The latest (2015) Los Osos Community Plan (County of San Luis Obispo 2015) provides some changes to the land use designations in Los Osos. The Los Osos Community Plan notes that the community wishes to maintain its "small-town" atmosphere.

Response 17.3

The commenter states that an undeveloped area along Los Osos Valley Road between Palisades Avenue and Broderson Avenue shown in Figure 2-3 could be used for a future regional park.

The County acknowledges the commenter's preference for more parks and open space in the center of town, which will be shared with decision makers. The LOHCP was developed to streamline permitting and coordinate mitigation from development under the LOCP, as well as other covered activities; it does not propose any changes in land use designations. The LOCP focuses development in the center of town to reduce the effects of habitat fragmentation associated with more diffuse land use. Likewise, the LOHCP conservation program, which is designed to coordinate and consolidate mitigation from the covered activities, emphasizes protection and management of relatively large, contiguous blocks of habitat, which can support larger populations of the covered species and be more effectively managed. As a result, it emphasizes protection and management of habitat in the priority conservation areas which are illustrated in Figure 5-1 and described in Section 5.3.1.2. This area occurs on the perimeter of

the LOHCP area where new habitat protection can buffer, expand, and connect existing protected lands and thus be more effective at achieving the biological goals and objectives of the LOHCP.

Response 17.4

The commenter states that a large regional park that includes an aquatic center and library should be developed along Los Osos Valley Road. The commenter refers to Table 4-1 in the LOHCP.

The County acknowledges the commenter's preference for more parks and open space in the center of town, which will be shared with decision makers. As outlined in response to comment 17.3 above, the LOHCP is designed to streamline permitting of the LOCP, which is designates land use including areas designated for parks versus other forms of land use.

Response 17.5

The commenter expresses a desire to have more bicycle lanes in the Plan Area. The commenter refers to Table 4-1 in the LOHCP.

The LOHCP covers capital improvement projects by the County Public Works Department as described in Section 2.2.5 of the LOHCP. Anticipated capital improvement projects by the County Public Works Department appear to focus more on creating bicycle lanes and improving drainage along existing roadways, as opposed to added additional travel lanes or roadways. Adoption of the LOHCP would not directly result in development in Los Osos, but rather, would streamline covered activities in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area.

L.18 Letter 18

COMMENTER: Patrick McGibney, Los Osos Sustainability Group, community organization (commented on LOHCP and Draft EIR)

DATE: December 3, 2019 (letter received after close of public review comment)

Response 18.1

The commenter states that this letter provides clarification to comments submitted by Patrick McGibney on November 18, 2019 (Letter 20).

The County acknowledges receipt of the additional comments from Mr. McGibney.

Response 18.2

The commenter states that the EIR must discuss cumulative impacts from three projects, including the Los Osos Water Recycling Facility (LOWRF), the Los Osos Groundwater Basin Plan, and the LOHCP (the proposed project).

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 18.3

The commenter states that the adopted EAP should be "kept in place," assuming the current restrictions on building imposed by the California Coastal Commission (CCC) are kept in place, until the Los Osos Groundwater Basin can provide a sustainable water source for planned development under the No Project Alternative.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.19 Letter 19

COMMENTER: Rebecca McFarland, private citizen (commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 19.1

The commenter expresses concern that the LOHCP lacks a plan to patrol and maintain the Morro Dunes Ecological Reserve to prevent adjacent homes from being more susceptible to wildfires.

The Morro Dunes Ecological Reserve (MDER) is managed by the California Department of Fish and Wildlife. In 2019, CDFW collaborated with the Community Fire Safe Council and CalFire to enable CalFire to reduce fuel loads in this area. As described in Section 2.2.7, the LOHCP will cover the take/impacts of the Community Wildfire Protection Plan, which calls for creation of a shaded fuel break along Highland Drive within the Bayview Unit of the MDER, as illustrated in Figure 2-7. Anticipated treatments include removal of downed, dead, and/or diseased vegetation.

The LOHCP envisions that the MDER will be enrolled as part of the LOHCP Preserve System, as outlined in Table 5-5. In doing so, the LOHCP will enhance management for endangered species and their habitat within the CDFW MDER by funding enhanced management, restoration, and long-term monitoring activities on the reserve, including fencing, signage, and trails management. Although the LOHCP is not intended to address camping and other law enforcement issues on the MDER, installing and maintaining signage and fencing on the MDER and related activities to detect and close unauthorized trails are anticipated to help reduce other unlawful activities.

The Interim Adaptive Management and Monitoring Plan for the LOHCP Preserve System (McGraw 2020) outlines recommendations for fuels reduction as part of the CWPP within the Bayview Unit of the Morro Dunes Ecological Reserve, which is the first preserve planned for inclusion in the LOHCP Preserve System during initial implementation. The fuels management recommendations in the IAMMP are designed to facilitate implementation of the fuel break in a way that will maximally benefit the covered species and protect other natural resources, while achieving the fuel reduction and associated fire safety objectives.

Response 19.2

The commenter states that the LOHCP should address the growth of homelessness in Los Osos.

This comment is beyond the purview of the LOHCP.

Response 19.3

The commenter states that wildfire is a concern of the citizens of Los Osos. The commenter states that there is not enough firefighting staff or equipment to contain a large wildlife in the Los Osos area.

This comment is similar to Comment 19.1; the commenter is referred to Response 19.1.

Response 19.4

The commenter states that Figure 16 in the Draft EIR shows a new road from Travis in Cabrillo Estates to Bayview Heights. In addition, Figure 16 shows a segment of Highland Drive that does not currently exist.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 19.5

The commenter expresses concern that there will not be enough water to support buildout of the community plan.

The County believes this comment is not on the LOHCP; nonetheless, the LOHCP EIR provides a response to this comment.

L.20 Letter 20

COMMENTER: Patrick McGibney, private citizen (commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 20.1

The commenter states that streamlining the permitting process would be "detrimental to habitat, species, the Los Osos Groundwater Basin, and the community of Los Osos." The commenter also states that the LOHCP "does not provide a program for protection and enhancement," and the Los Osos Groundwater Basin has been in overdraft for decades, causing "an irreversible flow of seawater intrusion."

The County respectfully disagrees with this comment. Adoption of the LOHCP would not directly result in development in Los Osos, but rather, would offer a streamlined permitting process for covered activities, including public projects, capital improvement projects, facilities operations and maintenance activities, and conservation program implementation. The ITP, in combination with adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area, while contributing to a more comprehensive conservation strategy for the covered species.

As discussed throughout the LOHCP, the covered activities under the LOHCP include implementation of a conservation program which is described in Section 5 of the LOHCP. The LOHCP conservation program is intended to restore and manage habitat with the LOHCP Preserve System, which would be comprised of a network of protected lands that would be managed and monitored in perpetuity to mitigate the impacts of covered activities on covered species. The LOHCP Preserve System would be actively managed to maintain and enhance the natural structure and species composition of the vegetation communities and the size and persistence of covered species populations. Habitat management and restoration would be designed to address factors that are negatively impacting species populations and vegetation communities, including management of vegetation using manual and mechanical techniques and/or fire, eradication and control of exotic plants and non-native animals, erosion control in unnaturally denuded areas, demolition and removal of structures and other infrastructure, and removal of debris and hazardous material. In addition, the LOHCP would include general land stewardship management. The general activities that would be required to maintain the LOHCP Preserve System include maintenance of existing facilities (e.g., fences, gates, roads, trails, irrigation systems); installation and maintenance of trails; development and maintenance of interpretive facilities (e.g., signs, kiosks, wildlife observation platforms); and creation and maintenance of parking lots, staging areas, picnic areas, and restrooms. Maintenance of parks and open space would also be considered a covered activity under the LOHCP. Therefore, the LOHCP provides a robust program for protection and enhancement of biological resources.

The commenter's concern of overdraft of the Los Osos Groundwater Basin and seawater intrusion are address in the response to comments in the LOHCP EIR.

Response 20.2

The commenter states the Los Osos Groundwater Basin is in overdraft, is the sole water source for Los Osos, and may not be sufficient to meet future demand, similar to Comment 20.1. The LOHCP EIR addresses this and other comments regarding the groundwater basin and seawater intrusion, which are beyond the purview of the LOHCP.

Response 20.3

The commenter states that the LOHCP does not account for climate change and droughts, and that habitats and species are dependent on surface water, which indirectly relates to groundwater recharge.

The County respectfully disagrees with this comment. Adoption of the LOHCP would not directly result in development in Los Osos, but rather, would offer a streamlined permitting process for covered activities, including public projects, capital improvement projects, facilities operations and maintenance activities, and conservation program implementation. The ITP, in combination with adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area, while contributing to a more comprehensive conservation strategy for the covered species.

Global climate change is discussed and analyzed in detail in Section 6.5.3 of the LOHCP, which identifies anticipated direct and indirect effects of climate change on the covered species and their habitats, and outlines how impacts of climate change will be addressed during plan implementation.

The LOHCP EIR response to comments addresses the comments as they relate to groundwater and greenhouse gas emissions, which are beyond the purview of the LOHCP.

Response 20.4

The commenter states that there are no new impoundments for recharging groundwater basins for the County to consider as alternative water sources, as stated on page 197 of the Draft EIR.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 20.5

The commenter reiterates previous concerns that the Los Osos Groundwater Basin is in overdraft, and the LOHCP could accelerate development in the Plan Area, resulting in the displacement of habitat and species.

This comment is similar to Comments 20.1 and 20.2 and is also addressed in the response to comments within the Final EIR.

Response 20.6

The commenter states the LOHCP is part of the Los Osos Community Plan, which includes three alternatives related to development of the community with a sustainable water supply.

The pending Los Osos Community Plan takes into account the Updated Basin Plan for the Los Osos Groundwater Basin (County et al. 2015). Accordingly, the cumulative impact analyses in Section 4 of the LOHCP EIR include the Updated Basin Plan for the Los Osos Groundwater Basin, in addition to other cumulative projects and the proposed project (i.e., the LOHCP). Additional response to this comment is provided in the response to comments in the Final EIR.

Response 20.7

The commenter states Alternatives 3 and 4 in the Draft EIR for the Los Osos Community Plan should be combined and then adopted as the preferred alternative to the Los Osos Community Plan prior to adoption of the LOHCP. The commenter also recommends that Alternative 1 in the LOHCP EIR be adopted as the preferred alternative for the LOHCP.

Support for Alternative 1, the No Project Alternative, in the LOHCP Draft EIR is noted and will be provided to the decision-makers. Additional response to this comment is provided in the response to comments in the Final EIR.

Response 20.8

The commenter states that the EIR must discuss cumulative impacts to the Los Osos Groundwater Basin from the Los Osos Water Recycling Facility (LOWRF).

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.21 Letter 21

COMMENTER: Emily Miggins, private citizen (commented on LOHCP)

DATE: November 17, 2019

Response 21.1

The commenter states that CAL FIRE recommends a 300-foot brush clearance around residences and structures.

The County is unsure from where the commenter obtained this information. As described in the LOHCP, the CWPP states that a minimum 30-foot brush clearance is needed, except in steep or hilly areas, where a 50- to 300-foot brush clearance is required. In addition, PRC 4291 requires 100 feet of defensible space clearance around homes and structures up to the property line; however, it does not require or allow clearing beyond the property line.

Response 21.2

The commenter questions what agencies will do to improve fire hazard safety in the wildland-urban intermix. The commenter also states that the CDFW is not maintaining its lands regarding brush management, and that the agencies are ignoring Los Osos citizens, the San Luis Obispo County Community Fire Safe Council, and CAL FIRE regarding fuel breaks.

The LOHCP covered activities include fire hazard abatement in the Plan Area, in addition to private development, capital projects, facilities operations and maintenance, and conservation program implementation. Covered activities specifically include “defensible space” around private and public development structures. “Defensible space is an area of reduced vegetation, which, in turn, would slow the spread of fire and enable firefighters to safely access structures. Defensible space should extend 100 feet from structures or to the property line, whichever is nearer. The first 30 feet from a structure should not contain flammable vegetation or woodpiles. Within the remaining 70 feet (or to the property line), vegetation should be reduced/minimized and spaced to reduce the speed and/or intensity of any fires (CAL FIRE 2020).”

The LOHCP covered activities also include vegetation management and related fire hazard abatement work implemented as part of the CWPP. The CWPP identifies areas that could be subject to a range of fuel reduction and fire hazard abatement treatments in and adjacent to Los Osos (Figure 2-7; SLOCCFSC 2009). Anticipated treatments include removal of downed, dead, and/or diseased vegetation; creation of shaded fuel breaks; and mowing of non-native grassland. The CWPP would involve wildfire protection measures on 89.4 acres of the Plan Area in the wildland-urban interface as described in Section 2.2.7. Such activities would result in long-term risk reduction associated with wildfire for the Plan Area.

The Interim Adaptive Management and Monitoring Plan for the LOHCP Preserve System (McGraw 2020) outlines recommendations for fuels reduction as part of the CWPP within the Bayview Unit of the Morro Dunes Ecological Reserve, which is the first preserve planned for inclusion in the LOHCP Preserve System during initial implementation. The fuels management recommendations in the IAMMP are designed to facilitate implementation of the fuel break in a way that will maximally benefit the covered species and protect other natural resources, while achieving the fuel reduction and associated fire safety objectives.

The USFWS and CDFW worked with CAL FIRE to develop AMMs for the CWPP (Table 5-4). Fire suppression, fuel reduction, and fire planning efforts would continue to be implemented by CAL FIRE in areas where there would not cause take of federally or state-listed species. Individual projects covered under the LOHCP would be reviewed in an independent permitting process on a case-by-case basis that would ensure consistency with all applicable standards, including fire prevention and protection.

Response 21.3

The commenter states that CAL FIRE recommends a 300-foot brush clearance around residences and commercial structures, similar to Comment 21.1. Refer to Response 21.1.

Response 21.4

The commenter questions how the CDFW will maintain and fund the wildland-urban interface with the Morro Dunes Ecological Reserve to prevent adjacent homes from being more susceptible to wildfires. This comment is similar to Comment 21.2; refer to Response 21.2.

Response 21.5

The commenter suggests all agencies publish publicly accessible plans to discuss how the agencies will manage and mitigate for fire risk.

Covered activities under the LOHCP include vegetation management and related fire hazard abatement work implemented as part of the CWPP. The most recently adopted version of the Los Osos CWPP is dated November 2009 and is limited mainly to fuel reduction projects and public education (SLOCCFSC 2009). The latest version of the CWPP for the Los Osos area (CAL FIRE/San Luis Obispo County Fire 2013) remains in draft form, covers San Luis Obispo County (not just Los Osos), and has yet to be adopted. The 2013 Draft CWPP provides a more comprehensive plan than the 2009 Final CWPP in that the former provides a mechanism for collaboration and coordination with multiple fire protection agencies; assesses wildfire risk in areas throughout the county; pre-fire resource/fuel management, strategies, education, and community planning; applicable statutes and regulations; and fire prevention, including maintenance of defensible space around buildings. The commenter is also referred to Response 21.2.

Response 21.6

The commenter questions how public agencies will enforce fuel reduction requirements, how fuel reduction activities will be funded and accomplished annually in public lands and parks, if a schedule of fuel reduction/maintenance activities will be made available to the public, if agencies will pay for new signage to prohibit fires and smoking in public lands, and if agencies will patrol public land to enforce rules.

This comment is similar to Comments 21.2 through 21.5; refer to Responses 21.2 through 21.5.

L.22 Letter 22

COMMENTER: Babak Naficy, private citizen (commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 22.1

The commenter states that the public review period should be extended.

The County provided adequate public notices of completion and availability of the Draft LOHCP, and also provided a 45-day public review period for the Draft EIR, which is typical. Accordingly, the County did not extend the public review period of the beyond November 20, 2019 (or November 18, 2019, for the LOHCP).

Response 22.2

The commenter states that the LOHCP AMMs violate CEQA because none of the AMMs are mandatory or enforceable.

To receive take coverage under the LOHCP, individual project proponents who elect to participate in the LOHCP would be required to implement the applicable AMMs (LOHCP Tables 5-2 through 5-4) identified by the Implementing Entity during the application review process. This means that if individual project proponents want to utilize the LOHCP and its associated ITP, the project proponents must implement applicable AMMs specific to individual project sites and projects.

Response 22.3

The commenter states it is unclear if avoidance of pesticides and herbicides is mandatory.

This comment is similar to Comment 22.2; refer to Response 22.2. The LOHCP includes AMM C3, which states, “Avoid use of herbicide and pesticides; where necessary, apply biocides as part of integrated pest management strategies, and following all local, state, and federal regulations.” If individual project proponents want to utilize the LOHCP and its associated ITP, the project proponents must implement applicable AMMs specific to individual project sites and projects.

Response 22.4

The commenter states the use of the phrase “whenever possible” in a mitigation measure is inadequate.

The County respectfully disagrees with this comment. The phrase “whenever possible” in this mitigation measure is realistic and adequate as certain measures are only implementable in certain circumstances. The County will work with the Implementing Entity to ensure that the appropriate and relevant measures are implemented as part of each project permitted under the LOHCP.

Response 22.5

The commenter states the use of the phrase “maximum extent practical” in an AMM for Morro shoulderband snail is unlawful.

The County respectfully disagrees with this comment. AMM MSS-1 in the LOHCP is the only AMM that include the phrase "maximum extent practical." AMM MSS-1 states, "Avoid and minimize the impacts to Morro shoulderband snail to the maximum extent practical by locating projects away from known or likely occupied habitat, as well as suitable but unoccupied habitat." The phrase "maximum extent practical" in this AMM is completely realistic and lawful. Specifically, if individual project parcels are located in areas known or likely to have occupied Morro shoulderband snail habitat, project proponents would be required to locate the proposed disturbance envelope as far away from such habitat to the "maximum extent practical," based on existing topography, vegetation communities/land cover types, drainages, etc. on individual parcels.

In addition, as stated in Response 22.2 and the LOHCP, to receive take coverage under the LOHCP, individual project proponents who elect to participate in the LOHCP would be required to implement the applicable AMMs (LOHCP Tables 5-2 through 5-4) identified by the County during the application review process. This means that if individual project proponents want to utilize the LOHCP and its associated ITP, the project proponents must implement applicable AMMs specific to individual project sites and projects. If individual project proponents do not want to implement applicable AMMs, the project proponents would be required to draft and process individual HCPs and compliance documents, including compliance with CEQA, as needed.

Response 22.6

The commenter states that there is no analysis of potential impacts from the loss of occupied Morro shoulderband snail habitat.

Section 4.2.1 of the LOHCP analyzes anticipated the impacts of the covered activities to Morro shoulderband snail habitat and individuals and assess the net effects of the LOHCP on the species based on the anticipated benefits of the LOHCP conservation program for the covered species. The LOHCP concluded that protecting, restoring, and managing an equivalent of 139 acres of habitat in the LOHCP Preserve System for the species will more than compensate, for the anticipated loss of 189 acres of habitat for the species due to the covered activities. The LOHCP EIR also analyzes the effects of the LOHCP on Morro shoulderband snail, which it concluded would be less than significant with incorporation of mitigation.

Habitat that would be temporarily impacted by covered activities would be restored to the pre-project or better habitat condition as part of the measures to minimize impacts to the covered species. The project would be subject to compensatory mitigation for temporary and permanent impacts to sensitive vegetation communities, as detailed in Section 5.3. As stated in Section 5.7 in the LOHCP, the mitigation provided through the LOHCP conservation program is expected to more than offset the anticipated impacts of covered activities, thus exceeding the ITP issuance criterion that the mitigation be commensurate with the impacts.

Impacts could occur to individual Morro shoulderband snails that are located in the footprints of covered activities, where vegetation removal and soil disturbance can cause individuals to be trampled, crushed, buried, or otherwise injured or killed. These impacts would be reduced or eliminated through implementation of AMMs included in Table 5-2. The AMMs require pre-project surveys to capture and relocate individuals out of harm's way.

In addition, some Morro shoulderband snails could potentially be killed, injured, or otherwise harmed during monitoring protocols included as part of the LOHCP. Long-term monitoring to examine the

effectiveness of the LOHCP conservation program would include Morro shoulderband snail surveys to evaluate their distribution and abundance within the LOHCP Preserve System. Although monitoring protocols would be conducted by highly qualified, Service-approved biologists following procedures designed to avoid impacts to this species, a small number of individuals could likely be taken in the form of harming, harassing, and/or killing as part of necessary monitoring.

As concluded in the LOHCP, the negative impacts of covered activities on the Morro shoulderband snail are expected to be offset by the beneficial impacts that would result from efforts to protect, restore, and manage habitat within the LOHCP Preserve System. Therefore, implementation of the LOHCP is anticipated to have an overall beneficial impact on the Morro shoulderband snail.

Response 22.7

The commenter states that the EIR defers mitigation in the form of preparation and implementation of the LOHCP Preserve System Adaptive Management and Monitoring Plan (AMMP), and that this violates CEQA.

The County respectfully disagrees with this comment. The LOHCP Preserve System AMMP is not a mitigation measure in the LOHCP EIR. As discussed in Section 5.3.3.2 and Section 6.2.3.2, the AMMP would be prepared by the Implementing Entity (IE) within the first three years of implementation of the LOHCP. The AMMP would be subject to approval by the USFWS and CDFW. The AMMP would include restoration, management, and monitoring activities necessary to achieve the goals and objectives of the LOHCP. Accordingly, the AMMP is considered to be a part of the proposed project (i.e., implementation of the LOHCP); the AMMP is not a mitigation measure under CEQA. It is typical for regional HCPs to prepare and implement management plans for a proposed preserve system during plan implementation.

An Interim Adaptive Management and Monitoring Plan (IAMMP) has been developed to guide management until the AMMP is developed (McGraw 2020). The IAMMP provides for the restoration of habitat within the Bayview Unit of the Morro Dunes Ecological Reserve through two main activities: 1) control of veldt grass and co-occuring invasive plant species within 23 acres, and 2) restoring an estimated 4.3 acres of habitat degraded by *de facto* trails that have been created by recreational users. It also describes how monitoring will be used to evaluate the effectiveness of the restoration on habitat for the covered species.

Response 22.8

The commenter states that the LOHCP EIR's conclusion that implementation of the LOHCP would result in an overall beneficial impact on Morro shoulderband snail is not supported by substantial evidence.

The County respectfully disagrees with this comment. The commenter is referred to Response 22.6. The LOHCP EIR provides additional responses to this comment.

Response 22.9

The commenter states that a "visual assessment" within Morro Bay kangaroo rat habitat would ensure no impacts to such habitat. The commenter states that a visual assessment is not an adequate substitute for Morro Bay kangaroo rat protocol surveys.

Because the Morro Bay kangaroo rat is a fully protected species and is critically endangered, pre-project surveys are necessary to avoid take of this species by implementation of covered activities in the LOHCP. Covered activities would avoid impacts to Morro Bay kangaroo rat individuals through incorporation of the AMMs included in the LOHCP. Surveys would be conducted to evaluate presence of the Morro Bay kangaroo rat (Section 5.2.1) and to monitor the species (Section 5.4). Prior to implementation of covered activities within potentially occupied habitat for the species, pre-project visual assessments and, if warranted, surveys would be conducted to evaluate whether the species is present (Section 5.2.1). If the species is detected, all work would be required to stop immediately and the project proponents would need to contact the Service and CDFW to discuss project permitting. Take of individuals of Morro Bay kangaroo rat, in any form, with the exception of habitat as part of specific restoration activities, will not be permitted under the LOHCP.

AMM MBKR-1 in the LOHCP states, "Prior to ground-disturbing activities in habitat suitable for Morro Bay kangaroo rat (Figure 5-3), the project proponent will retain a CDFW- and USFWS-approved biologist to conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied." Section F.1 in Appendix F, *Covered Animal Avoidance and Minimization Surveys*, provides a more detailed description of the pre-project surveys that would be required to be conducted to minimize take of Morro Bay kangaroo rat.

The short-term, negative impacts of covered activities on Morro Bay kangaroo rat habitat would be offset by the long-term benefits resulting from protection, restoration, and management of suitable habitat for this species within the LOHCP Preserve System. Under the LOHCP, the LOHCP Preserve System would benefit 240 acres of coastal sage scrub, the preferred habitat of the Morro Bay kangaroo rat, and 110 acres of central maritime chaparral communities, which the Morro Bay kangaroo rat can utilize when in an early-successional state.

Response 22.10

The commenter states that the phrase "work with" in the following sentence from the LOHCP EIR is vague and unenforceable: "Moreover, as part of the compensatory mitigation component of the LOHCP conservation program, the IE would work with individual landowners to protect remaining private land with suitable habitat for the Morro Bay kangaroo rat as part of the LOHCP Preserve System." This sentence is also included in the LOHCP.

The County respectfully disagrees with this comment. As described in Section 6 of the LOHCP, the County anticipates it would select an IE that would contract with the County to implement most components of the LOHCP including land protection. All land protection projects will be conducted with willing sellers. The intent of the phrase 'work with' is to reflect the voluntary nature of the land protection element of the LOHCP conservation program.

Response 22.11

The commenter states that mitigation measure MM BIO-1(a) in the LOHCP EIR is "unworkable" and violates CEQA.

Mitigation measure MM BIO-1(a) is a component of the LOHCP EIR; therefore, the responses to this comment is provided in the Final LOHCP EIR.

Response 22.12

The commenter questions if the "biologist" included in mitigation measure MM BIO-1(c) in the LOHCP EIR would be a "County expert" biologist.

Mitigation measure MM BIO-1(c) is a component of the LOHCP EIR; therefore, the responses to this comment is provided in the Final LOHCP EIR.

Response 22.13

The commenter states that the EIR does not analyze an "adequate range of alternatives."

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

L.23 Letter 23

COMMENTER: Ellen Nelson, private citizen (commented on LOHCP)

DATE: not dated

Response 23.1

The commenter expresses concern that data regarding climate change in the LOHCP are at least nine years old and thus out of date.

The LOHCP used the best available science when the plan was being drafted to prepare the analysis of climate change which is outlined in Section 6.5.3. Scientific information is continually developed, making it impossible to ensure that a plan of this size and breadth in terms of scientific topics, integrates all of the most recent information. Recognizing that the scientific information used to develop the plan will almost certainly be out of date when the plan is finalized, the LOHCP includes an adaptive management framework that enables it to be adapted based on new information, as outlined in Section 5.5.

Response 23.2

The commenter states that a large area in the center of town, shown on Figure 4-1 of the LOHCP as primary habitat for Morro shoulderband snail just south of the area labeled "Sweet Springs," should be mapped on LOHCP Figure 5-1 as "Priority Conservation Area" under the LOHCP. The commenter also states that conservation of this area would be beneficial to biological resources, as well as humans living in Los Osos.

As discussed in Section 5.3.1 of the LOHCP, land protection will be prioritized in the priority conservation area, illustrated in Figure 5-1, where additional habitat protection can:

protect relatively large areas of habitat, including by buffering and expanding existing protected habitat areas, in order to safeguard large areas that feature reduced perimeter-to-area ratios that are therefore more resistant to edge effects and can be effectively managed using techniques designed to promote diversity and long-term population persistence, including prescribed fire of fire surrogates; and

maintain and restore critical landscape linkages between significant habitat areas, including protected lands and other large areas of relatively intact habitat. Connecting habitat that might otherwise become isolated will facilitate gene flow (exchange of genetic material) between individuals in otherwise isolated habitat, and recolonization of sites where populations are extirpated.

Nonetheless, the LOHCP provides protection for threatened and endangered species outside of the priority conservation areas. The location which the commenter suggests should be mapped as "Priority Conservation Area" is proposed to be a Morro shoulderband snail Minimization Area, as illustrated in Figure 5-2. As stated in Table 5-11, implementation of the LOHCP Conservation Program would require project proponents of covered activities in Morro shoulderband snail Minimization Measure Areas to implement AMM MSS-2, which requires a biologist approved by the Service to capture and move all Morro shoulderband snails to suitable habitat away from potential impact areas prior to and during all ground-disturbing activities in designated parcels. In addition, AMM E1 and AMMs C1 through C5 would help minimize short-term negative impacts of the LOHCP Conservation Program on Morro shoulderband snail.

The LOHCP Preserve System would include 219.6 acres of habitat and potential habitat for the Morro shoulderband snail. Specifically, the LOHCP is anticipated to protect, restore, and/or manage in perpetuity approximately 54.7 acres of Morro shoulderband snail habitat and potential habitat that is currently unprotected, and thus, is subject to development and other land uses that could degrade such habitat. Of the 54.7 acres, approximately 5.5 acres of habitat would be restored; such restoration would include repair of areas that have been severely degraded by erosion or dense exotic plant infestations). The LOHCP Preserve System would also include protection, restoration, and/or management in perpetuity of 164.9 acres of Morro shoulderband snail habitat and potential habitat within existing protected lands. Such existing protected lands feature some of the largest areas of remaining habitat, where additional restoration and management can promote species population sizes and viability. For these reasons, implementation of the LOHCP is anticipated to have an overall beneficial impact on the Morro shoulderband snail.

Response 23.3

The commenter states that the large area mapped as Morro manzanita habitat in the southern portion of the Plan Area shown on Figure 4-2 of the LOHCP, *Morro Manzanita Habitat*, should be designated in the LOHCP as Protected Lands because the steeply-sloped area contains a substantial number of large stands of Morro manzanita and habitat would be fragmented if it is not protected.

The LOHCP does not map the distribution of Morro manzanita, which has not been comprehensively mapped. Figure 4-2 of the LOHCP shows the locations of suitable habitat for Morro manzanita based on the vegetation communities identified as habitat for Morro manzanita in LOHCP Table 4-4. The table and map identify areas where the species has potential to occur based on suitable habitat conditions including the physiognomy (structure) of existing vegetation. As part of work to develop the Adaptive Management and Monitoring Plan for the LOHCP Preserve System, surveys will be conducted to further evaluate Morro manzanita and other covered species habitat and occurrences in the preserves and track their changes over time, as detailed in Section E.3 of the LOHCP.

Areas proposed to be designated as Protected Lands under the LOHCP would include parcels that would be protected from development in perpetuity. The parcels to which the commenter refers are privately owned, and as such cannot be designated as Protected Lands by the County or the Service.

L.24 Letter 24

COMMENTER: Jean Public, private citizen (commented on LOHCP)

DATE: October 2, 2019

Response 24.1

The commenter expresses opposition to killing covered species and loss of their habitat due to increased human population.

This comment is noted and will be provided to the decision-makers. However, it is noted that this comment is beyond the purview of the LOHCP. Adoption of the LOHCP would not directly result in development in Los Osos; rather, it would offer a streamlined permitting process for covered activities, including capital improvement projects and facilities operations and maintenance activities. The ITP, in combination with adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area.

L.25 Letter 25

COMMENTER: Joey Racano, private citizen (commented on LOHCP)

DATE: October 3, 2019

Response 25.1

The commenter expresses opposition of take of the LOHCP's covered animal species, as well as other species, for any reason.

This comment is noted and will be provided to the decision-makers. However, it is noted that this comment is beyond the purview of the LOHCP. The community-wide permit process and regional conservation strategy of the LOHCP are designed to provide superior protection to and great conservation benefits for the covered species by coordinating and consolidating mitigation and tracking of cumulative impacts.

Adoption of the LOHCP would not directly result in development in Los Osos; rather, it would offer a streamlined permitting process for covered activities, including capital improvement projects and facilities operations and maintenance activities. The ITP, in combination with adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area.

L.26 Letter 26

COMMENTER: Stephanie Raphael, private citizen (commented on LOHCP)

DATE: November 18, 2019

Response 26.1

The commenter expresses opposition for "the proposed housing/multi apartment complexes" in Los Osos.

The County is unsure of the proposed complexes to which the commenter is referring. Nonetheless, this comment is beyond the purview of the LOHCP. Adoption of the LOHCP would not directly result in development in Los Osos, but rather, would offer a streamlined permitting process for covered activities, including capital improvement projects and facilities operations and maintenance activities. The ITP, in combination with adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area. The community-wide permit process and regional conservation strategy of the LOHCP are designed to provide superior protection to and great conservation benefits for the covered species by coordinating and consolidating mitigation and tracking of cumulative impacts.

Response 26.2

The commenter expresses concern that there will not be sufficient water supply for additional population growth in the community.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 26.3

The commenter expresses concern for the ecology in Los Osos and states that a "massive amount of construction" would strain biological resources in the area.

Section 4 of the LOHCP analyzes the net effects of the LOHCP covered activities and conservation program, and concludes that the benefits of the latter will offset the impacts of the former for all four covered species. This is because the negative effects associated with the covered activities, which will occur primarily within degraded habitat within the Urban Services Line (USL) will be more than offset by the land protection, restoration, and enhanced management that will occur within the LOHCP Preserve System, which will occur within more intact habitat located in the priority conservation area located on the perimeter of the LOHCP area, largely outside of the LOHCP.

Section 4.2, *Biological Resources*, of the LOHCP EIR, provides an extensive analysis of potential impacts to biological resources, including special-status species other than the four covered species included under the LOHCP. Section 4.2 of the EIR includes AMMs from the LOHCP that relate to biological

resources, as well as significance thresholds developed in collaboration with federal and state resource agencies, the County, and Appendix G of the CEQA Guidelines.

The AMMs under the LOHCP and the mitigation measures in the EIR would require pre-project surveys for covered species, as well as several other measures to minimize or avoid direct and indirect impacts to covered species and other special-status species. The negative impacts of covered activities on Morro shoulderband snail, Morro manzanita, and Indian Knob mountainbalm would be offset by the beneficial impacts of implementation of the LOHCP conservation program from efforts to protect, restore, and manage habitat within the LOHCP Preserve System. Additionally, the benefits of LOHCP conservation program to Morro Bay kangaroo rat habitat through habitat restoration and/or preservation would offset the adverse effects of covered activities on the Morro Bay kangaroo rat. Furthermore, take of individuals of Morro kangaroo rat, in any form, with the exception of habitat as part of specific restoration activities, will not be permitted under the LOHCP.

Implementation of the LOHCP would provide benefits to special-status plant and animal species and nesting birds by protecting habitat of suitable size to support existing populations of unique or special-status species. The LOHCP would create opportunities to protect and improve habitats of greater quality and extent than the small-scale restoration efforts that are feasible for individual small development projects. The larger size and contiguous nature of many of the lands proposed for inclusion in the Preserve System would be superior to preservation of small, noncontiguous parcels as would occur without the implementation of the programmatic LOHCP.

Regardless, adoption of the LOHCP would not directly result in development in Los Osos, but rather, would offer a streamlined permitting process for covered activities, including capital improvement projects and facilities operations and maintenance activities. The ITP, in combination with the adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area. The community-wide permit process and regional conservation strategy of the LOHCP are designed to provide superior protection to and great conservation benefits for the covered species by coordinating and consolidating mitigation and tracking of cumulative impacts.

Response 26.4

The commenter expresses concern that future development would affect the health of existing residences in Los Osos, particularly with regard to air quality/fugitive dust.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 26.5

The commenter states that they understand growth must occur; however, growth should be limited to a few small buildings at a time in Los Osos.

Adoption of the LOHCP would not directly result in development in Los Osos nor will it affect the pace of development. Rather, the LOHCP provides a streamlined permitting process for covered activities,

including capital improvement projects and facilities operations and maintenance activities. The ITP, in combination with the adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area. The community-wide permit process and regional conservation strategy of the LOHCP are designed to provide superior protection to and great conservation benefits for the covered species by coordinating and consolidating mitigation and tracking of cumulative impacts.

L.28 Letter 27

COMMENTER: Deborah Ross and Robbie Conal, private citizens (commented on LOHCP and Draft EIR)

DATE: November 16, 2019

Response 27.1

The commenter states that water supply will not be sustainable based on the projected population growth in Los Osos. The commenter also states that climate change and saltwater intrusion have severely altered water supply sustainability.

The LOHCP would not cause further seawater intrusion into the groundwater basin and the Updated Basin Plan would need to be successfully implemented before development could occur. The LOHCP EIR acknowledges a development constraint within Los Osos is the availability of resources including water. The Final EIR provides a detailed response to this comment.

Response 27.2

The commenter states concern for the lack of proper fire prevention and protection in Los Osos.

The LOHCP includes creation of defensible space and implementation of the Los Osos Community Wildfire Protection Plan as covered activities.

Defensible space is an area of reduced vegetation, which, in turn, would slow the spread of fire and enable firefighters to safely access structures. Defensible space should extend 100 feet from structures or to the property line, whichever is nearer. The first 30 feet from a structure should not contain flammable vegetation or woodpiles. Within the remaining 70 feet (or to the property line), vegetation should be reduced/minimized and spaced to reduce the speed and/or intensity of any fires (CAL FIRE 2020).

The current CWPP identifies areas that could be subject to a range of fuel reduction and fire hazard abatement treatments in and adjacent to Los Osos (Figure 2-7; SLOCCFSC 2009). Anticipated treatments include removal of downed, dead, and/or diseased vegetation; creation of shaded fuel breaks; and mowing of non-native grassland. The CWPP would involve wildfire protection measures on 89.4 acres of the Plan Area in the wildland-urban interface as described in Section 2.2.7. Such activities would result in long-term risk reduction associated with wildfire for the Plan Area.

The Interim Adaptive Management and Monitoring Plan for the LOHCP Preserve System (McGraw 2020) outlines recommendations for fuels reduction as part of the CWPP within the Bayview Unit of the Morro Dunes Ecological Reserve, which is the first preserve planned for inclusion in the LOHCP Preserve System during initial implementation. The fuels management recommendations in the IAMMP are designed to facilitate implementation of the fuel break in a way that will maximally benefit the covered species and protect other natural resources, while achieving the fuel reduction and associated fire safety objectives.

L.29 Letter 28

COMMENTER: Andrew Christie, Santa Lucia Chapter of the Sierra Club, and Keith Wimer, Los Osos Sustainability Group, community organizations (commented on LOHCP and Draft EIR)

DATE: November 18, 2019

Response 28.1

The commenter states support for Alternative 1, the No Project Alternative.

Support for the No Project Alternative is noted and will be provided to the decision-makers.

Response 28.2

The commenter states that the LOHCP Draft EIR cannot rely on the Draft EIR for the Los Osos Community Plan as a "set of mitigation measures for impacts contemplated" in the LOHCP.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 28.3

The commenter states that the LOHCP relies on "vague and unenforceable mitigation measures that make it impossible to analyze the extent to which target species would be protected."

The commenter is incorrect. The LOHCP does not include mitigation measures, although the LOHCP EIR includes mitigation measures under CEQA. However, the LOHCP includes Avoidance and Minimization Measures (AMMs).

To receive take coverage under the LOHCP, individual project proponents who elect to participate in the LOHCP would be required to implement the applicable AMMs (Tables 5-2 through 5-4) identified by the County during the application review process. This means that if individual project proponents want to utilize the LOHCP and its associated ITP, the project proponents must implement applicable AMMs specific to individual project sites and projects.

Response 28.4

The commenter states that the LOHCP EIR does not adequately analyze cumulative impacts.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 28.5

The commenter states that the adopted EAP should be kept "in place" until the Los Osos Groundwater Basin can provide a sustainable water source for planned development under the No Project Alternative.

The LOHCP does not determine land use designations which instead are determined by the Los Osos Community Plan. The LOHCP and ITP, in combination with the adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, would result in a "streamlining" of development in the Plan Area by reducing the

length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area while contributing to a more comprehensive conservation strategy for the covered species.

The demand for water under the LOHCP would be based on the land uses allowed under the approved EAP or the pending Los Osos Community Plan, if adopted, and would not be altered by the LOHCP. Furthermore, future development in Los Osos cannot occur until successful implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin, which includes demand management and supply-side improvements to ensure adequate water supplies meet demand under future buildout of the Basin. The County would not issue building permits for individual projects that do not have a will-serve letter from the applicable water supplier.

Response 28.6

The commenter states that the LOHCP EIR proposes to move water wells away from the ocean but the does not analyze impacts associated with such activities.

Covered activities under the LOHCP would include new water wells by the Los Osos Community Services District and Golden State Water Company. The purpose of the LOHCP is to streamline the permitting process, which would reduce the permitting timeline and costs to individual project applicants, and contribute to a more comprehensive conservation strategy for the covered species. Individual projects covered under the LOHCP would be reviewed in an independent permitting process on a case-by-case basis that would ensure consistency with all applicable standards, including surface water and groundwater supplies.

Response 28.7

The commenter states that the LOHCP, in combination with the pending Los Osos Community Plan (if approved), would result in unsustainable development that would adversely affect the community, particularly with regard impacts to the Los Osos Groundwater Basin.

This comment is similar to Comment 28.2 and is also addressed in the response to comments in the Final EIR for the LOHCP.

Response 28.8

The commenter states that seawater intrusion into the Los Osos Groundwater Basin will affect the sustainability of water from the Basin.

The LOHCP would not cause further seawater intrusion into the groundwater basin and the Updated Basin Plan would need to be successfully implemented before development could occur. The LOHCP EIR further addresses this comment, which addresses the environmental impacts of the LOHCP.

Response 28.9

The commenter states that they will provide their comments on the Los Osos Groundwater Basin Plan. Comment noted; however, it is noted that these other comments from the commenter were not provided.

Response 28.10

The commenter reiterates concerns raised in Comments 28.1 through 28.9; refer to Responses 28.1 through 28.9 and associated responses to comments in the LOHCP EIR.

Response 28.11

The commenter states that the public review period should be extended.

The County provided adequate public notices of completion of the LOHCP and the LOHCP EIR and availability of the Draft EIR, and also provided a 45-day public review period for the LOHCP and the Draft EIR, which are typical for documents of this complexity and complies with the public review requirements under CEQA. Accordingly, the County did not extend the public review period of the Draft EIR beyond November 20, 2019 (or November 18, 2019 for the LOHCP).

Response 28.12

The commenter states that until the Los Osos Community Plan is amended to address the commenters concerns presented in Comments 28.1 through 28.11, the LOHCP and the LOHCP EIR should be amended to delay implementation of the LOHCP until seawater intrusion no longer occurs within the Los Osos Groundwater Basin.

This comment is beyond the purview of the LOHCP. This comment is similar to Comments 28.2, 28.4, 28.5, and 28.8; refer to Responses 28.2, 28.4, 28.5, and 28.8 including those comments in the LOHCP EIR.

L.30 Letter 29

COMMENTER: Julie Tacker, private citizen (commented on LOHCP)

DATE: November 18, 2019

Response 29.1

The commenter states that the LOHCP does not fully depict the extent to which the Morro shoulderband snail is "threatened."

The LOHCP provides information about Morro shoulderband snail, which is federally listed as threatened, in Section 3.2.2.1 and Section B.1.

Response 29.2

The commenter questioned how the Service spends the fees collected from previously processed HCPs and ITPs. This comment is beyond the purview of the LOHCP; however, the County coordinated with the USFWS which offered the following response.

The fees were used to mitigate project effects to the Morro shoulderband snail by funding activities that would contribute to the recovery of the snail. The majority of the fees, approximately $14, 500, were used to fund a study to address various recovery tasks through the collection of data about Morro shoulderband snail populations, habitat associations, and current habitat conditions on conserved lands within the range of the species. Nine conserved parcels located in and around the community of Los Osos, San Luis Obispo County, California were chosen for the study. These conserved lands included parcels located within two of the four Conservation Planning Areas (CPAs) and two of the three Critical Habitat Units (CPUs) designated for the Morro shoulderband snail. Parcels in possible restoration corridors and outside of the CPAs and CHUs were surveyed as well. The nine parcels surveyed during the study included six contiguous parcels in the northeastern region of Los Osos, two parcels in the western region of Los Osos, and one centrally located parcel. The parcels are owned by The Land Conservancy of San Luis Obispo County, the U.S. Bureau of Land Management, and the California Department of Parks and Recreation. Parcel size varied from just under 5 acres to around 42 acres with a combined total of approximately 152 acres of conserved habitat.

Response 29.3

The commenter states that the LOHCP does not fully explain why the Morro shoulderband snail is federally listed as endangered. The commenter also states that the species should be downlisted or delisted.

This comment is beyond the purview of the LOHCP, which was developed to facilitate permitting under Section 10(a)(1)(b) of ESA. It is not the role of the County in preparing an HCP to evaluate the endangerment status or delisting of covered species, which instead is the purview of the USFWS. The commenter is referred to the USFWS listing decision for more information about the listing status (USFWS 1994).

L.31 Letter 30

COMMENTER: Marc Weber, private citizen (commented on LOHCP and Draft EIR)

DATE: November 17, 2019

Response 30.1

The commenter states that the LOHCP EIR needs additional analysis on impacts to ecology of the Morro Bay Estuary.

This comment addresses the EIR; refer to the Final EIR for the response to this comment. Notably, the LOHCP and proposed ITP would not be used to cover impacts/take to wetland or other non-covered species that would result from projects that would impact or have the potential to impact wetland or riparian communities and/or wetland species. As described in Section 2.3 of the LOHCP, if the proponent of a project along the coastline or other waterways wishes to conduct projects that would cause take/impacts to non-covered listed species, that project proponent would need to obtain separate permits to cover those impacts, in order to be eligible for coverage of their impacts to the LOHCP covered species through the LOHCP.

Response 30.2

The commenter states that Los Osos is included in Morro Bay National Estuary, so the LOHCP would impact the Morro Bay Estuary.

The County believes the commenter may be confused by what the National Estuary Program is and what legal standing, if any, is given to estuaries in this program. This comment is similar to Comment 11.6; the commenter is referred to Response 11.6 for citations applicable to this response.

The National Estuary Program, which was established in 1987 by amendments to the federal Clean Water Act, is overseen and managed by the United States Environmental Protection Agency (U.S. EPA). The U.S. EPA also provides annual funding, national guidance, and technical assistance to the currently 28 estuaries accepted into the National Estuary Program. In 1995, Morro Bay was accepted into the National Estuary Program. The Morro Bay National Estuary Program is a collaborative, non-regulatory, non-profit organization that brings citizens, local governments, non-profit organizations, state and federal agencies, and landowners together to support a healthy environment and vibrant local communities. The Clean Water Act requires each National Estuary Program to develop and implement a Comprehensive Conservation and Management Plan. The primary purpose of the plan is to identify priority issues that threaten the ecological and economic resources of the estuary and watershed, and to define various action plans to effectively reduce those problems. The County of San Luis Obispo is one of the numerous agency partners committed to help achieve the four main watershed goals of the Comprehensive Conservation and Management Plan for the Morro Bay National Estuary Program, including (1) water quality protection and enhancement; (2) ecosystem restoration and conservation; (3) public education, outreach, and stewardship; and (4) fostering collaboration.

Implementation of the LOHCP would not hinder the Morro Bay National Estuary Program or its partners from implementing the action plans in the Comprehensive Conservation and Management Plan to reduce and minimize priority issues of Morro Bay and/or Morro Bay Estuary.

Response 30.3

The commenter states that a narrow, viable "nature corridor" should be created within "multi-family and commercial development," so all species located in the Plan Area will not go extinct.

The County is unsure as to what "multi-family and commercial development" the commenter is referring. Nonetheless, as discussed in Section 5.3.1, land protection will be prioritized in the priority conservation area, illustrated in Figure 5-1, where additional habitat protection can:

protect relatively large areas of habitat, including by buffering and expanding existing protected habitat areas, in order to safeguard large areas that feature reduced perimeter-to-area ratios that are therefore more resistant to edge effects and can be effectively managed using techniques designed to promote diversity and long-term population persistence, including prescribed fire of fire surrogates; and

maintain and restore critical landscape linkages between significant habitat areas, including protected lands and other large areas of relatively intact habitat. Connecting habitat that might otherwise become isolated will facilitate gene flow (exchange of genetic material) between individuals in otherwise isolated habitat, and recolonization of sites where populations are extirpated.

As discussed in Section 4.2, *Biological Resources*, of the EIR, small conserved areas within larger developed areas do not provide suitable movement opportunities for larger wildlife; areas suitable for protection of small numbers of covered species may not be sufficiently sized to support larger wildlife, thus the larger Preserve System provides benefits to wildlife movement corridors and overall ecosystems. The LOHCP would provide opportunities for coordinated management of existing protected lands, which would promote protection of larger continuous areas of protected habitat rather than small isolated patches as are frequently conserved under small-scale individual project ITPs.

Response 30.4

The commenter expresses support for Alternative 2, the Reduced Take Alternative.

The commenter's support for Alternative 2 is noted and will be provided to the decision-makers.

Response 30.5

The commenter states that some open space should be designated in the center of the community near Sweet Springs.

This comment is similar to Comment 30.3; refer to Response 30.3.

L.32 Letter 31

COMMENTER: Amber Wiehl, private citizen (commented on LOHCP)

DATE: November 18, 2019

Response 31.1

The commenter expresses support for implementation of the LOHCP. The commenter also expresses the community's need for a Community Wildfire Protection Plan (CWPP).

Support for the proposed project is noted and will be provided to the decision-makers.

The LOHCP includes implementation of the Los Osos Community Wildfire Protection Plan, as well as creation of defensible space, as covered activities.

The current CWPP identifies areas that could be subject to a range of fuel reduction and fire hazard abatement treatments in and adjacent to Los Osos (Figure 2-7; SLOCCFSC 2009). Anticipated treatments include removal of downed, dead, and/or diseased vegetation; creation of shaded fuel breaks; and mowing of non-native grassland. The CWPP would involve wildfire protection measures on 89.4 acres of the Plan Area in the wildland-urban interface as described in Section 2.2.7. Such activities would result in long-term risk reduction associated with wildfire for the Plan Area. The latest version of the CWPP for the Los Osos area remains in draft form, covers San Luis Obispo County (not just Los Osos), and has yet to be adopted. The 2013 Draft CWPP provides a more comprehensive plan than the 2009 Final CWPP in that the former provides a mechanism for collaboration and coordination with multiple fire protection agencies; assesses wildfire risk in areas throughout the county; pre-fire resource/fuel management, strategies, education, and community planning; applicable statutes and regulations; and fire prevention, including maintenance of defensible space around buildings.

The Interim Adaptive Management and Monitoring Plan for the LOHCP Preserve System (McGraw 2020) outlines recommendations for fuels reduction as part of the CWPP within the Bayview Unit of the Morro Dunes Ecological Reserve, which is the first preserve planned for inclusion in the LOHCP Preserve System during initial implementation. The fuels management recommendations in the IAMMP are designed to facilitate implementation of the fuel break in a way that will maximally benefit the covered species and protect other natural resources, while achieving the fuel reduction and associated fire safety objectives.

L.33 Letter 32

COMMENTER: Susan Wiest, private citizen (commented on LOHCP)

DATE: November 11, 2019

Response 32.1

The commenter expresses opposition to the LOHCP, stating that the LOHCP will result in 8,000 additional residents and "destroy highly valued open space."

The County respectfully disagrees with this comment. Adoption of the LOHCP would not directly result in development in Los Osos, but rather, would offer a streamlined permitting process for covered activities, including public projects, capital improvement projects, facilities operations and maintenance activities, and conservation program implementation. The ITP, in combination with the adoption of the latest (2015) Los Osos Community Plan and implementation of the Updated Basin Management Plan for the Los Osos Groundwater Basin The ITP, in combination with, would result in a "streamlining" of development in the Plan Area by reducing the length of time and costs associated with the ESA permitting process for covered activities. Implementation of this community-wide LOHCP, in contrast with the current project-by-project approach, would maximize the benefits of the conservation program and eliminate potentially expensive and time-consuming efforts associated with processing individual ITPs for each project in the Plan Area, while contributing to a more comprehensive conservation strategy for the covered species.

Response 32.2

The commenter states the LOHCP will adversely affect the community's currently strained water supply.

This comment addresses the EIR; refer to the Final EIR for the response to this comment.

Response 32.3

The commenter requests that the Service deny the LOHCP ITP application.

Support for the LOHCP EIR's No Project Alternative is noted and will be provided to the decision-makers.

L.34 Letter 33

COMMENTER: Laurie Wright, private citizen (commented on LOHCP)

DATE: November 14, 2019

Response 33.1

The commenter requests additional opportunities to provide public input on the LOHCP prior to the plan's approval.

The County provided adequate public notices of completion and availability of the LOHCP and Draft LOHCP EIR, and also provided a 45-day public review period for the documents, which is typical for documents of this complexity and complies with the public review requirements under CEQA. Accordingly, the County did not extend the public review period beyond November 20, 2019 (or November 18, 2019, for the LOHCP).

The public will have the additional opportunity to review the Final LOHCP and Final LOHCP EIR prior to the public hearing to determine whether to certify the Final EIR and approve the LOHCP. The County will hear public comments on the LOHCP and Final EIR at the County Planning Commission and the County Board of Supervisors public hearings.

Appendix M Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System

This appendix contains the *Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System* (IAMMP; McGraw 2020).

Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System



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November 2020

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1 Introduction

This Interim Adaptive Management and Monitoring Plan (IAMMP) will guide work by the County of San Luis Obispo (County) to restore habitat within the Morro Dunes Ecological Reserve (MDER) during the initial five-year period of implementation of the Los Osos Habitat Conservation Plan (LOHCP; McGraw 2020). During that period, the MDER will be enrolled into the LOHCP Preserve System—a network of protected habitat that will be restored, managed, and monitored to promote the covered species. Habitat in the MDER that has been degraded by invasive plants and incompatible recreation will be restored to promote populations of LOHCP covered species. Once specific performance criteria for the restoration have been achieved, the restoration will generate mitigation credits that will offset the impacts of development, public infrastructure, and other covered activities in Los Osos on the covered species.

This section of the IAMMP provides an overview of the LOHCP and its conservation program, the LOHCP Preserve System, and the adaptive management and monitoring plan that will be developed to manage it; it also describes the role of this IAMMP and outlines its contents. Additional information about the LOHCP can be found in the sections of that document that are referenced below.

1.1 Los Osos Habitat Conservation Plan

The County of San Luis Obispo prepared a habitat conservation plan (HCP) for the 3,644-acre area centered on the unincorporated community of Los Osos, in central coastal California (Figure 1; LOHCP Section 1.3) McGraw 2020). The Los Osos HCP covers anticipated incidental take[1]/impacts to four threatened or endangered species (Box 1) that is anticipated to result from private development, public and private utility and infrastructure projects, and community wildfire protection (LOHCP Section 2). The incidental take permit issued based on the LOHCP will cover take within a 3,209-acre permit area, which includes all land within the LOHCP Area except for State Parks lands other than those within the Community Wildfire Protection Plan fuel break area (LOHCP Section 1.3). These and other covered activities implemented during plan's 25-year permit term, which will begin following issuance of the incidental take permit, are anticipated to impact up to 621 acres of habitat for the covered species (LOHCP Section 2).

Box 1: LOHCP Covered Species

Morro shoulderband snail (FE)
(*Helminthoglypta walkeriana*)

Morro Bay kangaroo rat (FE, CE, FP)
(*Dipodomys heermanni morroensis*)

Morro manzanita (FT)
(*Arctostaphylos morroensis*)

Indian Knob mountainbalm (FE, CE)
(*Eriodictyon altissimum*)

FE: Federally Endangered
FT: Federally Threatened
CE: California Endangered
FP: California Fully Protected Species

[1] "Take" under the federal ESA does not apply to listed plant species. For purposes of the LOHCP and the federal permit, "take" when applied to the covered plant species refers to impacts to the species. The Plan features conservation measures to protect these species, which are included as covered species, so that the USFWS will extend "no surprises" assurances for them.

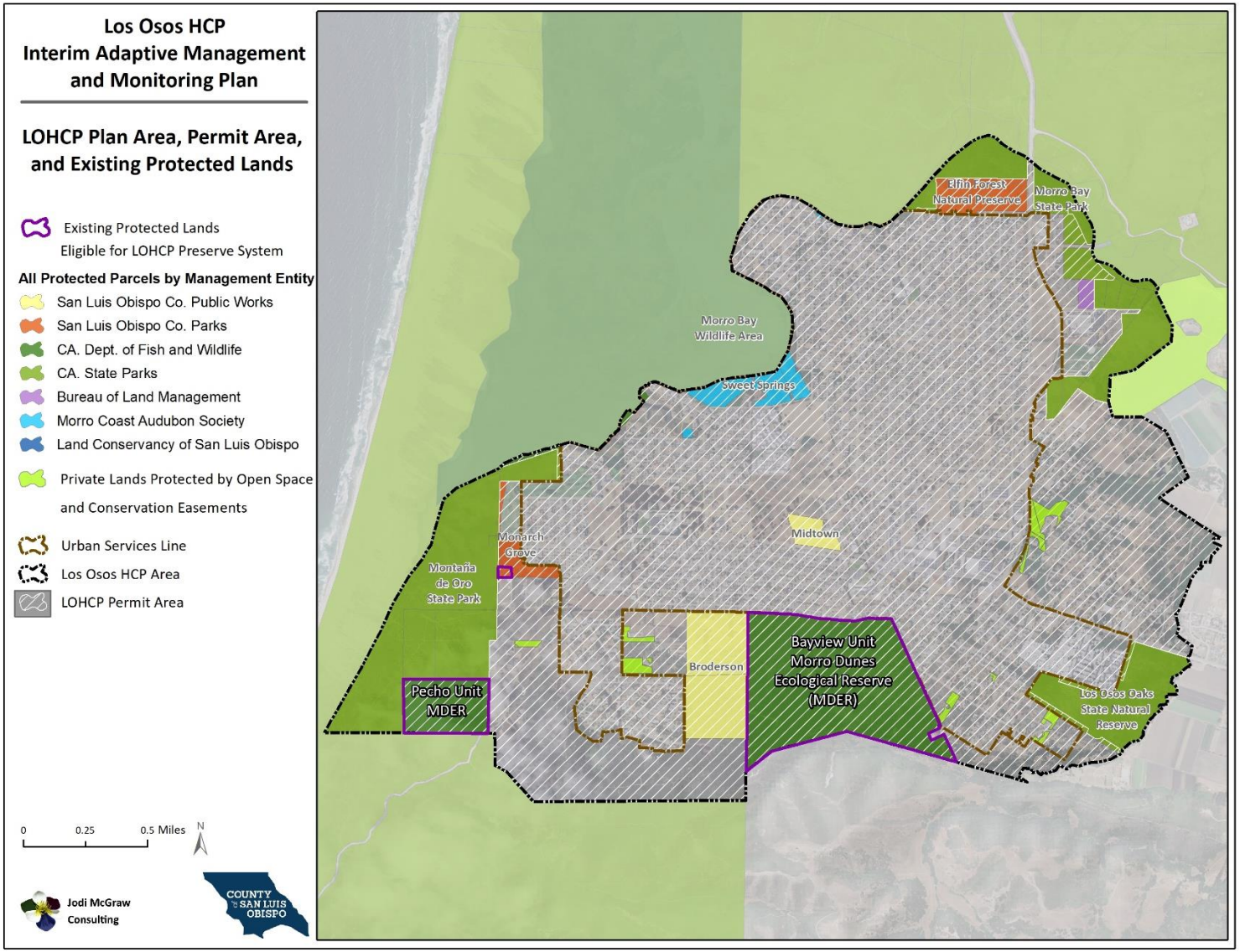


Figure 1: Los Osos Habitat Conservation Plan Area showing Existing Protected Lands including those Eligible for Inclusion in the LOHCP Preserve System

1.2 LOHCP Conservation Program

To mitigate the effects of the covered activities on the covered species, the County will implement the LOHCP conservation program—a suite of actions to avoid, minimize, and mitigate the impacts of the covered activities to a level that is commensurate with the impacts of the taking and will contribute to species recovery by addressing threats to survival to ensure long-term persistence (Box 2; LOHCP Section 5). The County intends to delegate specific responsibilities to implement aspects of the plan through contracts for services with an Implementing Entity—an existing or newly created non-profit conservation organization (e.g., land trust or conservancy) approved by the USFWS and CDFW (wildlife agencies), that will provide expertise in land conservation and management for endangered species, among other skills necessary to implement the delegated Plan tasks (LOHCP Section 6.1).

Box 2: LOHCP Conservation Program Elements

Biological Goals and Objectives which identify the desired future condition for the covered species, communities, and ecosystem in which they occur

Avoidance and minimization measures that will be implemented to reduce the negative effects of the covered activities on the covered species

Habitat Protection to safeguard remaining habitat and expand and connect existing protected lands

Habitat Restoration to recreate suitable habitat for the covered species where it has been substantially degraded by anthropogenic factors

Habitat Management ongoing efforts to maintain or enhance habitat conditions and promote population viability by addressing factors that degrade habitat

Monitoring to track the status and trends of the covered species populations and their respective habitats

Adaptive Management framework to adjust the conservation program elements over time to achieve the goals and objectives

1.3 LOHCP Preserve System

The LOHCP conservation program includes establishment and management of the LOHCP Preserve System—a network of protected habitat that will be restored, managed, and monitored to promote the covered species. The LOHCP Preserve System will include land acquired during implementation of the LOHCP , as well as selected existing parks and ecological reserves that will be enrolled in the LOHCP Preserve System to ensure that the habitat of greatest long-term conservation value for the covered species is benefited by the Preserve System activities (LOHCP Section 5.3).

The LOHCP identified two properties as eligible for inclusion in the LOHCP Preserve System (LOHCP Section 5.3.3.1; Figure 1):

1. The 278.7-acre Morro Dunes Ecological Reserve (MDER), which is managed by the California Department of Fish and Wildlife; and
2. An approximately 2.4-acre portion of the Monarch Grove Natural Area, which is managed by the County of San Luis Obispo Parks and Recreation Department.

The LOHCP anticipates enrolling the MDER into the Preserve System at the outset of LOHCP implementation. Conducting restoration and management activities in that preserve is designed to 'jump start' the LOHCP conservation strategy by providing mitigation credits that can be used to offset the impacts of covered activities in the first three years of LOHCP implementation (LOHCP Section 6.2.3.1). Monarch Grove Natural Area can be enrolled into the LOHCP Preserve System at a later date, as part of the phased approach to assembling the LOHCP Preserve System as covered activities are conducted so that mitigation balances the project impacts (LOHCP Section 5.3.3). The Monarch Grove Natural Area as well as new lands acquired through the LOHCP will be managed based on the Adaptive Management and Monitoring Plan for the LOHCP Preserve System, which will also guide management

and monitoring of the MDER following the initial phase of restoration outlined in this IAMMP.

1.4 Adaptive Management and Monitoring Plan

The LOHCP Preserve System will be managed, restored, and monitored as outlined in the LOHCP Preserve System Adaptive Management and Monitoring Plan (AMMP). The AMMP will be developed during the first three years of implementation of the LOHCP based on initial surveys that will be used to establish baseline information about habitat conditions and covered species populations and to inform the development of restoration and management strategies (LOHCP Section 5.3.3.2).

The AMMP will be developed based on the framework and information provided in the LOHCP, including (LOHCP Section 5.3.3.2): 1) biological goals and objectives; 2) information about the covered species ecology and conservation needs; 3) scientific information about the three main management issues for the covered species—exotic plants, incompatible recreation, and fire—and approaches to their management; and 4) monitoring protocols for the covered species, communities, and habitat conditions (e.g. exotic plants). The AMMP will establish success criteria that habitat protection, restoration, and management actions must achieve to be credited as mitigation for the take of/impacts from the covered activities on the covered species through this Plan. The AMMP will be subject to approval by the United States Fish and Wildlife Service, which will issue the incidental take permit, and the California Department of Fish and Wildlife, which protects listed species and also manages the MDER.

1.5 Interim Adaptive Management and Monitoring Plan

This Interim Adaptive Management and Monitoring Plan (IAMMP) was developed to:

1. guide initial habitat management, restoration, and monitoring within the MDER that will be conducted as the compensatory mitigation for the LOHCP during the first five years, until the AMMP is approved and can begin to be implemented; and
2. serve as the initial 'mitigation plan' in the Memorandum of Understanding (MOU) between the County of San Luis Obispo (County) and CDFW, which will enable the County to conduct restoration, management, and monitoring within the MDER and enroll the MDER into the LOHCP Preserve System.

The IAMMP was developed based on the following:

1. existing information about the MDER, including documents and spatial data, to characterize the abiotic and biotic conditions as well as anthropogenic factors influencing them;
2. information about CDFW's existing management activities and commitments (Section 2.8), which were used to identify the additional restoration and management needs;
3. reconnaissance-level site visits to assess habitat conditions and identify high-priority restoration and management projects; and
4. coordination with the USFWS and CDFW to ensure the document meets the planning objectives outlined above, including that the IAMMP is consistent with CDFW's policies and plans for management of the MDER.

The restoration projects outlined in this IAMMP were developed based on the following criteria:

1. The project is known or very likely to promote one or more of the biological goals for the LOHCP (LOHCP Section 5.1) including by increasing the distribution and abundance of the covered species populations by restoring degraded habitat or addressing anthropogenic factors that degrade habitat; and
2. The project will promote the effectiveness of future management under the AMMP by preventing further degradation of habitat which would occur if the project is not implemented.

This priority restoration activities as well as associated management and monitoring outlined in this document will be implemented by the County in the MDER during the first five years of LOHCP implementation, while the AMMP is being developed (LOHCP Section 5.3.3.2). The County will implement these actions directly or through a contract with the Implementing Entity, such as a land trust or land conservancy, that specializes in the management and restoration of sensitive habitat supporting endangered species (LOHCP Section 6.1).

1.6 IAMMP Contents

This plan provides the following information to develop and implement high-priority habitat restoration, and associated management and monitoring:

1. **Existing Conditions (Section 2):** This section provides an overview of the existing conditions of the MDER including the physical environment, land use, plant communities, sensitive species, covered species, and stressors, as well as the CDFW's existing management and commitments. It provides background information for the restoration, management, and monitoring work that will be conducted as part of this plan.
2. **Restoration (Section 3):** This section describes general restoration approaches used in the IAMMP, the initial restoration and management actions proposed for the Preserve, and the species protection measures that will be implemented to reduce the short-term negative impacts of the restoration projects on the covered species in order to maximize their long-term benefits and conservation.
3. **Monitoring and Adaptive Management (Section 4):** This section describes how the restoration treatment areas will be monitored to inform the need for follow-up treatments and remedial actions as part of the adaptive management framework. It also describes how restoration performance will be evaluated to determine whether it is successful and if so, how the mitigation area and credits will be calculated as compensatory mitigation for the LOHCP (LOHCP Section 5.7.2).
4. **Fuel Reduction (Section 5).** This section describes how a fuel break can be created within the MDER using methods that are consistent with the LOHCP and the Community Wildfire Protection Plan (SLOCCFSC 2009), which is a covered activity in the LOHCP (LOHCP Section 2.2.7). This description of the fuel break prescription and associated species protection measures is provided in this IAMMP to help ensure that work to reduce the risk of fire in the MDER is compatible with broader management of the property, and that it will protect the covered species and restore their habitat as it is within the LOHCP Preserve System. Fuel reduction is not a restoration activity in this IAMMP and is not being used as mitigation.

5. **Implementation (Section 6):** This section outlines the steps and anticipated timeframe for implementation of the IAMMP consistent with the LOHCP and MOU.

Additional information is available in the Los Osos Habitat Conservation Plan (McGraw 2020), for which specific section references are provided in this IAMMP.

2 Existing Conditions

This section describes aspects of the Morro Dunes Ecological Reserve that are relevant to initial, high-priority habitat restoration and management. Specifically, it provides overview of the physical environment and biology of the reserve, including current known and likely stresses for the covered species that can be addressed through active restoration and management. It also describes the existing management and commitments of CDFW (Section 2.8), which provides the basis for defining the enhanced management and restoration that can be credited as compensatory mitigation for the LOHCP. A more detailed analysis of the MDER as well as future LOHCP Preserves will provided in the AMMP, which will be developed following a comprehensive inventory of the MDER and other LOHCP Preserves, and which will provide more detailed information about the sensitive species and communities in the Preserve (Section 1.4).

2.1 Overview

The CDFW owns and manages the 278.7-acre MDER[2], which is located in the south-central portion of the LOHCP Area (Figure 1). The eastern 231-acre Bayview Unit of the MDER supports a mosaic of coastal sage scrub, central maritime chaparral, and coast live oak woodland. The Pecho Unit is a disjunct 48-acre parcel located in the southwest portion of the LOHCP Area, which supports coastal sage scrub and central maritime chaparral.

The MDER contains habitat that is of exceptional conservation value for the LOHCP covered species. The Bayview Unit of the Morro Dunes Ecological Reserve features populations of, or habitat for, all four covered species. It is deemed to have the greatest probability of supporting the critically endangered Morro Bay kangaroo rat (USFWS 1999). The Bayview Unit also supports the only known remaining populations of Indian Knob mountainbalm in the LOHCP Area (Kofron et al. 2019). Persistence of the dense stands of Morro manzanita that occur on the southern portion of the unit is deemed very important for conservation and recovery of the endangered shrub (Tyler and Odion 1996), which also inhabits the southeastern portion of the Pecho Unit. Both units of the reserve feature extensive coastal sage scrub habitat that is designated critical habitat for Morro shoulderband snail (USFWS 2001).

Ecological reserves are established under California law to protect rare, threatened, or endangered native plants, wildlife, aquatic organisms and specialized terrestrial or aquatic habitat types (Fish and Game Code 1580). They are managed to conserve biodiversity, while providing opportunities for education, research, and compatible recreation, as outlined in the California Code of Regulations, Title 14, sections 550 and 630. A management plan was prepared for the MDER in 1982, when it featured only the 48-acre Pecho Unit located west of Pecho Valley Road (CDFW 1982).

The existing management of the MDER is primarily limited to reconnaissance-level site visits by CDFW Environmental Scientists and law enforcement actions conducted by CDFW Wardens in response to illegal activities detected by CDFW staff or reported by the public (Section 2.8). The LOHCP identified enhanced management and restoration of habitat for the covered species in the MDER as an important

[2] Acreages presented in this plan are based on GIS analyses and differ slightly from those used by CDFW, which states that the Bayview Unit is 236 acres and the Pecho Unit is 48 acres (CDFW 2020b). GIS acres, rather than acreages reported on title reports or other sources, are used to facilitate spatial analyses and to track actions.

element of the conservation program that was developed to achieve the LOHCP Biological Goals and Objectives (LOHCP Section 5.3.1). During the initial phase of management described in this plan, efforts to control exotic plants and restore areas that have been denuded by recreation can restore the coastal sage scrub and maritime chaparral habitat in the MDER and in doing so, promote populations of the covered species all of which have current or historic occurrences within the site. Longer-term management of the MDER can address fire, erosion, and other factors that can further restore and enhance habitat, as will be described in the AMMP. An analysis presented in Appendix G of the LOHCP determined that such efforts, which are above and beyond CDFW's existing responsibility for management of the ecological reserve, are consistent with the CDFW's mitigation policy (CDFW 2012), supporting enhanced management and restoration of the MDER as compensatory mitigation for the LOHCP (McGraw 2020).

2.2 Location

The 278.7-acre MDER consists of two units: the Pecho Unit and the Bayview Unit. The Pecho Unit is a 47.8-acre unit in the southern half of the northeast quarter of Section 23, Township 30S, Range 10E of Mount Diablo Baseline and Meridian (MDBM). Comprised of a single assessor's parcel (APN: 074-011-011), the unit is west of Pecho Valley Road near Nokomis Court and adjoins residential development on its eastern border. The other three sides that surround the Pecho Unit are protected within the Montaña Del Oro State Park (Figure 1).

The Bayview Unit consists of 230.9 acres in the northwestern portion of Section 19, Township 30S, Range 11E of the MDBM. It consists of three parcels (APNs: 074-023-004, 074-023-005, and -067-131-006) which are south of Highland Drive, east of Broderson Avenue, west of Bayview Heights Drive and Calle Cordoniz Road, and north of the Hazard Canyon region. The unit adjoins open space on the west and south and residential development on the north; it is separated by residential development on the eastern boundary by a street (Figure 1).

2.3 Physical Environment

2.3.1 Geology

The MDER is underlain by rock of the Franciscan Complex, which is a mixture of igneous, metamorphic, and sedimentary rocks formed 120 to 180 million years ago during the Jurassic and Cretaceous Periods. Overlaying the Franciscan formation are sediments of the Paso Robles formation, an ancient dune complex formed during the Pleistocene and Holocene (Chipping 1987). This dune complex greatly influences the soils and thus biology of the MDER, as described below.

2.3.2 Soils

The ancient dunes of the Paso Robles Formation have given rise to the Baywood Fine Sands soil, which is mapped within all of the Pecho Unit, and all but 25 acres in the south of the Bayview Unit. Due to their coarse texture, Baywood Fine Sands soils are somewhat excessively drained (i.e., have low soil moisture). Gradual accumulation of organic matter has led to some clay synthesis, and in some places, the soil is loamy sand. Oxidation of iron minerals gives the surface soil a reddish color. While the surface layer is slightly acidic, the subhorizons are often strongly acidic (USDA 1984).

Located just north of the steep canyon at the headwaters of Los Osos Creek, the Bayview Unit also contains 25 acres of Santa Lucia Shaly Clay Loam soil on 50-75% slopes. This moderately deep, well-drained soil was formed from the weathering of shale and sandstone and the surface layer is a dark gray shaly clay loam. Due to the higher clay content compared to the Baywood Fine Sands, the Santa Lucia shaly clay loam has moderate water holding capacity. Surface runoff on this soil is rapid, and thus on steep, denuded slopes, erosion can be a problem (USDA 1984).

Within these soil types, differences in topography, microclimate, and plant cover result in soils that differ in depth, texture, and color. These soils create different conditions for plant growth, and thus contribute to the observed variability in plant community composition observed in the MDER.

2.3.3 Topography

The Bayview Unit is on a gently sloped, north-facing hillside. Elevation ranges between 180 feet above mean sea level (amsl) at the northern border near Highland Drive, and 580 feet amsl on the southern border, which features a ridge above the steep canyon containing the headwaters of Los Osos Creek. The overall slope of the site is 12%, though it is shallower in the northern half (10%) and steeper in the southern half (14%).

The Pecho Unit slopes downward from the southeast corner near Pecho Valley Road where elevation is approximately 335 feet amsl, to the northwest where elevation is approximately 125 feet amsl. As in the Bayview Unit, land is more gently sloping in the northern portion and steeper in the southern portion.

2.3.4 Climate

2.3.4.1 Current

Los Osos features a Mediterranean climate characterized by relatively warm, dry summers and cool, wet winters. Due to its proximity to the coast, Los Osos experiences moderate temperatures; mean high temperatures in July are just 66 ºF while mean low temperatures in January are 41 ºF (PRISM 2011). Dense morning fog is frequent during the summer and helps moderate temperatures and reduce plant desiccation stress. Los Osos receives an average of 18 inches of precipitation, which occurs as rain that falls primarily between November and March. There is a slight precipitation gradient within the LOHCP Area, with the coast receiving an average of 17 inches of rainfall and the higher elevation areas further inland receiving 19 inches (PRISM 2011).

Interannual variability in weather, particularly precipitation, is high and can have important implications for biological systems. Over the 53-year period of record for which daily rainfall was measured at the Morro Bay Fire Station Coop weather station north of Los Osos (WRCC 2013), mean rainfall was 16.6 inches; the standard deviation of the mean was 7.7, reflecting the high variability. In 21 of the years, precipitation was less than 75% of normal, and there were four periods of two or more years of such low rainfall, which constitute a drought: 1960 - 1961, 1984 - 1985, 1989 - 1990, and 2007 - 2009. Given the low water-holding capacity of the Baywood fine sand soil, drought can have important implications for plant and animal populations and habitat conditions.

2.3.4.2 Anticipated Changes

Mean annual temperature in San Luis Obispo County is projected to increase by 2.1 to 3.9 ºF by 2045 and 4.1 and 7.6 ºF by 2085, with summer temperature increases larger than those in winter (Koopman et al. 2010). Some of the models evaluated predict that temperature increases will be lower on the coast including in the Plan Area, than in inland portions of the county, while others do not (Koopman et al. 2010).Though precipitation projections varied across three models evaluated in a local study, a statewide analysis found consensus between six models that Central California would be drier (Westerling et al. 2009).

Unless global climate change brings substantial increases in precipitation, increased temperatures will reduce soil moisture by increasing evapotranspiration. This climatic water deficit may be exacerbated by continuation of a trend of 33% reduction in the frequency of summer fog in coastal California (Johnstone and Dawson 2010).

The hotter and likely drier climate could affect natural biological systems within the MDER and broader LOHCP Area through a variety of mechanisms, including by:

- shifting plant and animal distributions into regions with currently cooler climatic envelopes, thus increasing or reducing plant and animal species within their current range (Parmesan 1996, Schneider and Root 2001, Loarie et al. 2008);
- causing changes in vegetation structure (i.e., forests transition to shrublands, shrublands transition to grasslands, or potentially new plant communities emerge as a result of novel climates (Ackerly et al 2010);
- altering plant and animal phenologies (Stenseth and Mysterud 2002, Parmesan and Hanley 2015);
- increasing fire frequency, potentially promoting fire-adapted species and reducing fire-sensitive species (Lenihan et al. 2003, Halofsky et al. 2020);
- increasing pest and pathogen outbreaks due to drought-stress (Kurz et al. 2008); and
- promoting the spread of exotic species, due in part to increased fire (Walter et al. 2009).

Habitat restoration and enhanced management can play an important role in increasing the resiliency of the landscape to climate change by increasing the area of suitable habitat thus promoting their population persistence (Heller and Zavaleta 2009).

2.4 Land Use

2.4.1 Acquisition History

The Pecho Unit was acquired by the Department of Fish and Wildlife on July 12, 1978 using funds from a federal Endangered Species Act grant-in-aid. It was purchased to protect Morro Bay kangaroo rat, Morro shoulderband snail, and endemic plants (CDFW 1982). Land within the Pecho Unit was designated as part of the Morro Dunes Ecological Reserve in 1983 (CDFW 2020b).

Lands within the disjunct Bayview Unit were acquired through multiple acquisitions. Located in the southwestern corner of the unit, the 30.0-acre Pacey Property (APN: 067-131-006) was acquired in 2003 using Section 6, Proposition 50, as well as NOAA funds. The remaining 200.9 acres were acquired in November 2000 using general funds.

2.4.2 Historical Land Use

Historical aerial photographs of the region show that, sometime between 1937 and 1949, vegetation within the Bayview Unit was removed (Figure 2b). The cleared area largely conforms to the parcel lines and there is no sign of the trunks and branches of large shrubs and trees ("skeletons") that often remain after wildfire; these observations suggest that plant cover was mechanically cleared. The plant communities have become re-established over the subsequent 70 years or more, during which there has been no sign of widespread clearing or fire (Figure 2c), though the site features a network of dirt roads and trails likely created by off-highway vehicles (OHVs) as well as equestrians and pedestrians.

The Pecho Unit was used by the US Army and Navy as an impact area in World War II. In 1956, a bulldozer operation was used to remove unexploded ordinance, thus removing established plant cover (CDFW 1982). Prior to its acquisition by CDFW, the site was also subject to use by OHVs, which along with pedestrians and equestrians have created trails as in the Bayview Unit.

2.4.3 Current Land Use

Current uses of the MDER include the following:

1. **Research**: The site has been used for research into the endangered species, including surveys for Morro Bay kangaroo rat.
2. **Recreation**: Hiking, dog walking, and wildlife viewing are allowed activities within the Reserve, and occur via a network of trails in both units. The trails are also currently being used by equestrians and occasionally mountain bikes, both of which are not allowed under the regulations that govern management of the Reserve (Section 2.8).
3. **Vegetation Management**: The Los Osos Community Wildfire Protection Plan called for construction of a shaded fuel break on the eastern and northern sides of the Bayview Unit (SLOCCFSC 2009). In 2018, vegetation management was initiated in the western portion of the northern shaded fuel break (Section 5).

Section 2.8 describes State regulations and CDFW's management of the reserve.

2.4.4 Anthropogenic Features

2.4.4.1 Roads and Trails

The Bayview Unit features a network of historic dirt roads and trails along with some patchy denuded areas adjacent to trails (e.g., at trail intersections). First observed in the 1964 aerial photograph, four dirt roads were created to traverse the present-day Bayview Unit. By 1973, all roads appear to have been largely abandoned by vehicles except one the "Broderson Road extension" or "Old Broderson Road." This ~3,600-foot-long largely dirt road is partly on the Bayview Unit and partly on the Broderson parcel to the west, which is owned by the County. As a result of its largely straight trajectory

a)

b)

c)

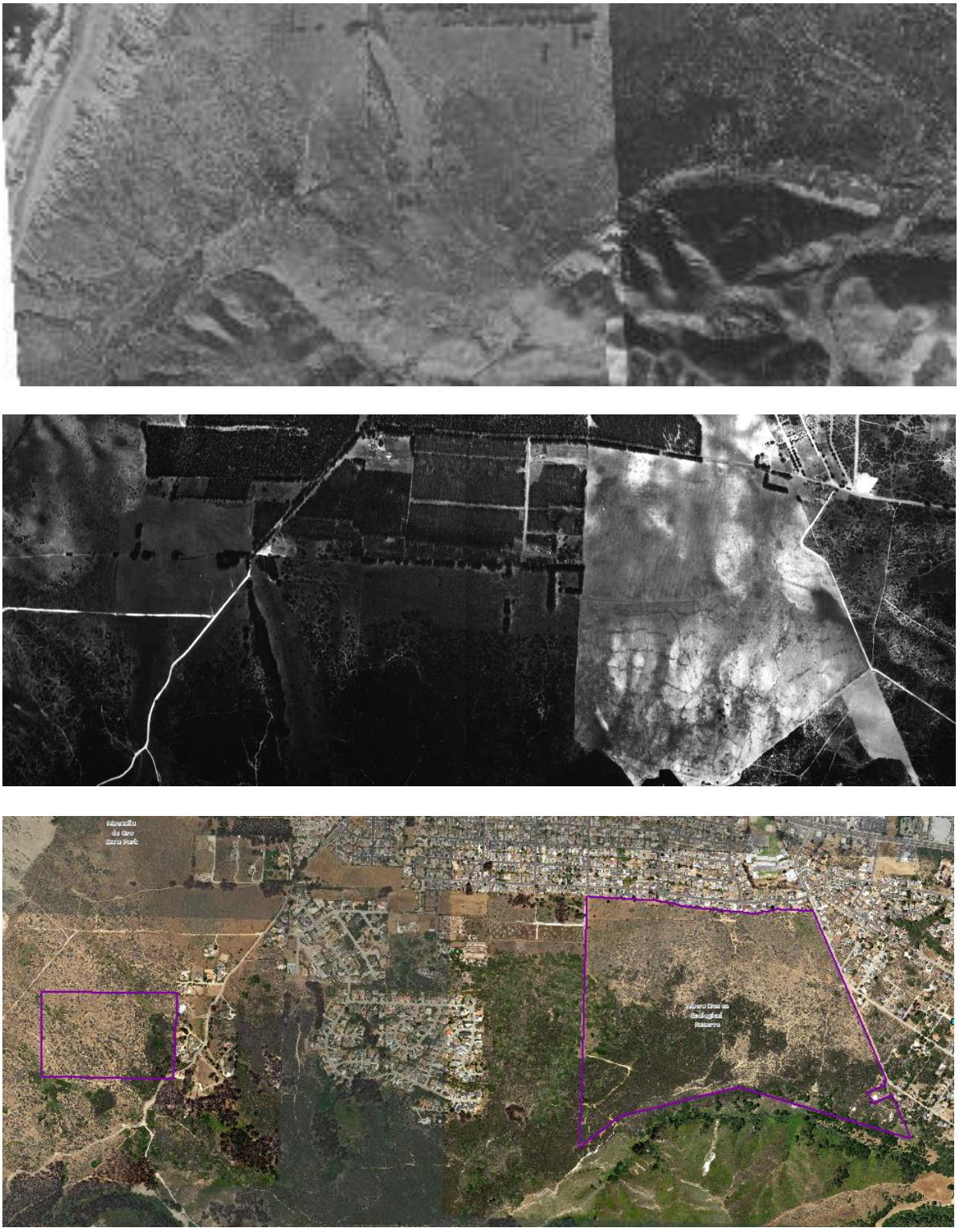


Figure 2: Aerial Images of the MDER, showing: a) largely intact habitat in 1937, b) 1949, following clearing of much of the Bayview Unit, and c) 2016.

perpendicular to a steep slope, the Old Broderson Road has experienced erosion. Between 1964 and 1973, the road segment located on the former Pacey parcel in the southern tip of the Bayview Unit changed its trajectory, perhaps because erosion rendered the original road impassable.

The northern section of the Broderson Road is currently used by vehicles to maintain the leach field on the County's Broderson property. The remainder of the old road is used as a trail. In total, the Bayview Unit features an estimated 11.8 miles of trails. These include 6.0 miles of primary trails and an additional 5.8 miles of access routes that crisscross the reserve (Figure 3). Figure 3 also depicts 0.5 miles of trails just south of the Bayview Unit.

The Pecho Unit does not feature any current roads, nor are any historic roads visible in analysis of historical aerial imagery. The unit features two primary trails (Figure 4). A 0.15-mile-long segment of the West Rim Trail that connects Pecho Valley Road to the ocean via Sand Spit Road crosses the southwestern portion of the Pecho Unit (Figure 4). In addition, a 0.28-mile long trail connects the West Rim Trail south of the Pecho Unit to a trail to its north near Costal Azul Road (Figure 4). The Pecho Unit also features 0.75 miles of secondary trails (Figure 4).

2.4.4.2 Other Features

Utility lines traverse the southeastern corner of the Pecho Unit, which features a single power pole (Figure 4). There are no known other anthropogenic features including infrastructure within the MDER, though additional features may be identified through more thorough examination of the site.

2.5 Plant Communities

The MDER supports three native plant communities: coastal scrub, central maritime chaparral, and woodlands. These communities were mapped and classified into seven series, along with two types of modified land cover (Table 1), as described in Section 3.1.5 of the LOHCP. Table 1 provides a crosswalk between the community types mapped for the LOHCP and those in the California Manual of Vegetation (Sawyer et al. 2009), which is CDFW's preferred vegetation classification system.

The natural communities and other land cover occur as a mosaic within the MDER where they reflect variations in soil conditions, microclimate, and disturbance history, including prior land use (Figures 5 and 6).The following sections describe the plant communities within the MDER to provide ecological context for management and restoration of habitat for the covered species. The descriptions were adapted based on those provided in the LOHCP (Section 3.1.5).

2.5.1 Coastal Sage Scrub

Approximately 67 acres (24%) of the MDER features coastal sage scrub: a shrubland dominated by short to medium height, soft-woody shrubs. When compared to the shrubs dominating central maritime chaparral, the other shrubland in the reserve, coastal sage scrub features shrubs that are shorter-statured, less woody, and form a discontinuous canopy.

Coastal sage scrub occurs primarily on relatively flat terraces adjacent to the Pacific Ocean. Within the Los Osos region, coastal sage scrub dominates the middle-aged dunes; it also occurs as a mosaic with central maritime chaparral and woodlands found on the older dunes. Within the MDER, coastal sage

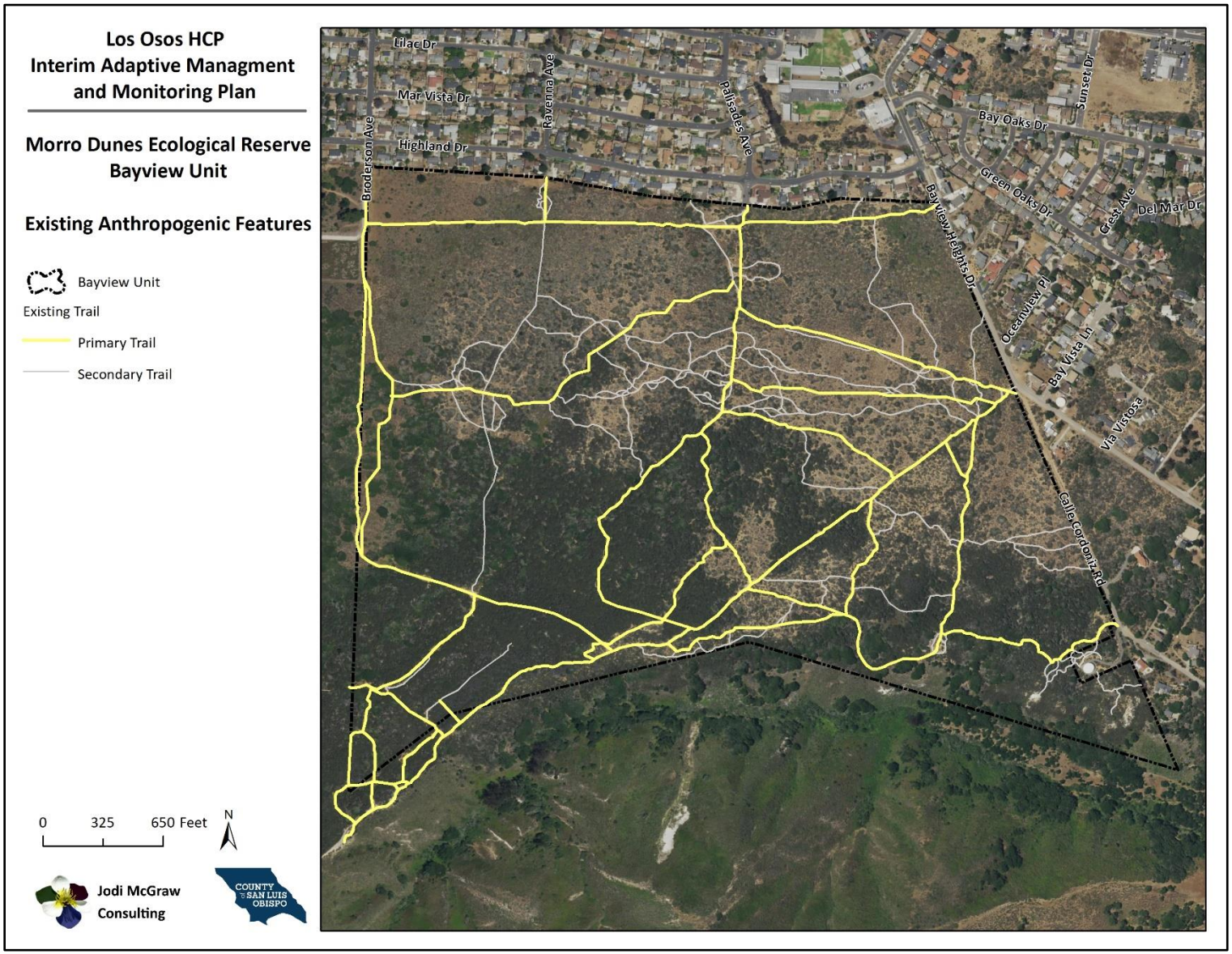


Figure 3: Existing Anthropogenic Features in the Bayview Unit of the Morro Dunes Ecological Reserve

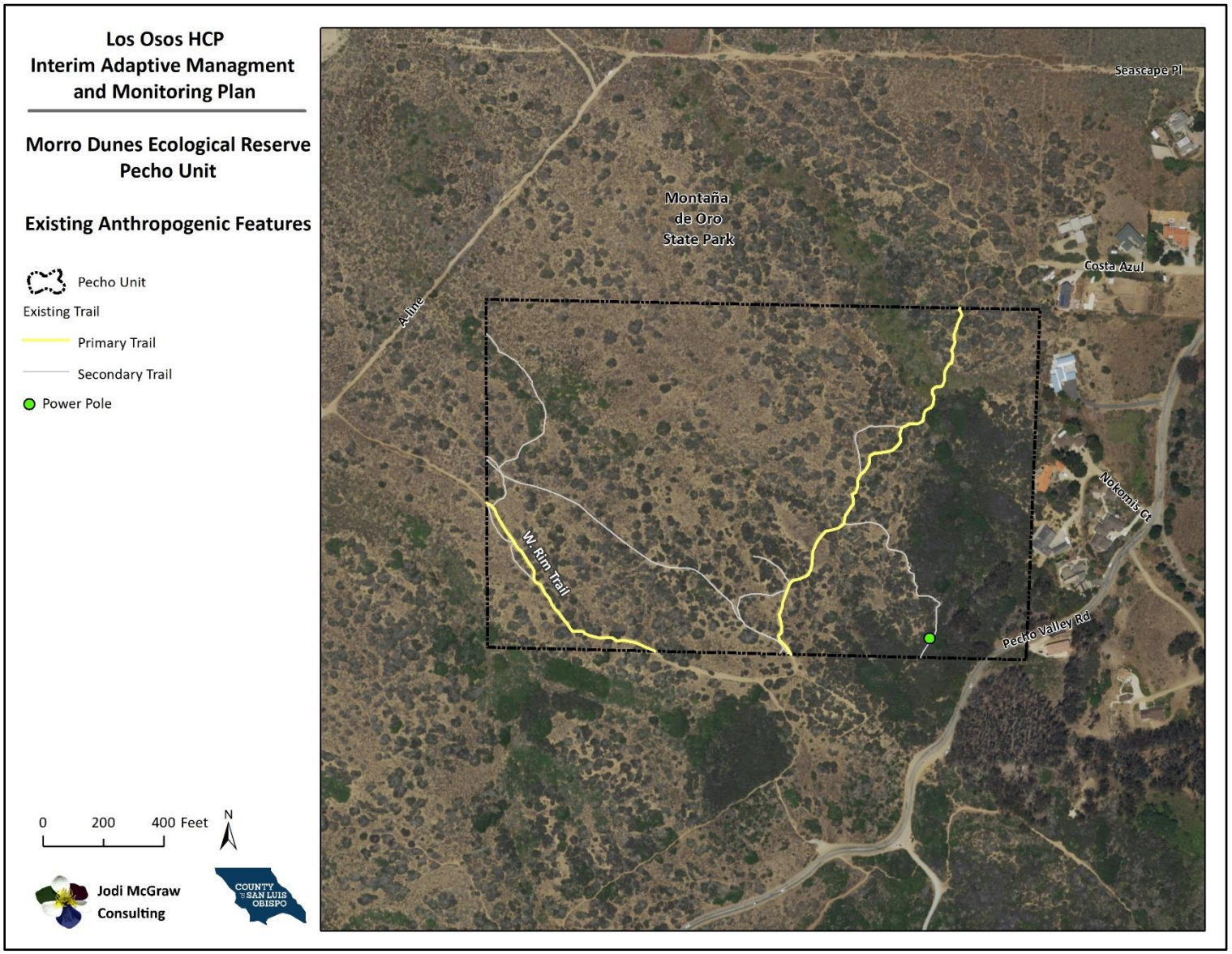


Figure 4: Existing Anthropogenic Features in the Pecho Unit of the Morro Dunes Ecological Reserve

Table 1: Plant communities of the Morro Dunes Ecological Reserve (MDER) showing acres and percent of total in the Bayview and Pecho units and overall[1]

Community Type and Series	California Manual of Vegetation Alliance (Sawyer et al. 2009)	Bayview		Pecho		Total	
		Acres	%	Acres	%	Acres	%
Coastal Sage Scrub							
California Sagebrush – Black Sage Series	*Salvia mellifera* Shrubland	57.1	25%	10.1	21%	67.2	24%
California Sagebrush – Black Sage Series Disturbed	*Salvia mellifera* Shrubland	0.001	<0.01%	0.11	0.23%	0.11	0.04%
		57.1	**25%**	**10.2**	**21%**	**67.3**	**24%**
Central Maritime Chaparral							
Morro Manzanita California Sagebrush Series	*Arctostaphylos morroensis* Shrubland	34.4	15%		0%	34.4	12%
Morro Manzanita Wedgeleaf Ceanothus Series	*Arctostaphylos morroensis* Shrubland	33.8	15%	29.4	61%	63.1	23%
Morro Manzanita Series	*Arctostaphylos morroensis* Shrubland	101.7	44%	8.2	17%	109.9	39%
		169.9	**74%**	**37.6**	**78%**	**207.5**	**74%**
Woodlands							
Bishop Pine Series	*Pinus muricata* Forest	3.4	1.5%		0%	3.4	1.2%
Coast Live Oak Series	*Quercus agrifolia* Woodland	0.4	0.2%		0%	0.4	0.1%
		3.8	**2%**		**0%**	**3.8**	**1.3%**
Other Land Cover							
Developed		0.03	0%	0.11	0.2%	0.14	0.05%
Largely Developed		0.02	0%		0%	0.02	0.01%
		0.06	**0.03%**	**0.11**	**0.2%**	**0.17**	**0.06%**
		230.9	**100%**	**47.9**	**100%**	**278.7**	**100%**

[1] Based on vegetation mapping conducted for all of Los Osos (CMCA 2004) and may not precisely delineate vegetation at the site level. Notably, the existing map and data may overstate the area occupied by Bishop pine and it does not include the area of blue gum.

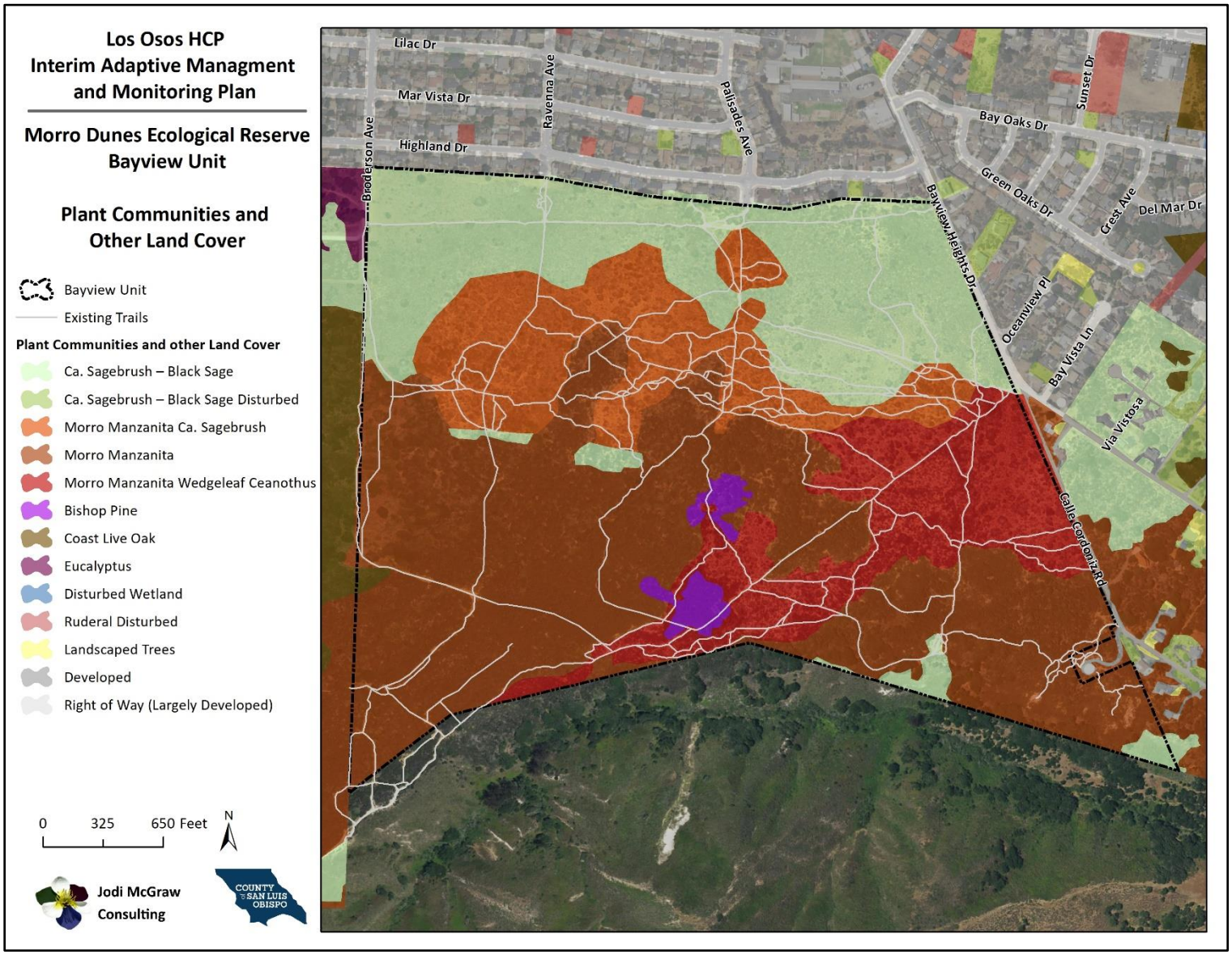


Figure 5: Plant Communities of the Bayview Unit of the Morro Dunes Ecological Reserve

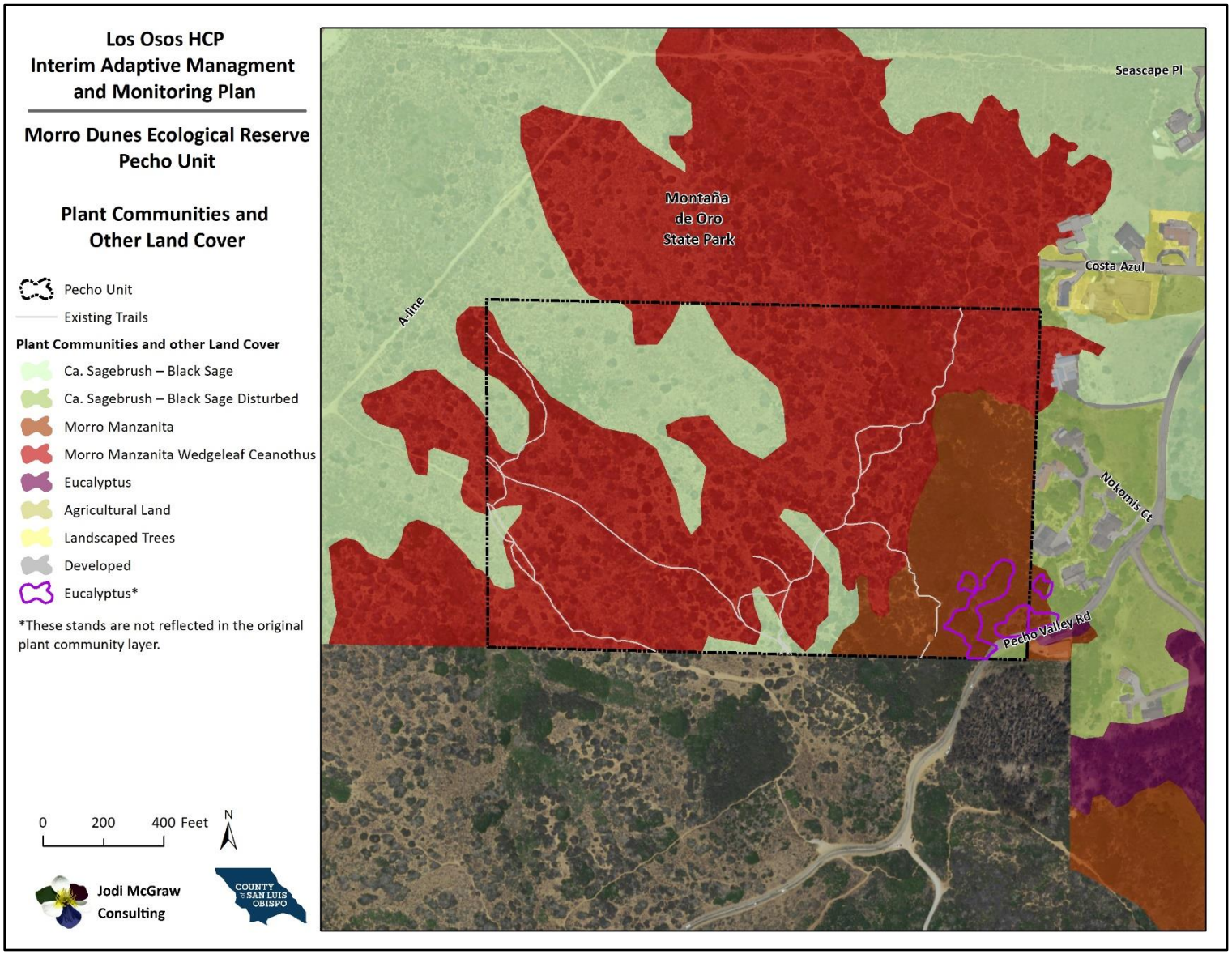


Figure 6: Plant Communities of the Pecho Unit of the Morro Dunes Ecological Reserve

scrub occurs primarily in the lower elevation, more gently sloping terrain located in the northern portions of each unit.

Coastal sage scrub is dominated by several shrubs including black sage (*Salvia mellifera*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), California goldenbush (Ericameria ericoides), silver lupine (*Lupinus albifrons*), dune (or sand) almond (*Prunus fasciculata* var. *punctata*), dune bush lupine (*Lupinus chamissonis*), and deer weed (*Acmispon glaber*). Herbaceous plants occur between shrubs, with common species including California croton (*Croton californicus*), wedgeleaf horkelia (*Horkelia cuneata*), rush rose (*Crocanthemum scoparium*), and common sandaster (*Corethrogyne filaginifolia*).

Areas of coastal sage scrub have been modified by prior land use, including clearing and road and trail development. These activities remove shrub cover and facilitate the invasion and spread of exotic plant species such as perennial veldt grass (*Ehrharta calycina*), freeway iceplant (*Carpobrotus edulis*), narrow leaved ice plant (*Conicosia pugioniformis*), wild oats (*Avena* spp.), rip-gut brome (*Bromus diandrus*), and red brome (*Bromus madritensis* ssp. *rubens*; Section 2.7.1).

Within the MDER, two coastal sage scrub community types (series) have been mapped; they are distinguished by their dominant shrubs and level of invasion by exotic plants (Table 1, Figures 5 and 6).

California Sagebrush – Black Sage: An estimated 67.2 acres, or 24% of the MDER, supports this community, which features a 2- to 5-foot-tall, continuous or intermittent canopy of California sagebrush and black sage with deer weed, mock heather, and dune bush lupine.

California Sagebrush – Black Sage Disturbed: The MDER also supports 0.11 acres (0.04% of total) of coastal sagebrush-black sage habitat that has been disturbed by land use. This includes primarily a ~0.011-acre patch in the southeast corner of the Pecho Unit, on the south side of Pecho Valley Road (Figure 6), as well as a 0.001-acre patch near the access road to the water tank in the southwest corner of the Bayview Unit (Figure 5). These areas feature a greater cover of exotic plants which are promoted by disturbance.

2.5.2 Maritime Chaparral

Central maritime chaparral occurs on approximately 207.5 acres (74%) of the MDER. It is dominated by sclerophyllous (hard-leaved) shrubs and features scattered trees. Due to the low light and deep leaf litter in the understory, herbaceous plant cover is primarily limited to gaps in the shrub canopy.

Central maritime chaparral occurs in coastal areas of central California that are within reach of the summer fog. Within the MDER and broader Los Osos region, central maritime chaparral occurs primarily on the older dunes (i.e., farther inland), on the southern hillsides and on the north-facing slopes of the marine terraces just south of Los Osos Creek in the southern portion of the Plan Area. Within the MDER, the central maritime chaparral occurs in the steeper, southern portion of the units, with the Pecho Unit also featuring this community on the eastern portion of the unit which also features steeper terrain (Figures 5 and 6).

Within the MDER and broader Los Osos region, central maritime chaparral is dominated by Morro manzanita, which is endemic to the Los Osos Baywood Fine Sands ecosystem. Other common species include chamise (*Adenostoma fasciculatum*), wedge-leaf ceanothus, sticky monkeyflower (*Diplacus aurantiacus*), and coast live oak. Canopy gaps support a variety of shrubs including California goldenbush and deer weed, as well as herbs such as wedgeleaf horkelia, seacliff buckwheat (*Eriogonum parvifolium*), California croton, and golden yarrow (*Eriophyllum confertiflorum*).

Central maritime chaparral forms a mosaic with coastal sage scrub and woodland communities. Though it occurs primarily on the Baywood fine sand, central maritime chaparral is also supported by the Santa Lucia shaly clay loam in the southern portion of the Bayview Unit. When compared with the coastal sage scrub, central maritime chaparral occurs on the steeper slopes. This may reflect the dominant shrubs' requirements for more developed soils that occur on the older dunes farther inland. Alternatively, it may result because the gentler slopes (2-9%) have been more recently cleared (Tyler and Odion 1996).

Central maritime chaparral is a fire-adapted community. Though precise aspects of the fire regime are unknown, long fire-free periods (i.e., 100 years) are thought to be necessary for the dominant Morro manzanita to accumulate a sufficient seed bank to regenerate (Odion and Tyler 2002).

Based on their variability in dominant species, three types of central maritime chaparral have been mapped within the MDER (Table 1, Figures 5 and 6).

Morro Manzanita - California Sagebrush: This community consists of Morro manzanita and California sagebrush as co-dominant species creating a sparse canopy that is approximately 3 to 6 feet tall. California buckwheat, deer weed, wedgeleaf ceanothus, sticky monkeyflower, and black sage may also be present. It occurs on 34.4 acres (12% of the MDER) within the northern half of the Bayview Unit, at the transition between middle-aged dunes and older dunes and in areas that have been cleared relatively recently.

Morro Manzanita - Wedgeleaf Ceanothus: This community occurs on 63.1 acres (23% of the MDER), with approximately half of the acreage occuring in each unit (Table 1). It features Morro manzanita and wedgeleaf ceanothus as co-dominant species creating a dense shrub canopy that is 3 to 6 feet tall. California sagebrush, black sage, and sticky monkey flower may be present in this community, which appears transitional between coastal sage scrub and Morro manzanita chaparral

Morro Manzanita: Found on 109.9 acres (39% of the MDER), the Morro manzanita community is characterized by dense cover of Morro manzanita, with coast live oak, wedgeleaf ceanothus, and sticky monkey flower, with black sage also present in a 4-12-foot tall canopy. Morro Manzanita chaparral occurs primarily on the older dunes and on steeper slopes in the southern portion of the Bayview Unit (Figure 5) and southeastern corner of the Pecho Unit (Figure 6).

2.5.3 Woodlands

Approximately 3.8 acres (1.3%) of the MDER supports woodlands: upland communities characterized by a largely continuous canopy of trees, with variable understory featuring primarily shade-tolerant herbs and shrubs (Table 1). These small patches of native woodlands occur primarily on the older dunes in the southern portion of the Bayview Unit (Figure 5), on more developed soils featuring higher nutrient availability and water-holding capacity of the more developed soils found there.

The woodland communities are mapped as one of two types: coast live oak and bishop pine (Pinus muricata) woodland (Table 1, Figures 5 and 6).

Coast Live Oak: Approximately 0.4 acres (0.1%) of the MDER features an intermittent or continuous canopy dominated by coast live oak, which typically range from 20 to 45 feet in height. The understory can feature Morro manzanita, wedgeleaf ceanothus, coffee berry, poison oak, and herbaceous species including exotic annual grasses. As noted above, the central maritime chaparral features emergent oaks as well, which may overtop the chaparral shrubs as part of succession over time.

Bishop Pine: The Bayview Unit features two stands of bishop pine that were mapped in 2004 as totaling 3.4 acres (1.2% of the MDER). Examination of the stands in 2020 indicates that they occupy a much smaller area (~0.5 acres total) and feature just a few living trees (< 10 trees), with several snags (dead standing trees). The surrounding area mapped as bishop pine is actually Morro manzanita chaparral (J. McGraw, pers. obs.).

This community features bishop pine trees that are 20 to 35 feet in height, and have shrubs in their understory. Located on soils derived from older dunes in the southern portion of the Plan Area, the bishop pine woodland occurs as pockets within Morro manzanita chaparral. More widespread in the Irish Hills, the isolated stands, which are visible in aerial photographs from 1949, may be restricted by unique soil conditions or lack of fire; like other closed-cone conifers, bishop pine establishes primarily following fire, which releases seeds from their serotinous cones and creates an open canopy and bare-mineral soil conditions that facilitate seedling establishment. As noted above, the several of the bishop pines in the Bayview Unit are dead with remaining live trees appearing senescent (J. McGraw, pers. obs.).

The southeastern portion of the Pecho Unit features an approximately 0.84-acre stand of blue gum (*Eucalyptus globulus*), referred to here as eucalyptus. In the vegetation map used for the Los Osos HCP, the stand was not mapped separately from the Morro manzanita chaparral from which it is emerging (Figure 6); therefore, the acreage is not reflected in Table 1. Section 2.7.1.2.4 describes this stand in greater detail.

2.5.4 Other Land Cover

The MDER features 0.17 acres (0.06% of total land) that has been classified as developed (0.14 acres or 0.05%) or largely developed (0.02 acres or 0.01%; Table 1). These areas include the 0.11-acre area in the southeastern corner of the Pecho Unit that is traversed by Pecho Valley Road (Figure 6), and 0.06 acres along the southeastern portion of the Bayview Unit where Calle Cordoniz Road is mapped within the reserve (Figure 5). Land surveys may reveal that one or both of these roads are located outside of the MDER units, such that the developed acreage, which was calculated in GIS based on remote-sensing data and the County cadastral data layer, does not, in fact, occur in the reserve.

2.6 Covered Species

The MDER provides habitat for all four covered species of the LOHCP (Box 1) and also supports suitable habitat for and occurrences of other sensitive species (Table 2). Additional rare species may be identified during the course of more detailed surveys of the property to develop the full LOHCP AMMP. The following sections provide an overview of the covered species and available information about their distribution within the MDER.

Table 2: Sensitive species known or likely to occur in the MDER

Species	Common Name	Status[1]	Occurrence in the MDER
Plants			
Arctostaphylos morroensis	Morro manzanita	FE, CRPR IB	Present
Cladonia firma	firm cup lichen	CNDDB G4/S1	
Eriodictyon altissimum	Indian Knob mountainbalm	FE, CRPR1B	Present
Erigeron blochmaniae	Blochman's leaf daisy	CRPR 1B	Present
Erigeron sanctarum	Saint's daisy	CRPR 4	
Erysimum capitatum ssp. *lompocense*	San Luis Obispo wallflower	CRPR 4	Present
Monardella undulata	curly leafed monardella	CRPR 4	
Prunus fasciculata var. *punctata*	sand almond	CRPR 4	Present
Sulcaria isidifera	splitting yarn lichen	CNDDB G1/S1.1	
Animals			
Helminthoglypta walkeriana	Morro shoulderband snail	FE	Present
Bombus crotchii	Crotch's bumblebee	CE	
Icaria icarioides morroensis	Morro blue butterfly		Present
Anniella pulchra	California legless lizard	SSC	
Phyrnosoma blainvillii	coast horned lizard	SSC	
Circus cyaneus	northern harrier	SSC	Present
Dipodomys heermanni morroensis	Morro Bay kangaroo rat	FE, SE	

[1] Status Designations

CNDDB G1/S1.1: CA Natural Diversity Database: limited distribution and abundance; very threatened

CNDDB G4/S1: Apparently Secure globally but critically imperiled in CA

CRPR IB: list of most endangered plants by the California Native Plant Society

CRPR 4: 'Watch list' compiled by the California Native Plant Society

SSC: CA Dept. of Fish and Wildlife Species of Special Concern

FE: Federally listed endangered species

SE: State-listed endangered species

CE: Candidate for state-listing as endangered

2.6.1 Indian Knob Mountainbalm

2.6.1.1 Species Background

Indian Knob mountainbalm (*Eriodictyon altissimum*) is a shrub in the borage family (Boraginaceae) that is both state and federally-listed as an endangered (USFWS 1994); it is also has a California Rare Plant Rank of 1B.1, which signifies that it is rare, threatened, or endangered in California and elsewhere (CNPS 2020a).

Indian Knob mountainbalm is known from just seven occurrences in western San Luis Obispo County of which six are thought to be extant. There are two extant occurrences on Indian Knob, a rock outcrop area south of San Luis Obispo and north of Pismo Beach approximately 13 miles east of Los Osos, two occurrences represented by a total of four, disjunct stands are in Hazard Canyon within Montaña de Oro State Park south of the LOHCP Area (USFWS 2013a), and two occurrences are within the Bayview Unit (Section 2.6.1.2). Indian Knob mountainbalm was not detected during a survey of the Broderson property just west of the Bayview Unit, suggesting the previously documented occurrences there may be extirpated (USFWS 2016, Kofron et al. 2019).

Though Indian Knob mountainbalm populations have not been comprehensively censused throughout the species' range, they are estimated to total fewer than 600 plants, with most of those (~500) located within the two extant Indian Knob occurrences (USFWS 2013a, Kofron et al. 2019).

Indian Knob mountainbalm occurs on sandy soils derived from marine sandstone at Indian Knob, and Pleistocene older and partly cemented aeolian deposits (i.e., the Baywood fine sand soils) in Los Osos. In both areas, the species occurs in a mosaic of chaparral and oak woodland vegetation. Within these communities, the species' distribution is very limited. While the microhabitat characteristics of the endangered shrub have not yet been examined, the stands are thought to be remnants of once larger occurrences that have contracted over time as a result of succession, which creates less favorable conditions for this early successional species that is promoted by fire (USFWS 2013a).

Indian Knob mountainbalm can reproduce vegetatively by establishing clones from rhizomes (Wells 1962). Individuals may survive fire by resprouting from belowground tissues. Fire may be required to stimulate seed germination and create open canopy, bare soil conditions conducive to seedling establishment and survival (USFWS 2013a).

As part of the most recent five-year review, persistence of Indian Knob mountainbalm was deemed threatened by fire exclusion, exotic plants, climate change, and demographic and environmental stochasticity (randomness; USFWS 2013a). Within the MDER, occurrences are also threatened by trail clearing conducted by people seeking to maintain trail access for recreation (Kofron et al. 2019).

2.6.1.2 Occurrence within the MDER

As noted above, the Bayview Unit supports two occurrences of Indian Knob mountainbalm: one just north of the water tank in the southeastern corner of the reserve (Occurrence 6), and the other near the center of the reserve by the Bishop pines (Occurrence 4). These occurrences were censused in April 2016 and found to contain a total of 46 ramets: 22 within a 63 m^2 area in Occurrence 6 and 23 within a 40 m wide area in Occurrence 4 (USFWS 2016, Kofron et al. 2019). Central maritime chaparral

communities elsewhere in the Bayview Unit and in the Pecho Unit, which cover 2008 acres or 74% of the MDER (Table 1), could provide suitable habitat for this species, particularly following fire or other disturbances that open up the shrub and tree canopy.

2.6.2 Morro Manzanita

2.6.2.1 Species Background

Morro manzanita (*Arctostaphylos morroensis*) is a large, evergreen shrub in the heath family (Ericaceae) that is federally listed as a threatened species (USFWS 1994). Though not state listed under CESA, Morro manzanita has a California Rare Plant Rank of 1B.1, which is used for plants that are rare, threatened, or endangered in California and elsewhere (CNPS 2020a).

Morro manzanita is endemic to the Los Osos region where it occurs primarily on Baywood fine sand soils. Based on the likely historic distribution of these soils, Morro manzanita may have covered between 2,000 and 2,700 acres (McGuire and Morey 1992). The current range of Morro manzanita is approximately 890 acres (LSA Associates 1992). Within that area, Morro manzanita covers approximately 350 acres (Tyler and Odion 1996).

Morro manzanita primarily occurs within central maritime chaparral communities; it is the dominant species (i.e., in terms of canopy cover) within the Morro manzanita chaparral and co-dominates with wedgeleaf ceanothus and California sagebrush. Morro manzanita also occurs at low abundance in the coast live oak woodland, in the understory or canopy gaps of coast live oak. Scattered Morro manzanita may also be found in other communities including within the developed areas.

Morro manzanita is a long-lived shrub (>50-year life span) that is adapted to recurring fire, which is an important component of the disturbance region within the Baywood fine sands ecosystem. Fire kills adult Morro manzanita, which lack a burl from which to resprout; however, it also promotes seed germination and establishment, and therefore regeneration (Tyler et al. 2000). Effective fire management will likely be essential to the species' long-term persistence. Too-frequent fire may decrease populations by killing adults prior to accumulation of sufficient viable seed to replace them (Odion and Tyler 2002). At the same time, fire exclusion may present a 'senescence risk': as adult shrubs senesce and die, seed production decreases and at some point, seed availability could be reduced to a level below which seedling establishment following an eventual fire is insufficient to replace the stand.

As a narrow endemic species, Morro manzanita persistence is also threatened by habitat loss, including land conversion. Persistence is also threatened by habitat degradation, including exotic plants and incompatible recreational uses, which can impact Morro manzanita directly through shrub removal or pruning that reduces survivorship and reproduction, as well as by causing erosion (USFWS 2008). Morro manzanita may also be impacted by vegetation management, including fire hazard abatement on private lands; the Community Wildfire Protection Plan avoids removing this species (SLOCCFSC 2009). Although individual Morro manzanita are typically trimmed rather than removed in most hazard abatement activities, as noted above, the species does not resprout from a burl when cut, and in the absence of fire, seedling establishment is very limited (Tyler et al. 1998).

2.6.2.2 Occurrence within the MDER

Morro manzanita occurs at relatively high density in the southern portion of the Bayview Unit and in the southeastern portion of the Pecho Unit in the central maritime chaparral community. Morro manzanita also occurs at lower frequency and abundance including as isolated, typically smaller shrubs in the coastal scrub communities within the reserve. The reserve features an estimated 211 acres (76% of the reserve) of suitable habitat for this species (Table 3), based on the vegetation mapping and classification in which all of the central maritime chaparral series as well as the Bishop pine and coast live oak woodland were considered suitable habitat (Figures 7 and 8; McGraw 2020). Mapping surveys for this species within the reserve will be conducted as part of implementation of the LOHCP and will increase understanding of the species distribution and areal extent (LOHCP Section E.3).

Table 3: Acres of Morro shoulderband snail and Morro manzanita habitat within the MDER based on regional plant community mapping (Table 1, Figures 5 and 6; McGraw 2020)

	Bayview		Pecho		Total	
Species and Habitat	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Morro Manzanita Habitat[1]	173.7	62%	37.6	13%	211.3	76%
Morro Shoulderband Snail Habitat						
Primary Habitat[2]	91.5	40%	10.2	21%	101.7	36%
Secondary Habitat[3]	33.8	15%	29.5	62%	63.3	23%
Total	**125.3**	**54%**	**39.7**	**83%**	**165.0**	**59%**

[1] Includes all maritime chaparral communities as well as coast live oak and Bishop pine woodlands

[2] Includes all coastal sage scrub as well as Morro manzanita California Sagebrush and Wedgeleaf Ceanothus-California sagebrush

[3] Includes Morro manzanita Wedgeleaf Ceanothus and Developed Areas, which can feature suitable habitat

2.6.3 Morro Shoulderband Snail

2.6.3.1 Species Background

The Morro shoulderband snail (*Helminthoglypta walkeriana*), is a federally listed endangered terrestrial mollusk endemic to the area immediately north and south of Morro Bay in coastal San Luis Obispo County (Roth and Tupen 2004). When listed by the USFWS in 1994, the taxon, which was also known as the banded dune snail, was comprised of two subspecies, *H. w. walkeriana*, and *H. w. morroensis* (USFWS 1994). These taxa have since been recognized as two separate species:
Morro shoulderband snail (*H. walkeriana*) and Chorro shoulderband snail (*H. morroensis*; Roth and Tupen 2004).

The current known range of Morro shoulderband snail is estimated to encompass approximately 7,700 acres (Roth and Tupen 2004). Most of the area is centered on Los Osos north of Hazard Canyon, west of Los Osos Creek, and south of Morro Bay; however, it also includes a narrow strip of coastal dunes north of Morro Bay in Morro Strand State Park (Roth and Tupen 2004, USFWS 2006). Within this geographic area, native habitat occupied by the species includes coastal sage scrub along the immediate coast, and coastal sage scrub and open central maritime chaparral communities on stabilized dunes further inland. Within these areas, Morro shoulderband snail is often found in areas featuring dense plant cover comprised of shrubs or mat-forming species (e.g., iceplant) where plant cover including branches is in

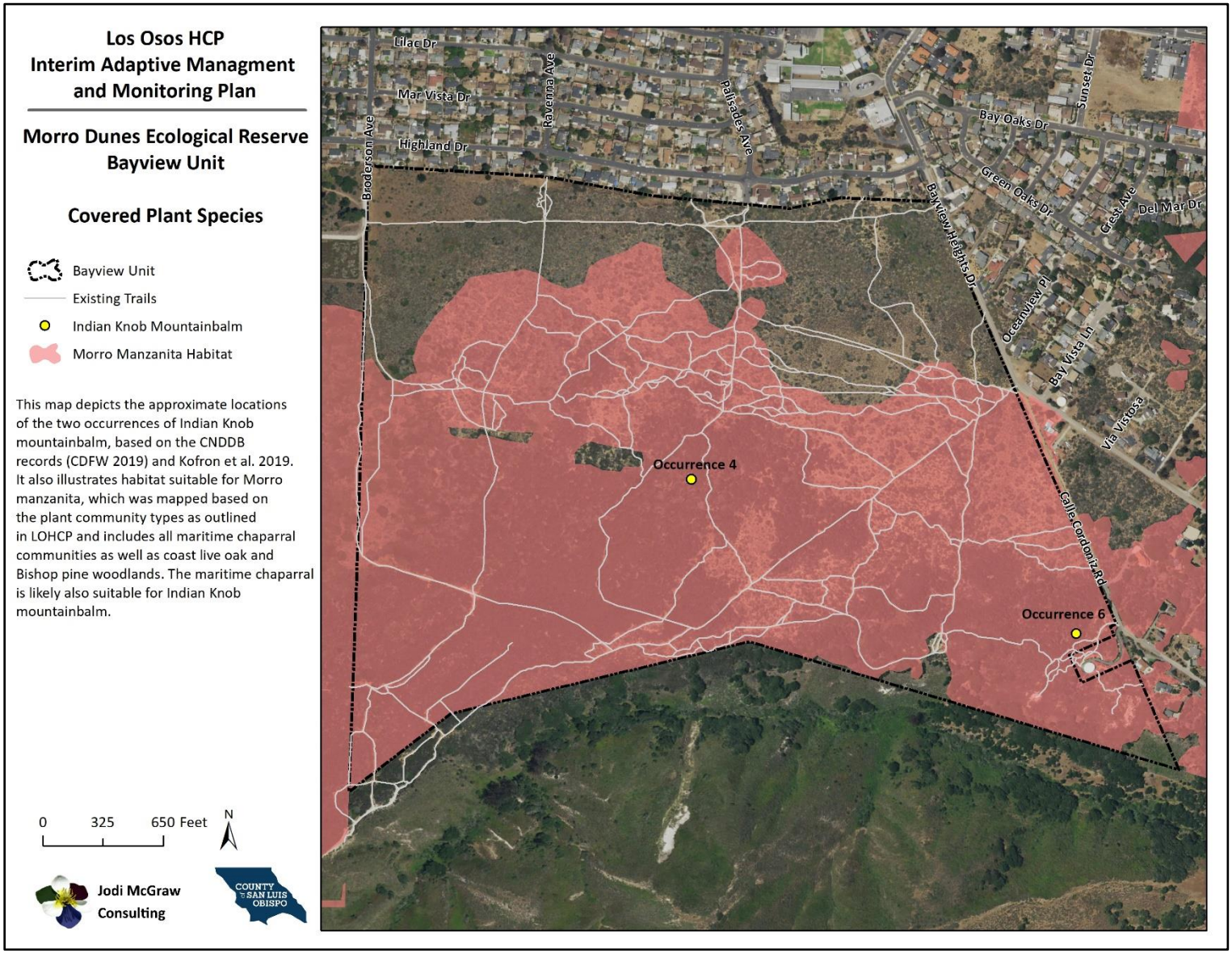


Figure 7: Covered plants in the Bayview Unit of the Morro Dunes Ecological Reserve

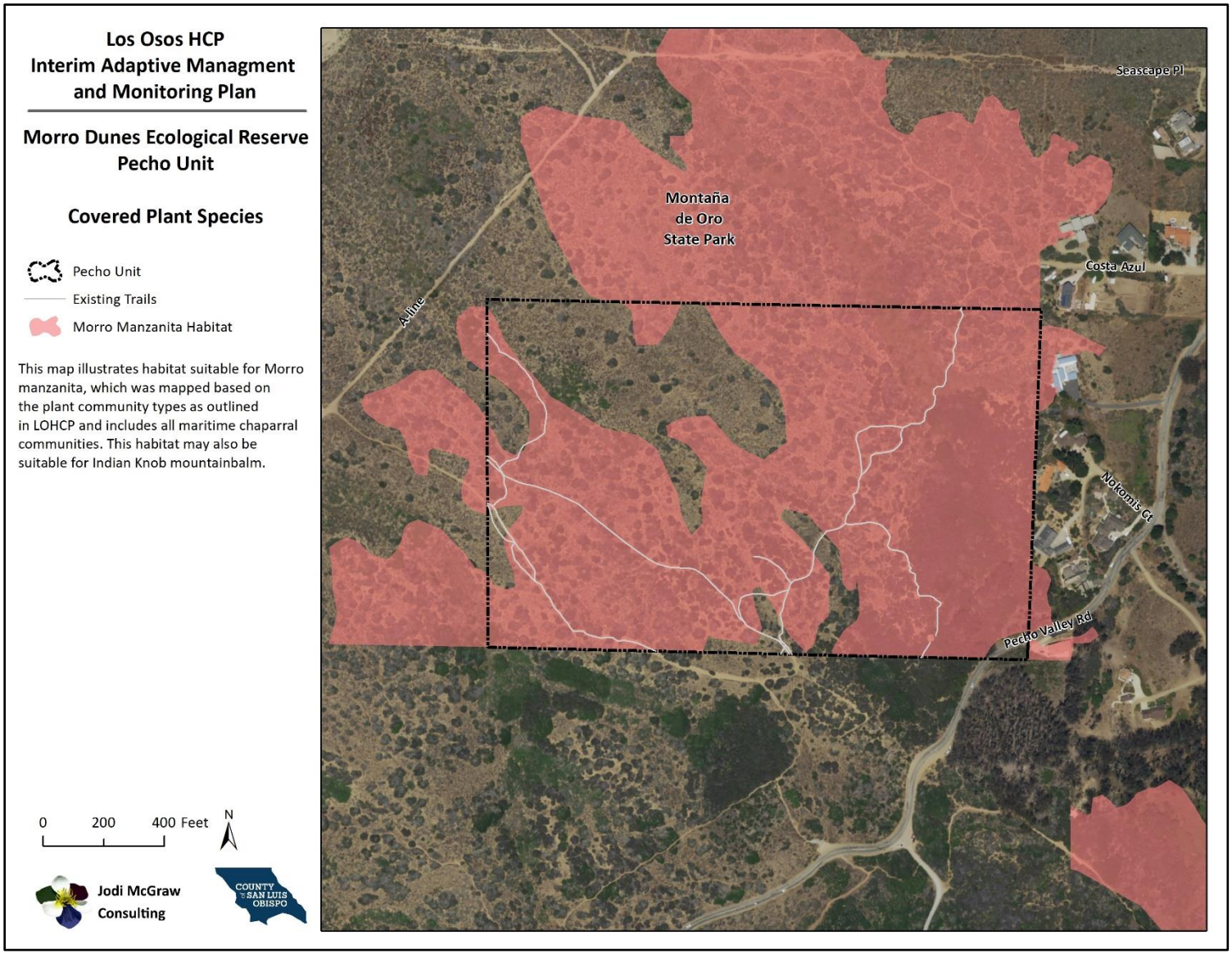


Figure 8: Covered plants in the Pecho Unit of the Morro Dunes Ecological Reserve

contact with the ground (USFWS 1998). Individuals are typically patchily dispersed and observed in clumps of coastal sage scrubs or clumps of veldt grass (SWCA 2014).

Though intact habitat for Morro shoulderband snail includes primarily coastal sage scrub, and open central maritime chaparral, the species can also occur, sometimes in high abundance, in areas of degraded habitat, including areas invaded by dense exotic plants, such as veldt grass, fennel (*Foeniculum vulgare*), and iceplant (SWCA 2013). However, the species distribution is negatively associated with exotic eucalyptus (Walgren and Andreano 2012). Morro shoulderband snails are also found in association with a variety of anthropogenically disturbed habitat areas, including areas where coastal sage scrub has been converted to non-native grassland due to vegetation clearing and mowing, areas covered by veldt grass and iceplant, landscaping and ornamental plantings, woodpiles, and other habitats within developed areas and rights-of-way (SWCA 2013, 2014, 2015, 2016, and 2017). Indeed, Morro shoulderband snail is found within a range of habitat conditions in existing developed areas as well as remaining intact habitat.

Morro shoulderband snail is also often found in litter that accumulates on the soil surface, and under piles of rock, downed wood, or other debris (SWCA 2013). These microsites provide moist, sheltered environments of reduced desiccation stress that are required by the terrestrial mollusk (Roth 1985). The species is occasionally observed in shallow (less than ½ inch) depressions within the soil (Belt 2016). Morro shoulderband snails can be attracted to and found in water puddles, where they can be drowned (SWCA 2013).

Morro shoulderband snails feed on decaying matter and fungal mycelia that grow on decaying matter and plant roots. The species is most active during periods of moist conditions, including during and after rain, as well as when there is heavy fog or morning dew. Feeding, reproduction, and growth occur primarily during the rainy season (i.e., October to April; Roth 1985). During periods of drought, Morro shoulderband snails are typically inactive, and may aestivate (Roth 1985).

Morro shoulderband snail is threated by loss of habitat due to development, and degradation of habitat as a result of exotic plants, recreational activities, and senescence of dune vegetation (USFWS 2001). When originally listed as federally-endangered in 1994, additional threats to Morro shoulderband snail included competition from non-native snails such as the European garden snail (*Helix aspersa*) and parasitism by sarcophagid flies (USFWS 1994); however, the most recent five-year review of the status of the species found no evidence for the effects of the former, and the latter threat was deemed unlikely to threaten the species' persistence (USFWS 2006).

2.6.3.2 Occurrence within the MDER

Morro shoulderband snail has been observed within the Bayview Unit of the MDER as part of surveys conducted during creation of the fuel break in 2020 (D. Hacker, pers. comm. 2020). The coastal sage scrub and wedgeleaf ceanothus-California sagebrush communities, which together cover a total of 102 acres (36%) of the MDER, are considered to provide primary habitat for Morro shoulderband snail (McGraw 2020). These communities largely occur in the northern portion of the Bayview Unit, and western portion of the Pecho Unit. The Morro manzanita-wedgeleaf ceanothus community, which covers an additional 63 acres (23%) of the MDER, is considered secondary habitat for Morro shoulderband snail, which is anticipated to occur there at lower frequency and/or abundance than in the primary habitat. This habitat extends south into the Bayview Unit (Figure 9) and occurs throughout

all but the southeastern corner of the Pecho Unit (Figure 10). The northern portion of the Bayview Unit was identified as critical habitat for the endangered mollusk (USFWS 2001).

2.6.4 Morro Bay Kangaroo Rat

2.6.4.1 Species Background

The Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*) is a small, nocturnal, fossorial rodent endemic to the Baywood fine sands ecosystem centered on the community of Los Osos. Within its range, which was estimated at less than five square miles, habitat for the species includes compacted sandy soils with slopes of less than 15 degrees, supporting a range of vegetation types (Gambs and Holland 1988).

Optimal habitat for Morro Bay kangaroo rat appears to be early-successional stages of coastal sage scrub, which are characterized by scattered subshrubs and shrubs less than three feet tall, interspersed with herbaceous plants and bare ground. Characteristic plant species of Morro Bay kangaroo rat habitat include sandcarpet (*Cardionema ramosissimum*), wedgeleaf ceanothus, western thistle (*Cirsium occidentale*), California croton (*Croton californicus*), seacliff buckwheat, wedgeleaf horkelia, deer weed, and grasses (Roest 1973, Gambs and Holland 1988).

Morro Bay kangaroo rats are solitary, and inhabit burrow systems that they use for nesting, escape, and caching seeds, which constitute their primary food source. Predators likely include snakes, owls, bobcat (*Lynx rufus*), coyote (*Canis latrans*), domestic cat (*Felis catus*) and domestic dog (*Canis lupus familiaris*); the domestic animals enter habitat from adjacent residential areas (USFWS 2011b).

Morro Bay kangaroo rat is listed as endangered under the CESA and the ESA; the species is also fully protected under the California Fish and Game Code. Listed as federally endangered in 1970 (USFWS 1970), Morro bay kangaroo rat has not been observed in the wild since 1986 despite several surveys. The last observed occurrence was within habitat currently within the Bayview Unit of the Morro Dunes Ecological Reserve (USFWS 2011b). The species may still be present below detectable levels; alternatively, it may have gone extinct (USFWS 2011b). Observations of potential signs that may be evidence of the species (e.g., burrow entrance shaped like an upside down “U” with a runway, tail drag mark, surface seed pit cache) from 2008 to 2011 suggest that some isolated colonies may persist in pockets of suitable habitat (USFWS 2011b). The species may persist on several large, privately owned parcels featuring potentially suitable habitat, including two where the species previously occurred, where surveys could not be conducted (USFWS 2011b).

Declines in the population of this species are attributed to habitat loss, degradation, and fragmentation caused primarily by development within the Los Osos and Baywood Park communities; habitat has also been degraded and fragmented by fire exclusion, which converts early-successional coastal sage scrub habitat to later successional communities that lack the preferred food plants and perhaps other important structural components of their habitat. Declines may have also resulted from predation by domestic cats and use of rodenticides (USFWS 1999, USFWS 2011b).

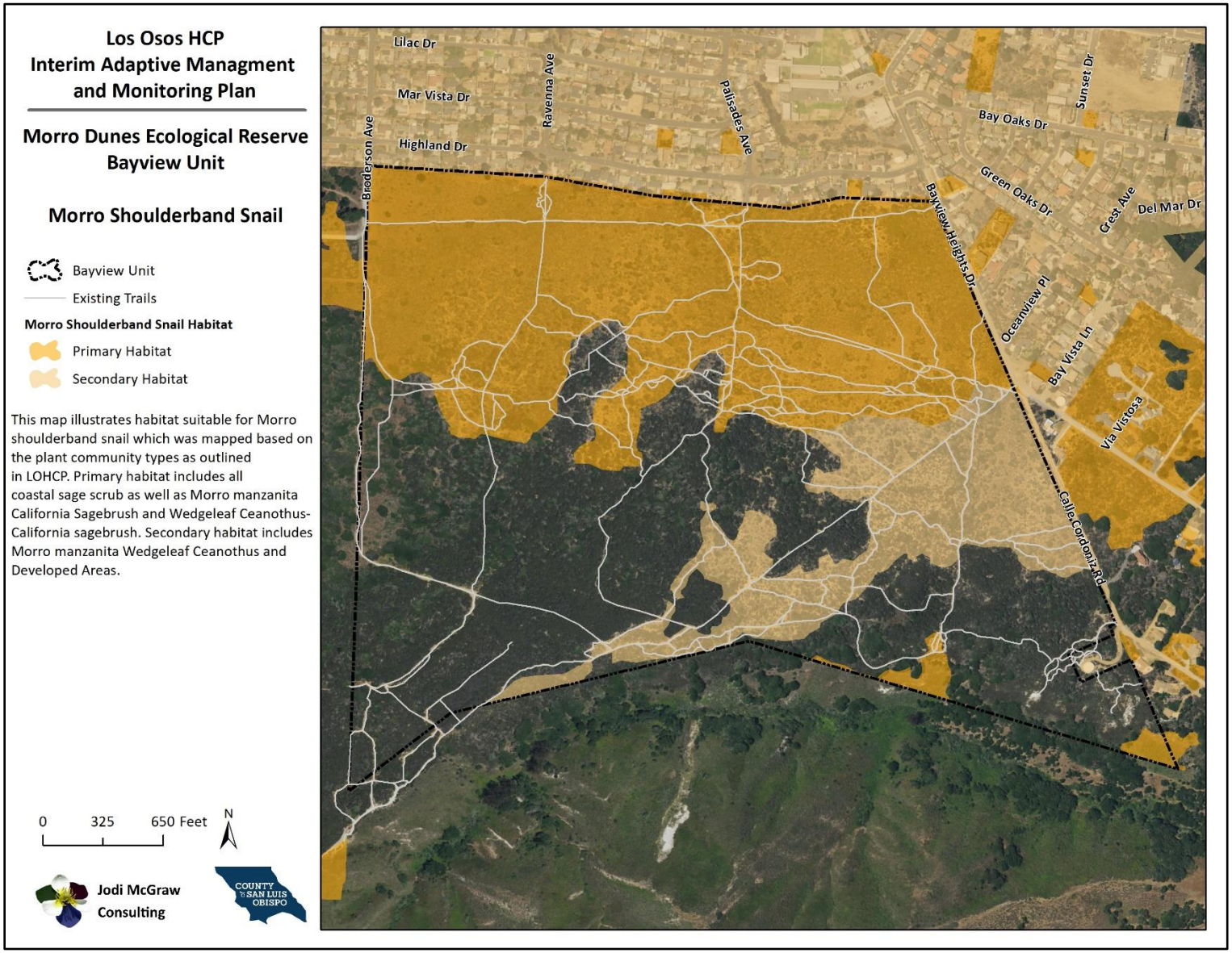


Figure 9: Morro shoulderband snail habitat in the Bayview Unit of the Morro Dunes Ecological Reserve

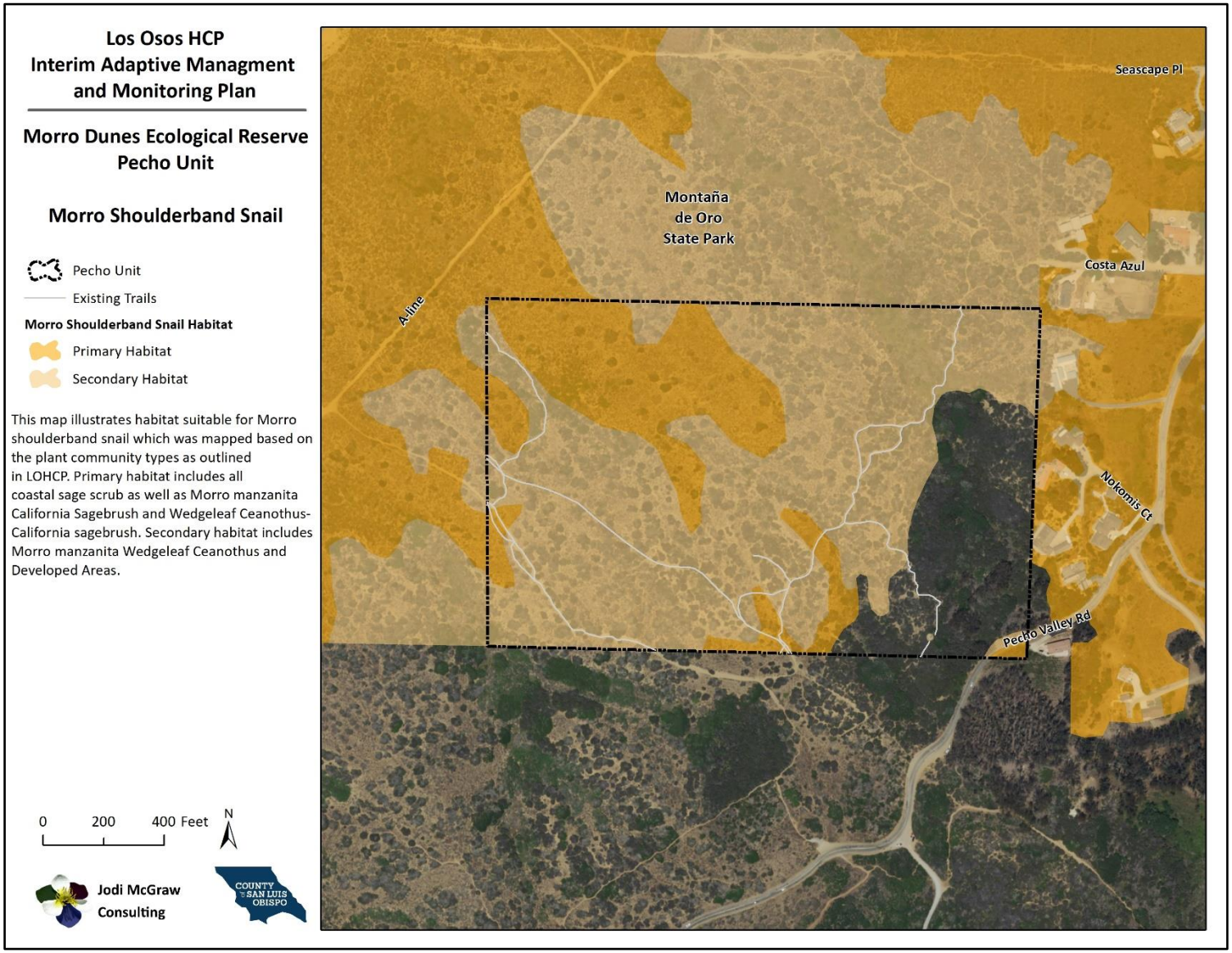


Figure 10: Morro shoulderband snail habitat in the Pecho Unit of the Morro Dunes Ecological Reserve

2.6.4.2 Occurrences within the MDER

The MDER provides suitable habitat remaining for Morro Bay kangaroo rat. Most notably, the more open associations of maritime chaparral and coastal sage scrub located away from adjacent development and associated threats (e.g., domestic pets) provide suitable habitat. The species was not observed during protocol surveys conducted at the site in 2009 (Villablanca 2009). While scent dogs trained to detect Lompoc kangaroo rat (*Dipodomys heermanni arenae*) gave two 'alerts' during searches in 2016, Morro Bay kangaroo rat was not detected in the belt/camera stations that were operated from 12 non-consecutive weeks. Nonetheless, the species may exist at the MDER at below detectable levels.

2.7 Stressors

The natural communities and rare species of the MDER, including the four covered species, are impacted by exotic plants and incompatible recreational use and associated erosion. The following describes the available information about these factors and their likely impacts.

2.7.1 Exotic Species

The MDER features several plant species that are not native to California. These exotic species can compete with native plants, and alter plant community structure and species composition in ways that degrade habitat for native animals (Table 4). The exotic plants discussed here are divided into two main groups: ornamental species and invasive species.

2.7.1.1 Ornamental Species

The northern portion of the Bayview Unit features patchy occurrences of ornamental plants that escaped from adjacent backyards along Highland Drive or in some cases, were deliberately planted into the area behind the houses. These ornamental species include pines (*Pinus* sp.), cypresses (*Hesperocyparis* or *Cupressus* sp.), agave (*Agave* sp.), yucca (*Yucca* sp.), and daffodil (*Narcissu*s sp.), though a comprehensive survey of the site would likely identify additional species. Some of these plants, including the agave, appear to be spreading (i.e., naturally recruiting).

2.7.1.2 Invasive Species

The MDER also features exotic plant species that have become established in natural areas and reproduce and spread on their own. These naturalized plants include some invasive plants, which spread quickly and cause impacts to natural systems. The main invasive plants know to occur in the site are listed in Table 5; a targeted survey of the site would likely reveal occurrences of additional exotic species including other invasive species.

The following sections describe five invasive plants that are of particular concern for management in the MDER, owing to their impacts on the covered species and other rare species, as well as native biodiversity in the reserve: veldt grass, freeway iceplant, narrowleaf iceplant, jubata grass, and eucalyptus. Section D.1 of the LOHCP provides additional information about these and other exotic plants and their management within the LOHCP Preserve System.

Table 4: Impacts of exotic plant species within the Bayview Fine Sands Ecosystem

Impact	Description	Implication for LOHCP Preserve System
Outcompete Native Plants	Exotic plants can deplete soil moisture and nutrients, shade-out native species, and compete for limited space	Exotic herbs (grasses and forbs) complete with native herbs, subshrubs, and shrubs and reduce native plant species richness and abundance. They can reduce establishment of the two covered plant species.
Create Thatch and Litter	Exotic plants can create dense thatch (dried herbaceous biomass) and litter (leaves from shrubs and trees) on the soil surface, which can inhibit establishment of native plants physically and also chemically (allelopathy). Thatch and litter also alter conditions for native animals.	Veldt grass creates persistent, dense thatch while eucalyptus creates thick litter from leaves and bark. These materials inhibit native plant establishment and may play a role in limiting Morro shoulderband snail use of eucalyptus stands (Walgren and Andreano 2012).
Alter Community Structure and Species Composition	Exotic plants alter the structure of native communities, and in doing so, can degrade habitat for native animals including by reducing availability of food and shelter.	Exotic grasses convert shrub-dominated communities including coastal scrub and maritime chaparral to grasslands, while invasive trees like eucalyptus can convert shrublands to forests. These type changes degrade habitat Morro shoulderband snail and Morro Bay kangaroo rat, which can also be impacted by loss of food (i.e., preferred host plants) and shelter.
Promote Fire	Invasive plants can create fuel conditions that promote fire, which can kill native woody species that are not adapted to fire. Fires that kill woody species can result in type-conversion of shrublands to grasslands as part of a grass-fire cycle (D'Antonio and Vitousek 1992).	Veldt grass creates fine fuels that promote fire in shrublands where widely spaced native shrubs and sparse herbs typically will not sustain fire. Grass-fire cycles can convert shrublands to grasslands. Eucalyptus creates dense fuels that can also promote fire (NPS 2006).

Table 5: Invasive exotic plants known to occur within the MDER

Common Name	Scientific Name	CalIPC Ratings[1]
eucalyptus	*Eucalyptus camaldulensis* and *E. globulus*	Watch-Limited[2]
veldt grass	*Ehrharta calycina*	High
freeway iceplant	*Carpobrotus edulis*	High
narrowleaf iceplant	*Conicosia pugioniformis*	Limited
jubata grass	*Cortaderia jubata*	High
red brome	*Bromus madritensis* ssp. *rubens*	High
rip gut brome	*Bromus diandrus*	Moderate
Saharan mustard	*Brassica tournefortii*	High
wild oats	*Avena* spp.	Moderate

[1]California Invasive Pest Plant Council Inventory (2020) Ratings

High – Severe ecological impacts on physical processes, plant and animal communities, and vegetation structure.
Moderate – Substantial and apparent, but generally not severe, ecological impacts on physical processes, plant and animal communities, and vegetation structure.
Limited – Invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score.
Watch – Pose a high risk of becoming invasive in the future in California.

[2] The range reflects the range of ratings for species in this genus

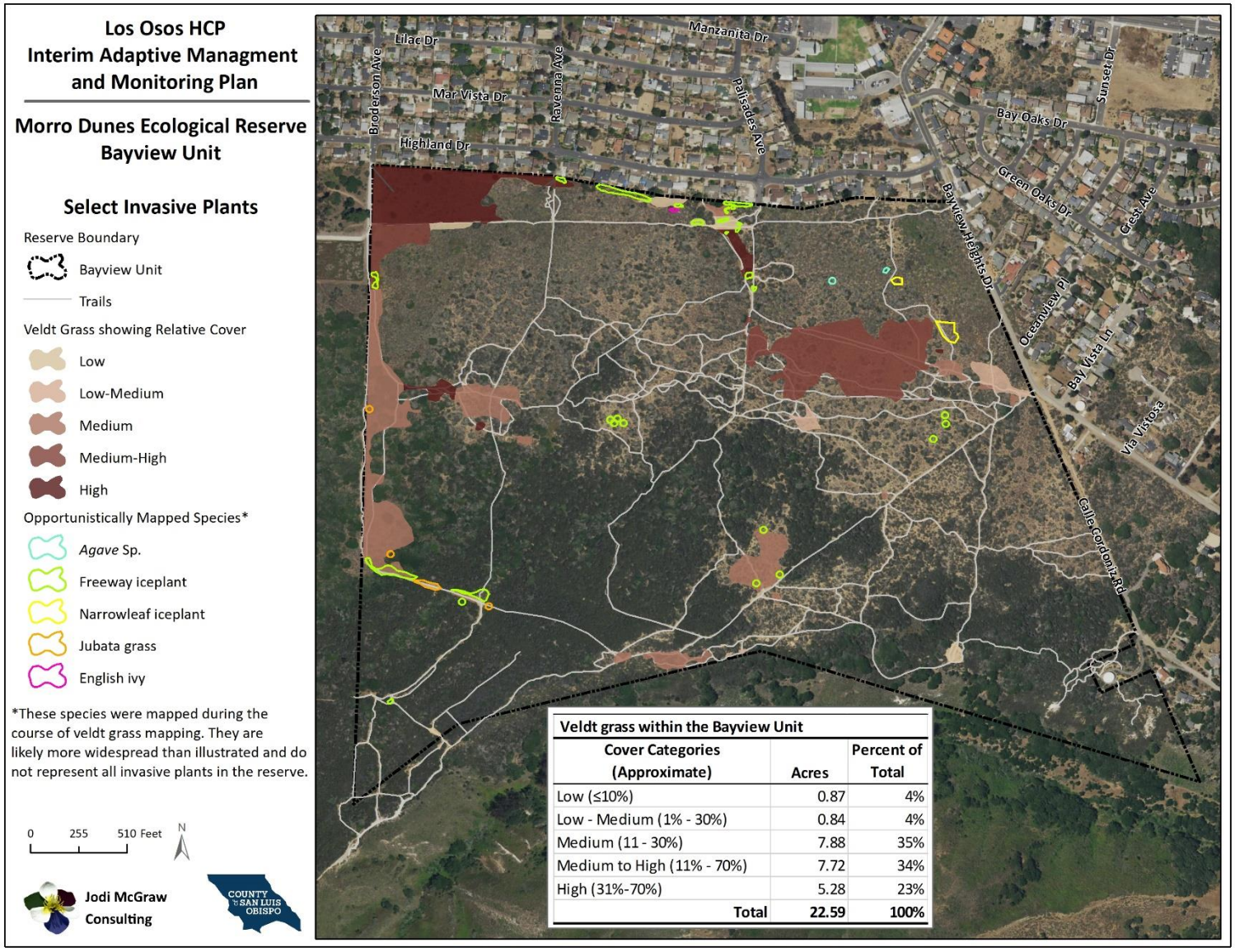
2.7.1.2.1 Veldt Grass

Veldt grass (*Ehrharta calycina*) occurs patchily within the MDER, where its distribution and abundance appear to reflect two primary factors: 1) plant community, and 2) disturbance history. Veldt grass is most widespread and abundant within the California Sagebrush-Black Sage series, and varies in abundance from less than 10% to 70% absolute cover in the Bayview Unit where the species was generally mapped as part of this project (Figure 11). The denser veldt grass patches appear to be associated with areas of soil disturbance, including prior land clearing and recreational use.

Veldt grass is patchily abundant in the Pecho Unit, where it was not mapped to prepare this plan which instead focused on informing initial exotic plant management, which was prioritized in the Bayview Unit (Section 3.1.1).

In the central maritime chaparral, veldt grass is primarily restricted to recreational trails and other gaps in the otherwise dense shrub and tree canopies. Current abundance is very low in these areas; however, future disturbance including fire has the potential to greatly enhance veldt grass distribution and cover in the Morro manzanita stands.

Dense infestations of veldt grass appear to inhibit native plants likely through competition for limited soil resources. Areas with dense (>50% cover of) veldt grass often have few native species occurring in very low abundance (J. McGraw, pers. obs.). These tussock-dominated fields provide very different habitat conditions than uninvaded coastal sage scrub, which is dominated by shrubs and forbs, and thus



Veldt grass within the Bayview Unit

Cover Categories (Approximate)	Acres	Percent of Total
Low (≤10%)	0.87	4%
Low - Medium (1% - 30%)	0.84	4%
Medium (11 - 30%)	7.88	35%
Medium to High (11% - 70%)	7.72	34%
High (31%-70%)	5.28	23%
Total	**22.59**	**100%**

Figure 11: Veldt grass and other invasive plants in the Bayview Unit of the Morro Dunes Ecological Reserve

a)



b)



c)



d)



e)



f)



Figure 12: Images of Stressors to the MDER, showing: a) patch of veldt grass featuring high cover in the Bayview Unit, b) patch of freeway iceplant mixed with veldt grass in the Bayview unit, c) patch of Agave sp. in the Bayview Unit, d) excessively wide trail in the Bayview Unit, e) incised and eroded trail in the Bayview Unit, and f) a stand of eucalyptus in the Pecho Unit. Photographs by Jodi McGraw.

alter conditions for native animals. Veldt grass is credited with transforming shrublands (i.e. maritime chaparral, coastal sage scrub) into grasslands through the grass-fire cycle (Pickart 2000).

A recent analysis of Morro shoulderband snail habitat in the Los Osos area found that the highest number of Morro shoulderband snail occurrences were in veldt grass, although the authors reported that a high count on one of the nine surveyed parcels skewed these results (EcoVision Partners 2019. Though the study confirmed that the Morro shoulderband snail occupies veldt grass areas, it did not compare the frequency or density of Morro shoulderband snails in areas with and without veldt grass, nor did it compare the abundance of veldt grass in areas with and without Morro shoulderband snail, as would be required to establish a preferential occurrence of the rare species in veldt grass-dominated areas. Despite the high abundance of Morro shoulderband snail in veldt grass areas, the authors concluded that invasive plants are a threat to the species and recommended their control to promote Morro shoulderband snail populations (EcoVision Partners 2019). Species protection measures will be used to help minimize the short-term negative effects of exotic plant control efforts on the species, while promoting long-term benefits for the populations (Section 3.3).

Veldt grass has been successfully controlled in other areas in Los Osos including in the Broderson and Midtown sites as part of the County's Wastewater Project, using a combination of herbicide and manual control methods (County of San Luis Obispo 2019).

2.7.1.2.2 Iceplants

The MDER features freeway iceplant (*Carpobrotus edulis*) and narrowleaf ice plant (*Conicosia pugioniformis*). Though primarily occurring in the California Sagebrush-Black Sage series, particularly near areas of disturbance such as trails, old roads, and adjacent residential development, freeway iceplant is also found in gaps in the shrub canopy created by trails in the Morro manzanita chaparral. Like veldt grass, the invasive iceplant species can spread following disturbance (e.g., fire), outcompete native shrubs and herbs, and degrade habitat for native animals.

Owing to their rapid lateral growth, in which shoots can grow 1m/year (D'Antonio 1990b), the long-lived freeway iceplant can form large, impenetrable mats that compete with native seedlings (D'Antonio 1993) and reduce shrub growth (D'Antonio and Mahall 1991). Freeway iceplant can also lower soil pH and increase soil organic matter (D'Antonio 1990a), and in doing so, can increase the invasibility of sandy soils such as the Baywood fine sands (Albert 2000).

Though shorter-lived than freeway iceplant, narrowleaf iceplant readily colonizes disturbances and gaps and grows very rapidly, allowing it to compete with native plants for space and resources. Narrowleaf iceplant may similarly alter soil conditions and facilitate invasion, though this has not been examined (Albert and D'Antonio 2000).

Morro shoulderband snail can also occur, sometimes in high abundance, in areas of degraded habitat, including areas invaded by iceplant (SWCA 2013). Nonetheless, invasive plants have been deemed a threat to the species and their control is recommended to promote Morro shoulderband snail populations (EcoVision Partners 2019). Species protection measures will be used to help minimize the short-term negative effects of exotic plant control efforts on the species, while promoting long-term benefits for the populations (Section 3.3).

2.7.1.2.3 Jubata Grass

Jubata grass (*Cortaderia jubata*) has established small, isolated patches within the Bayview Unit, where its distribution appears limited to trails and other areas of recreation-caused disturbance in the maritime chaparral assemblages on the southern half of the unit (Figure 11). The species was not detected in the Pecho Unit though could be found during future surveys.

Jubata grass is an extremely large bunchgrass that can outcompete native shrubs and herbs within maritime chaparral and coastal sage shrub, creating virtual monocultures. It is a prolific seed producer, creating up to 100,000 mature seeds per individual inflorescence, and windborne seed can disperse large distances (>20 miles; DiTomaso 2000). The distribution and abundance of jubata grass within the MDER may be limited by lack of appropriate conditions for seedling establishment, which appear to be created by disturbance including trail use and attendant erosion. As a result, future disturbances that remove established plants, including fires or activities associated with management, such as fuel management, may enhance the distribution and abundance of this plant.

2.7.1.2.4 Eucalyptus

The southeastern portion of the Pecho Unit features an approximately 0.84-acre stand of eucalyptus (Figures 6 and 12f); additional trees occur in the County road right of way and private parcels to the east. The eucalyptus trees appear to have spread into the reserve from the plantation south of Pecho Valley Road. The stand within the reserve features 26 trees that between approximately 12” and 36” diameter at breast height (DBH) and are approximately 60-100 feet tall. There are also numerous felled trees, many of which have resprouted from their cut stumps. According to CDFW, staff are not aware of any permitted eucalyptus control projects on the property and suspect that the trees were cut as part of utility line clearance projects or by neighbors seeking to maintain coastal views (D. Hacker, pers. comm. 2020). The stand also features several newly established trees that are less than 12” DBH and less than 40 feet in height. Within the 0.84-acre area, there are also two pines (*Pinus* sp.) that are likely non-native, ornamental species, though a positive identification could not be made with the material available during the assessment.

The eucalyptus established within an area of Morro manzanita chaparral (Figure 6). Native plants within the stand are patchily abundant and include Morro manzanita, coast live oak, black sage, California sagebrush, sticky monkeyflower, coyote brush, poison oak, and hedge nettle (*Stachys bullata*).

The large exotic trees compete with the native plants, including Morro manzanita, for light and soil resources. Several snags of Morro manzanita occur on the perimeter of the grove as well as the interior, where shrubs appear to be dying due to competition. The trees also produce a dense layer of litter (leaves, bark, and small limbs) on the soil surface, which can inhibit establishment of native plants. Eucalyptus litter and roots feature phenolic acids and volatile oils that have deleterious effects on other plants species (Molina et al. 1991, Sasikumar et al. 2002, Florentine and Fox 2003). Through these mechanisms, eucalyptus reduce the diversity and cover of native plants, and alter habitat conditions for native animals, including Morro shoulderband snail which was negatively associated with eucalyptus (Walgren and Andreano 2012). In addition, eucalyptus fuels increase the risk of wildfire (Tyler and Odion 1996, NPS 2006, Rejmanek and Richardson 2011).

Eucalyptus stands can provide roosting sites for overwintering monarch butterflies (*Danaus plexippus*; Frey et al. 2003). In order to provide suitable overwintering sites, the stands must feature a microclimate that includes (Griffiths and Villablanca 2015):

- temperatures that are above freezing (Calvert et al. 1983) but not too warm (Alonso-Mejia et al. 1997);
- low light intensity and solar radiation, with high water vapor pressure (Leong et al. 1991);
- wind speeds lower than 2 m/s (Leong 1990); and,
- access to fresh water, sometimes via streams or puddles but often in the form of fog drip or morning dew (Tuskes and Brower 1978).

Landscape factors, as well as tree canopy conditions including height, density, branch configuration, and type of foliage, will determine the microclimate and thus suitability of a stand. These characteristics have not been evaluated for the Pecho eucalyptus stand; however, its narrowness and overall small size suggest it may not be sufficiently sheltered from the wind. Neither the Pecho Unit stand nor the adjacent stand south of Pecho Road within Montana De Oro State Park are identified as known overwintering sites by the Xerces Society (Xerces Society 2020). Nonetheless, a stand assessment and survey would be needed to evaluate suitability of the site and its use by monarchs, respectively.

Eucalyptus stands can also provide habitat for nesting birds including raptors. Tree removal in Los Osos requires a coastal development permit from the County of San Luis Obispo and can be opposed by some members of the public.

2.7.2 Incompatible Recreational Use and Erosion

The MDER has been and is subject to a variety of recreational uses, including:

- Off-highway vehicle use, both by motorcycles and four-wheeled vehicles (quads, jeeps);
- Mountain biking;
- horseback riding;
- dog walking; and
- hiking.

Additionally, some neighbors along Highland Drive have set up recreational equipment in the portions of the reserve behind their houses. The site may also be subject to occasional camping.

Hiking and dog walking (on a leash of no more than 10 feet) are allowed under CDFW regulations that govern management of the reserve, while the California Code of Regulations, Title 14, Sections 550 and 630, prohibits bike riding, horseback riding, off-highway vehicle use, and camping.

As with other disturbances, recreation uses can impact habitat and sensitive species. Trail users can impact the rare plants directly by cutting their branches to create or maintain trails, as have been created through dense stands of Morro manzanita as well as the only known remaining occurrences of Indian Knob mountainbalm. Such pruning can reduce survivorship and reproduction, including seed production as well as vegetation reproduction in the case of Indian Knob mountainbalm. Trail use and

other recreation can trample Morro shoulderband snail directly, as well as degrade habitat by removing native vegetation which the species uses for cover and food. Recreation can similarly impact Morro Bay kangaroo rat habitat by reducing plants used for food and habitat, as well as trampling potential burrows.

The intensity of recreation impacts depends on the characteristics of the recreational use and the habitat in which it occurs. In general, the impacts are proportional to the intensity of the recreation, with off highway vehicles (OHVs) having greater impacts than equestrians which have greater impacts than pedestrians. However, all types of recreation cause disturbance, which removes native plant cover, reduces habitat available to native animals, causes erosion, and enhances the invasion and spread of exotic plants.

Recreational use has resulted in a proliferation of trails within the Bayview Unit, which adjoins residential development on two sides (Figure 3). Most of these trails were neither planned nor constructed in a manner that would reduce the need for maintenance and associated costs due to the perhaps inevitable erosion in sandy soils (USDA 1984). As a result, many of the trails have become incised especially on long, straight trail segments with moderate to steep grades such as the ones that run straight up and down slope (i.e., north to south; Figure 12e). Such trail segments channel water which erodes the trail bed. Eroded trail segments are common on steeper slopes in the southern portion of the two units.

The trails were also not planned nor constructed in consideration of the sensitive species and communities of the Baywood Fine Sands. As a result, they traverse areas supporting endangered species populations. In the central maritime chaparral community, recreational users maintain the trail by actively cutting shrubs such as Morro manzanita and perhaps also Indian Knob mountainbalm, as one of the two occurrences is located along a trail. In areas lacking dense shrub cover, trails become excessively wide; several trail segments in the coastal sage scrub exceed 30 feet in width. Such denuded areas deter use by Morro shoulderband snail and may inhibit the species movement through the site

2.8 Existing Management

Lands within the MDER were designated by the California Fish and Game Commission as an ecological reserve. Section 1580 of the Fish and Game Code states that ecological reserves are established to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind.

The CDFW manages ecological reserves including the MDER to protect and enhance its unique biological resources while providing the public with compatible, wildlife-dependent educational and recreational opportunities. Management is consistent with the California Code of Regulations (CCR) Title 14, Chapter 11, Sections 550 et seq., which includes general provisions for all ecological reserves, and Section 630, which does not contain any specific provisions for the MDER. Regulations for the MDER provide that wildlife viewing, hiking, and dog walking are permitted, provided that dogs are on a leash of no more than 10 feet; however, equestrian use, mountain bikes, hunting, and camping are prohibited, as is the removal of plants. Activities outside of those described in the regulations may be permitted through the CDFW special-use permit process.

The CDFW develops land management plans to:

- Serve as a descriptive inventory of fish, wildlife, and native plant habitats that occur on or use the property;
- Guide management of habitats, species, and programs described in the LMP to achieve the Department's mission to protect and enhance native wildlife for their ecological value and enjoyment by the public;
- Serve as a guide for appropriate public uses for that property;
- Provide an overview of the property's operation, maintenance, and personnel requirements to implement management goals and to serve as a planning aid for annual budget preparation; and
- Present the environmental documentation necessary for compliance with state and federal statutes and regulations, provide a description of potential and actual environmental impacts that may occur during plan management, and identify mitigation measures to avoid or lessen these impacts.

In 1982, CDFW developed a management plan for the MDER that describes the Pecho Unit, which was the only land included in the reserve at the time; the Bayview Unit was added beginning in 2000 and the LMP has not yet been updated to incorporate the new unit (Section 2.4.1). The LMP may be updated at a later date; however, there are no current plans to update the MDER LMP (R. Stafford, pers. comm. 2020).

The LMP for the Pecho Unit recommends the following actions, which are listed in order of priority (CDFW 1982):

1. Complete a flora and invertebrate survey by competent biologists;
2. Delineate the most important habitat areas for habitat enhancement for Morro Bay kangaroo rat;
3. Delineate the areas critical for protection of the banded dune snail (Morro shoulderband snail) and various endemic plants, so they can be left ‘as is’;
4. Conduct periodic monitoring of the efficacy of the management practices, including population sampling for the kangaroo rat; and
5. Meeting twice a year with the State Parks, the USFWS, and Cal Poly staff to review the progress of management and determine the course of future management efforts.

Management of ecological reserves including the MDER is implemented as funding and other resources allow; CDFW does not have a requirement to implement LMPs. The existing management of the MDER is limited to occasional reconnaissance-level site visits by CDFW Environmental Scientists to examine site conditions and activities, and law enforcement actions conducted by CDFW Wardens in response to illegal activities detected by CDFW staff or reported by the public.

The CDFW has installed signs on the perimeter of both MDER units to identify the land as being in a state ecological reserve; however, on some boundaries the signs are too widely spaced to enable law enforcement to implement enforcement for violations of the provisions governing activities on the lands (D. Hacker, pers. comm. 2020). Due to lack of funding and other resources, CDFW does not implement ongoing habitat management to address the stressors to the covered species, nor does it monitor their

populations or habitat conditions. As staff time and other resources allow, CDFW does implement occasional additional biological resources management tasks, such as when biologists salvaged and relocated Morro shoulderband snails from burn piles in the fuel break prior to their ignition in February 2020 (D. Hacker, pers. comm. 2020).

Recognizing these unmet management needs of the MDER, which features large areas of habitat that is essential to the long-term persistence and recovery of the covered species, the LOHCP identified the MDER as an important existing protected habitat area to be included in the LOHCP Preserve System (LOHCP Section 5.3.3.1). Enhanced management, restoration, and monitoring of lands within the MDER will promote achievement of the LOHCP Biological Goals and Objectives (LOHCP Section 5.1), including to Increase the distribution and abundance of the covered species by restoring degraded habitat. As part of a prior analysis detailed in Appendix G of the LOHCP, the Department determined that enhanced management and restoration of lands within the MDER is consistent with the Department's Mitigation Policy Guidelines as well as the agreements associated with grants used to fund acquisition of the reserve lands (McGraw 2020).

The LOHCP requires that landowners who elect to enroll existing protected lands into the LOHCP Preserve System continue to manage, restore, and monitor lands at the same level of effort (or greater) as occurred prior to their enrollment (LOHCP Section 5.3.3.1). This maintenance of effort requirement ensures that the enhanced management, restoration, and monitoring activities implemented on existing protected lands will have additional benefits for the covered species populations and habitat, and thus can be credited for compensatory mitigation under the LOHCP. Enrollment of existing protected lands in the LOHCP Preserve System does not result in habitat protection credits, which instead are only generated with acquisition of fee title or conservation easements for habitat protected through the plan (LOHCP Section 5.3.2).

For purposes of the maintenance of effort requirement of the LOHCP, CDFW will continue to implement occasional site visits and conduct law enforcement activities as outlined above. The benefits for the covered species of the enhanced habitat management, restoration, and monitoring described in the following sections of this IAMMP will be eligible for compensatory mitigation credits as outlined in Section 5.7.2.3.1 of the LOHCP.

3 Habitat Restoration

This section describes how habitat restoration will be conducted in the MDER as part of the LOHCP conservation program during the initial phase of its implementation. Section 3.1 outlines the general approaches to the initial restoration, including the projects selected, their anticipated benefits, implementation steps, and general approaches to restoration including revegetation. Section 3.2 describes the three proposed restoration projects, eucalyptus removal (Section 3.2.1), veldt grass control (Section 3.2.2), and trail restoration (Section 3.2.3), which were identified as the initial priorities for restoration (Section 3.1.1). Section 3.3 describes the species protection measures that will be implemented to reduce the short-term negative impacts of the restoration projects on the covered species.

3.1 Approaches

This section provides general information about the restoration projects proposed in this plan, including: 1) how they were selected, 2) their anticipated benefits for the covered species and natural communities, 3) the phases of project implementation, and 4) general approaches to conducting restoration.

3.1.1 Project Selection

Three main actions are proposed to be implemented in the MDER to restore and enhance habitat as part of this Interim Adaptive Management and Monitoring Plan for the Los Osos Preserve System:

1. **Removing the stand of eucalyptus in** the Pecho Unit, and restoring the estimated 0.84 acres of habitat that has been degraded by the invasive trees (Figures 6 and 12f);
2. **Controlling veldt grass and co-occurring invasive plants** and restoring natural community structure and species composition in an approximately 22.6-acre area within the Bayview Unit (Figure 11); and
3. **Restoring trails** by fencing and signing trails to close excess routes and confining use of excessively wide trails to the central area, to promote native plants establishment and use by native animals within an estimated 4.3 acres of habitat within the Bayview Unit (Figure 12).

Implementation of these high-priority projects early during management of the LOHCP Preserve System will reduce the ongoing negative impacts associated with the continued invasion and spread of eucalyptus and veldt grass, and the ongoing proliferation of trails and the resulting habitat degradation that results, including erosion and spread of exotic plants.

These three initial actions were identified through consideration of the following:

1. examination of the site conditions, as described in Section 2, to identify opportunities to promote populations of the covered species and achieve the LOHCP goals and objectives for the broader ecosystem and communities and also limit the potential for future negative impacts associated with anthropogenic stressors;
2. consideration of the anticipated mitigation needs of the LOHCP and the funding that will be available through implementation of the plan during the initial phase covered by this interim plan (LOHCP Section 7.2.4).

During implementation of this plan, the County will work with its restoration and habitat management partners, including the LOHCP Implementing Entity, if/when appointed, biologists and restoration ecologists with expertise in this system, and the wildlife agencies, to select and implement one or more of the proposed restoration projects. The final project selection will be based upon: 1) the ecological benefits of the project, 2) the financial costs of the project, 3) the anticipated mitigation credits that would be generated, 4) the mitigation needs of the activities to be covered by the LOHCP, and 5) the funds available for mitigation based on the LOHCP mitigation fees and other sources.

If County mitigation needs and/or funding are insufficient to implement all of projects identified in this IAMMP, remaining projects will be addressed in the AMMP. Conversely, if the County has additional mitigation needs and/or additional resources available, it will expand its work as part of the IAMMP to initiate trail restoration and access management in the Pecho Unit.

3.1.2 Anticipated Benefits

Table 6 outlines the anticipated benefits of the proposed restoration projects for the covered species and communities, based on the ecology and life histories of the covered species and the known and hypothesized impacts of exotic plants and trail use on their populations. More detailed information including literature citations for the impacts of recreation and invasive plants and the benefits of their management are provided in Appendix D of the LOHCP, while Appendix B provides additional detailed information about the covered species life histories and ecologies used to prepare this analysis.

3.1.3 Project Implementation Steps

Restoration is anticipated to be implemented over a five-year period through the following process:

1. Develop a project work plan for each restoration project, that identifies the final treatment areas, and outlines the final treatment prescriptions based on the goals, objectives, proposed methods, and general approaches outlined in this IAMMP. The work plan can identify adjustments to the projects, relative to what is provided in this plan, provided that the modifications enhance effectiveness of the project at achieving its goals and objectives, are in keeping with the overall approaches of the plan, and are acceptable to the wildlife agencies, which will review and approve the work plan prior to implementation.
2. Implement initial restoration treatments, conduct monitoring to track conditions and evaluate performance, and inform the need for remedial actions and adaptive management, which will be described in annual work plans that are reviewed and approved by the wildlife agencies each year; and
3. Monitor effectiveness of the projects at achieving the quantitative objectives based on established performance criteria, and calculate the mitigation credits based on the acreage of habitat that is achieving the performance criteria.

As with all aspects of management of the MDER for the LOHCP, the County (or its Implementing Entity) will collaborate with CDFW on all efforts to implement this plan to ensure it is in keeping with the Department's management of the reserve (Section 2.8). Work will also be coordinated on an annual basis with the USFWS to ensure it is meeting the goals and objectives as well as permit requirement of the LOHCP (Section 4.8).

Table 6: Anticipated Benefits of the IAMMP Restoration Projects

Community/Species	Eucalyptus Removal	Veldt Grass Control	Trail Restoration and Access Management
Coastal sage scrub and central maritime chaparral communities	• Increase the cover and richness of native plants, by reducing competition from eucalyptus, which create shade and litter that inhibit native plants. • Restore the structure and native species composition thus improving habitat conditions for animals that utilize the native communities. • Limit the further spread of eucalyptus into intact communities, where it would displace native plants and degrade habitat conditions for native animals. • Reduce the fuel load, which can increase the risk of canopy fire.	• Increase the cover and richness of native plants, by reducing competition from veldt grass and co-occurring invasive plant species. • Restore the structure and native species composition thus improving habitat conditions for animals that utilize the native communities. • Limit the spread of veldt grass into uninvaded communities, where it would displace native plants and degrade habitat conditions for native animals. • Reduce the accumulation of fine fuels created by veldt grass, which can increase the risk of fire.	• Increase the cover and richness of native plants by reducing trampling associated with recreation. • Restore the structure and native species composition of the plant communities and thus restore habitat conditions for animals that utilize them. • Reduce soil erosion that can occur when trails become channelized, particularly on steep slopes. • Limit the proliferation of unauthorized trails, which remove native plants, promote the invasion and spread of exotic plants, and degrade habitat for native animals. • Reduce human and wildlife interactions which can negatively impact some native animal species.
Morro Shoulderband Snail	• Remove an invasive tree that inhibits use of habitat by Morro shoulderband snail (Walgren and Andreano 2012). • Prevent the spread of eucalyptus into occupied	• Increase the cover and richness of native plants with which Morro shoulderband snail has evolved and to which it is adapted, and which can provide food and shelter.[1]	• Increase the cover and richness of native plants in areas denuded by trail use, thus increasing food and shelter and the overall area of habitat that can support the species. • Limit mortality caused by trampling of individuals by recreators. • Promote the permeability of habitat within the reserve by reducing the potential

Table 6: Anticipated Benefits of the IAMMP Restoration Projects

Community/Species	Eucalyptus Removal	Veldt Grass Control	Trail Restoration and Access Management
	coastal sage scrub habitat. • Reduce the risk of fire, which could cause Morro shoulderband snail mortality and temporary habitat loss.	• Reduce fragmentation caused by veldt grass which converts coastal sage scrub and early successional (i.e., open canopy) maritime chaparral to grassland	barrier created by wide, denuded trail corridors traversing the site.
Morro Bay Kangaroo Rat	• Remove an invasive tree that has converted suitable shrublands to likely unsuitable forests. • Prevent the spread of eucalyptus into adjacent suitable coastal sage scrub and maritime chaparral habitat. • Reduce the risk of fire, which could cause Morro Bay kangaroo rat mortality and temporary habitat loss.	• Increase the cover and richness of native coastal sage scrub plants with which Morro Bay kangaroo rat has evolved, but that are outcompeted by veldt grass, thus increasing availability of food and restoring appropriate plant community structure (open shrubland rather than grassland). • Reduce fragmentation of coastal sage scrub and early successional maritime chaparral by veldt grass, which creates grasslands	• Increase the cover and richness of native plants in areas denuded by trail use, thus increasing food and shelter and the overall area of habitat that can support the species. • Limit impacts to of humans and dogs on burrows through trampling and digging, and the species behaviors including foraging, if present. • Create more continuous cover of shrubs to address habitat fragmentation caused by the numerous, and sometimes wide trails.

Table 6: Anticipated Benefits of the IAMMP Restoration Projects

Community/Species	Eucalyptus Removal	Veldt Grass Control	Trail Restoration and Access Management
Indian Knob Mountainbalm	• Remove an invasive tree that has converted potentially suitable maritime chaparral to low-light forests that are not suitable. • Prevent the spread of eucalyptus into adjacent suitable maritime chaparral habitat.	• Reduce potential competition of Indian Knob mountainbalm with veldt grass and co-occurring invasive plants, which could reduce the rare plant's establishment, survivorship, and/or reproduction • Limit the spread of veldt grass into uninvaded areas to maintain suitable habitat and enable population expansion.	• Create opportunities for Indian Knob mountainbalm establishment and growth by closing trails in suitable or occupied habitat, where the rare plant can colonize open canopy areas created by disturbance. • Reduce the incidence of pruning of the rare shrub by recreators seeking to maintain trail corridors, which can reduce survivorship and reproduction. •
Morro Manzanita	• Remove an invasive tree that has converted maritime chaparral that is potentially suitable, to low-light forests that are not. • Prevent the spread of eucalyptus into adjacent suitable maritime chaparral habitat. • Reduce the risk of fire that would cause Morro manzanita mortality and temporary habitat loss and may not promote regeneration of the endangered shrub if it occurs outside of the natural fire regime (e.g.,	• Reduce competition of Morro manzanita with veldt grass and co-occurring invasive plants, which can reduce the rare plant's establishment, survivorship, and reproduction • Limit the spread of veldt grass into uninvaded areas to maintain suitable habitat and enable population expansion. • Reduce the accumulation of fine fuels created by veldt grass, which can increase the risk of fire which could reduce the population if insufficient seed bank has established (Odion and Tyler 2002).	• Create opportunities for Morro manzanita establishment and growth by closing trails through suitable habitat, where the rare plant may establish in areas of open canopy created by the prior disturbance, or where canopy expansion can occur in the absence of ongoing pruning. • Reduce the incidence of pruning of the rare shrub by recreators seeking to maintain trail corridors, which can reduce survivorship and reproduction. • Limit the proliferation of unauthorized trails, which can impact the existing population and degrade suitable habitat including by promoting the invasion and spread of exotic plants.

Table 6: Anticipated Benefits of the IAMMP Restoration Projects

Community/Species	Eucalyptus Removal	Veldt Grass Control	Trail Restoration and Access Management
	insufficient return interval, too intense, canopy fire, etc.)		

[1] While a recent study stated that the highest number of Morro shoulderband snail occurrences were in veldt grass, the study did not establish a preferential occurrence of the species in the invasive plant. Moreover, the authors concluded that invasive plants are a threat and recommended their control to promote Morro shoulderband snail populations (Section 2.7.1.2.1; EcoVision Partners 2019).

3.1.4 Restoration Approaches

Restoration under this plan will be implemented using general strategies and specific techniques that are collectively designed to restore natural community structure, species composition, and ecosystem functions and processes to the communities of the Baywood fine sands ecosystem. As described in the LOHCP, this systems approach is anticipated to achieve the biological goals for the covered species, communities, and Baywood fine sand ecosystem. Single-species management will be limited to that which found to be necessary to facilitate population persistence and promote recovery. Such management will be addressed the AMMP.

The MDER, as well as future lands restored and managed as part of the LOHCP, will be managed as natural landscapes, as opposed to other types of intensively managed systems (e.g., horticultural areas or parks). Under this approach, restoration and management will rely, wherever possible, on strategies that:

1. reduce the anthropogenic (human-induced) factors (pressures) that can degrade ecological conditions (stressors) directly or indirectly; and
2. harness the ecological potential of the natural systems, including species' adaptations to natural disturbances, to re-establish native species using restoration techniques that are minimally invasive and reduce human intrusion into the landscape.

This general approach to alleviating anthropogenic stressors and pressures and managing the landscape using natural disturbances and management techniques that mimic them, is designed to achieve the following objectives for the restoration program within the context of the LOHCP Conservation Program:

1. **Reduce the potential for unintended negative consequences** associated with more intensive or intrusive restoration treatments, which can inadvertently alter genetics, populations, species, and communities.
2. **Promote the effectiveness of the extensive LOHCP monitoring program** (Appendix E; McGraw 2020), which is designed to increase understanding of factors influencing the distribution and abundance of the covered species, and the structure and composition of natural communities that comprise their habitat, in order to inform their conservation and management. The ability of these and other observational studies to use natural species distribution and abundance patterns to evaluate their habitat needs and inform conservation and management will be limited where/ when restoration techniques directly manipulate species distributions (e.g., through planting or translocations).
3. **Reduce restoration costs** and thus free up inherently limited funds that can be used to enhance effectiveness of the LOHCP conservation strategy, including additional restoration and management projects. Generally speaking, more intrusive restoration techniques, including active revegetation (seeding and planting) are more labor intensive and thus expensive. Accordingly, their use should be limited to where needed to achieve the restoration goals.
4. **Minimize anthropogenic infrastructure** within the landscape to that which is necessary, both spatially and temporally. Recognizing that these elements will be necessary for certain projects and in certain locations, limiting the amount of fences, cages, irrigation lines, and other anthropogenic features will limit their potential negative effects on native plants and animals and also scenic qualities of the habitat.

3.1.5 Revegetation Methods

The objective to limit the intrusiveness of restoration and management have important implications for the methods that will be employed to achieve the desired community structure and species composition of natural communities. Wherever possible, revegetation will rely on passive rather than active means; where active revegetation is deemed necessary, the techniques will be as minimally intrusive as needed to achieve the goals and objectives, and will follow the guidelines in Section 3.1.5.2 to achieve the four objectives above.

The following outlines the revegetation framework for this plan, which will be used to develop work plans for the specific restoration projects. It reflects, in part, the decision tree illustrated in Figure 13 (Holl 2020), which illustrates an approach to planting and seeding only where and when needed to assist regeneration of early and/or late successional species. Additional considerations will be used to phase in seeding and/or planting as active revegetation techniques during implementation of this plan.

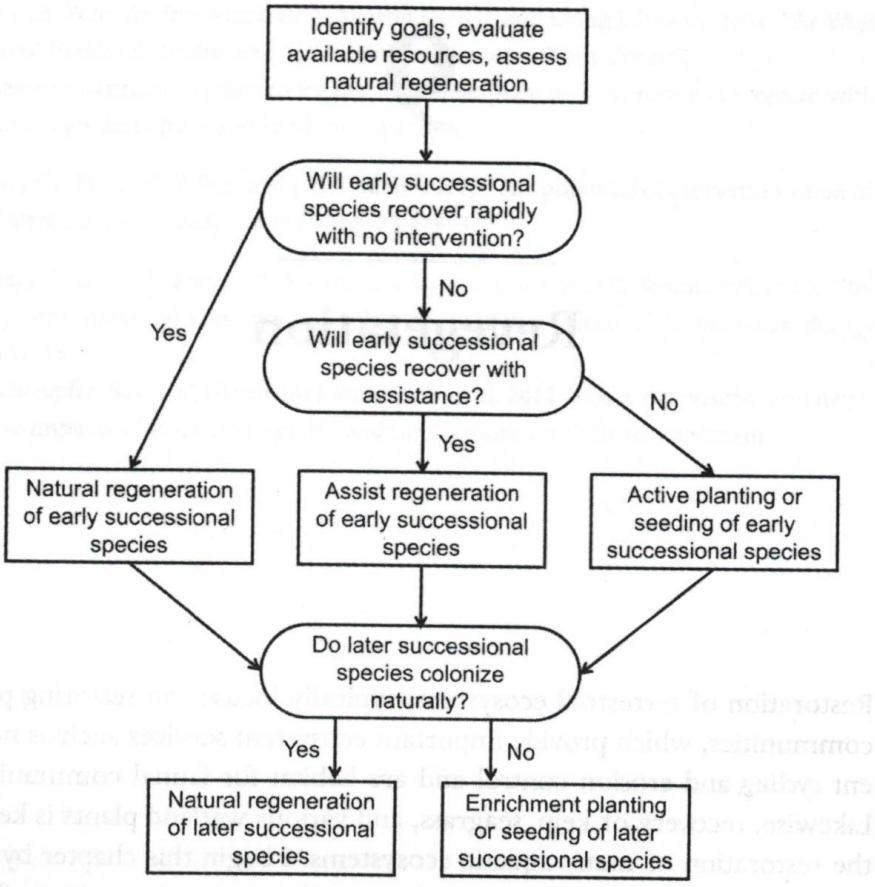


Figure 13: Decision tree for passive vs. active revegetation (Holl 2020).

3.1.5.1 Passive Revegetation

Passive revegetation, as defined for this plan, involves steps to recreate natural community structure and species composition by promoting the natural establishment and growth of native plants; it is

contrasted with active revegetation, which involves the introduction of native plants or their propagules through planting and seeding (Section 3.1.5.2). Passive revegetation differs from *passive restoration*, the process of recovery that occurs without active human intervention *at all,* which is often ineffective (Zahawi et al. 2014).

Passive revegetation promotes native plant establishment by: 1) reinstating or mimicking natural disturbance regimes, 2) restoring abiotic conditions that are limiting plant establishment, and 3) controlling exotic plant species (Holl 2020). In the case of this plan, passive revegetation involves addressing anthropogenic factors that limit native plant establishment and growth within the site: eucalyptus, veldt grass, and co-occurring invasive plant species, and incompatible trail use. These restoration techniques are desigend to allow native plant species within the site, many of which area adapted to disturbance (i.e., fire) and thus feature ecologies conducive to colonizing suitable sites, to expand their distributions into the areas that are currently denuded (trails) or support invasive plants.

This process of passive revegetation can help achieve all of the objectives of restoration in a natural landscape as outlined above. Specifically, passive restoration can:

1. Reduce potential for negative consequences associated with active revegetation, which can cause genetic erosion (i.e., break up locally adapted genetic complexes; Rogers and McGuire 2015), degrade habitat by inadvertently introducing exotic species and pathogens, or by inadvertently creating different community structure (e.g., denser shrubs) or species composition (wrong species palette) relative to what the native species, including the covered species, are adapted.
2. Avoid altering the structure and species composition of habitat in ways that will inhibit habitat characterizations and other observational studies proposed under the LOHCP (Appendix E; McGraw 2020). Specifically, the LOHCP proposes a habitat characterization study to assess Morro shoulderband snail distribution and abundance with respect to abiotic and biotic conditions in the various communities, including plant community composition. Native plant community composition is influenced by abiotic factors including soils and microclimates, that can affect Morro shoulderband snail and other species directly and indirectly. Where seeding or planting occur, they will limit the ability of the habitat characterization to evaluate factors influencing Morro shoulderband snail distribution and abundance. Seeding and planting at the outset also limit the ability of the projects to evaluate native plant responses to the treatments and inform the need for such active revegetation.
3. Reduce the costs of restoration relative to active revegetation by reducing the labor associated with seeding, which entails costs for seed collection, cleaning/processing, storage, and seed dispersal, and planting of container stock, which requires collection of seed or cuttings, contract growing at a nursery or greenhouse, plant installation, and associated plant maintenance including irrigation and caging (e.g., protection from herbivory).
4. Reduce the installation of anthropogenic infrastructure including irrigation and cages typically required (albeit temporarily) for planting.

Although researchers do not often monitor passive (but rather active) revegetation projects, there is evidence from the literature as well as anecdotal evidence that the communities of the Baywood fine sand ecosystem can be effectively revegetated passively. A study in southern California coastal sage scrub found passively revegetated areas achieved 32-78% native plant cover two to three years after removal of invasive artichoke thistle (*Cynara cardunculus*); the high success of the passive approach was attributed to the successful colonization of coastal sage scrub species (DeSimone 2011). A study in

Mediterranean dunes documented annual increases in native plant cover following fencing to prevent trampling, with mean absolute native plant cover increasing approximately 20 (raw) percentage points (i.e., from ~40% to 60%) in four years; native species richness also increased, but following a single-year time lag (Rosario Acosta et al. 2013). Another study in coastal sage scrub documented restoration using a passive approach and credited both shrub colonization and canopy expansion with increasing the cover of native species by an average of 13.7% following exotic plant control (alone), with increases higher in coastal sites compared to inland sites (Griffoul 2017).

In chaparral, seed limitation is cited as the key factor influencing whether passive revegetation will achieve restoration goals; if seed is present, refractory (i.e., dormant) seed can also limit plant establishment following removal of the stressor (Allen et al. 2018). Also, type conversion can occur if the areas are colonized by coastal scrub (Allen et al. 2018), though this community may ultimately succeed to maritime chaparral.

Passive revegetation has been documented in the Baywood fine sands ecosystem where native plant species have established following cessation of disturbance (i.e., ongoing trail use) and removal of veldt grass. In the Elfin Forest (State and County Park), passive revegetation was used to restore 10 areas identified in the Recovery Action Plan for the El Moro Elfin Forest (Morro Group 2003) where fences and targeted weed abatement were used to reduce the anthropogenic stressors of trampling and competition. A qualitative assessment in 2018 concluded that 7 of the 10 restoration sites were “largely or substantially revegetated”; the remaining three areas featured uncontrolled exotic plants and/or erosion. These passively revegetated areas were characterized similarly to two separate sites that had been actively revegetated through planting of coastal scrub species prior to 2003, which were also substantially revegetated (Terra Verde 2018). Quantitative analysis would be required to assess whether the passive and active revegetation areas differ in terms of plant species composition.

Current plant species composition in the Bayview Unit of the MDER also suggests that passive revegetation can be effective at restoring coastal sage scrub and maritime chaparral communities, which occupy areas that were completely cleared and used for agricultural crop production in 1949 (Section 2.4.2, Figure 2; Land Conservancy of San Luis Obispo County 1999). It is unlikely that the site was seeded or planted following cessation of agriculture (though this information is not available); nonetheless, the Bayview Unit features diverse assemblages of native plants characteristic of coastal sage scrub and maritime manzanita chaparral series (Section 2.5).

The successful natural regeneration of coastal sage scrub and maritime chaparral following clearing and restoration treatments (exotic plant control and trail closure at the Elfin Forest) likely reflects the adaptation of these communities to recurring disturbance. Though the natural disturbance regime includes fire, many plant adaptations to recurring fire, including the ability to colonize sites that feature bare mineral soil, could also promote regeneration following soil disturbances. Such beneficial responses of native plants and communities have been documented in the Santa Cruz sandhills (McGraw 2004)—an ecologically analogous system to the Bayview fine sands ecosystem, where native plant diversity was found to be enhanced by slides, trails, and gopher mounds. Experimental research in this system found that native plant cover and richness increase following exotic plant removal, even in the absence of seeding (McGraw 2004).

When compared with active revegetation, passive revegetation may result in slower rates of native plant establishment, due to the time lag between preparation of the site and natural dispersal of seed. Therefore it may not be suitable in situations where native plant establishment is time sensitive, as may

be in the case when plant cover is deemed necessary or advantages to controlling erosion, such as on steep slopes.

However, based on its demonstrated efficacy in this and other systems, and its advantages as part of the overall LOHCP conservation program, passive revegetation will be the default approach to recreating native plant community structure and species composition in the MDER. In circumstances where its efficacy is uncertain, it will be attempted and evaluated using monitoring. If native plant establishment from passive revegetation is limited, monitoring will be used to identify the causes. If the causes are erosion, exotic plant competition, or other factors not related to propagule supply, then remedial treatments will be implemented to address those limitations. If and where monitoring indicates that propagule supply is limiting native plant establishment, then active revegetation techniques (i.e., seeding then planting) will be phased in as part of remedial actions implemented through an adaptive management framework (Section 4.4, Table 9). Active revegetation will also be used at the outset under circumstances where passive revegetation is anticipated to be insufficient to establish the desired native plant community structure and species composition.

3.1.5.2 Active Revegetation

Active revegetation may be necessary to restore the structure and species composition of native plant communities when/where: 1) native plant seed is not present at the restoration site, and seed is not anticipated to disperse into the site from adjacent areas, at sufficient density and/or diversity, or b) when aspects of the site conditions might inhibit native plant establishment from seed, such as altered soils (e.g., thin or chemically altered), and thus seeding, planting, and amendments are needed, and/or, 3) when plant cover is needed to help prevent erosion that would otherwise occur if the site were left to passively revegetate, such as on steep slopes or in former gullies.

When and where deemed necessary, active revegetation will be implemented following a detailed plan that identifies revegetation treatments that address the following approaches designed to safeguard native biodiversity and restore the site as part of an ecological reserve.

1. **Use Only Site-Collected Seed:** All seed (or cuttings for container stock) will be collected within the reserve unit where the restoration will take place. This will ensure not only that the correct species are utilized, but locally adapted genetic complexes are incorporated in the seed and container stock. This will not only increase effectiveness of the revegetation, but also avoid the potential for genetic contamination to the native plant populations that could result from introducing genetic material collected from other sites. The exception could include incorporating Indian knob mountainbalm, if this is approved by the wildlife agencies and as covered under a separate scientific, educational, and management permit (2081[a] permit) issued by CDFW.
2. **Target Community and Species Palette**: Seeding and planting plans should be designed to achieve *over time*, with the aid of natural successional processes, the natural community composition and structure of the specific plant community(ies) (i.e., series) that would naturally occur within the area, based on the soils and microclimate. The revegetation should be designed to 'seamlessly' tie in with the existing natural plant communities.

   Species palettes will be identified in work plans based on the adjacent vegetation, which can inform decision-making about to species and their relative abundance. The species palette and seeding and planting plans should assume that some species will establish naturally from seed

dispersal over time, including as part of the natural successional process as described in Section 3.1.5 of the LOHCP (McGraw 2020).

The amount of seed and number of plantings in the seeding and planting plans should reflect the following factors: 1) the relative abundance of the species in the target community, 2) the species role in the successional process, and 3) the species anticipated rates of establishment, survivorship, and growth, based on its life history, the microsite conditions within the restoration area, and performance in other restoration sites.

3. **Revegetation Methods:** Seeding should be used to introduce the broad suite of native plants in the target community. The specific methods, including hydroseeding, broadcast seeding, and direct seeding, should reflect the microsite conditions within the restoration area and other goals for the restoration, such as erosion control; for example, where access is available, hydroseeding could be used on steep slopes to aid in erosion control, whereas flatter terrain could be broadcast seeded. Direct seeding could be used for species that establish when their propagules buried at depth (e.g., coast live oak).

   Plantings should be used to establish species that do not recruit well (or at all) from seed, and/or where container stock is deemed necessary to help prevent erosion (e.g., on the steep slope). Seeding, rather than planting, should be used wherever possible to reduce costs associated with contract growing, installation, irrigation, and associated plant maintenance (e.g., protection from herbivory), which can be considerable due to the labor involved. Seeding can also help create a more natural dispersion of plants than outplanting container stock, as the site environmental conditions can interact with life history of the species that are seeded to select those that are suitable in a given area much as occurs with natural seed dispersal.

4. **Container Stock:** Container plants must be grown from site-collected seed (or cuttings, where appropriate) as outlined in Item #1 above. Container stock should be grown following methods to limit contamination with exotic plants or pathogens (e.g., *Phytophthora* spp.). Planting plans, which identify the species and spacing should be designed to complement the existing plants at the site to 'tie into' what is already there, and should be integrated with the seeding plan.

5. **Amendments and Irrigation:** Use of fertilizers, mulches, and irrigation should be carefully planned to avoid promoting exotic plants, which generally benefit from increased nutrient availability and soil moisture that are otherwise limited; exotic plants can also be vectored by mulches. A soils analysis should be conducted to evaluate the need for fertilizer based on the soil nutrient requirements of native plant species (as opposed to agricultural crops). If fertilizers are necessary, the formulation, application rate, and areal extent should be limited to that necessary. Generally speaking, slow-release fertilizers applied to the rhizosphere of the container plants (as opposed to the entire site) are recommended.

   Likewise, mulches to reduce soil moisture loss and suppress exotic plants should be limited to just the area around individual plantings (as opposed to the entire site) as they can inhibit establishment of small-seeded native plants from seed.

Finally, irrigation should be targeted (e.g., drip) to avoid promoting exotic plants, and designed and timed to promote growth of deep roots. Plants should be protected from herbivory where it might prevent achievement of the goals and objectives.

3.2 Restoration Projects

The following sections describe the planned restoration treatments in terms of their:

1. Goals and Objectives; and
2. Specific methods, including treatment areas, initial treatments, and follow-up actions, which will be finalized in project workplans developed prior to implementation.

Section 4.2 identifies performance criteria for the restoration projects and how the treatment areas will be monitored to evaluate success based upon the quantitative objectives.

3.2.1 Eucalyptus Removal

This project will eradicate eucalyptus from the Pecho Unit and restore the estimated 0.84 acres of habitat that has been degraded by the invasive trees. This project was identified as a priority for implementation of the IAMMP because it can restore 0.84 acres of Morro manzanita habitat and also prevent the spread of eucalyptus into adjacent maritime chaparral and coastal scrub communities, where the trees could further impact habitat for the LOHCP communities and covered species. The project can also reduce the risk of a catastrophic wildfire that could ignite along Pecho Road and the spread into the tree canopies and beyond into the adjacent Baywood fine sands communities as well as Los Osos community.

3.2.1.1 Goals and Objectives

The goals of eucalyptus removal in the Pecho Unit are to:

1. Re-create the natural community structure and species composition in the Morro manzanita chaparral, by removing the eucalyptus and any co-occurring non-native plants (e.g., non-native *Pinus* sp.); and
2. Prevent eucalyptus from spreading further into uninvaded habitat within the reserve.

The objectives of eucalyptus control are to:

1. Remove the established trees and prevent their re-establishment from resprouts and seed;
2. Achieve native plant species absolute cover and native plant species richness that are similar to those values measured in intact (uninvaded) nearby Morro manzanita chaparral, which will be used as a reference site. The composition of species in the restoration site (i.e., the treatment area) should be similar to that in the reference sites as well.
3. Limit erosion on the over-steepened slope near the road; and
4. Prevent establishment of dense exotic plants within the treatment area.

Section 4.2 describes how monitoring will be used to evaluate achievement of performance criteria that were identified to evaluate whether the restoration will achieve the objectives over time.

3.2.1.2 Proposed Treatment

The eucalyptus removal project will consist of three elements:

1. Remove all eucalyptus trees and their biomass, and treat the trees in a manner that will prevent, or reduce the likelihood of, resprouting;
2. Actively revegetate the treatment area using seeding and container plant installation to promote establishment of native plants, and install erosion control measures where needed; and
3. Maintain the restoration area to control exotic plants and promote success of the native plants.

As with all of the projects, the detailed prescriptions will be developed in a work plan that will also identify the costs and schedule. The following describes the key elements of the restoration strategy that were developed to achieve the goals and objectives and inform such work plans.

3.2.1.2.1 Treatment Area

The treatment area will include the estimated 0.84-acre area affected by the eucalyptus within the Pecho Unit, which consists of a constellation of three stands (Figure 14). The final treatment area will ultimately include not just the area occupied by the trees, as measured here, but also all adjacent areas that are restored and that were impacted by the trees, including areas of dead Morro manzanita on the perimeter of the stand, or the tree removal activities (e.g., slash removal); as a result, it may differ from the acreage estimated in this plan.

As resources allow, the County may elect to remove additional eucalyptus trees located in the County road right-of-way and/or work with adjacent landowners to remove trees on the adjacent, private residential parcels to the east (Figure 14). These areas, which are also within the LOHCP Permit Area, have approximately six trees greater than 12" DBH, as well as additional smaller (newly established) trees. Removal of these trees can promote restoration of habitat offsite as well as within the reserve, by: 1) reducing the shade and litterfall from said trees into the reserve, 2) reducing the likelihood of re-invasion (which may still occur from trees south of Pecho Valley Road), and 3) reducing the risk of catastrophic fire. Such tree removal areas would not be included in the treatment area used to calculate the mitigation credit for the LOHCP, unless they are permanently protected from development and actively managed as part of the LOHCP preserve system.

3.2.1.2.2 Tree and Biomass Removal

The first element of the restoration project is to remove all of the eucalyptus and co-occurring non-native woody species biomass from the treatment area. As described in Section 2.7.1.2.4, the treatment area contains an estimated 26 eucalyptus greater than 12" DBH, additional saplings and stump sprouts, and numerous felled trees and cut stumps; it also includes two pines that will be removed assuming they are not naturally recruiting bishop pine.

To maximize achievement of the goals and objectives for the restoration, the tree removal treatment will include the following elements:

1. Cut all live trees at or near their base and then grind out or grub out the stumps to both prevent tree re-establishment and make bare soil available for native plant establishment;

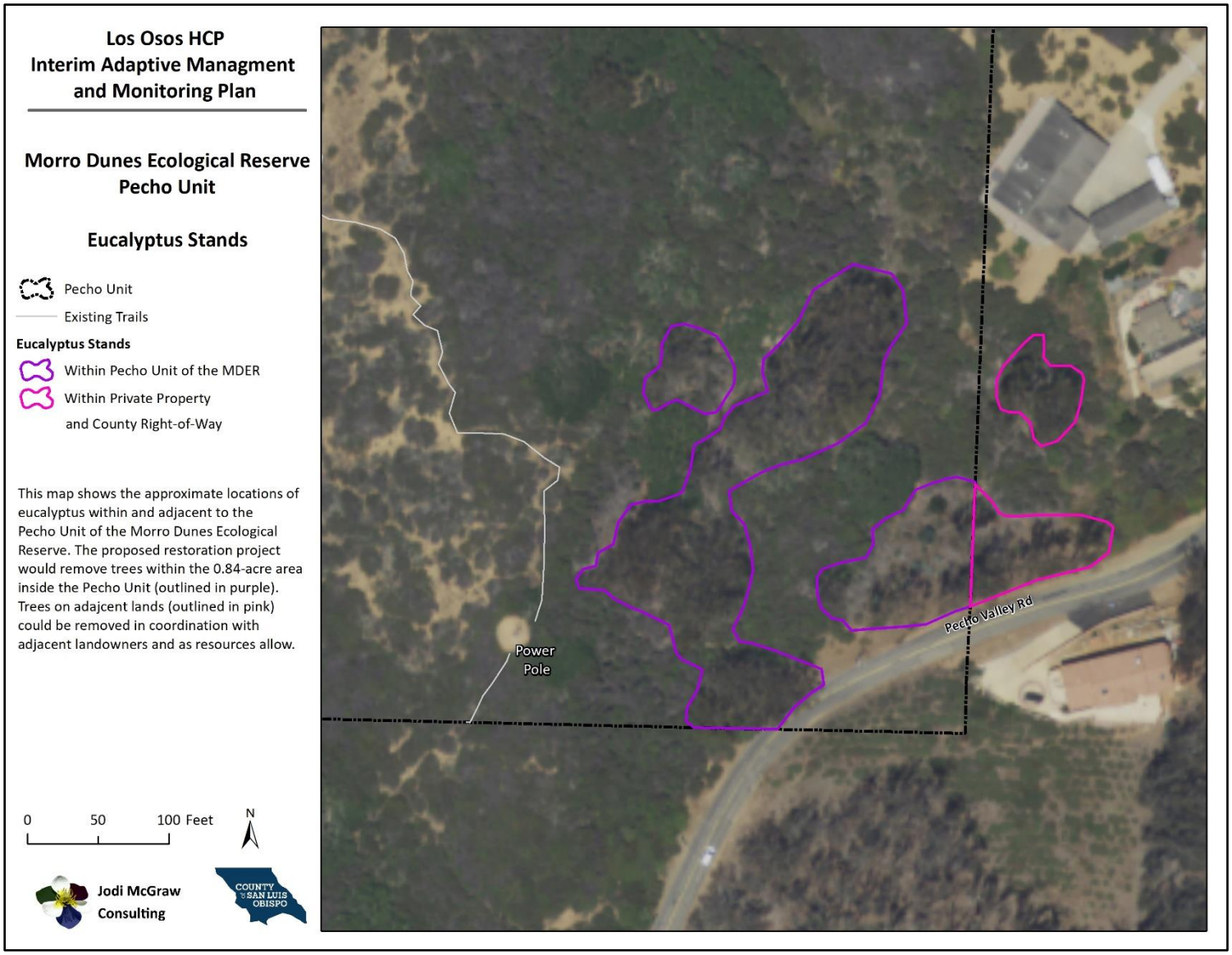


Figure 14: Eucalyptus within the Pecho Unit of the Morro Dunes Ecological Reserve

2. Remove all biomass, including the newly cut trees as well as biomass left on site from prior tree removal/felling, including all stumps (or their grindings), trunks (i.e., rounds), branches, leaves, and bark;
3. Remove all of the native plant biomass in and on the perimeter of the stand, including snags of Morro manzanita.

These elements are designed to remove not only the trees but also the other biomass on the soil surface that will mechanically inhibit native plant seedling establishment (Bossard et al. 2011) and could also reduce the performance of native container stock due to allelopathy (Watson 200; Section 2.7.1.2.4).

Pile burning could provide a cost-effective method to remove slash (branches) and litter (leaves and bark) from the site, where steep slopes limit access from chippers and otherwise make off-hauling challenging. Such treatments should be coordinated with CAL FIRE, and can potentially be conducted through their Vegetation Management Plan (VMP) program. If pile burning is not feasible, all biomass should be removed from the site; chips should not be left on site as a mulch as they will physically and/or chemically limit native plant performance and degrade habitat for other native species (Section 2.7.1.2.4).

If/where it is not feasible to remove the tree stumps through grinding or grubbing, including where such treatments would otherwise increase the cost or reduce the efficacy of the restoration, then a cut-stump treatment must be used to prevent resprouting of the live eucalyptus, which will otherwise vigorously resprout from lignotubers (i.e., dormant buds; Skolmen 1983). Stumps will be cut as low to the ground as possible, and then an herbicide applied to the cambium within 5 minutes of cutting, with 1 minute preferable to ensure it is absorbed into the cambium. If herbicide application is delayed, a second cut should be made immediately before herbicide application. The herbicide will be identified by a pest control advisor in consultation with CDFW Integrated Pest Management (IPM) coordinator as part of the IAMMP restoration work plan, though practitioners report using 25-50% solution of glyphosate (Holloran et al. 2004).

Removal of the trees and their biomass will be complicated by a variety of factors including:

- Vehicle access will not be possible for most trees, which are located down a steep slope and are surrounded by dense native vegetation dominated by Morro manzanita;
- Several trees are growing under/near power lines that are located along Pecho Valley Road and that service private residences north of the reserve and traverse the Pecho Unit.

These and other logistical considerations will be addressed in the work plan (Section 3.2.1.2.5).

3.2.1.2.3 Revegetation and Erosion Control

Following removal of the trees and their biomass, treatments will be implemented to:

1. Stabilize the soil on the steep slopes adjacent to the road, to prevent erosion following removal of the established trees; and
2. Actively revegetate the treatment area through seeding and planting site-collected native plants, to overcome anticipated limitations to natural recruitment of native plants and expedite establishment of native plant cover to control erosion that would degrade habitat.

Erosion control and revegetation treatments will be specified in the workplan developed for this restoration project and will be carefully coordinated to ensure that they will achieve the goals of preventing erosion and promoting native plant establishment.

Erosion control will be used only where needed (e.g., on the steeper slopes) and could include installation of a biodegradable erosion control blanket or turf reinforcement mat on steeper slopes, with coir rolls and/or surface treatment of straw on the gentler slopes. Hydroseeding using biodegradable organic tackifier can also help with slope stabilization. If straw is used, it should be certified 'weed free' straw or rice straw (which generally lacks terrestrial weed species) to avoid introducing invasive plants, which will be eradicated if detected during quarterly monitoring (Section 4.1.1.2).

Active revegetation involving seeding and planting is anticipated to be needed to restore the eucalyptus removal site for the following reasons: 1) the site likely has a limited seedbank due to decades of exotic tree dominance, 2) the site is relatively large and wide in areas, which will reduce natural seed dispersal, and 3) the soil modifications including potential allelopathy caused by the eucalyptus may hamper native plant establishment and growth. Seeding and outplanting container stock with limited amendments can help overcome these factors that are anticipated to limit natural regeneration of native plants within the site. Active revegetation can also help control erosion on the steeper slopes where the sandy soils might erode following removal of the tree canopy, as outlined above.

The revegetation treatments will be identified in the project workplan, which will include a seeding plan for the collection and application of site-collected native plant seed, and a planting plan for the propagation, outplanting, and maintenance of native container stock. These revegetation elements of the work plan will reflect the IAMMP's approaches to active revegetation that are designed to safeguard native biodiversity and restore the site as part of an ecological reserve (Section 3.1.5.2). They will also address the following specific elements for the eucalyptus site:

1. Planting and seeding will be conducted using only material collected in the Pecho Unit. The exception could include incorporate of Indian knob mountainbalm, if this is approved by the wildlife agencies and as covered under a separate scientific, educational, and management permit (2081[a] permit) issued by CDFW.
2. Seeding and planting plans will target establishment of the Morro manzanita series, which occurs adjacent to the grove and likely previously occurred in the area, based on the senescent manzanita snags that remain and the prior mapping (Figures 6 and 8). Due to the north-facing slope and swale topography, the area features a relatively high abundance of coast live oak which may colonize the revegetation area over time (i.e., through succession). However, the revegetation will target early-successional maritime chaparral using species that will be adapted to the high light/more exposed conditions post-tree removal; specifics species to consider including in the palette are: black sage, California sagebrush, wedgeleaf ceanothus, sticky monkeyflower, and Morro manzanita.

   The species palette will be identified in the work plan based on additional examination of the adjacent vegetation to identify the species and their relative abundance. The seeding and planting plans should be finalized after the site is cleared of exotic trees and their biomass, when additional microtopographic variation will be revealed.

   The species palette and seeding and planting plans should assume that some species will establish naturally from seed dispersal over time, including as part of the natural successional

process in maritime chaparral based on the chronosequence (i.e., from wedge-leaf ceanothus to Morro manzanita dominated), as described in Section 3.1.5 of the LOHCP (McGraw 2020).

Other elements of the revegetation should be described in the work plan, and follow the general approaches outlined in Section 3.1.5.2.

3.2.1.2.4 Restoration Area Maintenance

Following tree removal and revegetation, the eucalyptus removal restoration area will be maintained to promote native plant growth and prevent establishment of exotic plants. The site will be examined quarterly to detect and eradicate (or control, where eradication is not feasible), invasive plants that establish following removal of the trees. Targets will include eucalyptus, which may reestablish from buds in cut stumps (even some that are treated with herbicide) and from seed, and also other invasive plants that disperse into the area or are adherently vectored in with restoration materials (equipment, surface treatments, container stock, etc.). Site monitoring will also be used to evaluate the need for container plant maintenance, including supplemental irrigation or protection form herbivory, or remedial erosion control.

3.2.1.2.5 Work Plan

As part of the project design process, a qualified biologist will develop a detailed work plan for implementation of the eucalyptus removal project that incorporates the PCA recommendations, and identifies all relevant elements of the treatment based on the guidelines above, including:

- Final treatment areas;
- Species protection measures, including pre-project surveys and biological monitoring for the covered (Section 3.3) as well as other sensitive species, including monarch butterfly and nesting birds;
- Site preparation methods, including delineating treatment areas and flagging covered plants or other special-status non-target species;
- Personnel including crew size and number and qualifications of supervisors as well as biological monitors;
- Crew and equipment access including routes and travel methods and methods of avoiding impacts to the power lines;
- Tree removal and biomass removal methods;
- Erosion control treatments, including locations and specific methods that are integrated with the revegetation treatments;
- Active revegetation treatments, including seeding and planting plans that identify species, quantities, and spacing, as well as use of amendments, irrigation, and plant protection;
- Site maintenance treatments, including irrigation, plant production, and exotic plant control treatments, which will be refined based on the results of monitoring (Section 4.1); and
- A budget for all work to conduct the project including initial and follow-up treatments, and species protection measures.

The work plan will be provided to CDFW and the USFWS for review at least one month prior to project initiation to enable final review and approval by necessary staff including the CDFW Integrated Pest Management (IPM) Coordinator, who is responsible for reviewing and approving all pesticide use on CDFW lands.

3.2.2 Veldt Grass Control

This project would control veldt grass within the Bayview Unit to enhance habitat that has been degraded by the invasive plant. The Bayview Unit was chosen for initial treatment because it features intact coastal sage scrub and open canopy maritime chaparral that has been degraded by the invasive plant, as well as large areas of uninvaded habitat where the species could spread if not controlled. While the Pecho Unit also features intact as well as invaded habitat, it is surrounded on three sides by densely invaded habitat within the Morro Dunes Natural Area, from which veldt grass will likely reinvade if is not controlled. Control of veldt grass within the Pecho Unit will be further evaluated as part of development of the AMMP, through which the County or its Implementing Entity will work with State Parks to coordinate veldt grass control in the conservation lands in the region west of Pecho Valley Road.

In addition to veldt grass, the Bayview Unit features other invasive plant species that similarly merit control. These species will be controlled in the veldt grass treatment areas, in order to achieve the benefits of invasive plant control and prevent their spread; as resources allow, the other invasive plant species will be addressed adjacent to the designated treatment areas and elsewhere, as outlined below. The AMMP will address control of the invasive species occurrences that are not addressed in this IAMMP.

3.2.2.1 Goals and Objectives

The goals of veldt grass control in the Bayview Unit are to:

1. Re-create the natural community structure and species composition in the treatment areas, by controlling veldt grass and co-occurring invasive plants, including freeway iceplant, narrowleaf iceplant, English ivy, and jubata grass in and adjacent to veldt grass patches; and
2. Prevent veldt grass and co-occurring invasive plants from spreading further into uninvaded habitat within the reserve.

The objectives of veldt grass control are to:

1. Achieve native plant species absolute cover and native plant species richness that are similar to those values measured in intact (uninvaded) areas used as a reference site. The composition of species in the restoration site should be similar to that in the reference sites as well.
2. Achieve exotic plant cover within the treatment area that is similar to values measured within intact (uninvaded) areas of the same community type (reference sites); and
3. Eradicate veldt grass from any new areas where it establishes.

Section 4.2 describes how quantitative monitoring will be used to evaluate achievement of performance criteria designed to evaluate whether the restoration will achieve these objectives over time.

3.2.2.2 Proposed Treatment

3.2.2.2.1 Treatment Area and Targets

This project consists of controlling invasive veldt grass throughout the Bayview Unit (Figure 11). Based on the preliminary mapping conducted in February 2020 to develop this plan, the treatment area is estimated at 22.6 acres (Figure 11). Veldt grass cover in the treatment areas varies and was generally mapped based on five density categories (Figure 11):

- Low density: veldt grass cover 1- 10% (~ 0.87 acres or 4% of total);
- Medium density: veldt grass cover 11-30% (~ 7.88 acres or 35% of total);
- High density: veldt grass cover 31-70% (~ 5.28 acres or 23% of total);
- Low – Medium: patches in which density varied between low and medium (i.e., 1 - 30%) (~ 0.84 acres or 4% of total); and

  Medium – High: patches in which density varied between medium and high (i.e., 11 - 70%) (~ 7.72 acres or 34% of total).

In some cases, other invasive plant species including most notably freeway iceplant, narrowleaf iceplant, and jubata grass, occur within and/or immediately adjacent to the veldt grass patches (Figure 11). These co-occurring invasive plants must also be controlled to achieve the goals, objectives, and success criteria for the restoration. Controlling these species will reduce their impacts on native plants and prevent their spread within and beyond the treatment areas.

3.2.2.2.2 Treatment Methods

The veldt grass restoration project will be accomplished through two primary treatments: invasive plant control and passive revegetation.

3.2.2.2.2.1 Invasive Plant Control

Table 7 outlines the proposed methods to control the four primarily invasive plant species in the Bayview Unit. For veldt grass and freeway ice plant, different treatments are proposed to occur in patches of varying size and abundance (i.e., cover). Manual removal including pulling by hand will be used to remove small patches of veldt grass and freeway iceplant, and also to control occurrences of these species where these species occur at low density. Hand pulling or other non-chemical methods of removal are also recommended for follow-up treatments, assuming the density is low and the occurrence can be managed manually. Herbicide will be used only where it is needed to control medium to large patches with moderate to high density of invasive plants, as part of an overall integrated pest management approach designed to limit herbicide use and its impacts. Chemical control will also be used to control jubata grass, to prevent plants from resprouting following brush cutting. Similarly, herbicides will be used to control narrowleaf iceplant, which is difficult to kill through hand pulling as it readily reestablishes when its tap root is not effectively removed (Table 7).

Table 7: Summary of proposed treatments for veldt grass and co-occuring invasive plants[1]

Species	Patch Type	Initial Treatment	Follow-up Treatment	Treatment Comments
Veldt grass	Small, low to medium density patches	Hand Pull as feasible	Hand pull if low density Spray large or high density	• Hand pulling can be used throughout the treatment area, though can promote seedling establishment and is time consuming • Glyphosate can be used in near monocultures, as needed to achieve control
	Large and/or Medium to High Density patches	Spray with grass-specific herbicide (e.g., fluazifop-p)		
Freeway iceplant	Small patches	Cut and hand pull	Hand pull	Biomass can be left in place to provide litter for Morro shoulderband snail and/or suppress a secondary invasion of exotic plants, though live plants may re-root
	Medium-large patches (which are typically monocultures)	Foliar spray with herbicide (e.g., 2% glyphosate)	Hand pull or respray if the area is large	
Narrowleaf iceplant	All	Foliar spray with herbicide (e.g., 2% glyphosate)		Manual removal is often unsuccessful as it requires complete removal of the taproot, which is often not attained
Jubata grass	All	Cut with chain saw or brush cutter in summer and then foliar spray resprouts in fall.	Re-cut and re-treat resprouts as needed, for up to five years Remove seedlings using a hoe	Manual removal can work but requires complete removal of the root crown to avoid resprouting. All inflorescences must cut, bagged, and removed to avoid spreading seed.

[1] Recommended treatments to be refined through preparation of invasive plant control project work plan developed based upon recommendations from a certified pest control advisor regarding chemical treatments

3.2.2.2.2.2 Herbicide Use

During development of the project work plan for this project, a pest control adviser (PCA) licensed by the State of California will be consulted to develop prescriptions for herbicide use for each species based on the unique circumstances of the treatment areas, including patch density and co-occuring species. The PCA recommendations, which will be reviewed by the CDFW IPM Coordinator, will be designed to ensure that herbicide treatments are effective at controlling the invasive species, and that they minimize negative impacts to native species, as well as humans and other aspects of the environment. In developing the prescription, the PCA evaluate the following:

- Using grass-specific herbicides (e.g., fluazifop-p or clethodim) to control veldt grass, in order to limit impacts on non-target native plant species, virtually all of which forbs, subshrubs, and shrubs (i.e., broad-leaved plants) and therefore will not be as susceptible to herbicide impacts;
- Spraying herbicide during the time of year when it is most effective, including for veldt grass, when the plants are actively growing in the winter;
- Using herbicides that are known or likely to have no or only limited impacts on mollusks to limit impacts to Morro shoulderband snail, spraying during dry conditions when the species is inactive, and relocating the species out of harm's way using pre-project surveys (Section 3.3.4);
- Employing application techniques that will limit overspray and thus non-target species impacts, such as using low-pressure backpack sprayers equipped with large droplet nozzles, and applying herbicides only when winds are less than 10 mph and ground moisture is minimal; and
- Incorporating appropriate adjuvants to improve the performance and effective application of the herbicide, including dyes to facilitate even application.

Herbicides have been successfully used as part of a broader IPM strategy to control invasive plants in the Baywood Fine Sands ecosystem as part of other habitat restoration and management projects in the Los Osos region, including Arrow 2EC (clethodim) which was used as part of the Los Osos Wastewater Project to greatly reduce the abundance of veldt grass in areas that support Morro shoulderband snail (County of San Luis Obispo 2019, KMA 2019). All herbicide applications will be conducted or supervised by licensed qualified applicators registered in the State of California, who will adhere to herbicide label as well as the PCA recommendations. Herbicide treatments will also need to be approved by the CDFW IPM Coordinator. All treatment work, including herbicide application, will be implemented following species protection measures (Section 3.3.4).

3.2.2.2.2.3 Passive Revegetation

Veldt grass restoration areas will be passively revegetated as outlined in Section 3.1.5. While seeding and/or planting could potentially accelerate the rate of native plant establishment, these active revegetation techniques can have negative consequences for long-term conservation management of the site as described in Section 3.1.5. Natural regeneration of native plant communities is anticipated to be sufficient to achieve the performance criteria (Section 4.2.2) in most if not all of the veldt grass treatment areas for the following reasons: 1) most of the treatment areas feature native plants, and likely also feature their dormant seed in the soil (i.e., seedbank), 2) the treatment areas are relatively small and surrounded by intact natural communities from which native plants can spread vegetatively, and disperse from seed (i.e., by gravity, wind, water, and animals); 3) native plant establishment and growth in the treatment areas are not anticipated to be hampered by soil modifications or erosion, 4) seeding and planting the areas would limit the ability of this project to evaluate the potential for passive

restoration to achieve the goals and objectives of this and future similar restoration projects conducted as part of the LOHCP, 5) the treatment areas collectively constitute a large area that would require significant labor and thus cost to seed and/or plant, and 6) the treatment areas are scattered throughout the 230.9-acre property (Figure 11) where installation and maintenance of container plants would be logistically challenging and thus expensive to implement effectively.

If and where native plant establishment and growth are insufficient to achieve the restoration objectives as measured by the performance criteria (Section 4.2.2), remedial actions will be taken to address the known or likely factors limiting success, as outlined in Section 4.4. If propagule supply and/or seedling establishment and survivorship are identified as the causes of the limited native plant cover and/or species richness, and treatments to promote natural seedling establishment and growth and canopy spread are not appropriate, then active revegetation techniques including seeding (first priority) and/or planting (only if seeding is not sufficient) will be used, where appropriate. Such treatments will be developed following the guidelines for revegetation methods of the IAMMP as outlined in Section 3.1.5 and will proposed in the annual work plan (Section 4.8); they will be review by the agencies as part of the annual meeting (Section 4.8) and will be approved prior to implementation.

3.2.2.2.2.4 Work Plan

As part of the project design process, a qualified biologist will develop a detailed work plan for implementation of the treatments that incorporates the PCA recommendations, and identifies all relevant elements of the treatment including:

- Final treatment areas and specific treatments by area, based on examination of the density of veldt grass, co-occurring invasive plants, and native plant and potential sensitive animal species in each area;
- Species protection measures, including pre-project surveys and biological monitoring (Section 3.3);
- Site preparation methods, including delineating treatment areas and flagging covered plants or other special-status non-target species;
- Personnel including crew size and number and qualifications of supervisors as well as biological monitors;
- Crew access including routes and travel methods;
- Biomass removal methods;
- Anticipated follow-up treatments, which will be refined based on monitoring (Section 4);
- A budget for all work to conduct the project initial and follow up treatments, and species protection measures

If the budget for the work outstrips the initial startup funds available for the LOHCP, as described in Section 7.2.4 of the LOHCP, the treatment area can be reduced relative to that illustrated in Figure 11, to focus on the priority areas for invasive plant control. Work should be prioritized to maximize long-term effectiveness such as by working away from undisturbed habitat toward the more invasive habitat, as recommended as part of the Bradley Method (Bradley 1997)

The work plan will be provided to the wildlife agencies for review at least one month prior to project implementation to enable approval by necessary staff including the CDFW IPM Coordinator.

3.2.3 Trail Restoration and Access Management

This project will restore habitat within the MDER that has been degraded by recreation by managing trail use (Section 2.7.2). As with veldt grass management, trail restoration as part of this interim plan for the LOHCP Preserve System will focus on the Bayview Unit of the MDER where:

1. Recreational use is more widespread and the proliferation of trails is resulting in greater impacts on the covered species and their habitats than at the Pecho Unit, where trail use is limited to a few routes (Figures 3 and 4); and
2. Access management can complement efforts to restore veldt grass treatment areas by reducing trampling which could inhibit native plant establishment.

As resources allow, trail restoration could be initiated within the Pecho Unit; accordingly, this plan identifies recommendations for management in this unit, which can be evaluated as part of work to develop the trail restoration work plan.

3.2.3.1 Goals and Objectives

The goals of trail restoration are to:

1. Re-create the natural community structure and species composition in areas degraded by prior recreational use, by using signage, fencing, patrols, and community outreach to limit access to designated trails to hiking, dog-walking, and wildlife viewing, and to close unauthorized routes; and
2. Prevent the ongoing proliferation and widening of trails within the reserve by increasing community awareness of the sensitivity of habitat and thus compliance with the access regulations, and conducting patrols to discourage unauthorized access.

The objectives of trail restoration are to:

1. Achieve a level of native plant species absolute cover and native plant species richness within trails (or portions thereof) where use is discontinued, that is similar to reference sites. The composition of species in the restoration site should be similar to that in the reference sites as well.
2. Achieve exotic plant cover within the treatment areas (i.e., closed trails) that is similar to values measured within intact (uninvaded) areas of the same community type and successional stage (reference sites);
3. Prevent establishment of new trails.

Section 4.2 describes how monitoring will be used to evaluate achievement of performance criteria designed to evaluate whether the restoration will achieve the first two objectives over time.

3.2.3.2 Treatment Methods

3.2.3.2.1 Overview

Under this initial management plan for the LOHCP Preserve System, trail restoration will include three elements:

1. Restricting access to limit ongoing disturbance;
2. Controlling establishment of invasive plants to reduce their negative impacts on the covered species and natural communities; and
3. Passive revegetation, to establish native plants by promoting their natural regeneration following cessation of disturbance.

Trail closure and invasive plant control are anticipated to promote native plant recolonization that will be sufficient to achieve the goals and objectives throughout much of the area subject to trail closure. Passive revegetation may require additional time in some areas, such as wide trails or trails through maritime chaparral where species pools consist of slower-growing shrubs; however, native plant species adapted to disturbance are anticipated to colonize much of the denuded trail areas over time (Sections 3.1.5 and 3.2.3.2.4).

Sections of former trails and roads that have become incised may require additional restoration treatments, including earth work, to prevent continued erosion. Treatments that require more intensive efforts will be phased in during implementation of the LOHCP AMMP in areas where regulating access and controlling invasive plants are not sufficient.

In addition, some segments of the trails designated in this plan for ongoing use may need to be rerouted to be more sustainable; specifically, trails may not to be located on suitable gradients and out sloped so they do not become channelized and erode. These and other trail restoration treatments, which can be identified in the LOHCP AMMP, can build upon the initial efforts to restore trails as part of this plan.

3.2.3.2.2 Regulating Access

The first step to restoring trails will be to promote visitor compliance with existing CDFW access regulations which: 1) limit access to designated routes within the reserve, and 2) allow access only by pedestrians (i.e., hikers) including those walking dogs on leashes that are no more than 10 feet in length (Section 2.8). As a potential exception to this, CDFW will evaluate allowing equestrian use of the West Rim Trail—an existing trail that provides access from Pecho Valley Road to the beach, and which cuts through the southwestern corner of the Pecho Unit (Section 3.2.3.2.1).

The County or its implementing entity will take the following steps to promote compliance with CDFW's access regulations:

1. Install and maintain fences to limit access to designated routes, including to:
    a. close unauthorized trails;
    b. limit use of overly wide trails to the central three-foot-wide portion of the trail, and prevent trails from widening and encroaching into adjacent intact habitat; and

c. protect veldt grass treatment areas to prevent trampling from inhibiting native plant recolonization.

2. Install brush piles to help close trails while providing habitat for certain species;
3. Install and maintain signs to identify open and closed trails, and provide visitors with interpretive information about the sensitive ecology of the site and the conservation needs of the covered species to promote their compliance with the access regulations.
4. Patrol trails to promote compliance with the access regulations and deter access by unauthorized users (OHVs, mountain bikes, equestrians, and campers), and prevent ongoing use of trails designated for closure.
5. In coordination with CDFW staff, conduct community outreach to user groups, neighborhood groups, and community organizations to promote compliance with the access regulations.

3.2.3.2.2.1 Trail Closures

Of the 11.8 miles of trails mapped within the Bayview Unit, 8.9 miles (75% by length) will be closed (Figure 15). These trails are 2 to 30 feet wide (Section 2.7.2). Assuming an average width of four feet, restoration of these trails by preventing disturbance to promote native plant regeneration, and conducting invasive plant control, where needed (Section 3.2.3.2.3), will restore approximately 4.3 acres of habitat.

Within the Pecho Unit, closure of all trails other than the East Rim Trail could similarly restore an estimated 0.50 acres of habitat within the 1.0 miles of trails designated for closure (Figure 16).

To continue to provide visitors with opportunities for compatible recreation, access by hikers and dog walkers will be allowed within the Bayview Unit on a total of 3.0 miles of trails (Figure 15):

1. **Loop Trail:** This 2.2-mile trail on the outer perimeter of the unit will remain open to provide visitors with an opportunity to explore the range of plant communities in the unit and access the southern ridge, which affords scenic vistas. It was designated by selecting from the existing routes those that were deemed most suitable for long-term use; as noted above, the LOHCP AMMP may ultimately identify additional improvements including re-route sections of this trail.
2. **Ridge Trail**: This 0.73-mile route traverses the top of the ridge from Calle Cordoniz Avenue to the East Rim Trail, which is in the northeastern portion of Montaña de Oro State Park. An additional 0.21 miles along the ridge which are illustrated in Figure 15 are south of the Bayview Unit on the adjacent property.
3. **Neighborhood Access:** Two short access routes totaling 0.06 miles will be maintained to provide access from Ravenna and Palisades avenues, as well as Broderson Avenue, where access will remain open as part of the Loop Trail.

Collectively, these trails will provide the community and other reserve visitors the opportunity to access the reserve from the surrounding neighborhoods, experience the various native plant communities traversed by the Loop Trail, enjoy scenic vistas afforded by the Ridge Trail, and tie into the Montaña de Oro State Park trail network via the East Rim Trail. The CDFW will maintain responsibility for operating these trails; the provision of recreation opportunities is beyond the scope of the IAMMP and will not be



Figure 15: Trail restoration within the Bayview Unit of the Morro Dunes Ecological Reserve

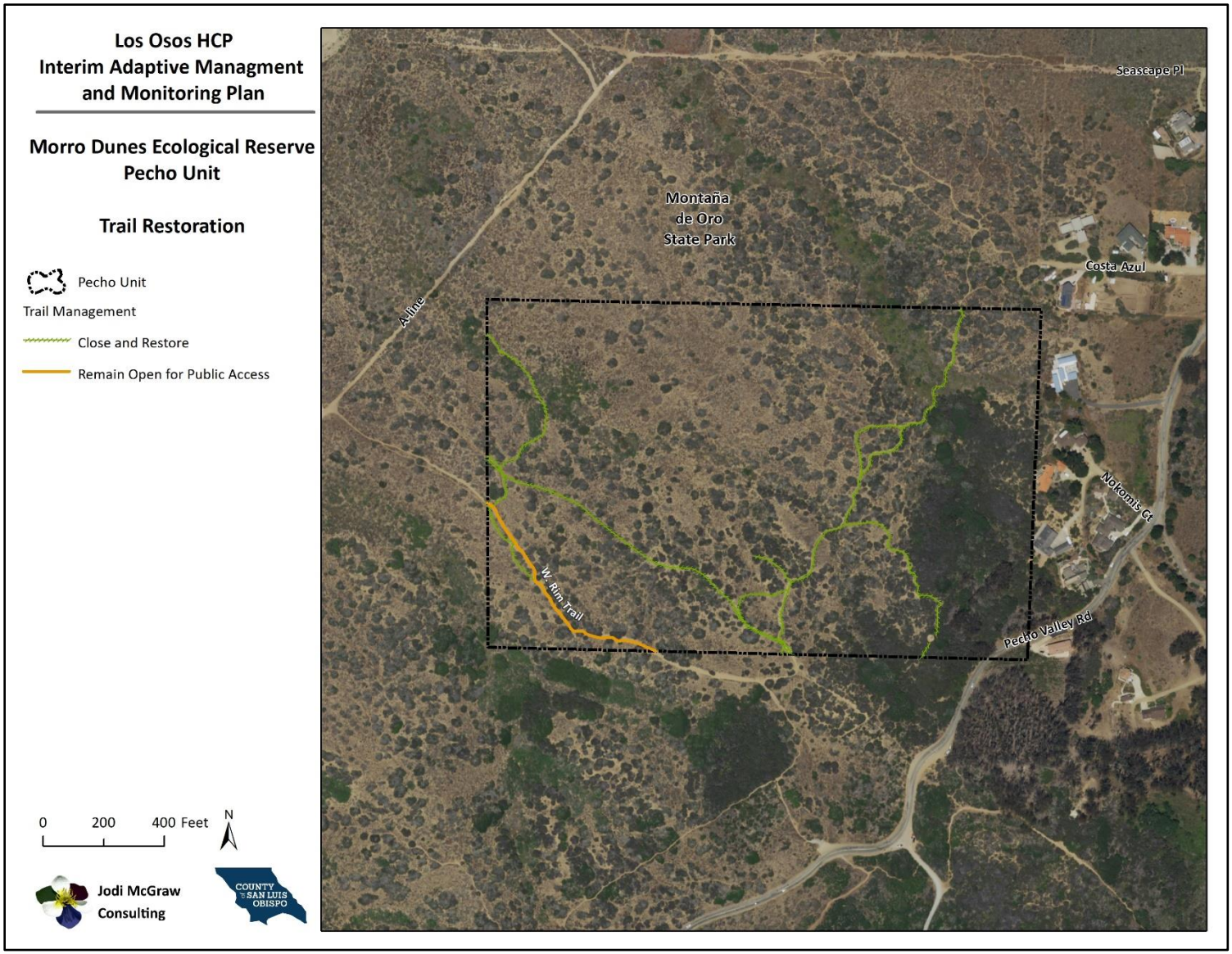


Figure 16: Trail restoration within the Pecho Unit of the Morro Dunes Ecological Reserve

credited for mitigation under the LOHCP, which instead is based on restoration of the closed trails including the narrowing of excessively wide trail corridors.

In the Pecho Unit, the 0.15-mile section of the West Rim Trail will remain open, to connect Pecho Valley Road to the beach and other destinations beyond via the A-Line Trail in the Morro Dunes Natural Area, which is part of Montaña de Oro State Park. The other trails, including the north-south trail on the eastern portion of the reserve, are proposed to be closed (Figure 16).

3.2.3.2.2.2 Signs

To promote compliance with the trail use regulations, which will be necessary to achieve the trail restoration objectives and success criteria, the County will develop, install, and maintain of at least three types of signs:

1. **Entrance Signs or Kiosks**: At the main entrances to the Bayview Unit, large-format signs or kiosks containing maps, graphics, and text, will be posted to provide visitors with information about the reserve's unique ecology, including rare species, and its access regulations and their role in protecting endangered species and restoring their habitat. The signs or kiosks could feature reserve brochures with maps, interpretive information, and the access regulations. Figure 15 identifies eight reserve entrances where the trail restoration work plan will evaluate posting such signage; if resources are limited, priority will be given to entrances with the highest rates of ingress.
2. **Open Trail Signs**: Posted at the entrances to the open trails, these signs will name each trail to aid navigation, and identify the allowed uses; specifically, these trails will note that horses and mountain bikes are not allowed, that dogs must be on a leash less than 10 feet in length at all times, and that trail use must be confined to the designated corridor.
3. **Closed Trail Signs:** These signs will be posted at all junctions between the open trails and the trails that are closed. They will explain briefly that the trail is closed to facilitate restoration of habitat for endangered species.

Additionally, the Loop Trail within the Bayview Unit could feature interpretive signs that educate visitors about the uniqueness and rarity of the ecosystem, both to enhance their experience and to promote compliance with the access regulations. Rather than signs, the Loop Trail could feature numbered posts that correspond to numbered stations in a brochure available at the Entrance Signs or Kiosks, or perhaps available on-line. This signage, which could enhance overall compliance with the trail closures, is optional and not required as part of the IAMMP.

As part of its management of the reserve, CDFW will provide ecological reserve signs for the County to post on the perimeter of the reserve at a minimum frequency of three signs per mile. These signs will enable CDFW Wardens to implement law enforcement action in response to violations.

3.2.3.2.2.3 Fences

The County will erect fences to promote compatible trail use including to facilitate trail closures and to control access from the perimeter of the Bayview unit. Three main types of fences are anticipated to be erected. Fences should feature the appropriate signs (Section 3.2.3.2.2) to communicate their rational and promote their effectiveness at regulating trail use and restoring the designated trails.

1. **Perimeter Fence:** Fences will be installed on the western and eastern boundaries of the reserve where they are needed to control access. The perimeter fencing will be installed in areas where there is evidence of current ingress/egress, and where the perimeter lacks dense, impenetrable vegetation (i.e., a brush barrier) that would inhibit access. To be wildlife friendly, the fence will be constructed of four-stand smooth wire on t-posts. The perimeter fence segments will be posted with ecological reserve signs furnished by CDFW to facilitate law enforcement action in response to violations (Section 3.2.3.2.2).
2. **Fences to Delineate Open Trails:** Fences will be installed along segments of trails designated for ongoing use that are much wider than they need to be to accommodate the allowed use by hikers and dog walkers. In these areas, fences should be installed within the center of the trail corridor, or off to one side, to confine use to the designated three-foot-wide area and promote native plant regeneration along the remainder of the existing corridor. To avoid impeding native animal movement, create an enjoyable visitor experience, and ideally reduce costs, these fences will be symbolic, in that will not prevent people from moving through them. Instead, they will be constructed using posts and cables, as used at the Morro Dunes Natural Area along Army Road, or made of low posts and rope, as used in the County's Mid-Town Site (Figure 17).
3. **Fences to Close Trails:** Where posting signs is not sufficient to deter ongoing use of the myriad trails to be closed, segments of barrier fence will need to be installed. Such fences can be constructed of green plastic mesh or other material that better blends with the natural environment, as is used at the Elfin Forest. Fence segments will need to 'tie in' to shrubs, trees, or other impenetrable vegetation or perhaps topographic features (e.g., steep slopes) to be effective; otherwise, people will simply go around the fence.



Figure 17: Examples of symbolic fences to confine trail use to designated corridors

3.2.3.2.2.4 Brush Piles

Piles of brush (i.e., cut branches of woody plants) can be installed at the entrances to trails or other ingress/egress points to facilitate trail closure or otherwise regulate access. In addition to creating a visual and real barrier, brush piles create habitat for Morro shoulderband snail, dusky footed woodrat (*Neotoma fuscipes*), native bees, and herpetofauna, which were encountered frequently during monitoring of the brush piles created in fall 2019 for the Bayview Unit fuel break (D. Hacker, pers. comm. 2020). Brush piles may also promote establishment of some native plants by collecting or trapping seed and providing a safe site for germination and seedling establishment; however, smaller-

seeded herbaceous plants and subshrubs including many disturbance adapted species that could colonize the closed trails may be physically inhibited by woody debris.

To minimize the negative impacts of brush piles while promoting their effectiveness, the piles should be:

- Comprised of cut material from exotic plants (though should be weed free), dead native shrubs and trees, or native shrubs and tree branches cut during fuel break creation. Living native shrubs or trees, particularly the covered shrub species, will not be cut to generate material for brush piles;
- Located strategically to inhibit trail access, such as the entrances to closed trails, rather than throughout the site;
- Comprised of discrete piles rather than brush spread out on along the trail corridor, where it would inhibit establishment of early successional plant species, and thus the successional processes including soil development necessary to revegetate the trails; and
- Located away from houses (e.g., along Highland Drive) to avoid creating fuels that could exacerbate wildfire risk.

3.2.3.2.2.5 Patrols

The County (or its Implementing Entity) will conduct patrols, as needed, to promote compliance with the trail use regulations. The need for patrols is anticipated to be greater during the initial period of trail closures, which will follow coordinated outreach to the community by the County and CDFW (Section 3.2.3.2.6). During this time, County personnel or volunteers will walk the trails and conduct outreach to people about the trail management regulations. The frequency of patrols necessary to achieve sufficient compliance with the trail closures and promote the trail management goals, objectives, and success criteria is anticipated to decrease over time as compliance increases.

Outreach could be facilitated through establishment of a volunteer trail patrol group whose members could patrol trails and conduct outreach to users, including by providing informative brochures that explain the trail use provisions. Such groups patrol trails in other ecologically sensitive natural areas including the Fort Ord National Monument and Henry Cowell State Park Sandhills, where they have been effective at promoting compliance with the trail closures and other use regulations.

County personnel conducting other aspects of management in the reserve should also conduct outreach to reserve visitors regarding trail use. Biologists and restoration crews can educate users about appropriate trail use when they encounter any use that is not in keeping with the plan.

The County will work with CDFW Environmental Scientists and Wardens to address persistent, unlawful trail use that inhibits achievement of the goals and objectives for trail restoration. Wardens can enforce regulations relating to recreation on CDFW lands including the MDER; likewise, the San Luis Obispo County Sheriff can enforce regulations on County-owned lands (e.g., Broderson).

3.2.3.2.2.6 Outreach

Prior to initiating the trail closures, the County and CDFW will coordinate to conduct outreach to inform neighbors, user groups, and the broader community about the trail use regulations and the plans to enforce them, as well as the planned trail closures and restoration. Representatives from CDFW and the

County (or its Implementing Entity), will provide presentations at existing venues (e.g., community group meetings), hold separate informational meetings, and/or meet with representatives of user groups, to explain the rationale for the regulations and seek compliance. As part of this outreach, CDFW and the County will evaluate interest from the community in forming a 'friends of the reserve' group that would be comprised of people who support the mission of the reserve. Such a group could assist with trail management (e.g., outreach and volunteer patrols, Section 3.2.3.2.5) as well as invasive plant management (e.g., volunteer workdays).

3.2.3.2.3 Invasive Plant Control

Invasive plant control may be needed to promote restoration of the closed trails, including areas along excessively wide trails. Following cessation (or at least significant reduction) of use, these closed areas are anticipated to be colonized by a diverse suite of native plants that are adapted to colonizing bare sand soil; these disturbance-adapted plants are anticipated to passively revegetate the areas, thus facilitating achievement of the goals, objectives, and success criteria without the need for active revegetation (Section 3.1.5). There is evidence of such natural recolonization of former trails within the Bayview Unit, where native plants have recolonized an old trail along Broderson Road that became incised and was presumably abandoned by users in favor of the new route (J. McGraw, pers. obs.).

Like many native disturbance-adapted species, however, invasive plants including jubata grass, veldt grass, and iceplant species, may also colonize the trail corridors following closure. Though the extent of their invasion can be reduced by the concurrent invasive plant control work proposed in this plan (Section 3.2.2), these and other species may nonetheless re-establish from a seed bank, from remaining occurrences on-site, or perhaps through long-distance dispersal mediated by people, animals, or wind.

Accordingly, the County will monitor trails quarterly as part of the ongoing restoration monitoring (Section 4.1) and implement early detection-rapid response to detect and control any invasive plants that establish in the closed trail corridors. If a 'friends of the reserve' group is formed, volunteers can be trained to detect invasive plants to notify managers.

If detected early, new occurrences of invasive plants along closed trail segments and corridors should be small and thus able to be controlled manually (e.g., through hand pulling); however, larger occurrences may require use of herbicide, which would follow the prescription of a PCA (Section 3.2.2.2.2).

3.2.3.2.4 Passive Revegetation

Trail restoration areas will be passively revegetated as outlined in Section 3.1.5. Trail closure and invasive plant control are anticipated to promote native plant recolonization that will be sufficient to achieve the goals and objectives throughout much of the area subject to trail closure. Native plant establishment (i.e., passive revegetation) may require additional time in some areas, such as wide trails or trails through maritime chaparral where species pools consist of slower-growing shrubs; however, native plant species adapted to disturbance are anticipated to colonize much of the denuded trail areas over time.

While seeding and/or planting could potentially accelerate the rate of native plant establishment, these active revegetation techniques can have negative consequences for long-term conservation management of the site as described in Section 3.1.5. Natural regeneration of native plant communities is anticipated to be sufficient to achieve the restoration performance criteria (Section 4.2.2) in most if

not all of the trail restoration areas for the following reasons: 1) most of the treatment areas are narrow so feature adjacent to them diverse assemblages of native plants that can expand their canopies and also disperse their seed (i.e., by gravity, wind, water, and animals) to establish within the trails; 2) the treatment areas collectively constitute a large area that would require significant labor and thus cost to seed and/or plant, and 3) the treatment areas are scattered throughout the 230.9-acre property (Figure 15) where installation and maintenance of container plants would be logistically challenging and thus expensive to implement effectively.

If and where native plant establishment and growth are insufficient to achieve the restoration objectives as measured by the performance criteria, remedial actions will be taken to address the known or likely factors limiting success, as outlined in Section 4.4. If plant establishment is limited, the analysis will evaluate whether this is due to soil conditions (e.g., lack of topsoil, erosion, etc.) which will be addressed first. If limited seedling establishment and survivorship are linked to insufficient propagule supply, then active revegetation techniques including seeding (first priority) and/or planting (only if seeding is not sufficient) will be used, where appropriate. Such treatments will be developed following the guidelines for revegetation methods of the IAMMP as outlined in Section 3.1.5 and will proposed in the annual work plan (Section 4.8); they will be review by the agencies as part of the annual meeting (Section 4.8) and will be approved prior to implementation.

3.2.3.2.5 Work Plan

As part of the final project design process, a qualified biologist will work with CDFW to develop a detailed work plan for implementation of the trail restoration and access management treatments including:

- Signage and fence locations, based on the criteria outlined above and detailed examination of the site conditions including ingress/egress and vegetation (i.e., brush barriers);
- Species protection measures, including pre-project surveys and biological monitoring (Section 3.3);
- Site preparation methods, including delineating fence areas and flagging covered plants or other non-target species;
- Personnel including crew size and number and qualifications of supervisors as well as biological monitors;
- Crew access including routes and travel methods;
- Biomass removal methods for any vegetation removed to install fences or signs;
- Anticipated follow-up treatments, which will be refined based on monitoring (Section 4);
- A budget for all work to conduct the project initial and follow up treatments, and species protection measures.

If the budget for the work outstrips the initial startup funds available for the LOHCP, as described in Section 7.2.4 of the LOHCP, then the treatment area may need to be reduced relative to that illustrated in Figure 15 to focus on the priority areas for trail restoration and access management, such as by addressing areas where impacts of current trails or trail proliferation is greatest.

The work plan will be provided to CDFW and the USFWS for review at least one month prior to implementation of the project to enable final review and approval.

3.3 Species Protection Measures

The restoration treatments in this plan are designed to enhance habitat for the covered species and promote their long-term population persistence; however, they have the potential to cause inadvertent, short-term negative impacts to individuals and perhaps populations (McGraw 2020). The potential for these impacts will be avoided or minimized through implementation of measures identified in the Los Osos HCP as well as the environmental impact report (Rincon 2019). As part of work to develop the project work plans, the project biologist will develop a final set of species protection measures for each project based on the site conditions and the applicable measures below.

3.3.1 Overall

Bio-1: Environmental Awareness Training: Prior to initiation of any ground-disturbance, a United States Fish and Wildlife Service (Service)-approved biologist will conduct a pre-construction training that will be attended by all people who will participate in the project. The training will include a fact sheet that will provide information about the ecology and threats to the covered species, as well as other special-status species occurring in the project area (Table 2), including legless lizard (*Anniella pulchra*) and coast horned lizard (*Phrynosoma blainvillii*). The fact sheet will include pictures of each species and outline the avoidance and minimization measures that personnel must implement during the course of the project to protect them.

3.3.2 Indian Knob Mountainbalm

The following measures will be integrated into project work plans to avoid impacts to Indian Knob mountainbalm individuals. If the biologist, the County (or its implementing entity), and/or the agencies determine these measures are not sufficient to avoid impacts to Indian Knob mountainbalm, the County or its Implementing Entity will seek a State Scientific, Educational, and Management Permit under section 2081(a) of the Fish and Game Code, as the LOHCP take permits will not authorize take of this species (McGraw 2020).

IKM-1 Pre-Project Survey: Prior to initiation of any restoration treatments, a qualified biologist will conduct a survey for Indian Knob mountainbalm within the project areas, including the treatment areas, access routes, and any staging areas. All Indian Knob mountainbalm individuals encountered will be flagged or fenced, as needed, to facilitate avoidance by crews.

IKM-2 Herbicide Avoidance: In areas that support Indian Knob mountainbalm, herbicide application will be avoided in favor of manual or mechanical treatments, as feasible. Where herbicide treatment is deemed necessary, it will only be conducted if impacts to Indian Knob mountainbalm can be avoided through one or more of the following: 1) using a grass-specific herbicide (e.g., fluazifop-p) or other herbicides that otherwise will not harm the species, and/or 2) establishing a no-spray buffer around the shrubs that will prevent overspray and impacts. The buffer will be determined based on the PCA recommendations and will consider the method of application (e.g., foliar spray, daubing, or wicking), the herbicide, and the weather conditions, among other factors.

3.3.3 Morro Manzanita

MM-1 Pre-Project Survey: Prior to initiation of any restoration treatments, a qualified biologist will conduct a survey for Morro manzanita within the project areas, including the treatment areas, access routes, and any staging areas. All Morro manzanita individuals will be flagged or fenced, where needed, to facilitate for avoidance by crews.

MM-2 Herbicide Avoidance: In areas that support Morro manzanita, herbicide application will be avoided in favor of manual or mechanical treatments, where feasible. Where herbicide treatment is deemed necessary, it will only be conducted following methods that minimize impacts to Morro manzanita, including through one or more of the following: 1) using a grass-specific herbicide (e.g., fluazifop-p) or other herbicides that do not harm the shrub, and/or 2) establishing a no-spray buffer around the shrubs that will prevent overspray and impacts. The buffer will be determined based on the PCA recommendations and will consider the method of application (e.g., foliar spray, daubing, or wicking), the herbicide, and the weather conditions, among other factors.

3.3.4 Morro Shoulderband Snail

MSS-1 Pre-Project Surveys: Prior to initiation of any restoration treatments, a Service-approved biologist shall conduct a survey of the treatment area, including any access or staging areas, to evaluate presence of Morro shoulderband snail. All individuals will be relocated to suitable habitat away from the treatment area as outlined in Measure MSS-3.

MSS-2 Biological Monitoring: A Service-approved biologist will be present during invasive plant management and trail restoration activities that involve soil disturbance or vegetation removal (e.g., fence or sign installation) to similarly capture and relocate Morro shoulderband snails to suitable habitat away from the treatment area. During invasive plant management, the biologist will work alongside crews to inspect the branches and litter to detect any Morro shoulderband snails (including their egg masses) that may be present including on veldt grass and iceplants. Crews that encounter snails will cease work in the area until the biologist can take appropriate measures including relocation, as outlined in Measure MSS-3.

MSS-3 Relocate Morro Shoulderband Snails: Live Morro shoulderband snail in any life stage that are encountered during pre-project surveys and biomonitoring will be captured and moved by the biologist to suitable habitat located within the MDER. The biologist will identify the most suitable receiver site, which will generally be located near the treatment area in suitable habitat, as part of the work plan approved by the agencies. Within the designated receiver site, Morro shoulderband snails shall be placed in or near the center of a habitat patch to maximize chance of survival; habitat edges will be avoided.

Capture of individuals will be handled with care for the minimum time necessary. They will be placed in a protective, secure container that contains a layer of duff comprise of native leaf litter. Individuals should be kept in the protective container for the minimum amount of time necessary to move them to the receptor site; in any case, individuals will not be kept in the container for more than an hour. During this period, the biologist must take measures to keep individuals out of the direct sunlight and situations of excessive heat.

Individuals Morro shoulderband snails shall be gently transferred from their protective container to the base of a native shrub species with low-lying branches that can provide cover. The aperture (main opening of the shell) should face the ground surface. The biologist shall gently cover the Morro shoulderband snail with one to two inches of leaf litter.

Capture and release date, times, and locations shall be recorded and provided to CDFW and USFWS in the annual report.

M22 -4 Avoid Trampling Vegetation and Habitat: Measures will be taken to avoid trampling non-target plants during treatment to maintain refugia for Morro shoulderband snails within the treatment area.

3.3.5 Morro Bay Kangaroo Rat

Prior to implementation of the project, a pre-project survey will be conducted for Morro Bay kangaroo rat within the project area, including the treatment area as well as any access routes and staging areas. The survey protocol, which is contained in Appendix F of the LOHCP, will be implemented to ensure that the project does not impact Morro Bay kangaroo rat individuals, as the species is fully protected as well as State endangered and the LOHCP will not result in issuance of a State take permit.

4 Restoration Monitoring and Adaptive Management

This section describes how monitoring will be conducted to evaluate effectiveness of the restoration projects and achievement of the success criteria and thus crediting of compensatory mitigation.

The restoration areas will be monitored to:

1. Evaluate performance of the restoration treatments at achieving their goals and objectives, to gauge their success and thus establish mitigation credit under the LOHCP;
2. Examine the distribution and abundance of Morro shoulderband snail, Morro manzanita, and Indian Knob mountainbalm and assess conditions of Morro Bay kangaroo rat habitat;
3. Determine the need for remedial actions to achieve the performance criteria; and
4. Compare post-restoration habitat conditions to baseline conditions of the reserve.

Monitoring will occur through two main approaches:

1. **Qualitative monitoring** will be used to generally assess changes in site conditions and identify the need for follow-up treatments and remedial actions; and
2. **Quantitative monitoring** will be used to assess plant community structure and species composition to evaluate whether the treatments have achieved their performance criteria by comparing them to intact habitat within the site (i.e., in reference sites), and also assess the frequency and abundance of Morro shoulderband snail to evaluate use of the restoration areas by this covered species.

The following sections describe the two main monitoring approaches and provide specific protocols for each. It also describes how mitigation will be evaluated (Section 4.3), remedial actions will be identified (Section 4.4), and mitigation areas and credits will be determined based on performance of the restoration treatments (Section 4.5). Additional sections describe how ongoing management will be used to maintain the restoration areas (Section 4.6), the adaptive management framework that will be used to implement the plan (Section 4.7), and how restoration will be reported and coordinated with the wildlife agencies (Section 4.8).

4.1 Qualitative Monitoring

Visual observations including photographs will be used to track the status and condition of the restoration treatment areas over time.

4.1.1.1 Photomonitoring

Photomonitoring will be used as part of this plan to:

1. **Document the baseline conditions of the treatment areas,** including any access routes and staging areas, prior to initiation of the restoration projects. The photographs, along with narrative descriptions, will be used to document any existing damage, defects or hazards in the work area prior to the mitigation work, as described in Section IV(B) of the MOU between the County and CDFW.

2. **Evaluate changes in** habitat conditions including plant community structure in the restoration treatment areas over time.

Photomonitoring will be conducted prior to initiation of restoration and then upon completion of each project. Prior to initiation of restoration treatments, permanent photomonitoring stations will be established throughout the restoration areas, including access routes and staging areas, to capture important baseline conditions as well as representative conditions. To facilitate relocation, photostation locations will be permanently monumented on the ground (e.g., using a metal plate or other marker) and recorded using a resource-grade GPS. At each point, the general subject and view direction (azimuth) will be recorded for each photograph. The digital photographs will be labeled according to the station, azimuth, and date; for example, P05_143_20200504 would be the name of a photograph taken at photostation 5 with an azimuth of 143 degrees on May 4, 2020. Labeling photos in this way will enable them to be viewed sequentially to readily evaluate changes over time when stored in the same digital file folder.

4.1.1.2 Quarterly Monitoring

Quarterly monitoring of the restoration areas will be used to:

- Assess treatment effects including their effectiveness at promoting native plant establishment and limiting exotic plant cover, any additional effects including unintended consequences (e.g., non-target species impacts from herbicides);
- Evaluate habitat conditions including the distribution and abundance of any invasive plants and any covered species that are observed; and
- Determine the need for remedial actions to enhance treatment effectiveness, address unintended consequences, or promote covered species populations.

The specific observations and data collected during quarterly monitoring will vary depending on the restoration project(s) being implemented. All projects will examine the following: invasive plants, erosion, human activities, including trail use and vandalism.

The quarterly monitoring for the eucalyptus removal will also include assessment of container plant status and need for maintenance. The project workplans can identify additional factors to assess during quarterly monitoring as well.

4.2 Quantitative Monitoring

Quantitative monitoring will involve collecting data from replicate plots located in the restoration areas and intact communities within the same reserve unit, which will serve as reference sites. The data will be collected to assess whether the restoration areas feature sufficient native plant cover and native plant species richness to achieve the long-term objectives, or success criteria, based on shorter-term measures, or performance criteria. The covered species will also be monitored in the restoration areas; however, restoration success and performance will be gauged based on the ability of the treatments to create natural community structure and species composition, as described in this section.

4.2.1 Success Criteria

Quantitative monitoring of plant species composition will be used to evaluate whether the restoration projects proposed in this plan are meeting the following quantitative objectives, which constitute the success criteria for restoration:

1. Absolute native plant species cover and native plant species richness that are similar to those values measured in intact areas of the same community type. The composition of species in the restoration site should be similar to that in the reference sites as well.
2. Absolute exotic plant cover that is similar to that measured in intact areas of the same community type and successional stage.

These success criteria for the initial restoration work of this IAMMP reflect the goal to re-create native plant community composition and reduce two key stressors to the covered species: invasive plants and incompatible trail use (Sections 2.7 and 3.1.4). Addressing these stressors is anticipated to benefit the covered species in the long-term by promoting native plant establishment and, in doing so, recreating the natural community structure and species composition of the covered species habitat. Addressing the stressors is also anticipated to promote populations directly through other mechanisms as outlined in Table 6.

The abundance of Morro shoulderband snail, Morro manzanita, and Indian Knob mountainbalm within the restoration areas and reference sites will also be examined as part of this monitoring study, which can also be used to evaluate suitable habitat conditions for Morro Bay kangaroo rat. However, the success of the restoration will not be evaluated based on covered species abundance. Colonization of the treatment areas by the covered species, and their occurrence within the monitoring plots, will be influenced by a variety of factors including the suitability of microhabitat conditions, which will vary within the restoration treatment areas, the distance of the restoration treatment areas from occupied habitat, and the timeframe for monitoring restoration; a time lag is expected between removal of the stressors and establishment of the covered shrubs and dispersal by Morro shoulderband snails.

If the monitoring of the restoration treatment areas as outlined below reveals that the covered plants and Morro shoulderband snail do not become established in the restoration areas that otherwise achieve their performance criteria based on plant community structure and species composition, and if the results of the long-term monitoring of the populations as part of the LOHCP AMMP reveals declines relative to the baseline, which will be established as part of the AMMP as described in Appendix E of the LOHCP, then future restoration and management projects developed as part of the AMMP will incorporate additional measures to promote the covered species populations. These additional measures could include growing and outplanting Indian Knob mountain balm and Morro manzanita, and translocating Morro shoulderband snail from occupied habitat into the restoration areas. Such efforts would be evaluated to examine their effectiveness at restoring habitat for the species as well as enhancing understanding of the habitat factors that influence their distribution, abundance, and population growth and persistence. However, the approach of the LOHCP as a habitat-based conservation plan is to promote the covered species populations by addressing the anthropogenic factors that limit their populations and reserve more intrusive interventions including planting and translocations for if/when restoration are not successful.

4.2.2 Performance Criteria

Performance criteria will be used to evaluate whether each restoration project is on track to achieve its success criteria. That is, while ultimate success is defined based on achieving similar native plant cover and species richness as in intact natural communities (reference sites), achieving this objective could take several years. This is because the reference sites are not subject to ongoing anthropogenic disturbances (e.g., trail use) and do not support (large) populations of invasive and exotic plants; as a result, they feature relatively high cover and also diverse assemblages of native plants. It will take several years or perhaps more than a decade, in the case of the maritime chaparral communities, to establish native plant species cover and richness that is similar to that in communities that have not been recently disturbed by trails or invasive populations. Likewise, exotic plant populations may initially be higher in the short term than desired in the long term, since many exotic plants are disturbance adapted (Hobbs and Huenneke 1992) and could be promoted by aspects of the restoration treatments. Accordingly, it may take several years to reduce their populations to those observed in the intact natural communities selected as reference sites.

For this reason, performance criteria were established to gauge whether the treatments are likely to ultimately achieve the desired metrics for native plant cover, native species richness, and exotic plant cover over time. The performance criteria identify the level that must be achieved at three monitoring intervals within the five-year restoration period to conclude that the revegetation is performing as desired and will likely achieve the success criterion over time, as part of succession. Once they are met, the mitigation can be calculated and credited (Section 4.5). The restoration sites will be subject to ongoing management and observation to ensure they continue to proceed toward the desired future condition (Section 4.6).

As described in greater detail in Section 4.2.3, the performance criteria will be evaluated by sampling plant species composition within replicate plots randomly located within the restoration areas and comparing those measurements to data collected from reference sites: intact (non-degraded, non-managed/restored) habitat of the same community type within the same reserve unit. This reference site approach is designed to help ensure that the restoration is compared to conditions that are comparable to intact natural communities both spatially and temporally (White and Walker 1997, Holl 2020).

The performance criteria were selected to reflect the anticipated trajectories of plant species populations following the treatments and were established for years 2, 4 and 5 (Table 8). They were developed based on the available literature on the rates of passive revegetation following disturbance, which are admittedly limited since researchers often do not monitor passive (but rather active) revegetation projects (Section 3.1.5.1). As a result, the quantitative targets represent hypotheses (educated guesses) for successful restoration trajectories, as there are no known published data from this system or an ecologically analogous system under similar treatments as proposed here. If the performance criteria are determined to not effectively reflect the efficacy of the restoration areas at achieving the goals and quantitative objectives, then they can be adjusted, with approval from the wildlife agencies, as part of the adaptive management process (Section 4.7).

The criterion for exotic plant cover is based on (raw) absolute cover measured in the restoration sites, as exotic plants can be subject to active control as part of the restoration treatments. The specific criteria call for a reduction in exotic plant cover over time, based on the assumption that exotic plants may establish early in the restoration, as many exotic plants are disturbance adapted (Hobbs and Huenneke

Table 8: Performance criteria to gauge long-term success of the restoration

	Percentage to be achieved in each Monitoring Year		
Measure and Specific Metric	**Year 2**	**Year 4**	**Year 5**
Native Plant Cover (All Species) (minimum percentage relative to reference site)[1]	10	20	40
Native Woody Plant Cover (Shrubs and Trees Only) (minimum percentage relative to reference site)[1]	5	15	20
Native Plant Species Richness (minimum percentage relative to reference site)[1]	15	30	50
Exotic Plant Cover (maximum absolute value)[2]	25	10	5

[1] These values represent the minimum percentage of the value in the restoration (i.e., treatment) area relative to the value in the reference site. For example, if the restoration area has 20% cover of native plants while the reference site has 40% cover of native plants, then the restoration site has 50% of the reference site. Likewise, a restoration site with 6 native plant species would have 33% of the native species richness of a reference site with 18 species.

[2] This is the maximum absolute cover of exotic plants in the restoration site. That is, the restoration site can have no more than 25%, 10%, and 5% absolute cover of exotic plants in years 2, 4, and 5, respectively.

1992), but that that their abundance can and should be controlled to promote native plant establishment and growth within the sites.

The performance criteria for native species, (total) native plant cover, woody native plant cover (i.e., cover of shrubs and trees), and native plant richness, are based on percentages of the values measured in the reference sites. A separate revegetation criterion is provided for shrubs and trees to ensure that these important species are establishing within the site.

These performance criteria reflect the desire to have the restoration sites increase in native plant cover and richness over time but recognizes that, due to their earlier successional stage, the absolute values will necessarily be lower as described above. Using a comparative approach addresses the potential for interannual variability in rainfall to influence the reference and restoration sites, and allows that temporal variability in the reference site to be factored into the target conditions.

For example, if the plots located in the reference area in California Sagebrush-Black Sage community at Bayview Unit average 50% cover of native shrubs, then in the second spring following restoration, the performance criterion for native woody plant cover would be 2.5% cover. This criterion would increase to 7.5% in Year 4 and 10% in Year 5, assuming that cover in the reference site remains at 50% over time; however, the criteria would be adjusted if the measured shrub cover in the restoration area changes to ensure that the reference areas are comparable temporally, as outlined below.

4.2.3 Sampling Design

As noted above, performance criteria will be quantified in replicate plots randomly located within the restoration areas, which will be compared to data collected from reference sites located within the same community type and reserve unit (i.e., Bayview or Pecho). This reference site approach is designed to help ensure that the restoration is compared to conditions that are comparable to intact natural communities both spatially and temporally (White and Walker 1997, Holl 2020).

1. **Spatially,** the reference sites will be located in the same unit and community type of the MDER where the restoration is occurring. This approach will help ensure that abiotic conditions (e.g., soils, slope-aspect, slopes) and species pools of the reference site are similar to those in the restoration areas and thus represent an appropriate 'yardstick' for assessing successful restoration.
2. **Temporally,** reference site conditions will be quantified the same year as data are collected in the restoration sites. This will reduce the potential for interannual variability in weather (e.g., high precipitation or drought), which can have strong effects on native plant cover and richness in sandy soil systems, to cause measurements in reference and restoration sites to differ, as might be the case if they were collected in different years. In contrast, sampling the reference and restoration sites in the same year will enable more apt comparison.

Figure 18 illustrates reference site locations within the various maritime chaparral and coastal sage scrub communities where restoration projects are planned within the Bayview Unit. Figure 19 identifies the reference site within the Morro manzanita chaparral within the Pecho Unit, that would be used to evaluate success of the eucalyptus restoration. These areas were selected based on on-the-ground examination of site conditions and aerial image analysis, which indicate that these areas feature plant communities that are dominated (in terms of cover) by native plants characteristic of the specific communities (i.e., series), as described in Section 2.5. Specifically, they are dominated by the characteristic native shrubs, and in the case of the California sagebrush, Morro manzanita-California sagebrush, and Morro manzanita-Wedgeleaf ceanothus series, they also feature perennial herbs and subshrubs and open (unvegetated) areas featuring lichens and other cryptograms and annual plants; the Morro manzanita chaparral areas generally feature a dense canopy of shrubs with emergent coast live oak).

The reference sites areas are traversed by some trails and likely also feature isolated occurrences of (unmapped) invasive plants; these and any other areas will be excluded from sampling and analysis, as outlined below. The degraded habitat will be subject to restoration as part of this IAMMP or the AMMP. The intact habitat within the reference site areas within the MDER will still require future management to address anthropogenic stressors including the invasion and spread of exotic plants, fire (exclusion and wildfire) and incompatible uses, as well as changed circumstances caused by climate change. As a result, these areas can be used as reference sites for restoration under the IAMMP while still being subject to enhanced manage and monitoring under the AMMP.

Sample plots within restoration and reference sites will be randomly located using the "create spatially balanced random points tool" in ArcGIS or a similar method that randomly selects plots throughout the sampling strata (i.e., restoration or reference site). This tool will enable the sample plots to capture the range of variation and avoid human bias associated with siting the plots deliberately. Reference site plots should collectively feature a mix of structure and species composition, including canopy gaps

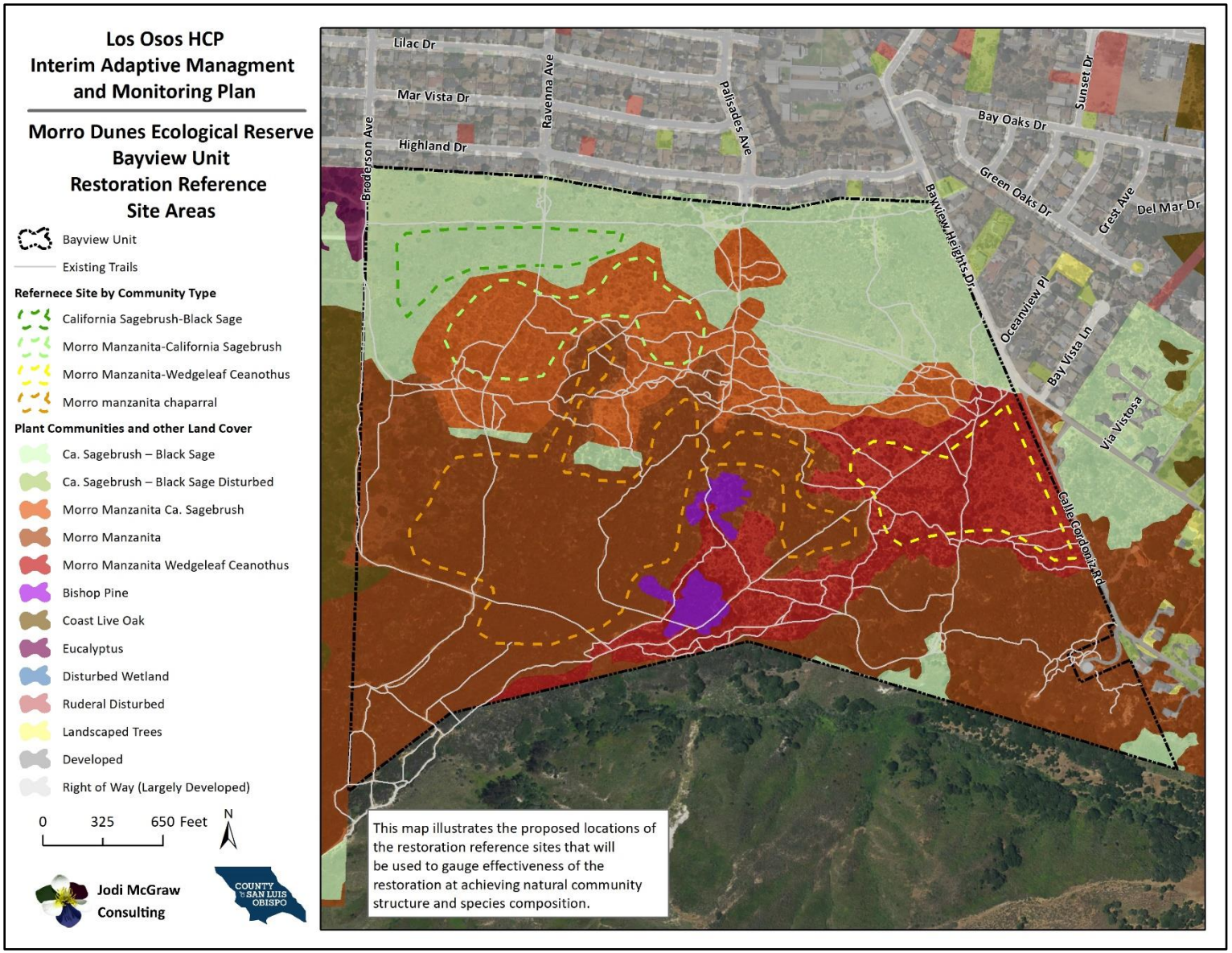


Figure 18: Restoration reference areas within the Bayview Unit of the Morro Dunes Ecological Reserve

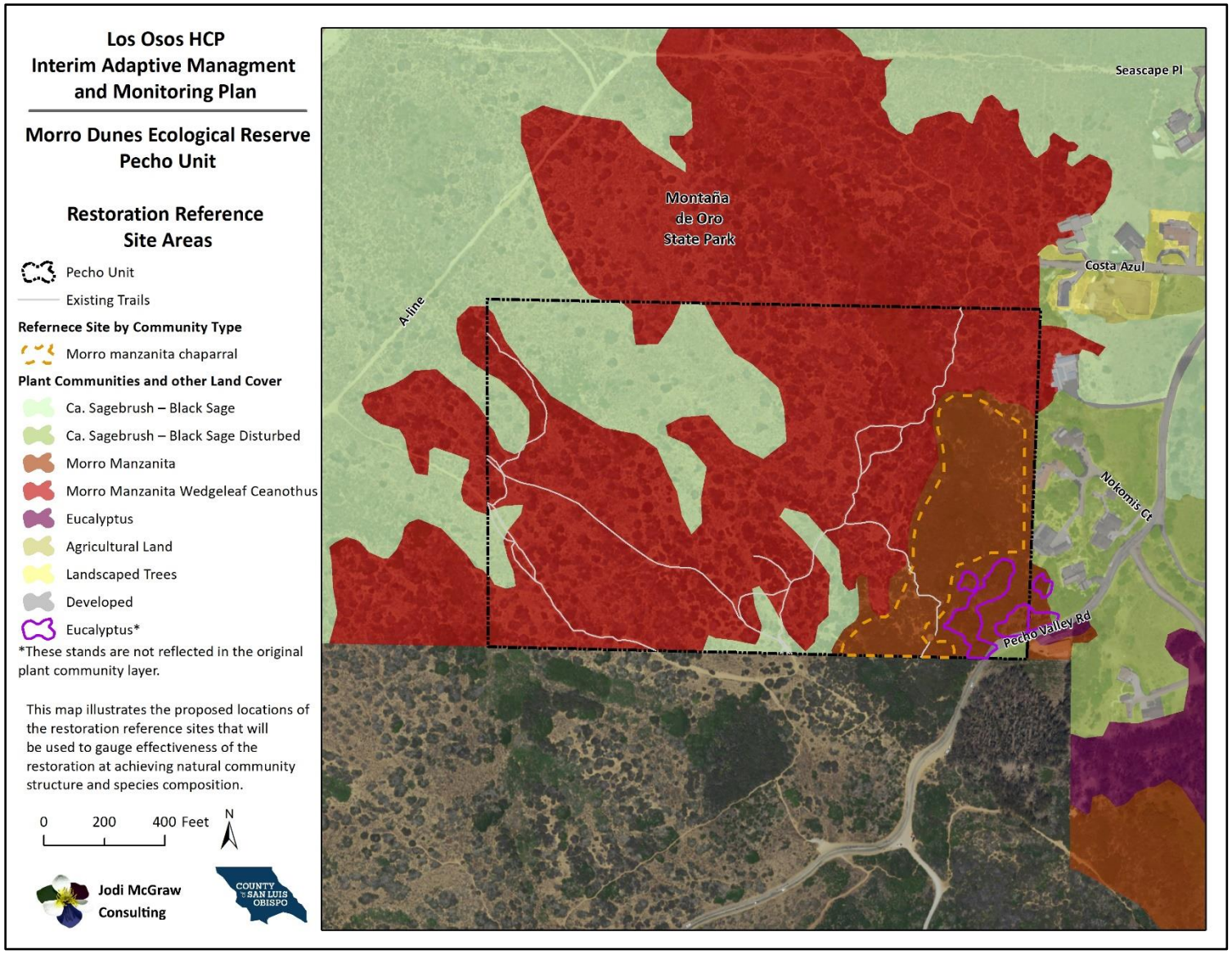


Figure 19: Restoration reference areas within the Pecho Unit of the Morro Dunes Ecological Reserve

between shrubs as well as areas of dense shrub (and tree) cover. However, reference plot locations will not be selected to be 'representative' in other respects. If any randomly located sample plots are located in areas that are unsuitable as references for restoration, because they feature anthropogenic factors that degrade habitat (invasive plants, trails, erosion, etc.), those plots locations will be replaced with alternates that are also randomly located.

For each restoration project (i.e., eucalyptus removal, trail restoration, and veldt grass control), a minimum of five plots will be sampled in the restoration area and also the reference area within each community type; stratifying sampling by community type will enable examination of differential performance of the restoration in the different plant assemblages, while also enabling direct comparison of restoration areas to their appropriate reference areas. The number of plots to be sampled in each sampling area may need to be increased (above five) if the plots are highly variable. To reduce costs associated with monitoring, the same reference plots (or a subset thereof) can be used for evaluating the effects trail restoration and veldt grass control within the Bayview Unit.

In each area, narrow rectangular plots (e.g., 1 m x 5 m) plots will be used, to facilitate sampling of trails (which are long and narrow), better capture native plant richness, and increase the diversity of the habitat sampled, both of which are generally greater in rectangular compared to square plots.

The plots will be permanently monumented (e.g., using metal stakes or other suitable markers) and georeferenced using global positioning system so that they can be resampled, as needed, thus reducing interannual variability associated with using temporary plots.

4.2.4 Data Collection

Data will be collected from each plot at two time periods: in the winter rainy season, to evaluate use by Morro shoulderband snail, and during the spring, to evaluate plant community structure and species composition, including occurrences of the covered plants.

During the winter rainy season when Morro shoulderband snails are most active and therefore visible, biologists will carefully search the vegetation, litter, and top one inch of soil for a specified period of time (e.g., 10 minutes). The time-constrained search should provide enough time to search the entire plot while avoiding inadvertent bias (e.g., searching plots located in perceived 'good habitat' longer). The number of live and dead snails will be recorded according to each of the three age classes developed by Roth (1985; Box 3). Dead snails (empty shells) will be removed from the plots so that they are not counted in future monitoring. Monitors will also record the number of other terrestrial snails including the native Big Sur shoulderband snail (*Helminthoglypta umbilicata*) and introduced European brown garden snail (*Cornu aspersum*) observed in each plot. If repeated sampling of plots for Morro shoulderband snail in years 2, 4, and 5 proves destructive, such as

Box 3: Morro Shoulderband Snail Age Classes (Roth 1985)

Category A: with periostracum intact or nearly so, shell about as in life although generally with some loss of luster and translucency. Age is approximated to be less than 1.0 year old.

Category B: with periostracum mostly or entirely missing, pigmentation of shell retaining brown. Age is approximated to be between 0.5 year and 2 years old.

Category C: with periostracum missing, shell white, all or nearly all brown pigment removed by erosion or bleaching. Age is approximated to be from 1.5 years old, possibly to 10.0 years or older.

if the surface litter and/or established plant cover is displaced in a manner that would degrade native plants or deter use of the habitat by Morro shoulderband snail, then methods of evaluating Morro shoulderband snail habitat use, such as temporary plots, will need to be used.

During the spring, when annual plants are in peak flower (e.g., mid-April to late May) and therefore have their highest visibility and cover, the absolute cover of each plant species will be estimated visually using the following values: 0.1%, 0.5%, 0%, and any integer between 1% and 100%. Additional data will be collected to understand factors that might influence plant community structure and species composition, including:

- Litter cover, using cover values;
- Litter depth;
- Soil depth, using a soil probe; and
- Canopy cover, using a spherical densiometer.

Quantitative monitoring will be conducted in years two, four, and five. Data will be collected by biologists who can identify the plant species and estimate their cover in an accurate and repeatable manner, and who can identify terrestrial snails in the region, including Morro shoulderband snail, and classify individuals based on thee age classes (Box 3).

4.2.4.1 Data Analysis

The spring plot data will be used to calculate the mean and standard deviation of the three main metrics:

1. **Native plant cover:** the sum of the absolute cover of all native plants;
2. **Native plant richness:** the number of species in each plot; and
3. **Exotic plant cover**: the sum of the absolute cover of all plants not native to the Los Osos Baywood fine sands ecosystem. This would include plant species that are native to California, but not native to this ecosystem, such as such as Monterey pine (*Pinus radiata*) or Monterey cypress (*Hesperocyparis macrocarpa*).

Other variables can be calculated to explore patterns in the data and evaluate the treatments; for example, the percent cover of native shrubs, versus that of native herbs, can be calculated to assess plant community structure.

The measures above will be calculated for the restoration areas and then compared to values from corresponding reference sites. Mean values from the reference site will be multiplied by the relative (i.e., percentage) values established as performance criteria (Table 8) to assess whether the restoration sites are achieving the performance criteria.

The frequency and abundance of Morro shoulderband snail (by age class), Morro manzanita, and Indian Knob mountainbalm in the restoration treatment plots will also be quantified and compared to reference sites to evaluate the extent which the restoration treatments promote natural recolonization of the covered species. The plant community composition and structure will be compared to that described as suitable for Morro Bay kangaroo rat, as detailed in Section B.4 of the LOHCP. However, as

described in Section 4.2.1 , there are no specific success criteria (or performance criteria) related to the species occurrences or specific habitat conditions tied to the species for these restoration projects. Instead, the restoration success will be evaluated based on whether it achieves native plant community structure and species composition similar to that in the intact habitat located within the reference sites.

4.3 Mitigation Evaluation

The data analyses outlined above will be used to evaluate whether the restoration projects have achieved their performance criteria in years two, four, and five following treatment. For example, if the eucalyptus trees are removed in September 2021, and the treatment area is revegetated in winter 2021-2022, then monitoring would be conducted in April or May 2023, 2025, and 2026. If the tree removal or revegetation are delayed, so too will the monitoring be delayed, so that it occurs two, four, and five years after treatment, rather than on a fixed annual calendar.

For the veldt grass and trail restoration projects, achievement of the performance criteria will be used to credit the restoration as mitigation, as outlined in Section 4.5. For the eucalyptus removal project, mitigation credits will be generated following removal of the trees and their biomass from the site (Section 3.2.1.2.2). This reflects the more immediate benefit of this project from a restoration and risk-reduction standpoint.

For the veldt grass and trail removal projects, if the restoration area or portions thereof are not meeting the performance criteria overall, descriptive statistical analysis and further on-the-ground assessment will be used to identify specific restoration areas that are meeting the objectives versus those that are not. In this approach, the mean values for native cover, native species richness, and exotic plant cover calculated within intact habitat will be used as the basis for evaluating whether each treatment area has achieved the performance criteria.

If the performance criteria are not being met three years following treatment but progress suggests they will achieve the Year 5 criteria with more time, monitoring can be repeated in subsequent years after the treatments; this will allow more time for the beneficial effects of the restoration treatments to develop, including by allowing native plant regeneration to progress. Additionally, subsequent monitoring can be conducted following implementation of remedial actions to promote success.

4.4 Remedial Actions

Where additional treatments are determined to be needed to facilitate achievement of the restoration success and performance criteria, such remedial measures will be taken. The specific measures will depend on the conditions of the site and the factors determined to be inhibiting achievement of the performance criteria; as a result, the actions may differ among treatment areas as well as projects. Table 9 identifies examples of potential actions that could be taken to promote achievement of the performance criteria based on issues identified during monitoring of the restoration areas and the overall approach to landscape-level habitat restoration and management outlined in section 3.1.4. To ensure that sufficient funding is available to implement remedial actions, budgets in project workplans should feature funding for remedial actions.

Table 9: Examples of Remedial Actions that can be Implemented to Achieve Performance Criteria

Issue	Description	Potential Remedial Actions
Trampling	Ongoing trampling by humans, horses, and/or dogs limits native plant establishment and performance	• Install additional fencing, signage, or brush piles to deter ongoing use • Conduct additional patrols and outreach to deter ongoing use
Erosion	Wind, water, or gravity displace soil and limit native plant establishment or performance	• Install erosion control based on the erosion feature, including surface treatments (e.g., weed free hay or rice straw), coir rolls (wattles), brush piles, or other biotechnical treatments to intercept rainfall and break up flow paths. • Use active revegetation where seeding and/or planting can help stabilize soils and slopes
Exotic Plant Competition	Exotic plants limit native plant establishment or performance	Conduct targeted treatments to reduce the abundance or competitive effects of exotic plants
Non-Target Native Plant Competition	Abundant early successional native plants (e.g., *Erigeron canadensis, Heterotheca grandiflora*) limit shrub establishment and performance	• First, confirm that early successional species are having competitive effects, as many can be abundant initially in restoration sites but decline over time and may actually facilitate native shrubs (e.g., through soil development, or by acting as nurse plants). • If early successional native plants are inhibiting shrub establishment, conducted targeted removal
Limited Seed Availability	The seed bank and seed dispersal are insufficient to establish native plants of the target species/community	Identify species or guilds (e.g., shrubs) missing from the restoration site and seed site-collected seed of these species. If they fail to establish from seed, develop a planting plan to grow and outplant container stock to complement existing native plants.
Limited Native Plant Survivorship	Native plants established from seed (natural or seeded) and/or outplanted container stock experience low survivorship and/or growth	Identify the factors influencing poor native plant performance and address them. For example: • Protect plants from exposure (e.g., shade cloth) • Apply a thin layer of weed-free straw or mulch around plants to reduce evaporative water loss • Provide protection from herbivory (e.g., cages) • Provide supplemental water (irrigation) Outplant (additional) native container stock if/where doing so is anticipated to establish native plant cover

In areas where aspects of the habitat (e.g., topography) are determined to inhibit restoration performance in ways that cannot be overcome with remedial actions, at least not in a reasonably cost-effective manner, then these areas can be excluded from the final calculation of the restoration area.

This assumes that the areas are small and will contribute to overall heterogeneity of habitat conditions and will not present issues for the ecology and conservation of the site.

4.5 Determining the Mitigation Area and Credit

The compensatory mitigation value of the habitat restoration in this plan will be quantified on a per-acre basis. As part of steps to develop each project workplan, the specific treatment areas will be mapped using global positioning systems and/or remote sensing using geographic information system technology, which will enable spatial tracking of the treatments. After evaluation of mitigation effectiveness based on quantitative monitoring (sections 4.2 and 4.3), the areas deemed to achieve the restoration objectives will be measured to calculate the acres benefited to the nearest thousandth of an acre (i.e., 0.001 acres or 44 square feet). For the eucalyptus removal project, where restoration success will be based on or after tree and biomass removal, the area of tree removal and associated restoration treatments will be used to calculate the mitigation area and thus credits.

The projects in this plan will be credited as restoration, rather than management, under the LOHCP conservation program, as they meet the operational definition for restoration used in the LOHCP, which is to recreate native habitat structure and/or function where they have been lost or severely impacted by anthropogenic (human-related) factors (e.g., invasion by exotic plant species, vegetation removal; McGraw 2020). Thus, eucalyptus removal, veldt grass control, and trail restoration areas will generate 1.5 acres of mitigation credit for every one acre of habitat that achieves the restoration success criteria.

4.6 Ongoing Management

Once the treatment areas have been restored, the County will implement ongoing habitat management to maintain their conditions, as part of the LOHCP conservation program (McGraw 2020). This ongoing management for the restoration areas identified in this IAMMP is anticipated to entail the following:

1. **Exotic Plant Control:** Control of exotic plant species in the invasive plant removal areas, where the invasive plants as well as other exotic plant species may become established following treatment. Exotic plant control will also likely be needed in the trail restoration areas. The intensity and frequency of this maintenance is anticipated to diminish over time as the frequency and intensity of disturbance are reduced, native plants increase in cover and thus outcompete exotic plants, and the exotic plant seed sources, including seed bank, are reduced.
2. **Fence and Sign Replacement:** Signs and fences may need to be replaced following achievement of the objectives. The overall length of fencing that needs to be maintained is anticipated to decrease over time as trails are recolonized by plants and less attractive to users, and community awareness of, and support for, the trail closures increases.

Additional management activities may also be needed to maintain the restoration areas in keeping with the requirements of the LOHCP, which requires that areas credited as restoration mitigation be subject to ongoing management (McGraw 2020). These will be determined by the County during the course of restoration and monitoring. The management actions will be identified in the AMMP, which will guide ongoing management of the restoration areas addressed in this IAMMP

4.7 Adaptive Management

The IAMMP will be implemented in an adaptive management framework, which addresses the uncertainty inherent in habitat restoration and management, enables managers to adapt to changed conditions, and increases understanding of the covered species and communities over time, in ways that will promote long-term effectiveness of management. Adaptive management will also be needed to confront the changes in conditions during the course of implementation of the IAMMP. Changes caused by the invasion of new exotic plants or fire, among others, may necessitate changes in implementation of this plan.

As part of this adaptive approach, the results of monitoring of the restoration projects will be used to evaluate their effects on the covered species and communities, including their effectiveness at achieving the success criteria. Should the projects succeed, their benefits will be documented and used to inform future restoration and management. Should they fail, monitoring results will be used to inform future restoration projects to increase the likelihood restoration project success. Notwithstanding the objective of learning from unsuccessful projects, management and restoration projects will still be required to meet specified performance criteria (in the case of veldt grass removal and trail restoration) in order to be credited as mitigation (sections 4.3 and 4.5). The exception will be made if the performance criteria are found to be inappropriate (Section 4.2.2).

The success criteria and performance criteria used to evaluate them, will be revised, when needed, to ensure that the restoration achieves the restoration goals and objectives (sections 3.2.1.1, 3.2.2.1, and 3.2.3.1). Specifically, the IAMMP performance criteria identify quantitative targets predicted to indicate whether the restoration treatments are on track to re-create natural community structure and species composition over time. If monitoring reveals that those metrics (e.g., native plant cover) or their target values were not appropriate for the system, then the targets will be adjusted to better reflect the goals and objectives, with approval of the wildlife agencies.

Specifically, the performance criteria reflect an anticipated successional trajectory for native plant regeneration following initial treatment (invasive plant removal and/or trail closure). If the restoration metrics reflect the desired trajectory towards improvement but are not meeting the quantitative targets identified in Table 8, the role of anthropogenic related factors, such as human activities (e.g., trail use or vandalism), erosion, or exotic plants in deterring progress will be evaluated. If anthropogenic factors are found to be causing or contributing to slower than anticipated restoration progress, they will be addressed through remedial actions. If, however, anthropogenic factors are not causing reduced progress relative to the targets reflected in Table 8 and if the trajectory of the metrics indicates that the success criteria will be achieved over time, then the performance criteria will be adjusted to reflect the more realistic pace of native plant regeneration, with approval of the wildlife agencies.

4.8 Reporting and Agency Coordination

Activities implemented under this plan will be documented within the LOHCP annual monitoring reports, as outlined in Section 5.6 of the LOHCP (McGraw 2020). The annual reports for the IAMMP can be an appendix to the LOHCP annual reports, and will contain the following information:

1. Description of the restoration activities conducted, in terms of the area treated and specific management treatments implemented including any changes relative to the plan;

2. Species protection measures implemented and their outcomes including covered species observations and relocations, and incidental take/impacts;
3. Results of monitoring including qualitative and quantitative monitoring, if performed; and
4. Management and monitoring planned for the following year, including follow-up treatments and remedial actions.

The final annual monitoring report for the IAMMP will also document:

- the acres and location of habitat deemed successfully restored (Section 4.3);
- mitigation credits generated (Section 4.5); and
- ongoing management that will be used to maintain the restoration areas to ensure that the benefits for the covered species and communities are sustained (Section 4.6). These management measures will be incorporated into the LOHCP AMMP, which will guide ongoing management of the MDER following completion of this plan.

In the fall of each year, the County will prepare an annual work plan that will document the restoration treatments planned for the following year. The work plan will be provided to the wildlife agencies for review and approval at least thirty days in advance of planned work. After the work plan is circulated for review, the County will convene the wildlife agencies to discuss the work that was conducted during the current year, the results of qualitative and quantitative monitoring (which may be preliminary), and the proposed work plan for the follow year. Key discussion points and decisions from these meetings will be incorporated into the annual report provided the following winter, which will also contain the final work plan. Preparing the work plan in the fall/early winter and the annual report the following spring, will allow managers to plan the work based on preliminary results of monitoring, while allowing more time to prepare a detailed and comprehensive annual report.

5 Fuel Reduction

This section describes how fuel reduction can be conducted in the MDER by fire safety agencies and organizations seeking to develop a shaded fuel break as part of efforts to implement the Los Osos Community Wildfire Protection Plan (SLOCCFSC 2009)[3]. Specifically, it provides treatment recommendations to protect sensitive species and their habitat as well as identifies the avoidance and minimization measures that must be implemented for incidental take associated with the treatments to be covered under the incidental take permits issued based on the LOHCP. Such fuel modification is not proposed as mitigation under the LOHCP; however, it is described in this plan to ensure that the methods employed are consistent with the LOHCP, which includes implementation of fuel break as part of the Community Wildfire Protection Plan (CWPP) as a covered activity (LOHCP Section 2.2.7). The fuel break prescription and species protection measures are also provided in this IAMMP to ensure that the work is conducted in a manner that is compatible with the management of the MDER as a preserve within the LOHCP Preserve System, as well as a CDFW ecological reserve.

5.1 Background

In 2009, the San Luis Obispo County Community Fire Safe Council developed the CWPP, which identifies fuel reduction and fire hazard abatement treatments to reduce the risk of wildfire (SLOCCFSC 2009). The latest version of the CWPP for the Los Osos area (CAL FIRE/San Luis Obispo County Fire 2013) remains in draft form, covers San Luis Obispo County (not just Los Osos), and has yet to be adopted.

The approved CWPP calls for creation of a shaded fuel at the wildland-urban interface—the area between the intact native vegetation in parks and reserves (the wildland) on the perimeter of Los Osos, and the developed portions of the community (the urban area) in the center. In a shaded fuel break, vegetation is thinned to reduce the risk of fire and the rate of fire spread as well as provide a point of access to facilitate fire control. Shaded fuel breaks do not remove all vegetation in a given area but rather, reduce, modify, and manage fuels.

As part of coordination to develop the LOHCP, CAL FIRE Station 15, which works under contract with the Los Osos Community Service District to provide fire protection in the region, mapped an 89.4-acre area proposed for creation of a shaded fuel break (Figure 20). This included an approximately 100-foot-wide strip on the northern portion of the Bayview Unit where the unit abuts residences along Highland Drive.

While the CWPP identified a potential shaded fuel break in the southeast corner of the Pecho Unit (SLOCCFSC 2009), this fuel break was not included in the project description and the associated GIS layer provided to the County by CAL FIRE for coverage in the LOHCP; accordingly, this area was assumed to be dropped and was not included in the covered activities of the LOHCP.

The USFWS and CDFW have worked closely with CAL FIRE to develop avoidance and minimization measures for the CWPP; these measures have been incorporated into the LOHCP, which includes the CWPP as a covered activity (McGraw 2020). As a result of these measures and other aspects of the design of the project, the CWPP will avoid take of Morro Bay kangaroo rat and Indian Knob

[3] The latest version of the CWPP for the Los Osos area (CAL FIRE/San Luis Obispo County Fire 2013) remains in draft form and has yet to be adopted. Accordingly, the 2009 adopted plan is included as a covered activity in the LOHCP.

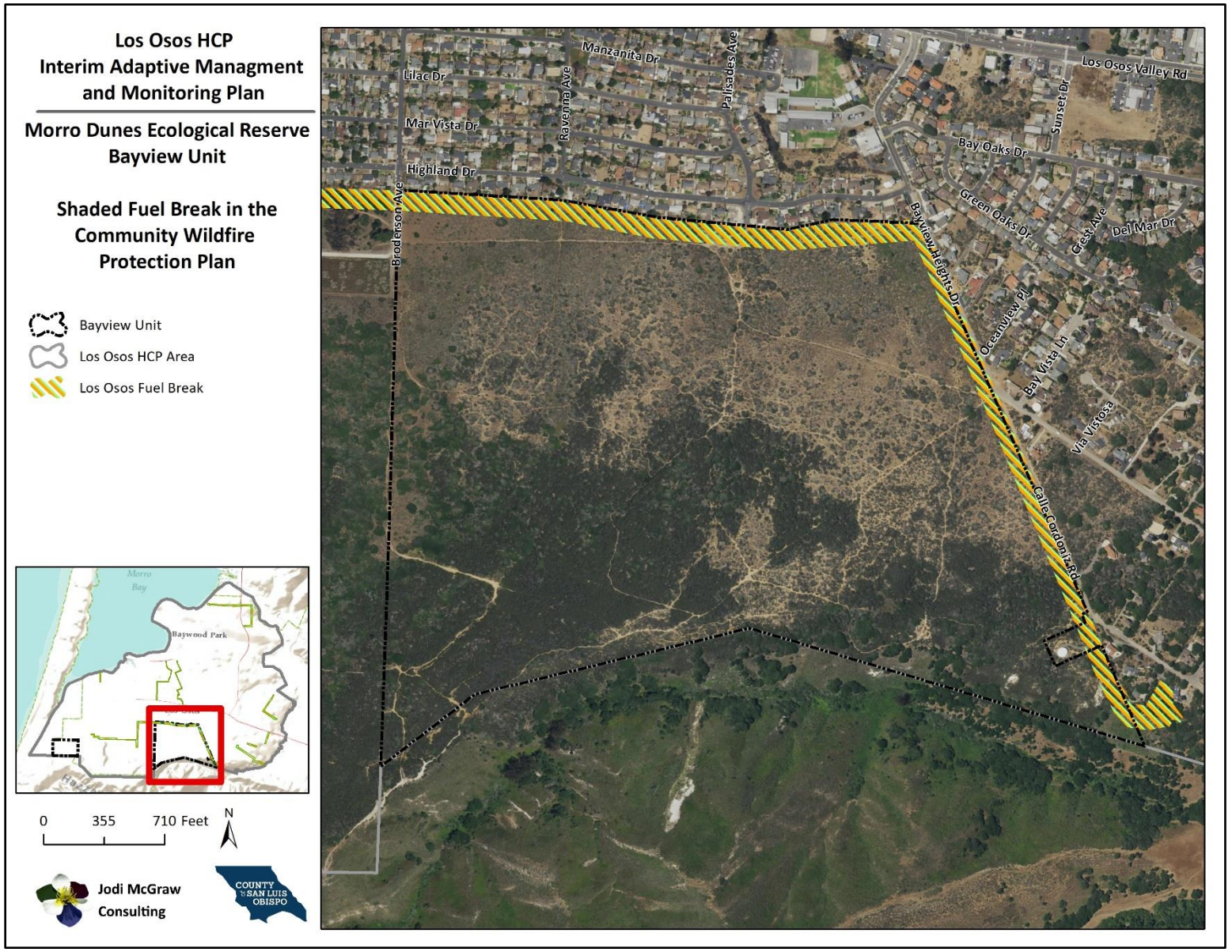


Figure 20: Fuel Break within the Bayview Unit Proposed as Part of the Community Wildfire Protection Plan

mountainbalm, and is anticipated to have negligible effects on Morro shoulderband snail and Morro manzanita through implementation of avoidance and minimization measures (McGraw 2020).

In 2019, CAL FIRE began constructing the fuel break within the Bayview Unit, where work to date has consisted of removing dead and downed material only; removal of live plants has not yet been initiated. The remaining work will be treated as funds allow. Cal FIRE and others must seek approval from CDFW for fuel break modifications prior to entering the site for work.

To help ensure that this restoration and management of the fuel break can be successful, the IAMMP provides recommendations for fuel reduction work in the MDER to maximize its benefits and minimize its impacts on the covered species and their habitats and to ensure that the work to reduce fire risk is maximally compatible with efforts to manage the MDER to promote populations of the covered species and safeguard sensitive habitat in the reserve. Such fuel modification is not proposed as mitigation under the LOHCP or the IAMMP.

5.2 Shaded Fuel Break Treatment Guidelines

The LOHCP specifies that, within the LOHCP Preserve System, CWPP projects must be designed and implemented to ensure that they limit their short-term negative impacts on, and maximize their ecological benefits for, the covered species and natural communities within the Baywood fine sands ecosystem.

The following are recommendations for future work to construct the shaded fuel break in the Bayview Unit by reducing fuels; the recommendations were based on the existing site conditions, including plant cover in the proposed treatment area and the sensitive ecology of the covered species and rare communities. Prior to implementation of the next phase of fuel break work in the reserve, a qualified biologist should be engaged to conduct a detailed assessment of the proposed treatment area and work with fire professionals to develop a fuel break prescription based on the current conditions within the treatment area and the fuel management objectives identified by the fire safety experts (i.e., desired height and spacing of remaining plants).That prescription should incorporate the following recommendations, which are listed in order of their priority for inclusion in the prescription; that is, step 1 should be implemented first, then step 2 should be implemented if and where additional biomass must be removed to achieve the fuel reduction objectives. Steps 3 and 4 should be implemented sequentially, only where needed to achieve the fuel reduction objectives.

> **Step 1: Remove Exotic Plant Species:** As part of work to reduce the amount and continuity of fuels within the fuel break, crews should prioritize removal of all plants (dead and alive) that are not native to the Baywood fine sands ecosystem. The target list should be compiled by a qualified biologist as during preparation of the site-specific prescription prepared based on examination of the treatment area, but should include the following species that have been observed in the designated fuel break area (i.e., the area within 100 feet of the residences along Highland Drive).
>
> a. Non-native trees including pines (other than naturally occurring Bishop pine, *Pinus muricata*) and cypresses (*Cupressus and Hesperocyparis* spp.);
>
> b. All escaped and planted ornamental plants including (but not limited to) Agave species, cacti (e.g., *Opuntia* sp.), yuccas (*Yucca* sp. or *Hesperoyucca* sp.), and daffodil (*Narcissus* sp.);

c. Invasive plants including veldt grass, freeway iceplant, and narrowleaf iceplant; and

d. Exotic annual grasses and forbs, including ripgut brome, red brome, and wild oats.

Removing these non-native plants can contribute to the fuel reduction goals for the shaded fuel break while also enhancing habitat for covered species, as required for the CWPP impacts to covered species to be covered under the LOHCP incidental take permit.

All biomass resulting from this and subsequent steps should be removed from the treatment area as part of the project and not left in piles for later burning, as such piles could be occupied by Morro shoulderband snail, which would then be incinerated. Woody biomass (i.e., shrub and tree branches) can be used by the County and/or CDFW to create brush barriers to close trails (Section 3.2.3.2.2.4).

Step 2: Remove Dead Biomass: After all exotic plants are removed, the next step to achieve fuel reduction should entail removing dead native shrubs and trees (if present) and their biomass laying on the soil surface (e.g., old branches). This material has ecological benefits including for Morro shoulderband snails, which can inhabit areas beneath dead shrubs, so some woody material should be retained where doing so is consistent with the fuel management objectives.

Step 3: Prune Live Shrubs and Trees: For senescent shrubs or trees featuring large areas of dieback, but that are still alive, cut dead branches at their base (i.e., where they diverge from live growth). For live shrubs and trees, cut lower limbs to reduce continuity of fuels.

a. In compliance with the LOHCP minimization measures for the CWPP (Table 10, Section 5.3), avoid and minimize canopy thinning or and limbing up of Morro manzanita.

b. Avoid removing mock heather, dune bush lupine, sand almond, and any other species important for Morro shoulderband snail, as required by the CWPP Avoidance Measures (Section 5.3).

Step 4: Remove Entire Native Woody Shrubs: Where entire shrubs need to be removed to achieve the desired spacing and height:

a. retain a diverse assemblage of native shrubs by preferentially removing more abundant species and retaining those that occur at lower abundance (the actual species to be removed versus retained will be determined based on examination of species composition and abundance);

b. Do not remove Morro manzanita, as required by the CWPP Avoidance and Minimization Measures (Table 10, Section 5.3); and

c. Avoid removing shrubs important for Morro shoulderband snail, including mock heather, dune bush lupine, and sand almond, as required by the CWPP Avoidance Measures (Section 5.3).

5.3 CWPP Avoidance and Minimization Measures

Section 5.2.4 of the LOHCP identifies a series of avoidance and minimization measures to limit take of/impacts to the covered species and nesting birds during implementation of the fire hazard abatement treatments as part of the CWPP (Table 10). These measures were developed by the USFWS and CDFW, which have worked closely with CALFIRE since 2010 to facilitate the CWPP. The measures for the four

covered species are designed to reduce take in the form of injury or mortality for Morro shoulderband snail, reduce the severity of impacts to Morro manzanita, and avoid take of/impacts to Morro Bay kangaroo rat and Indian Knob mountainbalm. Take of Morro shoulderband snail would be predominantly in the form of capture; trimming of Morro manzanita would be limited to the minimum required to achieve the fuel reduction objectives, with no removal of individual plants allowed. Based on the use of these measures as part of the LOHCP (Table 10) and the limited scope of abatement activities, implementation of the CWPP is expected to have a negligible effect on the covered species.

5.4 Compatibility with Restoration and Management

As noted at the outset of this section, fuel reduction is not a restoration or management action under the IAMMP; it is not being implemented as part of the LOHCP conservation strategy nor will the activity be used as mitigation for the LOHCP covered activities. Rather, it is a covered activity under the LOHCP. Nonetheless, when conducted appropriately, including based on the treatment guidelines (Section 5.2) and following the requisite avoidance and minimization measures (Section 5.3), fuel reduction can enhance habitat for the covered species, including by reducing the cover and competitive effects of exotic plants. In doing so, it has the potential to promote their populations.

Fuel reduction can also enhance resiliency of the covered species populations by reducing the likelihood that a fire in the developed areas will spread into the reserve. As discussed in greater detail in Section D.3 of the LOHCP, fire is a natural part of the Baywood fine sands ecosystem disturbance regime, and several of the covered species have life histories and ecologies that are adapted to recurring fire, as detailed in Section B of the LOHCP. Nonetheless, fire could have negative consequences for the covered species, particularly if the fire is outside of the natural fire regime (return interval, season, type, etc.) or is very large. Notably, Morro shoulderband snail is not adapted to fire and a large fire could eliminate or greatly reduce their population, potentially having consequences for long term persistence (e.g., by reducing genetic diversity).

Recognizing its potential benefits, fuel reduction work is not being proposed in this IAMMP as a habitat restoration treatment; instead, the treatments in this plan focus on addressing other more impactful and time-sensitive stressors: incompatible trail use and invasive species. As a result, fuel reduction will not be funded or implemented by the County nor credited for mitigation as part of this IAMMP; instead, it will be implemented by CAL FIRE as a covered activity under the LOHCP following the guidelines and avoidance and minimization measures designed to make the treatments maximally beneficial.

Nonetheless, the area within the designated fuel break features habitat for the covered species that is currently negatively impacted by invasive plants, ornamental plants, and incompatible recreation as, described in Section 2.7 and illustrated in Figures 3, 11, and 12. Work implemented by the County within the designated fuel break area, to restore and manage this habitat by addressing these stressors, including restoration projects outlined in this IAMMP, will be credited for compensatory mitigation as part of the LOHCP provided it meets the performance criteria (Section 4.5).

As described above, the fuel reduction work is anticipated to be compatible with the County's restoration work in the fuel break area. However, if fuel break activities conducted by CalFire or others degrade the habitat that was restored by the County, the County will provide alternative mitigation to replace any areas for restoration mitigation credit was received. The likelihood of such a conflict is low, since CAL FIRE and others must seek approval from CDFW prior to fuel break work, and must adhere to the prescriptions and mitigation measures designed to protect species.

Table 10: **Avoidance and Minimization Measures for Creation of the Shaded Fuel Break as part of the Community Wildfire Protection Plan (McGraw 2020)**

Taxa	Measure	Description
All Covered Species	All-1: Procedures and Training	Clearly defined operational procedures will be developed and implemented by CALFIRE. A USFWS-approved biologist will develop and deliver environmental awareness training sessions for all personnel involved in hazard abatement activities. The training will inform personnel regarding the identification, status, and presence of covered species likely to be present in each abatement area; those avoidance and minimization measures that must be implemented, and the legal ramifications associated with non-compliance. Training materials will include descriptions and pictures of the covered species, relevant provisions of the State and Federal Endangered Species Acts, and the project boundaries for each abatement action. CALFIRE will ensure that all personnel who participate in hazard abatement activities within the Plan Area receive this training immediately prior to the start of any hazard abatement activities.
	All-2: Biological Monitor	A USFWS-approved biologist will monitor all vegetation removal activities that will take place within habitat suitable for the covered species. Monitoring activities will be required daily until completion of initial disturbance at each location to ensure that avoidance and minimization measures are implemented. The monitor will be granted full authority to stop work at his or her discretion if abatement-related activities occur outside the demarcated boundaries of the treatment footprint. The monitor will stop work if any of the covered species are detected within the proposed abatement area and take the appropriate species-specific avoidance or minimization measures.
Morro Shoulderband Snail	MSS-1: Pre-Project Survey and Translocation of Morro shoulderband snail	Prior to the start of any abatement activities, a USFWS-approved biologist will conduct surveys to identify the location of any Morro shoulderband snails present in treatment areas. These surveys shall be conducted within 24 hours of the commencement of any activities associated with hazard abatement that could result in take of the species. The primary objective of the pre-activity surveys is to locate as many Morro shoulderband snails as possible so that they can be captured and moved out of harm's way. All live Morro shoulderband snails of any life stage found during pre-activity surveys, or any phase of hazard abatement, will be captured and moved out of harm's way to a pre-determined, USFWS and CDFW-approved receptor site by the surveying biologist.
	MSS-2: Minimize Impacts to Native Plants Important to	Canopy thinning and limbing up of plant species of particular value to Morro shoulderband snail must be avoided or minimized to the maximum extent possible. Pre-project surveys of treatment areas should be used to identify native plant species that should be avoided, which include but are not

Table 10: **Avoidance and Minimization Measures for Creation of the Shaded Fuel Break as part of the Community Wildfire Protection Plan (McGraw 2020)**

Taxa	Measure	Description
	Morro shoulderband snail	limited to mock heather (*Ericameria ericoides*), dune bush lupine (*Lupinus chamissonis*), and sand almond (*Prunus fasciculata* var. *punctata*).
	MSS-3: Monitor for Morro shoulderband snail	Prior to initiating any hazard abatement activities, a USFWS-approved biologist will be present to ensure that the limits of work are clearly delineated. This biologist shall have the authority to order any reasonable measure necessary to avoid the take of Morro shoulderband snail and to stop any work or activity not in compliance with the conditions set forth in the HCP/ITP. The biologist will notify the Ventura Fish and Wildlife Office, CDFW, and the County of San Luis Obispo Department of Planning and Building of any "stop work" order that is issued and this order will remain in effect until the issue has been resolved.
Morro Bay Kangaroo Rat	MBKR-1: Avoid Impacts to Morro Bay Kangaroo rat	Prior to initiating any fire hazard abatement activities in areas featuring habitat suitable for MBKR, a CDFW and USFWS-approved biologist will conduct a visual assessment of the site, which will be followed by a survey, as needed, to ensure the site is not occupied.
Morro Manzanita	MM-1: Minimize Impacts to Morro Manzanita	No individual Morro manzanita plants will be removed and all canopy thinning and limbing up of lower branches of Morro Manzanita will be avoided or minimized to the extent that abatement goals can still be achieved.
Indian Knob Mountainbalm	IKM-1: Avoid Impacts to Indian Knob Mountainbalm	Prior to initiating any hazard abatement activities, a CDFW and USFWS-approved biologist will survey the treatment area to assess the presence of Indian Knob mountainbalm. If the species is detected within or adjacent to the treatment area, CALFIRE must consult with the USFWS and CDFW to determine how to proceed as no impacts to individuals this species will be authorized.
Migratory Birds	MBA-1: Avoid Impacts to Migratory Birds	All hazard abatement activities will be conducted outside of the bird breeding season, which is generally considered to be between March 15 and September 15, annually. This seasonal prohibition period will be adjusted, as needed, to reflect changes in the breeding bird season due to climate change or other factors. If it is necessary to conduct abatement activities during this timeframe, a USFWS and CDFW-approved biologist must be retained to conduct breeding bird and nest surveys; treatments may only proceed if no breeding activity or nests are detected.

6 Implementation

This section describes how the MDER will be enrolled in the LOHCP Preserve System so that the habitat restoration and management actions outlined this plan can be credited as mitigation under the LOHCP. It also outlines the IAMMP implementation steps and their anticipated timeline.

6.1 Enrollment of the MDER in the LOHCP Preserve System

The following are required for the County to enroll the MDER into the LOHCP Preserve System and begin the restoration, management, and monitoring outlined in this plan:

1. **Memorandum of Understanding** The Memorandum of Understanding (MOU) between the California Department of Fish and Wildlife and the County of San Luis Obispo will enable CDFW to permit the County to conduct restoration and management within the property under the terms of a special-use permit.
2. **Cooperative Management Agreement:** The Cooperative Management Agreement between the County and CDFW meets the requirements in the LOHCP (sections 5.3.3.1 and 6.2.3.1), which require that preserve landowners maintain their management effort and ensure durability of the conservation actions on lands enrolled in the LOHCP Preserve System.

As described in detail below, the County and CDFW will develop a MOU that meets the requirements for both of these agreements.

6.1.1 Memorandum of Understanding

The County and CDFW are developing a Memorandum of Understanding (MOU) that will enable the County or its Implementing Entity to conduct the habitat restoration, management, and monitoring actions outlined in this plan on the MDER, which is managed by CDFW. This Interim Adaptive Management and Monitoring Plan for the Los Osos Habitat Conservation Plan Preserve System (IAMMP) was developed, in part, to serve as the "Mitigation Plan" for the MOU. The purpose of the IAMMP is to describe the specific management and/or restoration actions that will be implemented and the monitoring that will be used to evaluate their effectiveness, consistent with the Adaptive Management and Monitoring Plan for the Los Osos HCP Preserve System. The Mitigation Plan must be approved in writing by CDFW prior to CDFW's issuance of a Special Use Permit (SUP) to the County, which will enable the County to enter the MDER to implement habitat restoration, management, and monitoring. As these activities are being conducted as mitigation for the LOHCP covered activities, the MOU will refer to them as "the Mitigation."

6.1.2 Cooperative Management Agreement

To ensure that management of existing lands like the MDER promotes attainment of the LOHCP goals and objectives, Section 6.2.3.1 of the LOHCP requires that land management agencies and organizations seeking to enroll their lands into the LOHCP Preserve System must guarantee the following:

1. **Maintenance of effort:** the agency or organization will continue existing restoration and management efforts on the property, such that efforts funded through the LOHCP have added benefit for the covered species and do not simply replace existing efforts; and

2. **Long-term habitat protection:** the agency or organization must demonstrate that the property, or at least the portion that will be managed as part of the LOHCP Preserve System, is permanently protected from development or other activities that would result in loss or degradation of the habitat.

Table 11 outlines the elements of the cooperative management agreement (CMA) to enroll the MDER into the LOHCP Preserve System. Rather than creating a separate legal agreement, the MOU that will be signed by the County and CDFW incorporates these elements and will constitute the CMA for purposes of enrolling the MDER into the LOHCP Preserve System. The MOU includes the language in Table 11 regarding *Maintenance of Effort* and the *Method of Habitat Protection*. The MOU also describes how the entire MDER *Habitat is to be Enrolled*, and this IAMMP, which will be an appendix to the MOU, details the *Habitat Treatments.*

6.2 Responsibilities

The following outlines the responsibilities of the agencies involved in implementation of this plan.

1. **County**: The County will be responsible for all aspects of plan development and implementation.
    a. The County, which has funded development of this IAMMP, will be responsible for funding and implementing all work including developing the work plans. As outlined in the LOHCP and MOU, the County intends to designate an entity acceptable to CDFW (Implementing Entity), such as a land trust or conservancy, to implement the habitat restoration, management, and monitoring.
    b. The County is also responsible for California Environmental Quality Act (CEQA) compliance and must obtain and maintain all state, federal, and local permits, and licenses and approvals applicable to the Mitigation.
    c. The County will provide 60-days' notice to CDFW prior to conducting restoration and management, and will schedule a walk through with CDFW at least 30 days prior to any work to document the baseline conditions, as required by the MOU .
2. **CDFW:** Representatives of CDFW will facilitate implementation of the plan.
    a. Following approval of this plan, CDFW will be responsible for issuing to the County a SUP that will enable County entry into the MDER for purposes of implementing this IAMMP.
    b. CDFW will coordinate with the County on implementation of the IAMMP including by reviewing work plans and participating in walk throughs to establish baseline conditions.
    c. CDFW will assist with outreach to the community regarding trail management as outlined in Section 3.2.3.2.2.6.
    d. Consistent with the maintenance of effort requirement for enrolling existing protected lands in the LOHCP Preserve System (Section 6.1), CDFW will continue existing management of the reserve, which consists of occasional site visits and law enforcement (Section 2.8).
    e. Provide feedback on the restoration work plan, annual work plans, and the annual monitoring reports developed by the County (Section 4.8).
3. **USFWS:** The USFWS will review and provide feedback on the final work plan, annual work plans, and the annual monitoring reports developed by the County (Section 4.8).

Table 11: Elements of the Cooperative Management Agreement (CMA) required to enroll the MDER in the LOHCP Preserve System

CMA Element	MDER
Habitat to be Enrolled: the specific habitat areas to be enrolled in the LOHCP Preserve System, which must meet the following criteria: • provide suitable habitat for one or more of the covered species; and • have management or restoration needs that are not the current responsibility of the landowner/manager and met by available resources. If the property will be enrolled over time, the management units and their sequence or phasing will be determined.	The entire 278.7-acre area of the MDER including all of the Pecho and Bayview units will be enrolled in the LOHCP. As part of this IAMMP, the County will focus work on the Bayview Unit such that only the 230.9 acres within that unit needs to be enrolled at this time.
Habitat Treatments: the specific habitat restoration and management activities that will be implemented to improve habitat conditions as mitigation for the LOHCP.	This IAMMP describes the habitat restoration and management actions that the County (or its Implementing Entity) will conduct in the Bayview Unit as part of this plan. The AMMP will be developed during implementation of the IAMMP and will guide subsequent restoration, management, and monitoring within the MDER.
Method of Habitat Protection: the legal mechanism that will be used to ensure that the enrolled habitat is permanently protected from development, so that the restoration and management benefits resulting from mitigation are not wasted. Legal mechanisms can include conservation easements, permanent deed restrictions, and other legal documents (e.g., contracts) that restrict land use and associated activities, as appropriate and as approved by the USFWS.	As an ecological reserve, the MDER is protected by CDFW pursuant Fish and Game Code Sections 1580 and 1764 managed per California Code of Regulations (CCR) Title 14, Chapter 11, Sections 550 et seq., which includes general provisions for all ecological reserves, and Section 630, though the latter does not currently contain any specific provisions for the MDER. If there is a change in the laws or regulations that remove protection for the MDER, CDFW will provide the County and USFWS with 60-days advance notice before taking action to void or modify the protected status of the MDER. If there is a change in law or regulation that removes protection for MDER lands enhanced, restored, or managed by the County as part of the Conservation Program, the County will meet with the Service to identify alternative compensatory mitigation acceptable to the Service for any loss of mitigation value resulting from such a change.

Table 11: Elements of the Cooperative Management Agreement (CMA) required to enroll the MDER in the LOHCP Preserve System

CMA Element	MDER
Maintenance of Effort Plan: the current management and restoration activities that are being implemented by the landowner. These activities will continue to be implemented by the landowner to ensure that the LOHCP mitigation has added benefits for the covered species.	As described in greater detail in Section 2.8, CDFW has a land management plan that provides recommendations for management and monitoring of the Pecho Unit of the MDER; however, CDFW has not committed to implementing the LMP nor any other management, restoration, or monitoring activities within the MDER, which are implemented only as CDFW funds and other resources allow. Currently, CDFW Environmental Scientists conduct occasional site visits while CDFW Wardens conduct necessary law enforcement activities. For purposes of the CMA, CDFW agrees to continue to conduct occasional sites visits and implement law enforcement.

6.3 Plan Implementation Steps and Anticipated Timeframe

Table 12 outlines the steps to implement the IAMMP including their estimated timeframes relative to approval of this plan. It incorporates the requirements of the LOHCP for enrollment of preserves, and the MOU, including issuance of the Special Use Permit (SUP) and documentation of baseline conditions. As reflected in Table 12, the restoration treatments and monitoring to document their effectiveness are anticipated to be implemented over a five-year period that will begin following approval of this plan and subsequent issuance of a SUP. Initial restoration treatments will be conducted in the first year, while follow-up treatments and any remedial actions will be implemented in Years 2 and 3. Qualitive monitoring will be conducted quarterly in Years 1-3 while quantitative monitoring will be conducted the third spring following implementation of the treatments. If remedial actions and/or more time are required for the restoration areas to achieve the quantitative objectives, then monitoring will be repeated into years 4 and 5 as needed.

The steps to implement the IAMMP will occur concurrently with development of the AMMP based on surveys and more detailed planning as outlined in Section 5.3.3.2 of the LOHCP (McGraw 2020). The AMMP will incorporate the results of the IAMMP including by documenting the need for ongoing management actions to maintain the restoration areas once they have achieved the quantitative objectives and thus been credited for mitigation. The AMMP will also include any restoration projects identified in the IAMMP but not implemented due to limitations of the budget and/or LOHCP mitigation needs (Section 3.1.1). Concurrent with the steps to implement the IAMMP, the County will work to develop and obtain CDFW and USFWS approval for the AMMP prior to conclusion of the IAMMP. These and other steps to implement the LOHCP are outlined in Section 6.10 of the LOHCP (McGraw 2020).

Table 12: Tasks and timeline for implementation of this plan

Task	Description	Anticipated Timeframe
Year 1		
Enter into the MOU	CDFW and the County will sign the MOU to enable the County to conduct restoration, management, and monitoring	Within 2 weeks of approval of the IAMMP
Issue the Special Use Permit	The CDFW will issue to the County a SUP to permit implementation of the plan	Within 2 weeks of signing the MOU
Develop Restoration Project Work Plan(s)	The County will develop work plans for the selected restoration projects, to identify the final treatments, schedule, and costs, among other details.	Within 2 months of issuance of the SUP
Approve Work Plan(s)	CDFW and the USFWS will approve the restoration work plan(s)	Within 1 month of receipt of the work plan(s)
Conduct Baseline Monitoring	The County and CDFW will walk through the property and the County will document baseline conditions and conduct photomonitoring as required by the MOU.	Within 2 weeks of CDFW approval of the work plan(s)
Implement Initial Trail Restoration (if selected)	The County and CDFW will implement trail restoration per the workplan • CDFW and the County will conduct coordinated outreach to the community regarding trail management. • The County will install signs and fences to restrict trail use to designated areas and protect the restoration areas.	Within 2 weeks of documenting baseline conditions (except where the work plan schedule calls for seasonal timing)
Implement Initial Invasive Plant Control (if selected)	The County will conduct initial treatments to control veldt grass and co-occurring invasive plants per the management plan prescriptions	Within 1 year of MOU being signed (treatments will be seasonally timed)
Eucalyptus Removal (if selected)	The County will • conduct seed collection and contract growing • conduct surveys for monarch butterfly overwintering and nesting birds (as needed) • conduct the tree and biomass removal, and conduct erosion control and revegetation, if container stock will be available in time for winter planting (otherwise wait a year)	Tree Removal: September 1 – mid-October (after nesting bird season and before monarch arrival)

Table 12: Tasks and timeline for implementation of this plan

Task	Description	Anticipated Timeframe
Qualitative Monitoring	The County will assess habitat conditions and treatment effectiveness quarterly	Every three months following initial treatment
Agency Review Meeting (Year 1)	The County, CDFW, and USFWS will meet to discuss the restoration and monitoring activities and preliminary monitoring results, as well as anticipated actions for the following year	Fall Year 1
Annual Report (Year 1)	The County will prepare an annual report documenting the restoration treatment(s) and monitoring results, which will be included as part of the LOHCP Annual Report	March 31 of the year following initiation of restoration
Agency Review Meeting (Year 1)	The County, CDFW, and USFWS will meet to discuss the restoration, monitoring results, and next steps including follow-up treatments	April – June of the year following initiation of restoration
Year 2		
Follow-up Treatments	• The County will conduct follow-up invasive plant control in the invasive plant removal and trail restoration areas (if selected), and conduct remedial management, as needed • CDFW and the County will conduct additional coordinated community outreach, as needed, to enhance compliance with access regulations, if trail restoration is selected	Year 2
Qualitative Monitoring	The County will assess habitat conditions and treatment effectiveness quarterly	Quarterly in Year 2
Quantitative Monitoring	The County will use quantitative monitoring to assess achievement of the restoration objectives	Third spring (April or May) following initiation of restoration
Agency Review Meeting (Year 2)	The County, CDFW, and USFWS will meet to discuss the restoration and monitoring activities and preliminary monitoring results, as well as anticipated actions for the following year	Fall Year 2
Annual Report (Year 2)	The County will prepare an annual report documenting the restoration treatments and monitoring results, which will be included as part of the LOHCP Annual Report	March 31 following the second year of restoration
Year 3		

Table 12: Tasks and timeline for implementation of this plan

Task	Description	Anticipated Timeframe
Follow-up Treatments	• The County will conduct follow-up invasive plant control in the invasive plant removal and trail restoration areas (if selected), and conduct remedial management, as needed • CDFW and the County will conduct additional coordinated community outreach, as needed, to enhance compliance with access regulations, if trail restoration is selected	July – December in Year 3
Qualitative Monitoring	The County will assess habitat conditions and treatment effectiveness quarterly	Every three months in Year 2
Agency Review Meeting (Year 3)	The County, CDFW, and USFWS will meet to discuss the restoration and monitoring activities and preliminary monitoring results, as well as anticipated actions for the following year	Fall Year 3
Annual Report (Year 3)	The County will prepare an annual report documenting the restoration treatments and their effectiveness, which will be included as part of the LOHCP Annual Report. The report will document the acres of habitat restored to calculate the mitigation under the LOHCP.	March 31 following the third year of restoration
Years 4 and 5		
Follow-up Treatments	• The County will conduct additional follow-up treatments, qualitative monitoring, and quantitative monitoring, as needed for individual projects (invasive plant control vs. trail restoration) and within specific treatment areas, as needed, to achieve the restoration objectives. • The County will identify ongoing management needed to sustain the restoration treatment benefits, which will be incorporated into the AMMP.	Fourth and fifth years after initiation of management, as needed
Qualitative Monitoring	The County will assess habitat conditions and treatment effectiveness quarterly	Every three months in Years 4 and 5
Quantitative Monitoring	The County will use quantitative monitoring to assess achievement of the performance criteria	April or May each year
Agency Review Meeting	The County, CDFW, and USFWS will meet to discuss restoration and monitoring activities and preliminary monitoring results, as well as	Fall each year

Table 12: Tasks and timeline for implementation of this plan

Task	Description	Anticipated Timeframe
	anticipated actions for the following year (Year 4) as well as established mitigation credit (Year 5)	
Annual Report	The County will prepare an annual report documenting the restoration treatments and monitoring results, which will be included as part of the LOHCP Annual Report. The Year 5 report will document the mitigation credits resulting from monitoring.	March 31 following the reporting year

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Appendix N Letter of Intent

This appendix contains the April 6, 2021, letter from the County of San Luis Obispo (County) informing the United States Fish and Wildlife Service of its intent to contract with the Land Conservancy of San Luis Obispo County to serve as the Implementing Entity for the Los Osos Habitat Conservation Plan (LOHCP).

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING
TREVOR KEITH, *DIRECTOR*

April 6, 2021

U.S. Fish and Wildlife Service
2493 Portola Road Suite B
Ventura, California 93003
Attn: Debora Kirkland (Ventura Fish & Wildlife Office)

SUBJECT: IMPLEMENTING ENTITY FOR LOS OSOS HABITAT CONSERVATION PLAN

Dear Debora Kirkland:

This letter serves to inform the U.S. Fish and Wildlife Service ("Service") that the intent of the County of San Luis Obispo ("County") is to identify the Land Conservancy of San Luis Obispo County ("Land Conservancy") as the Implementing Entity for implementation of the Los Osos Habitat Conservation Plan (LOHCP).

As the recipient of the Programmatic Incidental Take Permit (ITP) based on the LOHCP, the County is responsible for the implementation of the LOHCP. That being said, due to the nature of the LOHCP, the County finds it beneficial and appropriate to partner with a non-profit conservation organization (e.g., land trust or conservancy) with expertise in land conservation and management of endangered species, among other skills necessary to implement the LOHCP, to ensure initial and continued success in implementing the LOHCP and maintaining good standing for the ITP.

The Land Conservancy is a local and experienced non-profit organization with expertise necessary to implement the LOHCP, such as land acquisition, conservation easements, habitat restoration, and monitoring. The County has approached the Land Conservancy to serve as the Implementing Entity, and the Land Conservancy has expressed strong interest. The County and the Land Conservancy are in discussions to determine the specific roles and responsibilities appropriate for both parties.

It is envisioned that the Implementing Entity would take on roles and responsibilities primarily focused on implementing the conservation program, which includes, but is not limited to, protecting new habitat, restoring habitat, and monitoring habitat incorporated within the LOHCP Preserve System; the County would take on roles and responsibilities primarily focused on screening and reviewing applications, participant compliance, and other regulatory functions. Such roles and responsibilities would be aligned with the

expertise and typical operation of both parties. An outline of the proposed roles and responsibilities for the County and Land Conservancy (serving as the Implementing Entity) has been included as an attachment. This outline serves to provide a brief overview of the roles and responsibilities and to demonstrate the relationship between the County and Implementing Entity. The details and specifics of the roles and responsibilities in the LOHCP will be updated to reflect the outline.

If the Land Conservancy chooses not to serve as the Implementing Entity, the County will approach other non-profit conservation organizations with the appropriate expertise to serve as the Implementing Entity. In the case that the County cannot identify a suitable existing non-profit conservation organization to serve as the Implementing Entity, the County intends to form a new non-profit entity, subject to review and approval from the Service and California Department of Fish and Wildlife (CDFW), to act as the Implementing Entity with roles and responsibilities similar to those envisioned for the Land Conservancy in the attached outline described above.

The County recognizes that the success of implementing the LOHCP will require significant coordination between the County, the Implementing Entity, state and federal resource agencies, and plan participants. As such, the County will establish a LOHCP Coordinator, a full-time County staff member, designated to oversee the Implementing Entity and coordinate directly with all agencies involved.

Although the Implementing Entity would take on specific roles and responsibilities to implement the LOHCP, the County is and will remain ultimately responsible for implementation of all aspects of the LOHCP and compliance with the terms and conditions of the ITP.

The County will secure a general funds loan to “jump-start” implementation of the LOHCP. The habitat mitigation fees collected will be used to repay the loan. Conservative revenue projections indicate that the County can expect to collect at least $1,500,000 in fees during the initial years of development in Los Osos. This amount is conservative as it only accounts for the development of the 226 properties (approximately 40 acres of disturbance) on the Single-Family Dwelling Building Permit Waitlist for Los Osos and is based on fees developed in 2015-2016, and does not include properties on the Multi-Family Dwelling Building Permit Waitlist for Los Osos nor does it include increases to fees. It is anticipated that the fees will, at minimum, increase to account for inflation over the last few years. This projection is realistic as the proposed 1.3 percent growth rate would allow for all 226 properties to develop within the five-year life of the growth rate.

If you have any questions or would like to discuss, please contact me at (805) 781-5713 or via email at kbrown@co.slo.ca.us.

Sincerely,

Kerry Brown
Supervising Planner

Cc: Leilani Takano, U.S. Fish and Wildlife Service
Land Conservancy of San Luis Obispo County

Attachment: Proposed County and Implementing Entity Roles and Responsibilities

Attachment:
Proposed County and Implementing Entity
Roles and Responsibilities

Section 1:
Coordination and Oversight

A. **County.** The County will lead implementation of the LOHCP in coordination with the Implementing Entity and affected agencies to ensure efficient and effective implementation of the LOHCP.

B. **County.** The County will oversee and review work conducted by the Implementing Entity to ensure successful implementation of the LOHCP and compliance with the terms and conditions of the ITP.

C. **County.** The County LOHCP Coordinator will serve as the point person and will be supported by other County staff and/or outside personnel with the appropriate biological expertise.

D. **Implementing Entity.** The Implementing Entity will submit an invoice for the work performed within a month to the County within 21 calendar days following the last day of that month. The invoice must be submitted via email to the County LOHCP Coordinator and must provide a brief description of the work performed for each amount invoiced.

E. **County.** The County will review the invoices from the Implementing Entity and submit payment to the Implementing Entity within 21 calendar days of receiving the invoice.

Section 2:
Screening, Review, and Processing of Applications

A. **County.** The County will screen all development and related projects to determine whether the projects meet the criteria for incidental take coverage under the LOHCP and ITP. If a project is identified as potentially eligible, the County will accept and review the application for incidental take coverage under the LOHCP and ITP, which includes:
   i. Review of all applications to identify the specific avoidance and minimization measures, as well as best management practices, that are necessary for each project, based on the general approaches, as well as site and project-specific conditions.

ii. Review of pre-construction surveys (which will also be reviewed by the Service and CDFW) and use results to evaluate additional measures to avoid and minimize impacts, including project design.
iii. Review of all applications to ensure that all participants implement the LOHCP avoidance and minimization measures to prevent impacts to other listed species not covered under the ITP.

B. **County.** Following review, if the project meets the LOHCP eligibility criteria and the proponent of the project agrees to comply with the requirements of the LOHCP and terms and conditions of the ITP, the County will issue a Certificate of Inclusion that confers incidental take coverage to the proponent of the project. All required mitigation must be secured by the County and Implementing Entity prior to issuance of a Certificate of Inclusion.

C. **County.** With the issued Certificate of Inclusion, the proponent of the project will be eligible to proceed with the local permitting process.

D. **County.** The County will refer proponents of projects that are determined to be ineligible for incidental take coverage under the LOHCP and ITP to the appropriate state and federal agencies to discuss alternative options for incidental take coverage.

Section 3:
Securing and Holding of Mitigation

A. **Implementing Entity.** The Implementing Entity will accept from participants the following mitigation required to compensate for the impacts of their projects:
i. Conservation easements for habitat set asides on parcels in the Priority Conservation Area that are developed as part of the LOHCP.
ii. Conservation easements for habitat acquired in fee title by the County using the Habitat Protection Fees.

B. **Implementing Entity.** The Implementing Entity will work with the Service to ensure that the easement will protect parcels where habitat is of high long-term conservation value for the covered species.

C. **Implementing Entity.** The Implementing Entity will serve as the easement holder and designate the County as the successor to the easement, in the event that the Implementing Entity at the time is dissolved.

D. **County.** The County will accept from participants the following mitigation required to compensate for the impacts of their projects:

i. Habitat mitigation fees, which include Habitat Protection Fees for those who do not set aside habitat.
ii. Habitat restoration and management fees, which are required for all participants.

E. **County.** The County will deposit all habitat mitigation fees into a dedicated trust account to ensure that they are applied to implementation of the LOHCP. A portion of the fees will be used to establish the endowment that will be held by the National Fish and Wildlife Foundation and will be used to fund habitat management and monitoring post permit.

F. **County and Implementing Entity.** The County and Implementing Entity will work with the Service to use habitat mitigation fees to acquire additional lands of high long-term conservation value to be included into the LOHCP Preserve System. This includes:
i. Conducting outreach to identify willing sellers (to be lead by County);
ii. Negotiating with landowners or their agents; and
iii. Securing fee title (to be held by County) or conservation easements (to be held by Implementing Entity).

G. **County and Implementing Entity.** Lands acquired in fee simple title will be held by the County and permanently protected by conservation easements held by the Implementing Entity.

Section 4:
Participant Compliance and Monitoring

A. **Implementing Entity.** The Implementing Entity will monitor easements over properties protected as part of the LOHCP for compliance to ensure long-term protection of habitat. Easement monitoring will follow the Implementing Entity's accredited policies and procedures.

B. **Implementing Entity.** The Implementing Entity will work with participants to achieve voluntary compliance with the requirements of the LOHCP and terms and conditions of the ITP.

C. **Implementing Entity.** If the Implementing Entity exhausted all standard procedures with a participant and voluntary compliance with the requirements of the LOHCP and terms and conditions of the ITP is not achieved, the Implementing Entity will notify the County.

D. **County.** Once notified that voluntary compliance from a participant cannot be achieve, the County will use its police and enforcement powers to revoke the Certificate of Inclusion and issue a stop-work order on the project.

Section 5:
LOHCP Preserve System Habitat Management, Restoration, and Monitoring

A. **Implementing Entity.** The Implementing Entity will coordinate and consult with the County (including County Parks Department) and CDFW to enroll lands to be managed, restored, and monitored as part of the LOHCP Preserve System, which includes:
   i. Identifying the priority areas for habitat restoration and management and the techniques that will be used to ensure the habitat is protected in perpetuity;
   ii. Determining the management goals and objectives for the property, which will be consistent with the biological goals of the LOHCP and the goals and objectives of the LOHCP Preserve System AMMP; and
   iii. Developing and executing MOUs or other cooperative agreements with the eligible land management entities who may elect to enroll their lands, including CDFW and County Parks. Such agreements will specify what they will continue to do (i.e., as part of their maintenance of effort) and what the County and Implementing Entity will do directly, or under contract with the land manager, as mitigation under the LOHCP.

B. **Implementing Entity.** The Implementing Entity will:
   i. Implement the Interim Adaptive Management and Monitoring Plan (IAMMP), which identifies high-priority restoration work within the Morro Dunes Ecological Reserve (MDER) to jump start the conservation program.
   ii. Prepare and implement the LOHCP Preserve System AMMP, which will identify the goals and priority restoration and management projects for the lands within the Preserve System, based on a critical examination of the biological conditions on site, as well as the role of the preserve in the broader landscape.
   iii. Prepare annual work plans and budgets to implement the LOHCP Preserve System AMMP. Work plans will identify the habitat management and monitoring tasks that will be conducted each year, based on the priorities and existing funding, derived from habitat mitigation fees and other sources (e.g., grants).
   iv. Conduct or oversee habitat restoration, management, and monitoring. Ensure that habitat management, restoration, and enhancement activities are carried out as outlined in the LOHCP Preserve System AMMP, LOHCP, and ITP, and that the work is keeping pace with or exceeding the pace of the incidental take/impacts in compliance with the Plan's stay-ahead provision.

v. Update the LOHCP Preserve System AMMP as part of the adaptive management process, in which changed conditions, new scientific information, and the results of prior projects and monitoring, among other changes, are addressed to promote long-term effectiveness of the conservation strategy.

Section 6:
Documentation and Annual Reporting

A. **County.** The County, as part of the Covered Activities Implementation Monitoring, will create and maintain a database to record relevant information about each application submitted, which includes:
   i. The amount and location of habitat impacted by each covered activity;
   ii. Whether all of the required avoidance and minimization measures, and best management practices required in the Certificate of Inclusion were implemented and the effectiveness of such measures;
   iii. The number and type of Certificates of Inclusion issued during each calendar year and cumulatively since the take permit was issued; and
   iv. The mitigation provided (i.e., the acres protected via conservation easement and fees accepted).

B. **County.** The County will submit data on all fees collected to the Implementing Entity on a monthly basis.

C. **Implementing Entity.** The Implementing Entity will establish one or more databases that will continuously track the following:
   i. The amount and location of new habitat protected (i.e. habitat acquired by the Implementing Entity and habitat set aside by project proponents on site);
   ii. The amount and location of habitat subject to each type of restoration treatment (e.g., erosion control);
   iii. The amount and location of habitat subject to enhanced management, including the type(s) of management activities conducted in the area (e.g., veldt grass control);
   iv. Progress toward the biological goals and objectives, based on monitoring; and
   v. Accounting for all fees collected and funds expended.

D. **County and Implementing Entity.** The County will maintain a database of all avoidance and minimization measures, including survey results. The Implementing Entity will use such database to develop the annual report as well as to increase understanding of the species distribution and abundance.

E. **County and Implementing Entity.** The County and Implementing Entity will collaborate to prepare the draft annual report to:
   i. Evaluate whether the area protected, restored, and managed as part of the conservation program is sufficient to meet the LOHCP stay-ahead provision;
   ii. Document implementation of the LOHCP and the steps conducted to promote long-term effectiveness of the LOHCP at achieving the biological goals and objectives, which includes:
      - **[Implementing Entity.]** Updating the overall conservation program as well as the LOHCP Preserve AMMP, based on changed conditions, new scientific information, and results of monitoring;
      - **[County.]** The County will lead this effort.] Conducting periodic reviews of the fees to ensure they are sufficient. (The initial review will occur after three years, with subsequent reviews conducted at least once every five years or sooner if circumstances, including information in the annual report, indicate that the fees collected may not be sufficient to implement conservation measures required under the plan); and
      - **[County and Implementing Entity.]** Identifying proposed changes to the plan, including administrative changes as well as minor and major amendments.

F. **County.** The County will review the annual report and coordinate revisions, as necessary. Following County approval of the annual report, the County will submit the approved annual report to the Service and CDFW for their review and feedback.

Section 7:
Other Implementation Duties

A. **County.** The County will maintain a publicly available website that provides information about the LOHCP, including annual reports and monitoring studies.

B. **County and Implementing Entity.** The County and Implementing Entity will, as feasible, seek outside funds to support research as well as additional restoration, management, and monitoring to complement the LOHCP conservation program strategy. Such funds sources would not replace or otherwise alter the mitigation responsibilities of the County or participants; rather, additional funding would be used to improve the quality of management of the LOHCP Preserve System.

C. **County and Implementing Entity.** The County and Implementing Entity will engage with agencies and organizations in the LOHCP Area to build support for projects aimed at achieving the LOHCP goals and objectives. This includes conducting

outreach to researchers to engage them in studies that will fill data gaps, evaluate effectiveness of monitoring, and otherwise inform the conservation program.

D. **County and Implementing Entity.** The County and Implementing Entity will, at least annually, or sooner if warranted, convene with the Service, as well as owners/agency managers of land within the LOHCP Preserve System, to keep these parties apprised of progress towards conservation goals and objectives and provide updates on funding, monitoring, adaptive management, and other topics relevant to long-term effectiveness of the LOHCP.