



Thurston County Habitat Conservation Plan

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**Thurston County Community Planning and Economic
Development Department**

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Acknowledgements

This Habitat Conservation Plan is the result of collaboration among numerous individuals and organizations working to create a broad-scale, science-based conservation plan for six prairie and riparian species for Thurston County. We appreciate the considerable time and effort contributed by each individual in providing technical expertise and community stewardship in the preparation of this draft.

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Executive Summary

Thurston County has developed this Habitat Conservation Plan (HCP) to provide regulatory certainty for the County and its citizens for growth and economic development, through measures that contribute to the conservation of listed and rare species. The HCP will limit liability under the federal Endangered Species Act and increase predictability and local control. The HCP will fulfill the requirements necessary to obtain an Incidental Take Permit from the U.S. Fish and Wildlife Service, which will provide for a limited amount of impacts to (also known as incidental take of) listed and rare species from a specific set of Covered Activities for a 30-year Permit Term within the Permit Area (lands in County jurisdiction and permitting authority). The HCP establishes and describes the HCP Conservation Program, which identifies the County's commitment to avoid, minimize, and mitigate, to the maximum extent practicable, impacts to the Covered Species from the Covered Activities identified in the Incidental Take Permit.

The Covered Species of the HCP (Chapter 2) are found in either prairies and grasslands or wetland and riparian habitats. The prairie and grassland species are Taylor's Checkerspot Butterfly, Oregon Vesper Sparrow, and three subspecies of the Mazama Pocket Gopher (Olympia Pocket Gopher, Tenino Pocket Gopher, and Yelm Pocket Gopher). The wetland and riparian species is the Oregon Spotted Frog.

The HCP's Covered Activities (Chapter 3) include actions and projects for which the County issues permits or approvals, or that it otherwise carries out through the course of its normal business, such as: residential development (and associated accessory structure construction, septic system repair/extension, and home heating oil tank removal), commercial and industrial development, public service facility construction (schools and fire stations), transportation capital projects and right-of-way maintenance, landfill and solid waste management, water resources management, and County parks, trails, and land management.

The quantity of unavoidable incidental take of the Covered Species, from the Covered Activities to be covered under the 30 years of the HCP (Chapter 4) was projected based on Thurston Regional Planning Council development projections and County analysis of past and future projects and permits. Unavoidable impacts and take were projected for the permit area and permit term, using a combination of impact area and the relative habitat value of the impact area for each of the Covered Species. The County estimates a total of 5,216 functional acres of habitat impact, across all Covered Species, for coverage under the Incidental Take Permit.

The Biological goal of the HCP Conservation Program (Chapter 5) is to maintain viable populations of each of the Covered Species within Thurston County, commensurate with, and on conserved lands in advance of, the unavoidable impacts from the Covered Activities. The Conservation Program includes a set of Best Management Practices to minimize impacts to the Covered Species, and mitigation measures to build the Conservation Lands System, expanding on the existing network of protected lands managed for Covered Species and their habitats in Thurston County. Conservation Lands will be prioritized for acquisition/engagement from willing landowners using specific criteria for the Covered Species, and will include New Reserves, Working Lands Easements, and Enhanced Existing Preserves. Habitat and Covered Species on the Conservation Lands will be enhanced, managed, maintained, and monitored in accordance with Site Management Plans and with the support of stewardship endowments in

perpetuity. Habitat quality and function for the Covered Species will be regularly monitored at Conservation Lands (Chapter 6), with resulting data measured against species-specific performance standards. As benchmarks in habitat quality and function and Covered Species occupancy are achieved and documented with on-the-ground surveys, mitigation credits will be verified and released for use in offsetting debits from the Covered Activities. The County's compliance with the terms and conditions of the HCP will also be monitored and included in HCP Annual Reports.

County development permit applicants can obtain incidental take coverage under the HCP through Certificates of Inclusion to the County's Incidental Take Permit (Chapter 7). Applicants will work with the County to apply Best Management Practices to reduce impacts (debits) to the maximum extent practicable. Applicants can secure a Certificate of Inclusion by paying a Mitigation Fee, dedicating land, or purchasing credits from an independent mitigation bank, and then can continue with their Covered Activity. On a per-project basis, Thurston County will also pay the same Mitigation Fees to secure mitigation credits to offset debits from County Implemented Covered Activities.

The County estimates an average annual cost to implement the HCP of \$4,171,966, which includes the expense of Conservation Program administration and Conservation Land acquisition, restoration enhancement, management, and maintenance (Chapter 8). If all the projected impacts of the HCP do not occur, these costs will be reduced. The Conservation Program will be funded through a mix of Mitigation Fees and County Conservation Futures funds. Mitigation Fees will be reviewed on a regular basis and adjusted as necessary to reflect costs.

The County considered alternatives (Chapter 9) to the HCP, and the only alternative that would completely avoid impacts to the Covered Species would be to not complete the Covered Activities where the Covered Species may occur. Thurston County has decided not to select this alternative since it would strongly limit economic growth, development, and sustainability within the County and inhibit maintenance of County transportation infrastructure.

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List of Acronyms

BMP – Best Management Practice

BOCC – Board of County Commissioners (Thurston County)

CAO – Critical Areas Ordinance (Thurston County)

CEPD – Thurston County department of Community Planning and Economic Development

Corps – U.S. Army Corps of Engineers

CFR – Code of Federal Regulations

DOD – Department of Defense

EA – Environmental Assessment

ECY – Department of Ecology, Washington

EIS – Environmental Impact Statement

EPA – Environmental Protection Agency

ESA – Endangered Species Act

ESRI – Environmental Systems Research Institute

GIS – Geographic Information System

GMA – Growth Management Act

HCP – Habitat Conservation Plan

HPA – Hydraulic Project Approval

ITP – Incidental Take Permit

JBLM - Joint Base Lewis-McChord

MBTA – Migratory Bird Treaty Act

MED – Monitoring, Enforcement and Defense

MPG – Mazama Pocket Gopher

NEPA – National Environmental Policy Act

NLCD – National Land Cover Dataset

NRCS – Natural Resource Conservation Service

OPG – Olympia Pocket Gopher

OSF – Oregon Spotted Frog

OVS – Oregon Vesper Sparrow

PHS – Priority Habitats and Species

ROW – Right-of-Way

RCW – Revised Code of Washington

RPA – Reserve Priority Area

SEPA – State Environmental Policy Act

SMA – Special Management Area

SMP - Shoreline Master Program

TCB – Taylor’s Checkerspot Butterfly

TCC – Thurston County Code

TPG – Tenino Pocket Gopher

TRPC – Thurston Regional Planning Council

UGA – Urban Growth Area

USC – United States Code

USFWS – United States Fish and Wildlife Service or U.S. Fish and Wildlife Service

WAC – Washington Administrative Code

WDFW – Washington Department of Fish and Wildlife

DNR – Washington Department of Natural Resources

WSDOT – Washington Department of Transportation

WSMA – Washington Shoreline Management Act

YPG – Yelm Pocket Gopher

YPG N – Service Area for Yelm Pocket Gopher at the northern portion of the subspecies range

YPG E – Service Area for Yelm Pocket Gopher at the eastern portion of the subspecies range.

YPG S – Service Area for Yelm Pocket Gopher at the southern portion of the subspecies range

Chapter 1 Introduction and Background

Thurston County is located in western Washington, south of the major metropolitan areas of Seattle and Tacoma (Figure 1.1). The County population has increased substantially in the last 50 years (from 64,400 residents in 1965 to 267,400 residents in 2015), amongst the fastest growth rates in the nation (Thurston Regional Planning Council (TRPC); TRPC 2012b). The population is expected to climb to 383,850 by 2045 (TRPC 2017). Population growth supports an important economy, which is projected to grow 71,200 jobs from 128,500 in 2010 to nearly 200,000 in 2045 (TRPC 2017), which will entail new commercial and industrial development. Thurston County is projected to add 62,000 new homes to support those people and businesses by 2045 (TRPC 2017). Thurston County is a great place to live, work, and play. People value the County's rural character, its farms, its cities, and its open spaces. The County has several programs that encourage property owners to maintain lands in open space, protect habitat on agricultural lands, as well as fund conservation projects that preserve habitat throughout the County. Significant lands within Thurston County have been conserved by other entities over time, including but not limited to Washington Department of Fish and Wildlife (WDFW), United States Fish and Wildlife Service (USFWS), Natural Resources Conservation Service (NRCS), Washington State Department of Natural Resources (DNR), and land trusts. These strategies have contributed over 60,000 acres toward conservation of fish and wildlife habitat.

Although Thurston County's growth has brought many benefits to the area, it has also fragmented the natural mosaic of wetland and riparian habitat, prairies, oak savannas, woodlands, and conifer forests. As people built homes and businesses, and communities built schools, water and sewer lines, and roads, prairie habitat that once covered more than 180,380 acres (ac) (73,000 hectares (ha)) before Euro-American settlement declined to less than 17,300 ac (7,000 ha) (Crawford and Hall 1997). Those declines in prairie habitat occurred commensurate with reductions in associated oak and wetland/riparian habitats.

As the quantity of prairie habitat has declined, the quality and function of remaining prairie habitat has also decreased. Of the remaining prairie habitat in western Washington, estimates suggest that only 2-3% of prairies are dominated by native prairie species (Dunwiddie and Bakker 2011). Part of this decline in prairie habitat quality is due to the cessation of regular burning of prairie ecosystems and encroachment from non-native invasive plant species, but development has also played a significant role (Crawford and Hall 1997). Invasive species (e.g., reed canarygrass, *Phalaris arundinacea*) have also impacted wetland and riparian habitat quality and function and have altered hydrology across the landscape of Thurston County.

Multiple prairie dependent species have declined to the extent that they have been listed as threatened or endangered under the federal Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.). Others are identified as endangered, threatened, or sensitive at a state level by WDFW. Many species persist on a limited number of protected natural areas managed by state and federal resource agencies or conservation organizations (e.g., Capital Land Trust, the Center for Natural Lands

Management), which may not be sufficient to support functioning and sustainable populations of these species into the future.

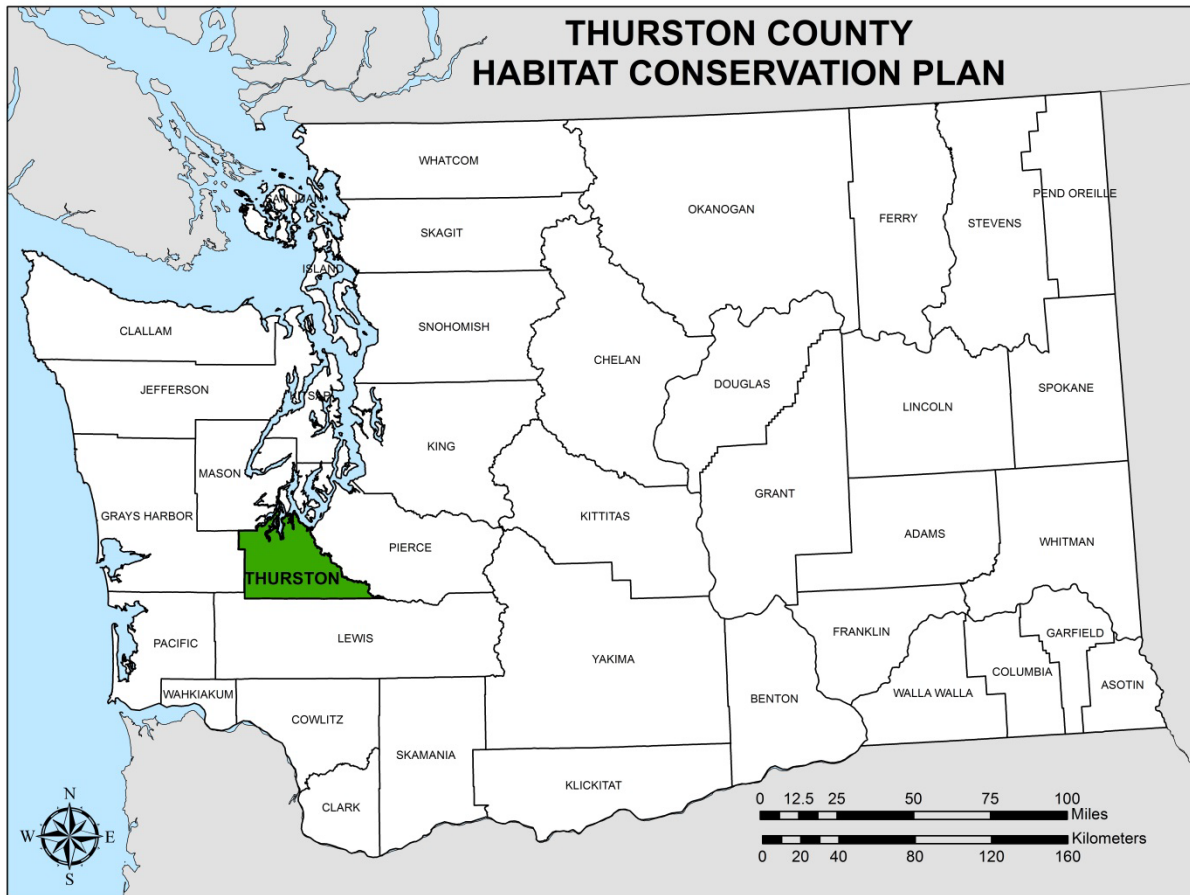


Figure 1.1 Location of Thurston County in Washington, USA.

The ESA makes it illegal to negatively impact listed animal species (known as “incidental take¹”) without an Incidental Take Permit (ITP). Negative impacts result from activities that cause death, harm, or harassment to such an extent the impacted species are unable to breed, feed, or seek shelter. Significant impacts to the species’ habitat can also result in violation of the ESA. The County is proactively addressing the need to comply with the ESA on behalf of its citizens and anticipates another 30 years of growth in the County. That growth will have unavoidable impacts for prairie and wetland/riparian habitats and the species dependent on them.

¹ Defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species. Harm may include significant habitat modification where it actually kills or injures a listed species through impairment of essential behavior (e.g., nesting or reproduction).

1.1 HCP Vision, Goals, Purpose, and Need

The County has developed this Habitat Conservation Plan (HCP) to benefit its citizens by providing long-term economic and ecological benefits. The vision of the HCP is to provide regulatory certainty for the County and its citizens for the next 30 years of growth and economic development, through measures that contribute to the conservation of listed and rare species. The HCP will limit liability under the ESA and increase predictability and local control. The HCP aims for a balance—providing for the viability of listed and rare species, but also reinforcing the thriving economies and communities that make Thurston County a great place to live.

The overarching goals² of this HCP are to:

- Achieve compliance with ESA protections and regulations to provide long-term certainty for growth and economic development in Thurston County;
- Protect, enhance, and maintain a network of New Reserves to support listed and rare species;
- Enhance and maintain critical Existing Preserves (Enhanced Existing Preserves) that support listed and rare species; and
- Protect and maintain working lands (Working Lands Easements) that retain value as habitat for listed and rare species while also supporting agriculture and the County's rural character.

The purpose of this HCP is to fulfill the requirements necessary to obtain an Incidental Take Permit. The Incidental Take Permit will provide for a limited amount of impacts to (also known as take of) listed and rare species, if the following criteria are satisfied: (i) the taking will be incidental; (ii) the Applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the Applicant will ensure that adequate funding for the plan will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (v) the measures, if any, required under subparagraph (A)(iv) will be met (ESA, Section 10(a)(1)(B)).

The County is voluntarily seeking an Incidental Take Permit from USFWS to cover activities it implements, permits, or funds (Covered Activities) that have the potential to incidentally impact a specific set of listed and rare species (Covered Species). The County is not required to obtain an Incidental Take Permit but must comply with the ESA. All applications for development including private development and public projects, as well as those proposed by county departments reviewed under this plan shall meet the requirements set forth in the Habitat Conservation Plan. Participation in the County's HCP is also voluntary. County permittees, departments, and partners may choose to pursue consultation directly with the USFWS and develop an HCP as part of their own, independent application for an Incidental Take Permit. USFWS will determine whether to process independent applications as appropriate based on the circumstances and applicable laws, regulations and USFWS policies in place at the time of the request. All other county permits are still required. The Thurston County HCP is intended to provide predictability to its permit Applicants by establishing more certain

² The specific Biological Goal and objectives of this HCP, per USFWS 5 Point Policy, are included in Chapter 5: Conservation Program.

development timelines and requirements and removing the burden to permit Applicants of developing individual HCPs before seeking County permits. All applicants choosing to work directly with USFWS shall submit to Thurston County a copy of their USFWS approved HCP and ITP prior to County approval.

The HCP establishes and describes the HCP Conservation Program, which identifies the County's commitment to avoid, minimize and mitigate, to the maximum extent practicable, impacts to the Covered Species from the Covered Activities identified in the Incidental Take Permit. The Conservation Program includes the establishment of a network of open space and habitat lands intended to conserve functioning healthy ecosystems and their biodiversity into perpetuity. Implementation of the Conservation Program will benefit from partnerships among the County, its local citizens, local entities, and the USFWS, and may assist in the recovery of listed and rare species in Thurston County.

1.2 Proposed Action

1.2.1 Geographic Scope- HCP Plan and Permit Area

The HCP's Plan Area includes the entirety of Thurston County, and includes all areas that may be influenced by HCP implementation regardless of ownership, political boundaries, or whether impacts to the Covered Species are likely to occur. The Plan Area also includes sites where mitigation may occur, downstream or down-slope areas where erosion or sedimentation effects could result from Covered Activities, or where benefits resulting from the HCP Conservation Program implementation are expected.

The Permit Area for this HCP includes lands over which Thurston County has permitting authority and where the Covered Activities and resulting take will occur—approximately 412,228 ac (166,823 ha) (Figure 1.2). Thurston County has no jurisdiction over the activities covered under the requested Incidental Take Permit and described in this HCP within the limits of incorporated cities, on tribal lands, or on lands under federal control including national wildlife refuges, national forests, or under the control of the Department of Defense (DOD; such as Joint Base Lewis-McChord (JBLM)) where such lands may fall within the boundaries of the County. Federal wildlife refuges, national forests, and the DOD and JBLM consult directly with USFWS for actions under their control which may affect listed species or their habitats in accordance with their obligations under Section 7 of the ESA.

1.2.2 Species to be Covered by the Permit

This HCP includes coverage for a total of six species/subspecies (hereafter 'Covered Species'; Table 1.1) that rely on prairie habitats throughout the County or on wetland/riparian habitat in the Black River watershed. These species include three mammal subspecies, one bird species, one amphibian, and one butterfly. Five of the Covered species are listed as threatened or endangered under the ESA and one species is unlisted but considered rare and sensitive by the State of Washington (see Table 1.1 and Section 1.2.2). By including listed species and currently unlisted but sensitive species in the HCP, the County is taking proactive steps to provide 30 years of development certainty and conservation action at a programmatic and landscape scale. In the event that the currently unlisted but sensitive species does become listed, incidental take coverage for that species will already be available through the County's

Incidental Take Permit. The Conservation Program of this HCP may also decrease the likelihood of this species ever being listed.

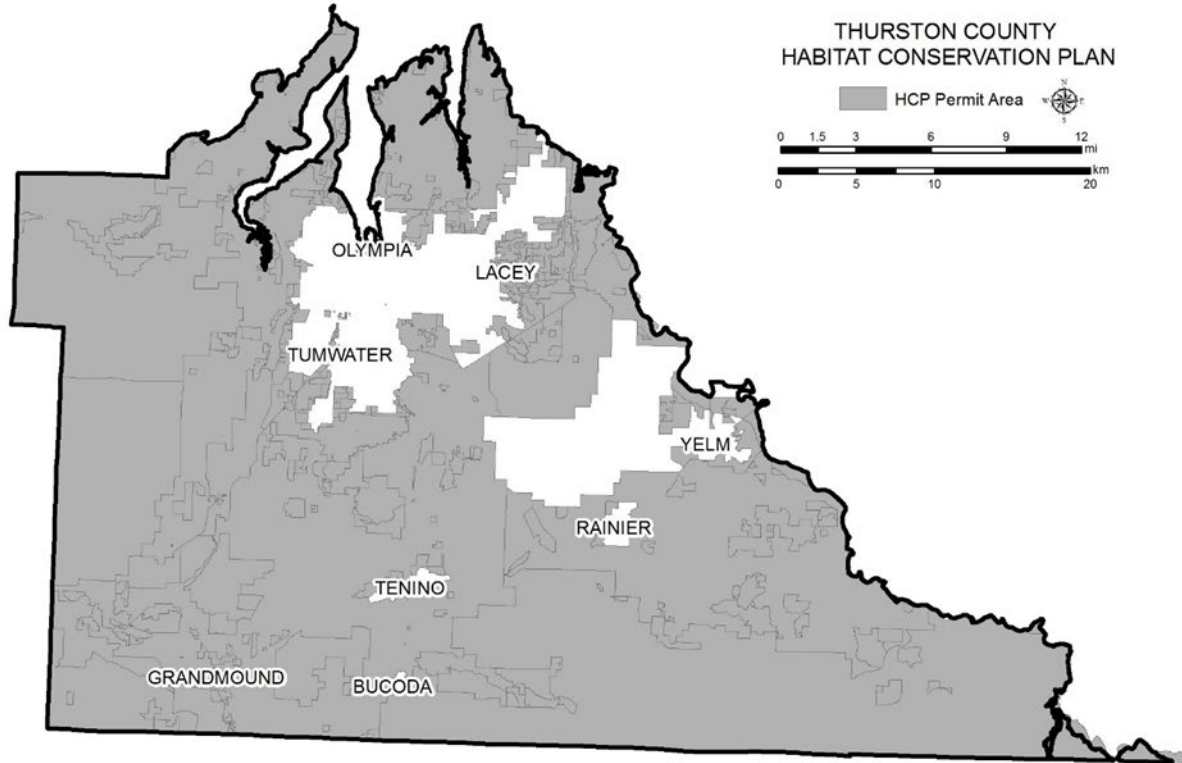


Figure 1.2 Thurston County HCP Permit Area.

Table 1.1 Covered species of the Thurston County HCP.

Common Name	Scientific Name	Status <i>Federal</i>	Status <i>State</i>
Olympia Pocket Gopher	<i>Thomomys mazama</i> spp. <i>pugetensis</i>	Threatened	Threatened
Tenino Pocket Gopher	<i>Thomomys mazama</i> spp. <i>tumuli</i>	Threatened	Threatened
Yelm Pocket Gopher	<i>Thomomys mazama</i> spp. <i>yelmensis</i>	Threatened	Threatened
Taylor's Checkerspot Butterfly	<i>Euphydryas editha taylori</i>	Endangered	Endangered
Oregon Vesper Sparrow	<i>Poocetes gramineus</i>	n/a	Candidate
Oregon Spotted Frog	<i>Rana pretiosa</i>	Threatened	Endangered

1.2.3 Conservation Lands System

Thurston County has developed a Conservation Program to offset the impacts to the Covered Species by the Covered Activities of the HCP. Central to the Conservation Program are mitigation measures to build the Thurston County Conservation Lands System (Conservation Lands System), expanding on the existing network of protected lands managed for Covered Species and their habitats. The Conservation Lands System identifies the priority places, tools, and processes to protect the habitats important to the Covered Species.

1.2.4 Term of Incidental Take Permit

Thurston County is seeking a 30-year Incidental Take Permit from USFWS (Permit Term). Thirty years was chosen as the permit duration because it is a reasonable timeframe in which to forecast local growth. All assessments and projections in the HCP are based on a 30-year time period. Prior to permit expiration, Thurston County may choose to apply to renew or amend the HCP and the associated Incidental Take Permit to extend their terms in accordance with USFWS regulations.

1.3 Plan Development

Thurston County began developing the HCP in 2010 and obtained funding through an HCP Assistance grant under the Cooperative Endangered Species Conservation Fund administered by WDFW with funds from USFWS. A broad overview of the major steps in the HCP plan development process is illustrated in Figure 1.3.

The Thurston Board of County Commissioners³ designated the Thurston County department of Community Planning and Economic Development to lead the HCP development process. The County relied on (or incorporated) input from technical advisors, consultants, stakeholders, and interested members of the public to identify the Covered Activities, Covered Species, and quantification tools of the HCP. Thurston County worked closely with the Thurston Regional Planning Council (TRPC) and multiple Thurston County departments to ensure that the final product would address the County's forecasted population growth, development, and land use needs within the requested term of the Incidental Take Permit. The County and consultants also received technical assistance and guidance from the USFWS and WDFW.

1.3.1 Public Outreach and Public Meetings

Thurston County provided public outreach opportunities through workshops, presentations, and public meetings during the development of the HCP. Such opportunities are listed in Appendix A: HCP Outreach Summary.

³ The Board of County Commissioners is the County's legislative authority and is made up of three commissioners elected to four-year terms. The Board is expected to formally adopt the HCP and incorporate its components into the County's Comprehensive Plan, local ordinances, and processes.

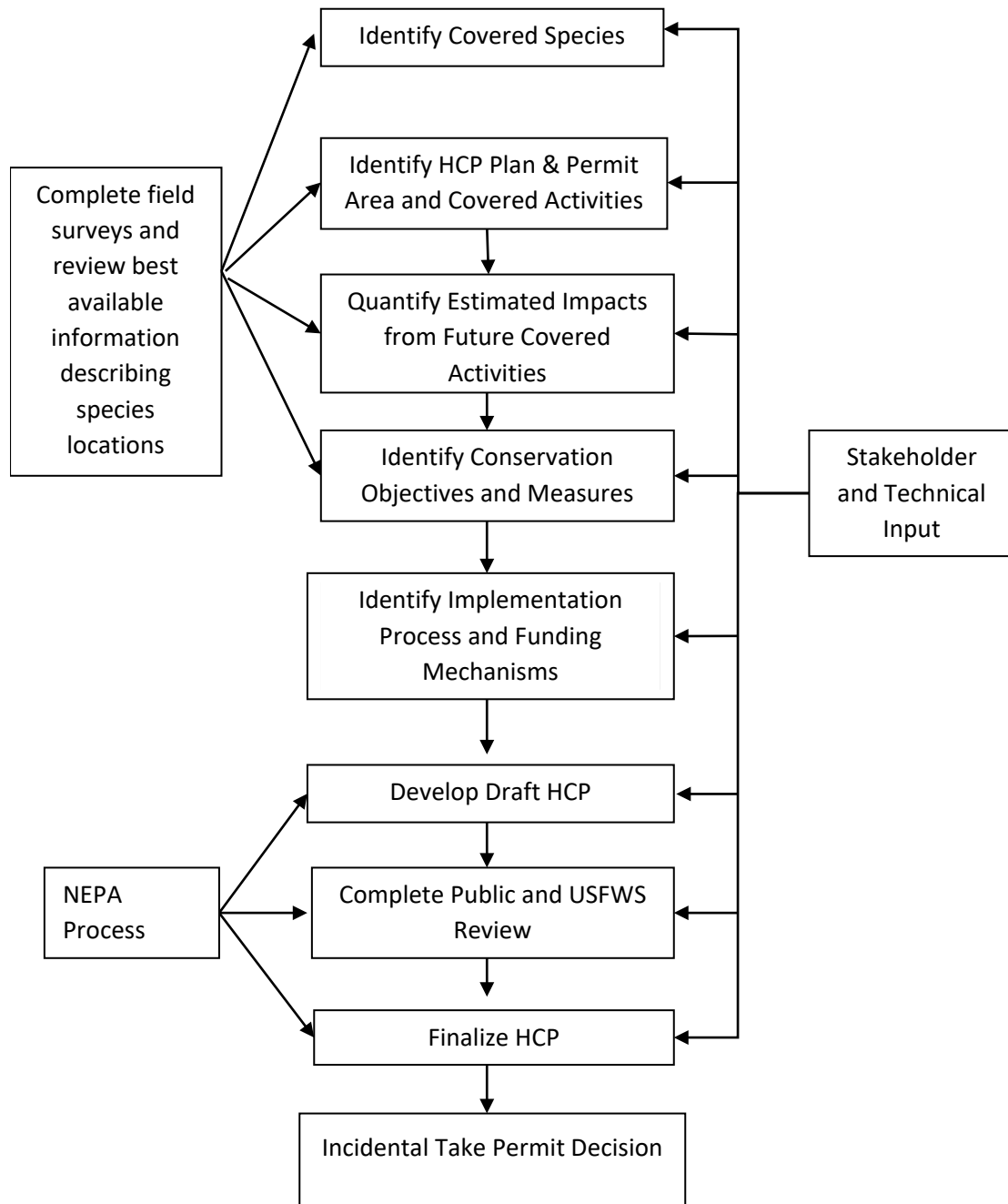


Figure 1.3 Steps in the HCP planning, development, and review process.

1.4 Regulatory Framework

The HCP is designed primarily to comply with the ESA as described below. The HCP is consistent with all other federal and state wildlife and related laws and regulations.

1.4.1 Federal Laws

Endangered Species Act

The United States Congress enacted the ESA to protect plants and animals in danger of, or threatened with, extinction. The USFWS is responsible for implementing the ESA for those species under its jurisdiction. The ESA and its implementing regulations in Title 50 of the Code of Federal Regulations (CFR) Section 17 prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the ESA. Section 3 of 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 United States Code [USC] § 1532 (19)). The term “harm” is defined to include any 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” (50 C.F.R. § 17.3).

Section 7(a)(2) of the ESA requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat (16 USC § 1536 (a)(2)). If the actions of a Federal agency are not likely to jeopardize the continued existence of any endangered or threatened species, but could adversely affect the species or result in a take, the action must be addressed under Section 7 of the ESA (16 USC § 1536 (a)(2)).

Section 9 of the ESA prohibits the “take” of threatened and endangered species, including the attempt or action to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” such species (16 U.S.C. § 1532).

Section 10 of the ESA allows non-Federal Applicants, under certain terms and conditions, to incidentally take ESA-listed species that would otherwise be prohibited under Section 9 of the ESA. When a non-Federal landowner or other non-Federal entity wishes to proceed with an activity that is legal in all other respects, but that may result in the incidental taking of a listed species, an Incidental Take Permit, as defined under Section 10 of the ESA, may be requested. Incidental take is defined as take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity” (50 CFR § 17.3). Under Section 10 of the ESA, an HCP that meets USFWS statutory and regulatory requirements is required to accompany an application for an Incidental Take Permit and, among other requirements identified below, the applicant must, to the maximum extent practicable, minimize and mitigate the impacts of such taking.

The USFWS is required to respond to all Applicants seeking permits, which would allow incidental take of listed species if approved. It is necessary for the USFWS to assure that the HCP comply with the incidental take provisions of the ESA [50 CFR 17.22 (b) and 17.32(b)] prior to issuance of a take permit for federally listed threatened or endangered fish and wildlife species.

An HCP submitted in support of a Section 10 permit application must specify [16 U.S.C. § 1539(a)(2)(A)(i)-(iv)]:

- The impact that will likely result from the taking;
- Steps the Applicants will take to minimize and mitigate such impacts; the funding available to implement such steps; and the procedures to be used to deal with unforeseen circumstances;
- Alternative actions to such taking considered by the Applicants and the reasons why such alternatives are not proposed to be used; and
- Other measures that may be required as necessary or appropriate for the purposes of the plan.

To issue an incidental take permit, the USFWS must find that [ESA § 10(a)(2)(B)]:

- The taking will be incidental;
- The Applicants will, to the maximum extent practicable, minimize and mitigate the impacts of such taking;
- The Applicants will ensure that adequate funding will be provided;
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild; and
- The Applicants will ensure that other measures as may be required by USFWS as necessary or appropriate for the purposes of the HCP will be implemented.

The *HCP Handbook Addendum* (USFWS and National Marine Fisheries Service [NMFS] 2000), referred to as the "5-point policy," provides additional guidance and recommendations for the development of HCPs (65 FR 250-256). The five points are as follows:

1. Defined conservation goals and objectives;
2. An adaptive management strategy;
3. Compliance and Effectiveness Monitoring;
4. An established permit duration; and
5. Opportunities for public participation.

The Thurston County HCP addresses each of these five points.

Mazama Pocket Gopher 4(d) Special Rule

Due to a special rule under section 4(d) of the ESA certain general activities conducted on non-federal agricultural and ranching lands, regular maintenance activities on the Olympia Airport, certain ongoing non-commercial activities by small private landowners, control of noxious weeds and invasive plants on non-Federal lands, and maintenance of roadside rights-of-way on both Federal and non-Federal lands

are exempt from accidentally disturbing, harming or killing (“taking”) the four subspecies of Mazama Pocket Gopher in Thurston and Pierce counties.

Accepted agricultural or horticultural (farming) practices include:

- Grazing;
- Routine installation, management, and maintenance of stock water facilities such as stock ponds, berms, troughs, and tanks, pipelines, and watering systems to maintain water supplies;
- Routine maintenance or construction of fencing;
- Planting, harvest, fertilization, harrowing, tilling, or rotation of crops. Disturbance to the soils shall not exceed a 12-inch (30.5-cm) depth. All activities which don't disturb the soil surface are also allowed, such as haying, baling, some orchard and berry plant management activities, etc.;
- Maintenance of livestock management facilities such as corrals, sheds, and other ranch outbuildings;
- Repair and maintenance of unimproved agricultural roads. This exemption does not include improvement, upgrade, or construction of new roads;
- Placement of mineral supplements, plant nutrients, or soil amendments;
- Harvest, control, or other management of noxious weeds and invasive plants through mowing, discing, herbicide and fungicide application, fumigation, or burning. Use of herbicides, fungicides, fumigation, and burning must occur in such a way that non-target plants are avoided to the maximum extent practicable; and
- Deep tillage (usually at depths of 18-36 inches (45.7-91.4 cm), for compaction reduction purposes) occurring between September 1 and February 28, no more often than once in 10 years.

Exempted non-commercial activities that occur in or adjacent to Mazama Pocket Gopher habitat include the following:

- Harvest, control, or other management of noxious weeds and invasive plants through mowing, herbicide and fungicide application, fumigation, or burning. Use of herbicides, fungicides, fumigation, and burning must occur in such a way that non-target plants are avoided to the maximum extent practicable;
- Construction and placement of fencing, garden plots, or play equipment; and
- Construction and placement of dog kennels, carports, or storage sheds less than 120 ft² (11.15 m²) in size.

Exempted, non-Federal, routine maintenance activities in or adjacent to Mazama Pocket Gopher habitat and associated with airport operations on the Olympia Airport include the following:

- Routine management, repair, and maintenance of runways, roads, and taxiways (does not include upgrades, or construction of new runways, roads, or taxiways, or new development at airports);
- Hazing of hazardous wildlife;
- Management of forage, water, and shelter to reduce the attractiveness of the area around the airport for hazardous wildlife; and
- Control or other management of noxious weeds and invasive plants through mowing, discing, herbicide and fungicide application, fumigation, or burning. Use of herbicides, fungicides, fumigation, and burning must occur in such a way that non-target plants are avoided to the maximum extent practicable.

Routine removal or other management of noxious weeds and invasive plants are limited to the following, and must be conducted in a way that impacts to non-target plants are avoided to the maximum extent practicable:

- Mowing;
- Discing;
- Herbicide and fungicide application;
- Fumigation; and
- Burning.

Routine maintenance activities of roadside rights-of-way of highways and roads are limited to the following, and must be conducted in a way that impacts to non-target plants are avoided to the maximum extent practicable:

- Mowing;
- Mechanical removal of noxious weeds or invasive plants;
- Selective application of herbicides for removal of noxious weeds or invasive plants; and
- Repair or maintenance of fences.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) (42 U.S.C. §4321 et seq.) requires that federal agencies analyze and publicly disclose the social, economic, and environmental effects associated with major federal actions (§4332). This analysis can take the form of an Environmental Assessment (EA) and/or Environmental Impact Statement (EIS). The issuance of an Incidental Take Permit is a federal action subject to NEPA compliance. Before it can decide whether to approve an Incidental Take Permit under Section 10(a)(1)(B), the USFWS will prepare and distribute an EA or EIS that addresses the direct, indirect, and cumulative effects of the incidental take authorized by permit issuance, and the direct,

indirect, and cumulative effects associated with the implementation of mitigation and minimization measures described in the HCP.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC § 40 et seq.), requires Federal agencies to take into account the effects of their proposed actions on properties eligible for inclusion in the National Register of Historic Places. “Properties” are defined as “cultural resources,” which includes prehistoric and historic sites, buildings, and structures that are listed or eligible for listing in the National Register of Historic Places. An undertaking is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency; including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency. The issuance of an Incidental Take Permit is an undertaking subject to compliance with Section 106 of the National Historic Preservation Act. Local development projects using federal funds are also subject to the Section 106 process, which affords Thurston County a reasonable opportunity to comment on those projects. The goal of Section 106 consultation is to identify properties potentially impacted by a project, assess the impacts, and seek ways to avoid, minimize, or mitigate any adverse impacts including physical changes to resources. Additionally, the goal is to avoid the disturbance or infringement on cultural landscapes.

Washington State and Thurston County also protect federally and locally identified historic and cultural resources through local planning and permitting laws and policies (described in Section 1.4.2). Thurston County is a Certified Local Government under the National Historic Preservation Act.

Clean Water Act

The Clean Water Act protects the physical, chemical, and biological integrity of the nation’s waters, including lakes, rivers, wetlands, and coastal waters. Programs conducted under the Clean Water Act are directed at both point source pollution (e.g., waste discharged from outfalls and filling of waters) and nonpoint source pollution (e.g., runoff from parking lots). Under the Clean Water Act, the U.S. Environmental Protection Agency (EPA) and Washington Department of Ecology (ECY) set effluent limitations and issue permits under Clean Water Act Section 402 governing point-source discharges of wastes to waters. The U.S. Army Corps of Engineers (Corps), applying its regulations under EPA guidelines and oversight, issues permits under Clean Water Act Section 404 governing under what circumstances dredged or fill material may be discharged to waters. These Section 402 and 404 permits are the primary regulatory tools of the Clean Water Act.

Under Clean Water Act Section 401, ECY has the authority to certify federal permits for discharges to waters under state jurisdiction. ECY may review proposed federal permits (e.g., Section 404 permits) for compliance with state water quality standards. The permit cannot be issued if the state denies certification. Compliance with the conditions on Covered Activities described in this HCP are consistent with the requirements of the Clean Water Act.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S. Government Code [USC] 703 et seq) implements various treaties of conventions between the United States and Canada, Japan, Mexico, and

countries of the former Soviet Union for the protection of migratory birds. The MBTA prohibits taking, killing, or possessing migratory birds or any parts, nests, or eggs of such birds (16 U.S.C. 703). Taking is defined under the MBTA separately from the federal ESA. The MBTA defines migratory birds broadly, and the Oregon vesper sparrow, which is a covered species in this HCP is also listed as a migratory bird species under the MBTA.

1.4.2 State and Local Laws

Washington State Endangered and Protected Species Regulations

Fish, wildlife, and shellfish in Washington State are managed by WDFW, which operates under Title 77 of the Revised Code of Washington and Chapter 220 of the Washington Administrative Code. The department is charged with conserving wildlife and food fish, game fish, and shellfish resources. The Fish and Wildlife Commission, made up of nine members appointed by the Governor and confirmed by the Senate, sets policy and direction for WDFW and has authorized the taking of wildlife resources in manners and quantity that will not impair the supply of these resources (Chapter 77.04 RCW). The Director of the Department may also recommend species to be protected from hunting, and may also determine that a species is threatened with extinction in the state of Washington and request that the Commission designate the species as endangered (Chapter 77.12 RCW).

State endangered species are listed in WAC 220-610-010. Classification of wildlife as endangered, threatened, or sensitive is addressed in WAC 220-610-110. The intent of this rule is to ensure survival of these species as free-ranging populations in Washington and to define the process by which listing, management, recovery, and delisting is implemented (WAC 220-610-110). WDFW writes recovery plans for species listed as endangered or threatened.

Washington State Growth Management Act

The Washington State Growth Management Act (GMA) was adopted by the state Legislature in 1990. In the findings of the GMA, it is stated:

“The legislature finds that uncoordinated and unplanned growth, together with a lack of common goals expressing the public's interest in the conservation and the wise use of our lands, pose a threat to the environment, sustainable economic development, and the health, safety, and high-quality of life enjoyed by residents of this state. It is in the public interest that citizens, communities, local governments, and the private sector cooperate and coordinate with one another in comprehensive land use planning. Further, the legislature finds that it is in the public interest that economic development programs be shared with communities experiencing insufficient economic growth.” (RCW 36.70A.010)

The Act outlines fourteen goals that must be balanced during development of state-mandated comprehensive plans and development regulations. The goals are not prioritized. Of particular relevance to the HCP are the following goals:

“...(8) Natural resource industries. Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands, and discourage incompatible uses.

(9) Open space and recreation. Retain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities.

(10) Environment. Protect the environment and enhance the state's high-quality of life, including air and water quality, and the availability of water.

..." (RCW 36.70A.020)

The GMA requires all cities and counties in Washington State to identify and protect five types of environmentally sensitive areas, known as critical areas, using best available science⁴. These critical areas include wetlands, geologically hazardous areas, frequently flooded areas, critical aquifer recharge areas, and fish and wildlife habitat conservation areas. In Thurston County, protections for these areas are created at the county level and integrated into County Code (TCC) in a set of development regulations known as a Critical Areas Ordinance (CAO) (TCC Title 24 and TCC Chapter 17.15). The most recent update to the Thurston County CAO was adopted in July 2012.

In the CAO, important habitats and species including, but not limited to, Federal and State threatened and endangered species and their habitats of primary association, prairie, , and wetland/riparian habitats are considered critical areas. Additionally, the federal critical habitat designations for the Mazama Pocket Gopher subspecies describe the designated critical habitat as presumed to be occupied by the Mazama Pocket Gopher subspecies. Therefore, designated critical habitat for the Mazama Pocket Gopher subspecies meets the definition of fish and wildlife habitat conservation area and is a Critical Area under Title 24 of the County CAO (24.01). The critical areas described receive protection through provisions for fish and wildlife habitat conservation areas (TCC Chapter 24.25), and wetland habitat, through wetland protections (TCC Chapter 24.30). In addition to the specific development standards located in the referenced Chapters of Title 24, parcels located within critical areas or associated buffer (as defined by TCC 24.03.010) are limited in their eligibility for subdivision. Those parcels which contain critical areas must meet certain standards to subdivide, which are included in TCC 24.55. This includes a requirement that "a contiguous portion of each proposed lot is located outside of the critical area. The proposed lots shall be accessible by a legally existing road or a proposed road located outside of critical areas or hazard areas. Where possible, subdivisions must be able to be designed to maintain adequate habitat connectivity, as determined by the review authority."

During land use application review, the County uses screening tools such as geographic information system (GIS) mapping to indicate the potential presence of prairie, oak, or wetland/riparian habitat or species. If screening tools indicate that these habitats or sensitive fish and wildlife species may be present, site visits are completed to determine the nature and extent of habitat and/or species presence. If fish and wildlife habitat conservation areas are detected on site, Applicants must comply with all provisions of Title 24 and/or Chapter 17.15, which includes, but is not limited to, submitting a critical area report (TCC 24.35) a habitat survey completed by a qualified professional and follows

⁴ The minimum guidelines for classifying and designating critical areas can be found in WAC 365-195. Counties and cities must include the "best available science" when developing policies and development regulations to protect the functions and values of critical areas as specified under WAC 365-190.

mitigation sequencing. When impacts to fish and wildlife habitat conservation areas cannot be avoided, a mitigation plan is required. The CAO will be revised to be consistent with the HCP and will defer to the HCP for Covered Species.

State and Local Protection of Historic and Cultural Resources

The GMA establishes a planning goal to guide local historic preservation: *Identify and encourage the preservation of lands, sites, and structures that have historical or archaeological significance* RCW 36.70A.020(13). The Thurston County Comprehensive Plan implements this goal through Chapter 10: Archaeological and Historic Resources. This Chapter includes policies to guide local inventory and protection of these resources, including Goal 1, Objective B, which states: “Important archaeological and historic resources are protected and preserved through the county’s land use permitting process. ...The county should encourage land uses and development proposals that retain or enhance archaeological and historic cultural resources and discourage the destruction or incompatible alteration of these resources.” These policies are implemented through state and local permit review processes.

The Comprehensive Plan includes a list of identified historic resources in Thurston County from the Thurston County Cultural Resources Inventory. Historic sites are mapped in the Comprehensive Plan (Comprehensive Plan Map H-1). Information and a map of the historic resources from the Thurston County Cultural Resources Inventory are also available to the public through the County’s online GeoData map service, which is updated when new resources are added to the inventory. The Cultural Resources Inventory is included in the County’s permit system and used for permit review. The local inventory includes resources listed on the Washington State Historic Register, which in turn includes sites on the National Historic Register established by the National Historic Preservation Act (NHPA).⁵ The Washington State Historic Register is maintained by the Washington State Department of Archeology and Historic Preservation (DAHP), Washington State’s historic preservation office as established under NHPA. DAHP maintains a statewide Historic Property Inventory that is consulted for local permit reviews (WISSARD).

The County’s Historic Register Program was started in 1984 with the adoption of the Thurston County Historic Preservation Ordinance (TCC Chapter 2.106). As part of establishing the program, the county created the Thurston County Historic Commission. Thurston County is a Certified Local Government meeting state and national standards for historic preservation under the NHPA. The Certified Local Government Program in Washington is administered by DAHP which houses the State Historic Preservation Officer.

The local inventory is maintained by the Thurston County Historic Commission. If a resource is listed on the inventory, consideration will be given to the effects of land use actions on the listed property. Mitigation of those effects may be required before a land use action can proceed. The Thurston County

⁵ The Geodata Historic Sites layer includes historic buildings, sites, natural features and objects from WA State Historic Register. This data is maintained and update by the Thurston GeoData Center with input from the Community Planning and Economic Development Permitting Department. This data includes federal, state, and local historic registered sites. The complete historic database, including some site-specific photographs, is available through Thurston County.

Historic Commission reviews projects with potential impacts to historic resources and makes specific mitigation recommendations.

Projects may also require review under the Washington State Environmental Policy Act (SEPA). SEPA includes a purpose to “preserve important historic, cultural and natural aspects of our national heritage.” Local development proposals evaluated under SEPA consider adverse impacts to historic resources and may require avoidance or mitigation. SEPA projects are reviewed by multiple state and local government agencies (including DAHP), Tribes, the Historic Commission, and the public.

Shoreline Management Act

The Shoreline Management Act, Chapter 90.58 RCW, is a Washington state law administered by the Department of Ecology. The goal of the Shoreline Management Act is to coordinate and prevent piecemeal development of the state’s shorelines while allowing preferred shoreline uses, protecting the shoreline environment, and providing public access (RCW 90.58.020). The Shoreline Management Act applies to the state’s shorelines which includes all marine waters; streams and rivers with greater than 20 cubic feet (ft) per second (0.57 cubic meters (m) per second) mean annual flow; lakes 20 ac (8.1 ha) or larger; upland areas called shorelands that extend 200 ft (61 m) landward from the edge of these waters; and biological wetlands and river deltas as well as some or all of the 100-year floodplain (including all wetlands within the 100-year floodplain) associated with the state’s shorelines.

Each local government must prepare and adopt a Shoreline Master Program (SMP), that is essentially a shoreline specific comprehensive plan, zoning ordinance, and development permit system. The SMP must be approved by the ECY, which is also required to review certain kinds of permits such as conditional use and variance permits for compliance with state law.

The intersection of the HCP and the SMP will be specific to wetland and riparian habitat for Oregon Spotted Frog, within the 200 ft (61 m) shoreline jurisdiction and associated riparian areas. Most Oregon Spotted Frog habitat is primarily protected under the County SMP and CAO. Habitat for the species that is not covered under these regulations will require HCP coverage.

State Hydraulic Code

Hydraulic Project Approvals (HPAs), are a state permit authorized by the Hydraulic Code and administered by WDFW. The Hydraulic Code was specifically designed to protect fish life and HPAs are required for some construction projects in waters of the state. A common list of activities requiring an HPA include work on bulkheads, piers, docks, culverts, bridges, dredging, aquatic plant removal and control, water diversions and intakes, mineral prospecting, and pond construction.

Thurston County does not issue HPAs but does require Applicants have all necessary permits before issuing a building permit. In addition, most people who apply for an HPA must submit documentation with their application showing that they have complied with SEPA. SEPA reviews are usually conducted with the County permit. Typically, road maintenance activities are exempt from the SEPA process under WAC 197-11-800, 468-12-800(1)(u), 173-27-040 9(2)(b), 40 CFR 232.3 and some Nationwide Permits (depending on location and activity).

Thurston County must also have an individual, general, or programmatic HPA for any work it performs under the Hydraulic Code Rule WAC 220-660. WDFW has issued four general permits to Thurston

County public works that covers specific routine maintenance activities, which includes Beaver Management, Non-Fish Bearing Culvert Maintenance, Drift Removal, and Bridge Maintenance. The general permits streamline the process and saves time and money by eliminating the need to apply for a new permit each time the work is performed. A general permit is good for five years and includes timing limitations and contributes to conservation of these species by following the Regional Road Maintenance ESA Guidelines that promotes using Best Management Practices (BMPs). Many of the activities requiring take authorization under this plan are also subject to WDFW approval under the HPA general permits.

Chapter 2 Description of the Area to be Analyzed

2.1 Environmental Setting

Thurston County is located in western Washington state at the terminus of Puget Sound (Figure 2.1). The County has a total land mass of 736 square miles (mi) (1,906 square kilometers (km)), with approximately 14% of the land area incorporated into cities (Thurston Regional Planning Council 2011), and roughly 4% owned and managed by DOD, as part of Joint Base Lewis-McChord (JBLM). The County is generally bisected by Interstate 5. This chapter broadly describes the climate, topography, geology, soils, surface water, land use, conserved lands, and ESA listed species occurring in the County, including those to be covered and not covered in the HCP.

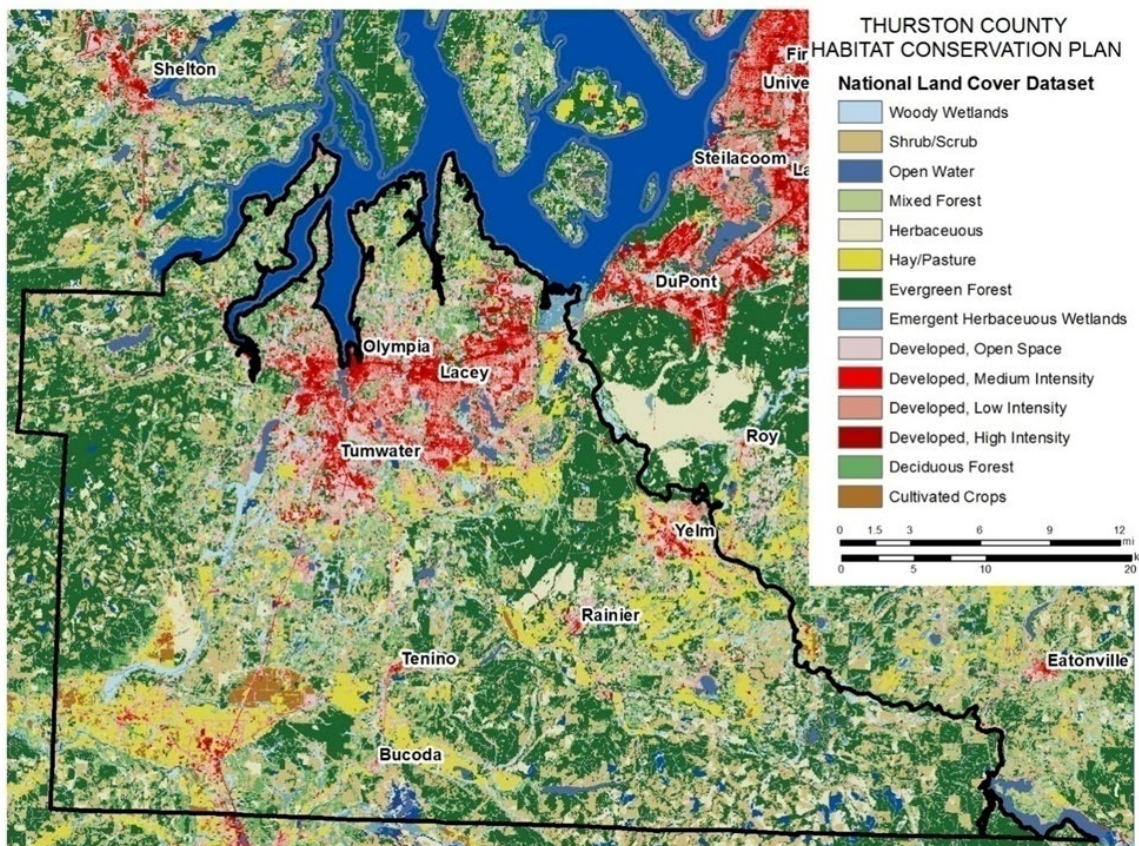


Figure 2.1 Land cover in Thurston County as defined by National Land Cover Data (Homer et al 2015).

2.1.1 Climate

Thurston County has a marine type climate with mild temperatures year-round. In summer, the average high temperature ranges between 70 and 77 degrees Fahrenheit (°F) (21-25 degrees Celsius (°C)) and average low temperatures range from 45 to 50°F (7-10°C) (WRCC 2014). Winter average high temperatures range from 44 to 54°F (6-12°C) while winter low temperatures range from 30-34°F (-1-1°C) (WRCC 2014). Generally, the County's weather is characterized by sunny, mild summers and wet, mild winters (Thurston Regional Planning Council 2011).

At the Port of Olympia Regional Airport, average (records from 1949-2013) annual total precipitation is 51 inches (in) (130 centimeters (cm)) (WRCC 2014). Precipitation occurs throughout the year in Thurston County, but is greatest between November and January, and lowest in July (WRCC 2014). More than a trace of rain falls on almost half of the days of the year (Thurston Regional Planning Council 2011).

The University of Washington's Climate Impacts Group has documented that all but six years of the period 1980-2014 were above the century's average temperature in the Puget Sound. By the 2050s, or near the end of the HCP, temperatures are expected to increase 4° to 6°F with more common extreme heat events. Over that same period, climate models predict 22% less rain during summer and increased rain in other seasons (Mauger *et. al* 2015). There is little data on how climate changes might affect HCP Covered Species, but the Conservation Program will respond to changed circumstances including but not limited to altered hydrology and changes to fire frequency. Specific measures to consider climate change are required in the Site Management Plan for each Conservation Land engaged/enrolled in the Conservation Program of the HCP. Climate change is also included as an adaptive management trigger in Chapter 6: Monitoring and Adaptive Management.

2.1.2 Topography, Geology, and Soils

The topography of the County ranges from coastal lowlands to prairie flatlands and the foothills of the Cascades. The lowest areas of the County lie at sea level along the shoreline of Puget Sound. Peaks ranging in size from 1,700 - 3,000 ft (518 - 914 m) in elevation are found in the northwest and southeast corners of the County (Thurston Regional Planning Council 2011). Generally speaking, the County is bordered on the west, south, and east by mountains, with Puget Sound along the northern boundary of the County.

An unusual landform in Thurston County are the Mima mounds: large earthen circular mounds that are typically 8 - 40 ft (2.5 - 12 m) in diameter and 1 - 6 ft (0.3 - 2 m) in height. Prairie vegetation and the mating and nectaring behavior of rare butterflies is often associated with the Mima mounds. The Mima mounds consist of gravelly sandy loam on top of thick outwash sand and gravel. The exact origins of these mounds are unknown (Nelson 1994).

Another unique area is the McAllister Geologically Sensitive Area. The McAllister Basin lies in the Puget Sound Trough, a broad depression created by the final geologic uplift which formed the Cascade mountain range 11 million years ago. It is supposed, based on limited exposed formations, that volcanic bedrock sits at the bottom of the trough, but due to the thick overlying sediments actual observation isn't possible. Following the uplift, glacial ice scoured the Puget Sound lowlands. The glaciers and ensuing erosion deposited the soils that compromise the existing McAllister Basin. Glacial "drift", the

finely ground remains of rock pulverized by glaciers, settled on the bottom of the trough. Each time the Ice Age glaciers advanced, their weight compacted underlying sediments into a concrete like material often called “till” or “hardpan”. Melting ice from the glaciers produced huge water flows that deposited “outwash” soils throughout the basin. Drift (clay), till, and outwash are all present in the basin in various combinations. They provide the parent material for most of the different soils. Drift soils contain large amounts of fine silt. They are “aquitard” or impermeable, preventing the downward migration of ground water. Till soils consist of unsorted gravel, sand, silt, and clay with fine silt predominating. These are moderately well drained to virtually impervious depending on the amount of clay in the soils. Outwash soils consist mainly of unconsolidated sand and gravel which drains rapidly, erodes easily, and has little capacity for holding water. The deepest soils in the basin are well-drained layers of outwash more than 200 feet thick. Repeated glaciation and erosion created a complex configuration of till and outwash throughout the basin. Most of the McAllister Basin contains at least 6 different soil layers. Each layer varies significantly in depth and lateral extent throughout the basin. The deposits include (from youngest to oldest): Vashon Recessional Outwash, Vashon Till, Vashon Advanced Outwash, Kitsap Formation, Salmon Springs Deposits and Pre-Salmon Spring drift. In addition to the glacial till, outwash and drift soils, muck soils occur frequently throughout the basin. Mostly found in the potholes and depressions and near creeks. Mucks are dark, fine, dense, and poorly drained soils with a highly decomposed organic content.

Thurston County contains a variety of soil types. Soils on floodplains make up approximately 5% of the County, and are level, deep, and well-drained. Soils on glacial uplands comprise approximately 60% of the County, ranging from level to steep, moderately to very deep, and moderately to somewhat excessively well-drained. Soils on uplands and mountains make up approximately 26% of the County, ranging from nearly level to very steep, moderately deep to very deep, and moderately well drained and well drained. Soils on sedimentary uplands and glacial drift plains comprise approximately 9% of the County. These soils are nearly level to steep, deep, and very deep, and moderately well drained to well drained (Pringle 1990).

Specific soils critical to the Covered Species are described in Section 2.2.

2.1.3 Vegetation

Thurston County includes a mosaic of vegetation types, with areas of coniferous and deciduous forest, prairie, and grassland, and a complex network of freshwater streams, lakes, and wetlands.

Thurston County prairie and oak ecosystems formed on excessively well-drained soils generated from glacial outwash (Ugolini and Schlichte 1973) over 10,000 years ago. Some prairies developed on flat or mounded plains with deep but well drained and uncompacted soils, whereas others developed on shallow, rocky soils of balds or bluffs, often with steep slopes and south or west facing aspects (Chappell et al. 2001). Historically, prairies persisted in an open state and avoided succession to coniferous forest though their tendency toward drought and frequent but patchy burning by native peoples (Boyd 1999).

High-quality examples of South Puget Sound prairies have a diversity of native plant species that support ecological functions (e.g., through food sources, host or nectar plants, nesting habitat). There are frequent native perennial grasses (graminoids), including Roemer’s fescue (*Festuca roemerii*), California

oatgrass (*Danthonia californica*), long stolon sedge (*Carex inops* ssp. *inops*), and prairie junegrass (*Koeleria macrantha*). Interspersed with the native grasses are a suite of native annual and perennial forbs, including yarrow (*Achillea millefolium*), camas (*Camassia quamash*), woolly sunflower (*Eriophyllum lanatum*), strawberry (*Fragaria virginiana*), white-top aster (*Sericocarpus rigidus*), buttercup (*Ranunculus occidentalis*) and violet (*Viola adunca*).

The low shrub kinnikinnick (*Arctostaphylos uva-ursi*) is also found in most South Puget Sound prairies (Dunwiddie et al. 2006). This grouping of plants has been described by the DNR Natural Heritage program (2015) as the *Festuca roemerii-Sericocarpus rigidus* plant association which is a type associated with the U.S. National Vegetation Classification (USNVC) Southern Vancouverian Shrub and Herbaceous Bald, Bluff, and Prairie Group (G488), and Chappell (2006) suggests most remaining native prairies in the south Puget Sound include this plant association. High-quality examples of this type are located on JBLM, Mima Mound and Rocky Prairie Natural Area Preserves, Scatter Creek Wildlife Area, and Glacial Heritage Preserve.

Since Euro-American settlement, high-quality native prairies in the Puget Sound region have declined due to losses from urban development, agricultural conversion, and fire suppression (Crawford and Hall 1997). Prairies that persist are threatened by invasion from aggressive introduced species (e.g., Scotch broom (*Cytisus scoparius*)) that out-compete native species. The grasslands and open woodlands are also being invaded by non-native grasses, often including perennials such as tall oatgrass (*Arrhenatherum elatius*), bentgrass (*Agrostis capillaris*), and velvetgrass (*Holcus lanatus*), or annuals such as silver or yellow hairgrass (*Aira caryophylla* or *A. praecox*) (Dunwiddie et al. 2006). The extent and diversity of non-native annual grasses often relates to ecological disturbance from past (or on-going) land management practices.

2.1.4 Existing Land Use

Thurston County features a wide array of land uses, ranging from open space and agricultural uses to urban development and military training and base facilities (Table 2.1; Figure 2.2). The northern end of the County is generally the most developed, as the County's three largest cities of Olympia, Lacey, and Tumwater are located there. Four other cities—Yelm, Rainier, Tenino, and Bucoda, in addition to the Grand Mound area (not an incorporated city)—are found in the middle to southern portions of Thurston County.

An analysis completed by TRPC indicates that between 1991 and 2006, approximately 23,500 ac (9,510 ha) of land were converted from forest stands, agriculture, or open space to urban landscapes. This area represents roughly 5% of the entire County, and approximately equal in size to the current acreage of the Urban Growth Areas in the County (Thurston Regional Planning Council 2011).

Table 2.1 Land use by zoning in Thurston County as of May 2018.

Land Use	Acres	Hectares	Percent
Cities	40,416	16,356	9%
Urban Growth Areas	20,541	8,313	4%
Military Reservation (Joint Base Lewis-McChord)	18,635	7,541	4%
Long-Term Agriculture	14,894	6,027	3%
Long-Term Forestry	144,023	58,284	31%
Public Parks, Trails, Preserves	7,889	3,193	2%
McAllister Geologically Sensitive Area*	9,313	3,769	2%
Rural, Commercial, Industrial, and Developable Land	215,593	87,247	46%
Total	471,304	190,730	100%

*The Urban Growth Area for Lacey includes an additional 1616 ac of this use.

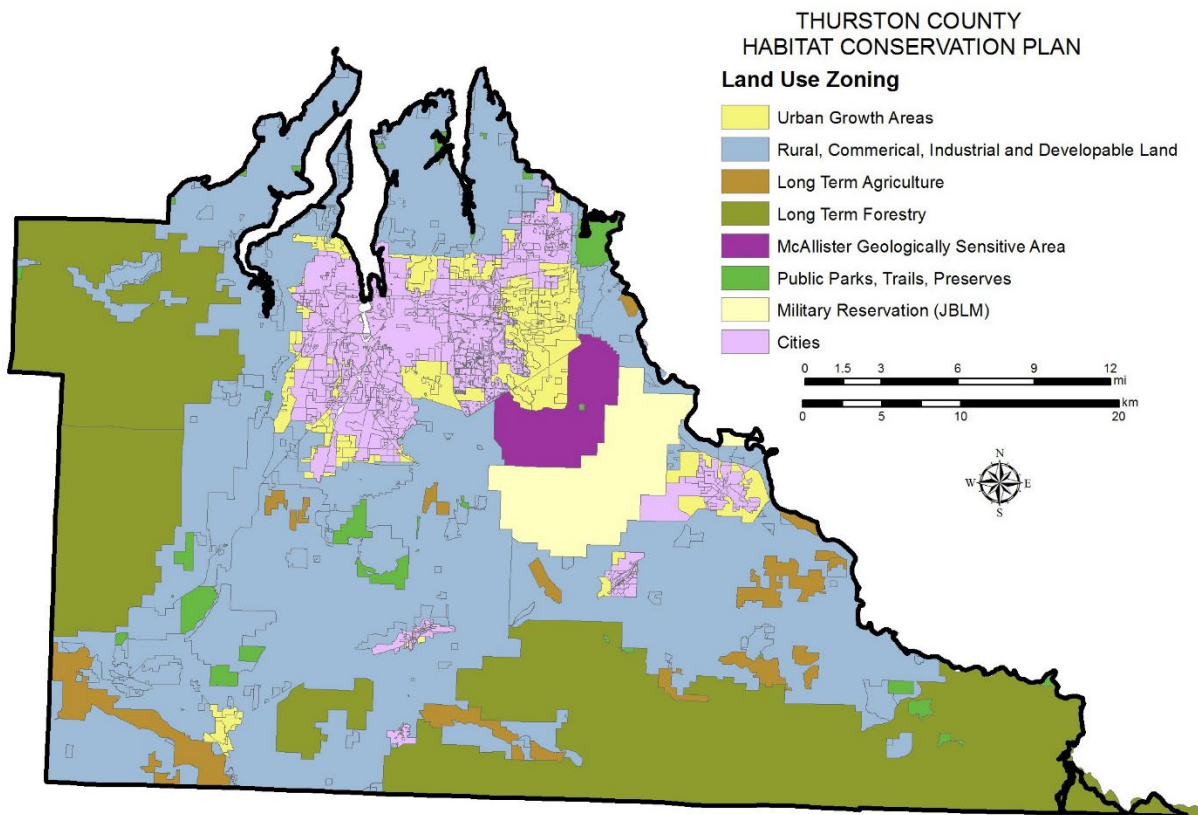


Figure 2.2 Land use zoning in Thurston County as of 2018.

2.2 Covered Species

2.2.1 Overview

The HCP Covered Species and their extent in the Permit Area are listed in Table 2.2. Five of the Covered Species occupy prairies (inclusive of grasslands and open oak savanna) and one is found in riparian/wetland habitat. Detailed descriptions of the Covered Species' biology and ecology and habitat is available in Appendix B: Covered Species Descriptions. Brief summaries of this information are included in this section, along with the methods used to delineate where each Covered Species occurs within the Permit Area.

The mapped extent of prairie species in the Thurston County HCP Permit Area (city jurisdictions are excluded) is displayed in Figure 2.3. The mapped extent for each species was identified as follows:

- Olympia, Tenino, and Yelm Pocket Gopher: Extent is defined by soils known to support the subspecies (Table 2.3). These species occur within Service Areas that include these soils. Service Areas for Mazama Pocket Gopher subspecies are designed around the five approximate geographic areas in Thurston County occupied by each Mazama Pocket Gopher subspecies.
- Taylor's Checkerspot Butterfly: Extent is defined by proximity to known locations.
- Oregon Vesper Sparrow: Extent is defined by proximity to known locations (on JBLM) and suitable habitat patch size and context.

Within the mapped extents for each Covered Species, not all habitat is presumed to be suitable to support Covered Species populations. For example, a dense conifer forested area, even if located proximal to a known Taylor's Checkerspot location, is not suitable habitat, because it does not support the resources for the butterfly's life cycle.

To account for this variability, the mapped extent for each Covered Species is further refined using methods described in the projection of impacts (Chapter 4) and HCP implementation (Chapter 6). One such refinement, applied for projections of impacts from the most widespread Covered Activities (e.g., residential development) is the use of the 2011 National Land Cover Dataset (NLCD; Homer et al 2015) to identify prairie habitat. NLCD is a National land cover product created by the Multi-Resolution Land Characteristics Consortium and uses a 16-class land cover classification scheme that has been applied consistently across the United States at a spatial resolution of 30 meters. NLCD 2011 is based primarily on classification of circa 2011 Landsat satellite data. Within the NLCD, the classes of: Barren Land (Rock/Sand/Clay), Shrub/Scrub, Grassland/Herbaceous, Pasture/Hay, Cultivated Crops, and Developed Open Space, Low intensity, Medium Intensity and High Intensity were considered potential prairie habitat. These NLCD classes (NLCD prairie classes) cover approximately 68% of the Permit Area supporting prairie soils.

Table 2.2 Prairie species in the Thurston County HCP (MPG = Mazama Pocket Gopher).

Species/ Subspecies	Range and Location Attributes in the Permit Area	Estimated Extent in Permit Area
Olympia Pocket Gopher (OPG)	For all the subspecies, current range and distribution is east of Black River and south of I-5 on soils that support the burrowing of MPGs (Table 2.3). The subspecies range for YPG includes three Service Areas. Dispersal distance is estimated at 656 ft (200m).	99,890 ac (40,424 ha), of which 843 ac (341 ha) is federally designated critical habitat for TPG and YPG.
Tenino Pocket Gopher (TPG)		
Yelm Pocket Gopher (YPG)		
Taylor's Checkerspot Butterfly (TCB)	Habitat includes upland prairie and wet prairie (uncommon) areas within dispersal distance (1,312 ft (400 m)) of known TCB populations (as of 2018, WDFW Data)*	2,424 ac (981 ha), of which 1481 ac (599 ha) are outside of habitat for MPG subspecies, and 1,053 ac (426 ha) are federally designated critical habitat.
Oregon Vesper Sparrow (OVS)	This was mapped as areas of 20 ac (8 ha) or greater of open grassland-oak savanna (less than 15% canopy). For projection purposes, this area was mapped using streamed Environmental Systems Research Institute (ESRI) high resolution imagery from 2017.	6,064 ac (2,454 ha), of which 1478 ac (598 ha) is outside of habitat for MPG subspecies.

*Dispersal distance was determined based on best available information provided by Ann Potter, Lepidopterist, WDFW and Ted Thomas, Biologist, USFWS.

THURSTON COUNTY Habitat Conservation Plan

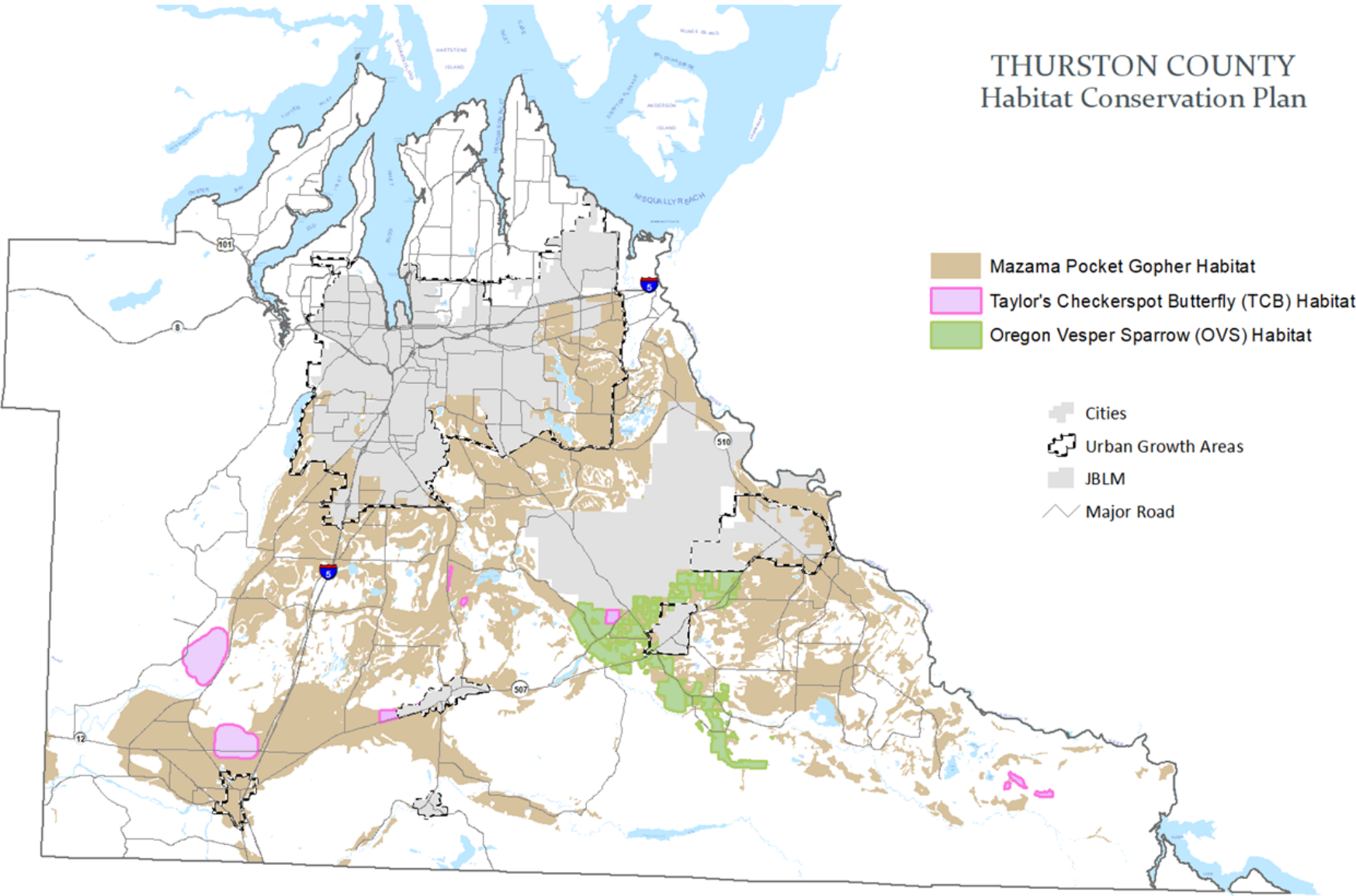


Figure 2.3 Mapped extent of prairie species in the Thurston County HCP Permit Area (city jurisdictions are excluded).

2.2.2 Mazama Pocket Gopher Subspecies

The presence of the specific prairie soil types listed in Table 2.3 is a strong factor in determining whether an area is suitable for Mazama Pocket Gophers. Mazama Pocket Gopher soils (MPG soils) are used by all subspecies, and are ranked in terms of gopher preference, which was determined through analysis of Thurston County soils, and the frequency and rate of Gopher occurrence within soil types based on survey data (USFWS 2016). A map of MPG soils, stratified by the Gopher preference for each soil, is included in Figure 2.4.

Occupancy of a site by Mazama Pocket Gophers is determined on-the-ground by mound surveys. Current survey methods can determine occupancy but cannot prove the species is not using a site because mounding activity may vary with season, moisture, vegetation, and other factors. The best available information describing distribution of Olympia, Yelm, and Tenino Pocket Gophers in the entirety of Thurston County is shown in Figure 2.5. This map is based on available survey data through the 2018⁶ survey season. Mound surveys were completed on properties in the subspecies' habitat where local permits or approvals were sought for proposed developments since the Federal listing of these subspecies in 2014. Therefore, not all parcels mapped with gopher soils in Thurston County have been surveyed. When Mazama Pocket Gophers have been detected on a parcel, this map considers all contiguous MPG soils (i.e., without obvious physical barriers⁷) within the parcel boundary to be occupied for the purposes of the HCP impact projection analysis (see Chapter 4: Analysis of Impacts). While projections of impacts for the HCP are based on these data, Thurston County will update this map with any new survey data available at the time of HCP finalization and use this updated map during HCP implementation.

In Figure 2.4 and Figure 2.5, no MPG soils or occupancy are included in the region of the County north of I-5. While some MPG soils are present in this region of the County, and mound surveys have occurred, there have not been documented Mazama Pocket Gopher detections in this area as of the time of HCP development. Future natural recolonization of the area by Mazama Pocket Gopher subspecies is unlikely due to the barrier presented by I-5. For this reason, the County has elected not to include this area north of I-5 in its impact projections for the HCP, or in the Conservation Program.

There are five Service Areas identified for the Mazama Pocket Gopher subspecies (one for Olympia Pocket Gopher, one for Tenino Pocket Gopher, and three for Yelm Pocket Gopher). The Service Area boundaries were delineated by the USFWS based on the natural pattern of suitable MPG soils across the landscape, Pocket Gopher occupancy patterns, genetics, habitat connectivity, and permeable or impermeable barriers to movement. Patterns of land use development and conversion (at the time), challenges to subspecies recovery, and land use development impacts that are likely to generate mitigation debits and drive landscape-scale needs and opportunities for compensatory mitigation were considered during Service Area development and finalization (USFWS 2017). The biologically and/or management relevant, specific, and recognizable on-the-ground features used to map the Service Area

⁶ At the time of HCP finalization, MPG maps for use in HCP implementation will be updated to the best available information at that date.

⁷ Barriers to dispersal in the HCP document are Forested areas, wet areas, watercourses, paved areas >200m in width, inhospitable soil types.

boundaries include: rivers, creeks, and wetlands, including those that are likely to act as barriers to Mazama Pocket Gopher dispersal; MPG soils and soil preferences (including discontinuities/ barriers); ridges and landscape-scale breaks in topography; and administrative and man-made features, such as County line boundaries, highways, streets or roads (USFWS 2017). Mitigation for Impacts to Mazama Pocket Gopher subspecies, further described in Chapter 5: Conservation Program, must be located within the designated Service Area(s) for the affected subspecies.

Table 2.3 Prairie soils with documented use by Mazama Pocket Gopher subspecies in Thurston County (USFWS 2016).

Preference by Mazama Pocket Gopher	Description
More Preferred	<p>Nisqually loamy fine sand, 0 to 3% slopes Nisqually loamy fine sand, 3 to 15% slopes Spanaway-Nisqually complex, 2 to 10% slopes Cagey loamy sand Indianola loamy sand, 0 to 3% slopes Spanaway gravelly sandy loam, 0 to 3% slopes Spanaway gravelly sandy loam, 3 to 15% slopes</p>
Less Preferred	<p>Alderwood gravelly sandy loam, 0 to 3% slopes Alderwood gravelly sandy loam, 3 to 15% slopes Everett very gravelly sandy loam, 0 to 3% slopes Everett very gravelly sandy loam, 3 to 15% slopes Indianola loamy sand, 3 to 15% slopes Kapowsin silt loam, 3 to 15% slopes McKenna gravelly silt loam, 0 to 5% slopes Norma fine sandy loam Norma silt loam Spana gravelly loam Spanaway stony sandy loam, 0 to 3% slopes Spanaway stony sandy loam, 3 to 15% slopes Yelm fine sandy loam, 0 to 3% slopes Yelm fine sandy loam, 3 to 15% slopes</p>

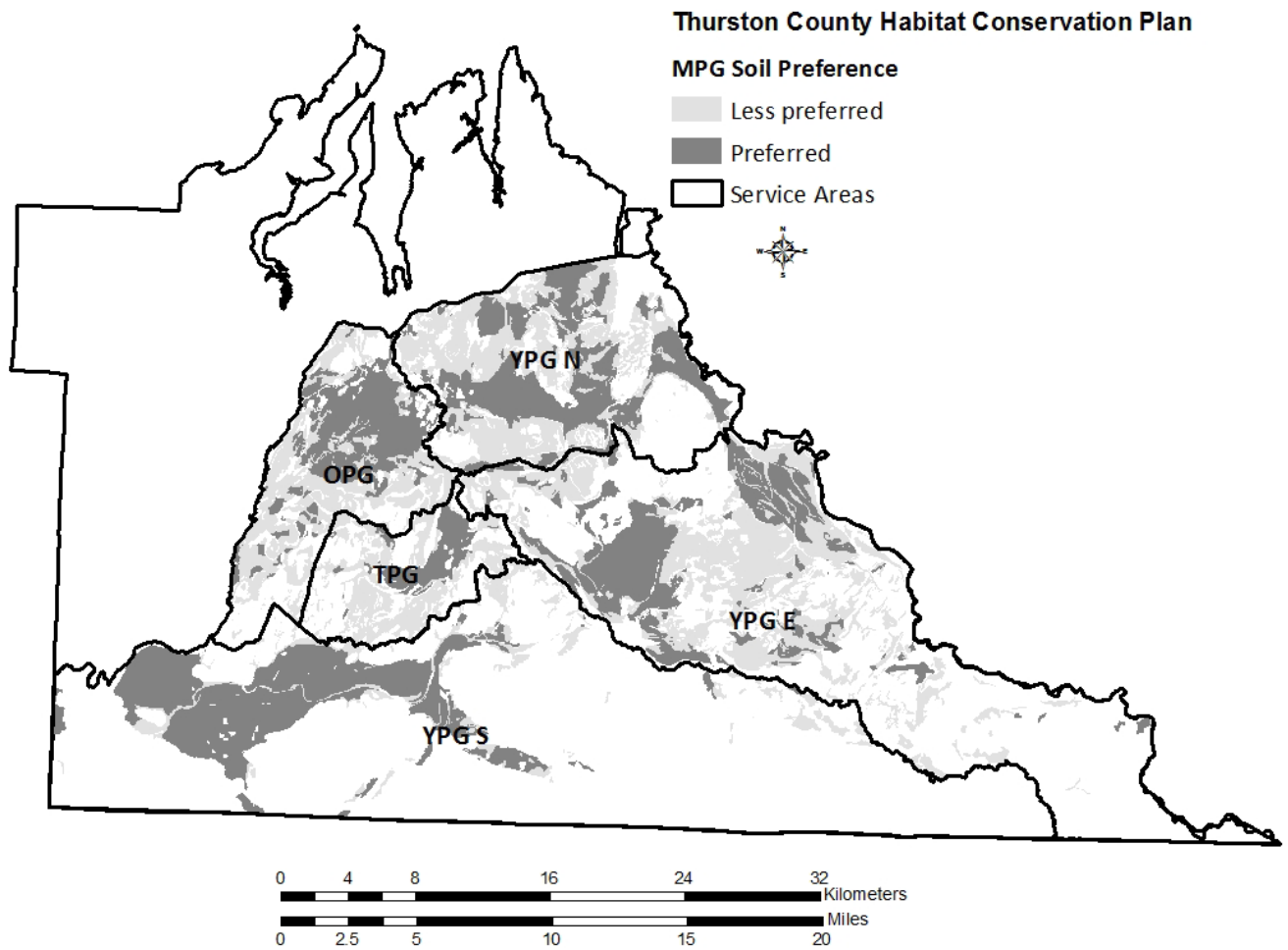


Figure 2.4 Map of Mazama Pocket Gopher soil preference in each Service Area in Thurston County, all jurisdictions.

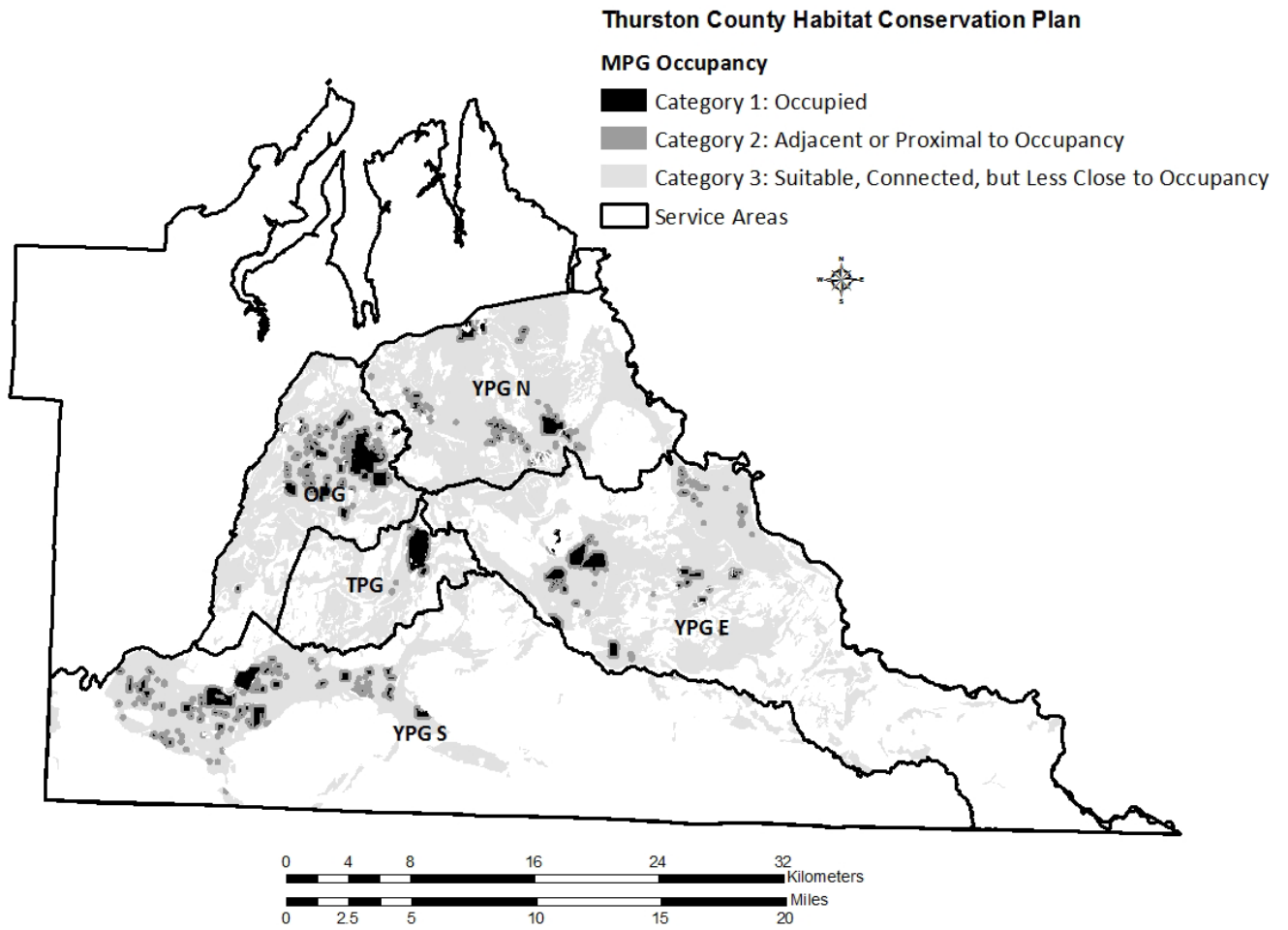


Figure 2.5 Map of Mazama Pocket Gopher occupancy categories in each Service Area in Thurston County, all jurisdictions.

2.2.3 Taylor’s Checkerspot Butterfly

Taylor’s Checkerspot Butterfly is an upland prairie and oak savanna species that has a very limited distribution in Oregon, Washington, and British Columbia. In Thurston County, outside JBLM, it currently persists only in the vicinity of Scatter Creek Wildlife Area and Glacial Heritage Preserve, as shown in Figure 2.3. Taylor’s Checkerspot Butterfly is a small and non-migratory butterfly with a life cycle of one year. The butterflies are thought to disperse up to 1,312 ft (400 m) from locations where they developed as larvae.

The species requires sites with food (host) plants for larvae and nectar plants for adult butterflies (Table 2.4). Larvae are documented to feed on plants in the Scrophulariaceae family, which includes paintbrush (*Castilleja* sp.) as well as the native and non-native plantains (*Plantago* sp.).

Active collaboration between USFWS and WDFW seeks to increase the distribution of Taylor’s Checkerspot Butterfly within the South Puget Sound portion of its range. Several conserved sites in Thurston County are priority locations for reintroductions of the species. The success of future reintroductions is unknown at the time of HCP development.

Table 2.4 Key species for Taylor’s Checkerspot habitat in Thurston County.

Species Type	Scientific Name	Common Name	Origin
Larval host species – Oviposition host	<i>Castilleja levisecta</i>	Golden paintbrush	Native
	<i>Plantago lanceolata</i>	English plantain	Non-native
	<i>Castilleja hispida</i>	Harsh paintbrush	Native
Larval host species	<i>Collinsia spp</i>	Blue eyed mary	Native
	<i>Plectritis congesta</i>	Seablush	Native
Nectar resources	<i>Armeria maritima</i>	Sea pink	Native
	<i>Balsamorhiza deltoidea</i>	Balsamroot	Native
	<i>Camassia quamash</i>	Camas	Native
	<i>Fragaria virginiana</i>	Strawberry	Native
	<i>Lomatium triternatum</i>	Nineleaf biscuitroot	Native
	<i>Lomatium utriculatum</i>	Spring gold	Native
	<i>Saxifraga integrifolia</i>	Wholeleaf saxifrage	Native
	<i>Plectritis congesta</i>	Seablush	Native
	<i>Ranunculus occidentalis</i>	Western buttercup	Native

2.2.4 Oregon Vesper Sparrow

Oregon Vesper Sparrow is a grassland bird species that is extremely imperiled across its range. At the time of HCP development, the species is being considered for endangered status in Washington and has been petitioned for threatened or endangered status under the federal Endangered Species Act.

In Washington, Oregon Vesper Sparrow is found in dry and open habitat types, including grasslands and pasturelands, often with moderately short and patchy grass cover, low to moderate shrub cover and low tree cover. Structural diversity of the vegetation appears important, with the species frequently inhabiting the edges of grasslands or the transition areas between grassland and forest or shrubland (Altman 2017). Habitat areas of at least 20 ac (8 ha) are likely most able to sustain Oregon Vesper Sparrow populations over time (Altman 2017).

The potential area for Oregon Vesper Sparrow within the Permit Area was identified near currently occupied areas on JBLM and the Tenalquot Prairie vicinity. Areas near currently occupied areas were identified as highest potential for Oregon Vesper Sparrows because the species has high site fidelity to the sites where they were hatched, and typically return to these areas to nest. First year birds are estimated to have 75-80% site fidelity, and adults are estimated to have 90-95% site fidelity (Altman 2017a). Birds that do not return to their home site are likely to settle in a proximal place, and more likely to be successful (e.g., breed and nest) if that proximal place is also occupied by Oregon Vesper Sparrow.

Thurston County identified the area of the county with the greatest potential for Oregon Vesper Sparrow occupancy with technical assistance from species experts. Within a roughly 5 mi (8 km) radius of JBLM and Tenalquot Prairie, the County used its Voluntary Stewardship Program (VSP) Agricultural Lands GIS layer and 2018 ESRI streamed aerial imagery to identify contiguous prairie-oak habitat blocks of 20 ac (8 ha) (e.g., not broken up by intensive development or forest). Twenty acres is estimated to be the minimum suitable habitat extent to support 1+ pairs of Oregon Vesper Sparrow. The VSP Agricultural Lands GIS Layer was assumed to indicate a greater likelihood of compatible land use for Oregon Vesper Sparrow. That GIS layer was created by Thurston County combining (through an additive process): National Agricultural Statistics Service (NASS), Cropscape data from 2011; United States Geological Survey GAP land cover data from 2011; National Land Cover Database (NLCD) 2011 land cover data; and windshield survey and mailing lists from the Thurston Conservation District, as well as by selecting parcels from Thurston County parcel data owned by entities including the word "Farm".

2.2.5 Oregon Spotted Frog

The Permit Area of the HCP also includes known and potential riparian and wetland habitat for Oregon Spotted Frog (OSF) (*Rana pretiosa*) (Figure 2.6). Washington's remaining populations of OSF occupy wetland and frequently flooded habitats connected by an aquatic network of streams, ditches, rivers, high-ground water areas and flooded wetlands. Habitat requirements for OSF vary with life stage and season (non-breeding, breeding, rearing, overwintering). Breeding habitat is characterized as in relatively unshaded shallows of that ideally have an aquatic connection to perennial waters. Eggs are laid in water that is typically less than 12 in (30 cm) deep. Emergent vegetation includes sedge, rush, and grass. Oregon spotted frog lay their eggs in openings between the vegetation that have shallow water and full sun exposure. In agricultural areas, breeding habitat is often seasonally flooded pasture and hayfields that may not be identified as wetlands. The extent of this habitat can vary inter- and intra-

annually with fluctuating water levels. Non-breeding habitat can include characteristics of breeding habitat but also includes still and slow moving deeper and shaded waters with floating and submerged vegetation. This can include springs, ponds, lakes, sluggish streams or rivers, irrigation canals, shrub wells, or roadside ditches. In contrast, shaded conifer dominated riparian areas with primarily coarse inorganic substrates (gravel, cobble, etc.), and swiftly flowing waters are not considered Oregon Spotted Frog habitat but are important as they may use these flowing systems for dispersal between wetlands.

The perennial creeks and associated network of intermittent tributaries provide aquatic connectivity between breeding sites, rearing, and overwintering habitat. The seasonally inundated wetland margins frequently consist of hay fields and pasture. Some occupied sites are formed by American Beaver (*Castor canadensis*) activity. Occupied Oregon Spotted Frog sites have often experienced habitat alteration such as a history of cattle grazing and/or hay production or encroaching or established rural residential development. Hydrology has been altered to some extent at most sites. A detailed description of the species and its habitat is included in Appendix B: Covered Species Descriptions.

Currently known and potentially suitable habitat was mapped in an overlay called the Oregon Spotted Frog Habitat Screen (OSF Habitat Screen; Figure 2.6). The OSF Habitat Screen includes 39,493 ac (15,982 ha) and intersects 5,718 tax parcels. Of this area, 4,773 ac (1,931 ha) are federally designated critical habitat (81 FR 29335 29396). Thurston County developed the OSF Habitat Screen with technical assistance from USFWS, WDFW, and other knowledgeable parties. The steps in development of the OSF Habitat Screen are described below.

1. OSF suitable wetland areas were identified using the ECY (2011) modeled wetland layer, with the following classes:
 - Grid Code 1, Class Name: Potentially Disturbed Wetlands
 - Grid Code 2, Class Name: Palustrine Forested Wetland
 - Grid Code 3, Class Name: Palustrine Scrub/Shrub Wetland
 - Grid Code 4, Class Name: Palustrine Emergent Wetland
 - Grid Code 9, Class Name: Water
 - Grid Code 10, Class Name: Palustrine Aquatic Bed
2. From the wetlands in step 1, those with needed hydrological connections qualifying them as potential OSF habitat were identified by selecting wetlands within 984 ft (300 m) of mapped streams (using a combination of the WA state hydrography dataset streams and Thurston Geodata streams). These are referred to as “wetland core areas” (e.g., as shown in Figure 2.7) and are a factor in the Impacts Projection Analysis in Chapter 4.
3. The resulting areas were reduced to the extent of the Black River watershed (HUC 12 units - Upper Black River, Lower Black River, Beaver Creek, Mima Creek, and Waddell Creek).

4. Selected wetlands were buffered by 328 ft (100 m) and merged the layer with the federally designated critical habitat for the species in Thurston County.
5. This layer was then merged with streams (WA state hydrography and Thurston Geodata streams) buffered by 328 ft (100 m).
6. The resulting layer was presented in a larger scale map for comment at the 2015 Oregon Spotted Frog Washington Working Group. At the recommendation of WDFW biologists, specific areas were added, including 1.4 mi (2.25 km) of the Black Lake Ditch (buffered by 328 ft (100 m)) north of Black Lake, the area of Lamberts Corner west to the Olympia substation, the area around Trospen Lake/Bush Prairie, and a section between Blooms Ditch and Salmon Creek. These additional areas were added due to Oregon Spotted Frog egg mass detection in certain locations and because biologists felt these areas contain habitat suitable for the species that was not captured using remote sensing (GIS screens) or provide important connections between known OSF populations or potential habitat. The areas of Mima and Waddell Creek drainages on Capitol State Forest (DNR) lands and a small inclusion of surrounded private land were removed from the OSF Habitat Screen for the HCP. The activities that the County is responsible for on that property are limited and the land is zoned for long-term forestry.
7. The resulting final OSF Habitat Screen was then buffered by 200 ft (61 m), with USFWS and WDFW technical assistance that activities within this distance of the habitat could result in impacts.

A portion of the OSF Habitat Screen (15,005 ac (6072 ha)) overlaps prairie habitat (soils for Mazama Pocket Gopher). Some of these areas are within the 200 ft (61 m) setback (buffer) on potential Oregon Spotted Frog habitat. Pre-project surveys to verify Oregon Spotted Frog habitat in the OSF Habitat Screen will ascertain whether suitable conditions for the species are present (described in Chapter 6: Implementation).

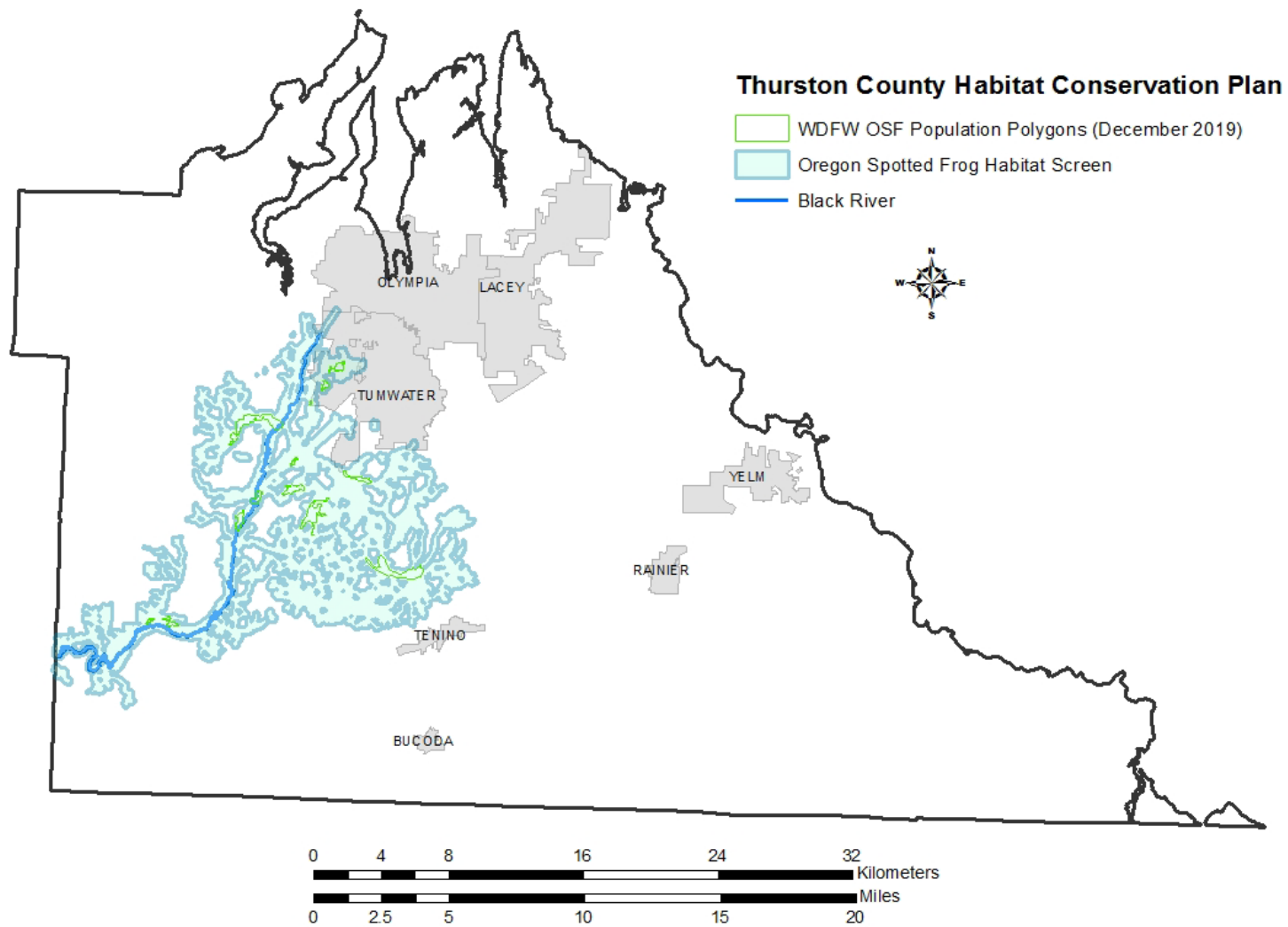


Figure 2.6 Oregon Spotted Frog Habitat Screen for the Thurston County HCP.

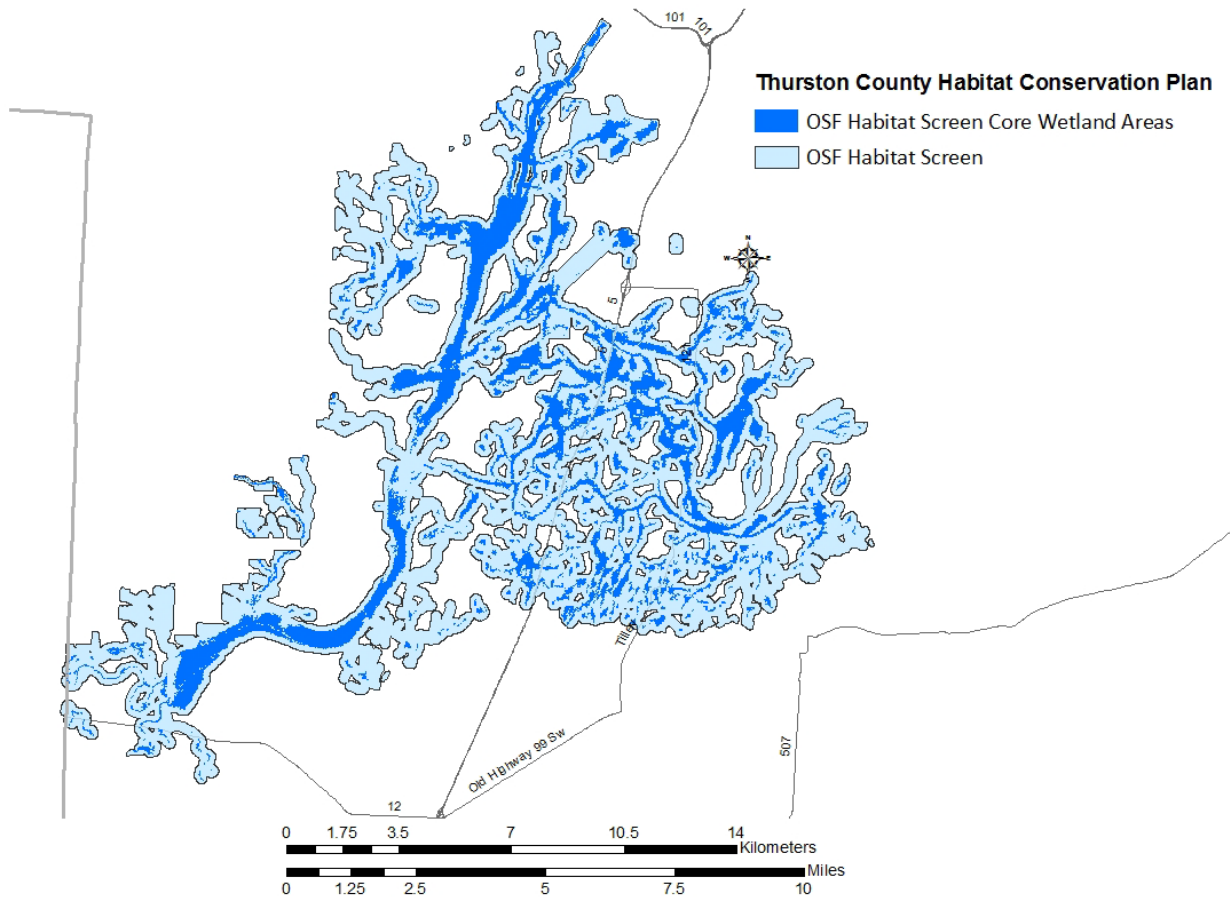


Figure 2.7 Map of the wetland cores within the Oregon Spotted Frog Habitat Screen in Thurston County.

2.3 Federally Listed Species Not Proposed for Coverage

Although federally listed, the species in Table 2.5 either have no federal protection from take on non-federal lands in the HCP Permit Area (e.g., golden paintbrush, water howellia), or have little or no overlap with the Permit Area or Covered Activities of the HCP (e.g., Marbled Murrelet, Streaked Horned Lark). Thurston County does not anticipate that any of these species will be subjected to incidental take associated with the Covered Activities, and these species are therefore not proposed for Incidental Take Permit coverage in this HCP.

Table 2.5 Federally listed species not proposed for coverage in the Thurston County HCP.

Group	Name	Status
Birds	Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened
Birds	Northern spotted owl (<i>Strix occidentalis caurina</i>)	Threatened
Birds	Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Threatened
Birds	Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Threatened
Fishes	Bull trout (<i>Salvelinus confluentus</i>)	Threatened
Flowering Plants	Golden paintbrush (<i>Castilleja levisecta</i>)	Endangered
Flowering Plants	Water howellia (<i>Howellia aquatilis</i>)	Threatened

Chapter 3 Proposed Action

3.1 Covered Activities

This section describes the activities (Covered Activities) within the Permit Area for which Thurston County is seeking incidental take coverage. The Covered Activities include a variety of actions and projects for which the County issues permits or approvals, or that it otherwise carries out through the course of its normal business.

Thurston County commits to implementing the set of Best Management Practices identified in Appendix C to the maximum extent practicable for each Covered Activity. The Best Management Practices are specific practices and sideboards to minimize the impacts to the Covered Species from the Covered Activities, by, for example, providing guidance in maintaining hydrology, project siting, revegetation, road/vehicle access, sediment and soil disturbance control, project timing, and overall vegetation management. The County will monitor the implementation of the Best Management Practices for Covered Activities and include this information as part of the in its annual reporting to the USFWS.

Activities are only covered under this HCP if the impacts resulting from those activities are of the type discussed in Chapter 4: Analysis of Impacts, and:

- There is sufficient take coverage available under the Incidental Take Permit issued to Thurston County for that activity;
- The activity does not preclude achieving the Biological Goal and Conservation Objectives of the HCP;
- The activity is an action under the jurisdiction of Thurston County, or is authorized by Thurston County;
- The activity occurs within the HCP Permit Area;
- The activity occurs within the term of the Incidental Take Permit;
- The activity's physical extent, frequency, and resulting impacts to Covered Species can be reliably projected or estimated;
- Mitigation for the activity is delivered in advance of the impacts; and
- The impacts from the activity, and the success/lack of success with minimization can be monitored, documented, and reported.

Activities that meet these criteria, and are otherwise lawful, are eligible for coverage under an Incidental Take Permit. Activities requiring a special use permit for mineral extraction or any activity determined to be an accessory use to mineral extraction are not covered under the Thurston County Habitat

Conservation Plan. Mineral extraction or its accessory uses in habitats of listed species would require an approved Incidental Take Permit from U.S. Fish and Wildlife or National Marine Fisheries Service.

In the sections below, we include the best available information on Covered Activity extent, frequency, and location. Projections of overall impact area for each activity and species, and methods used to reach those projections are described in more detail in Chapter 4: Analysis of Impacts.

3.1.1 Residential Development

Dwelling construction and related component activities covered by this HCP include:

- Site-built dwellings and manufactured homes. The site is typically graded with a bulldozer or grader prior to construction. Construction involves delivery of supplies or the manufactured home by large truss truck or other vehicle, and a cement mixer is used to pour the foundation. A laydown, or storage, area and scaffolding could potentially be half the size of the home, depending on construction practices. Workers involved with home construction may park personal vehicles on site. Building construction or placement occurs year-round, though seasonal restrictions may be put in place with respect to erosion control and protecting natural resources such as streams.
- When new dwellings are constructed, associated and new residential accessory structures (accessory dwelling unit, unattached garage, shop, shed, pool, etc.) are permitted at the same time. These buildings can range in size and composition, and construction methods will vary, but will be similar to those for site-built dwellings.
- Within lots with new dwelling construction activities occurring, the following associated actions may occur:
 - Private roads created to access small or large lot subdivisions and driveways, if associated with a County-issued permit. Driveways are typically required to be wide enough and of suitable material to allow for emergency vehicle access. Driveways may be gravel or pavement.
 - Installation of gravel pads, greater than 120 ft² (11.15 m²) for additional parking areas or similar use.
 - Installation, maintenance or removal of underground or above ground plumbing, heating fuel, mechanical, and utility facilities.
 - Additions to existing structures on existing legal lots (e.g., attached garage, added room, etc.).
 - Water supplies (wells) – well monitoring and construction.
 - Septic system feasibility studies, installation and testing, removal, moving, replacement, alterations, and repairs.

Best Management Practices applicable to residential development are described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures to minimize impacts from this activity, particularly through project siting and configuration.

The residential development Covered Activity is summarized in Table 3.1.

Table 3.1 Covered Activity summary for residential development.

Activity Summary – Residential Development	
Duration of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent
Location of Impacts	Throughout Permit Area, where development capacity is expected to be utilized.

3.1.2 Added Accessory Structures

Impacts will occur from development of additional accessory structures on parcels developed prior to completion of the HCP and outside of the prior development envelope that is assumed to already be impacted around driveways and existing structures.

The Mazama Pocket Gopher special 4(d) rule may exempt certain activities in this category - construction and placement of fencing, garden plots, or play equipment; and construction and placement of dog kennels, carports, or storage sheds less than 120 ft² (11.15 m²) (79 FR 19791-19793). These activities are not exempt from incidental take for the other species in the HCP.

Best Management Practices applicable to accessory structure development are described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures to minimize impacts from this activity through project siting and configuration.

A summary of this Covered Activity is included in Table 3.2.

Table 3.2 Covered Activity summary for accessory structures added to existing (pre-HCP) residential development.

Activity Summary – Added Accessory Structures, Extended Septic Installation/Repair and Home Heating Oil Tank Removal	
Timing of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent
Location of impacts	Throughout the Permit Area, on lots with development that occurred before the Incidental Take Permit was issued.

3.1.3 Septic Repair or Extension & Home Heating Oil Tank Removal

Two additional activities occurring on residential lots that are anticipated to affect the Covered Species are:

1. Placement of septic systems that must be installed outside the development envelope or repair or alteration of septic systems existing prior to HCP implementation. Installation of these systems occurs with similar equipment and process to standard septic installations addressed in Section 3.1.1.
2. Removal of above or below ground home heating oil tanks. This activity involves use of excavation equipment to remove home heating oil tanks and any adjacent concrete pad or contaminated soil.

Best Management Practices applicable to septic repair or extension, and home heating oil tank removal are described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures to minimize impacts through project siting and configuration, in addition to guidelines for management of sediments and sidecast materials.

A summary of this Covered Activity is included in Table 3.3.

Table 3.3 Covered Activity summary for extended septic system installation or repair and home heating oil tank removal.

Activity Summary – Extended Septic Installation/Repair, Home Heating Oil Tank Removal	
Duration of Impacts	Year-Round
Intensity of Impacts	Soil disturbance and replacement
Frequency/Permanence of Impacts	Permanent
Location of Impacts	Throughout Permit Area

3.1.4 Commercial and Industrial Development

Commercial and industrial development covered under this HCP may include, but is not limited to construction of business facilities for retail shopping, offices, restaurants, barber/beauty shops, veterinary clinics and hospitals, laundry, dry cleaning, motels, greenhouses, service stations, car washes, automotive and mechanical sales, auction yards, community centers, recreational uses, churches, libraries, museums, schools, and other public facilities in addition to facilities for research and development, factories, warehousing, wholesale, processing, storage, fabrication, printing, and other commercial or industrial uses. This does not include mining or associated activities. General building construction activities will include those described for residential development, and may also include establishment of signs, parking lots, and other facilities, affecting the entire lot.

Best Management Practices applicable to commercial development are described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures to minimize impacts through project siting and configuration. However, due to the expectation that most commercial

development will utilize entire lot areas, minimization measures may have limited practicability. However, practices which minimize sediment and foreign material discharge and runoff habitats for the Covered Species, during and after commercial construction, will help minimize impacts.

A summary of this Covered Activity is included in Table 3.4.

Table 3.4 Covered Activity summary for commercial and industrial development.

Activity Summary – Commercial/Industrial Development	
Duration of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent
Location of Impacts	Commercial tax lots throughout Permit Area

3.1.5 Public Service Facility Construction

A summary of the Public Service Facility construction Covered Activity, specifically rural schools and fire stations, is included in Table 3.5. Any other public facilities proposed during the term of the requested Incidental Take Permit will secure coverage following the mitigation process described for commercial and industrial development.

Table 3.5 Covered Activity summary for public service facility construction.

Activity Summary – Public Service Facilities: Schools & Rural Fire Stations	
Duration of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent
Location of Impacts	Throughout Permit Area, in prairie habitats.

Best Management Practices applicable to public service facility construction are described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures to minimize impacts through project siting and configuration, in addition to guidelines for procedures during construction and during maintenance of facility grounds (e.g., invasive species control) that can minimize impacts to the Covered Species.

Schools

Thurston County encompasses a total of nine school districts under County jurisdiction, including Olympia, North Thurston, Tumwater, Tenino, Rainier, Rochester, Griffin, and Yelm. Construction of new facilities or refurbishment and expansion of existing facilities is an activity covered under this HCP. At this time there are eight public school campuses in the County. Sites are 10 -20 ac (4-8 ha) in size with the exception of the 77 ac (31 ha) campus in the Rochester School District.

School construction or refurbishment can include but is not limited to establishment of buildings and associated walkways and out-buildings, parking lots and associated driveways, landscaping, and outdoor sports fields (including but not limited to soccer, baseball, softball, football), tennis courts, and outdoor pools. Per regulation, new school building coverage is limited to 6,000 ft² (557 m²) on parcels 5 to 10 ac (2-4 ha) in size and 20,000 ft² (1,858 m²) on parcels larger than 10 ac (4 ha). Typical coverage by school buildings is about one acre per site. This does not include ball fields and other accessory structures and uses. Existing schools can expand as needed with a special use permit and thorough environmental review.

Fire Stations

Population expansion outside current city limits and urban growth areas is expected to require additional fire facilities to serve the anticipated future growth and development. Unincorporated Thurston County currently includes approximately 47 fire stations (some of these are not currently functional). Fire facilities have no building coverage limit. Size is approved project by project through a special use permit and environmental review.

3.1.6 Transportation Capital Projects

Transportation construction projects within the Permit Area will be Covered Activities under this HCP. Activities with the potential to affect the Covered Species include those Capital Improvement activities occurring beyond the currently modified area of existing road, trail, or path prism and gravel shoulder⁸, which add bridge, culvert, road, or shoulder surface.

Thurston County public works staff used information from regular work plans and their 20-year Capital Facilities Plan (CFP) to identify the types of projects to occur during the HCP term (30 years) (Table 3.6).

These projects can occur at any time of year, and include:

- Construction of new roads: This activity involves heavy equipment for leveling, grading, and stabilizing to construct roadbeds, plus establishment of the road surface.
- Widening of existing roads: This activity uses a process similar to road construction to add additional road prism to an existing road, or to widen an existing road shoulder. It can occur year-round, but is typically in the drier months (varies by year, generally June – September).
- Improvements of existing roads: This activity includes upgrade of roads and intersections to add turn lanes, sidewalks, bike paths, and realignments where needed. This will involve addition of road prism (described above), modification of the gravel shoulder to add sidewalks, or extension of the gravel shoulder.
- Bridge and culvert installation or replacement: This typically involves heavy equipment for excavation to remove the existing structure, installation of the replacement structure, and repair of the adjacent roadway, shoulder, and drainage systems.

⁸ While Mazama Pocket Gopher subspecies may infrequently occur and may be impacted in the currently modified gravel road shoulder of the active ROW, these areas are excluded from the analysis because the area is already modified by past activities and has extremely low suitability and long-term viability as habitat for the species.

Table 3.6 Transportation projects expected to occur in HCP habitats as identified by the 20-year Capital Facilities Plan.

Project Location in Thurston County	Construction/ Replacement	Widening	Improvements
153rd Ave SE (Vail Rd to Lawrence Lake Rd)		x	x
183rd Ave SW - Old Hwy99 to SR12		x	x
Albany Rd SW (James Rd to Littlerock Rd)		x	x
Bald Hill Road Upgrade - Smith Prairie to Clear Lake Rd		x	x
Black Lake - Belmore Rd. Upgrade 49th to Sapp Rd.		x	x
Delphi Road Upgrade - Phase 2/3 - 62nd to McLane Creek		x	x
Elderberry Rd Upgrade - SR 12 to 196th Ave		x	x
Henderson Blvd. Upgrade - Old Hwy 99 to Tumwater		x	x
Kinwood Road Project (Pacific to Martin Way)		x	x
Lawrence Lake Rd (153rd Ave to Bald Hill Rd)		x	x
Littlerock Rd / 113th Ave.			x
Marvin Rd (Pac Ave/SR510 to Mullen)		x	
Maytown Rd. Upgrade SW - Littlerock Rd. to I-5		x	x
McCorkle Rd SE (113th Ave SE to Old Hwy 99) & 113th Ave SE (SR121 to McCorkle Rd SE)		x	x
Meridian Rd (Martin Way to I-5)		x	x
Mullen Rd. Upgrade - Vicinity of 46th Ave. SE		x	x
Mullen Road - W. City Limits to Marvin Rd		x	x
Mullen Road Upgrade - Lacey City Limits to Carpenter Rd SE		x	x
Old Hwy 99 / Tilley Rd. Intersection		x	
Old Hwy 99 Bridge O-7 Replacement	x		
Old Hwy 99 Rural Capacity Project (S. UGA Boundary to SR12)		x	x
Pacific Ave Capacity Project (Unions Mills to SR510)		x	x
Rich Road SE (Rixie Rd - Yelm Hwy)		x	x
Rich Road Upgrade - Phase 2-89th to Normandy St.		x	x
Sargent Rd. Upgrade		x	x
SR12 Grand Mound West UGA Boundary to US99 - Access Road	x		
Steilacoom Road - Phase 1 - Pacific to Marvin/SR510			
Steilacoom Road / Phase 2 - Marvin/SR510 to Duterrow		x	x
Tilley Road (T-2) Bridge Replacement Project	x		
Vail Rd. Upgrade - 138th to Bald Hill Rd		x	x
Vail Rd. Phase 2 (138th to 153rd)		x	x
Yelm Hwy / Meridian Intersection			x
Yelm Hwy Capacity Project 4-Lacey City Limits to West of Meridian/Phase1 (O-12 Bridge)	x	x	x

Best Management Practices applicable to transportation capital projects are described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures specific to habitat suitable for the prairie species and to Oregon Spotted Frog, including but not limited to project timing (e.g., completing work when habitats are dry), sediment control, minimizing tracking of heavy equipment in habitat areas, and managing side-cast materials from excavation. Best Management Practices are already in place for species outside the HCP (e.g., fish). The two sets of Best Management Practices will be reconciled as practicable.

A summary of this Covered Activity is included in Table 3.7.

Table 3.7 Covered Activity summary for transportation capital projects construction.

Activity Summary – Transportation Capital Projects	
Duration of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent

3.1.7 Transportation Maintenance & Work in Right-of-Way

This section includes overlapping activities that occur within Thurston County right-of-way under County jurisdiction. Thurston County maintains 1,035 mi (1,666 km) of County roadway and adjacent right-of-way. Within the County’s owned and managed roads, 32 mi (52 km) are gravel and the remainder are paved. A typical road cross section is shown in Figure 3.1.

Transportation Maintenance

Maintenance of existing paved or graveled road surface are not expected to have impacts to associated habitats. However, the County’s ongoing maintenance of the land from the edge of the road surface to the outer edge of County’s right-of-way (Figure 3.1) is expected to affect the Covered Species. The activities⁹ involved in that ongoing maintenance are described below. Additional detail is available in the Regional Road Maintenance Guidelines (WSDOT 2018). This Covered Activity is summarized in Table 3.8.

All transportation maintenance activities will be performed following the Best Management Practices (Appendix C) to the maximum extent practicable, however, because human health and safety drive most transportation maintenance needs, modification of maintenance practices to minimize impacts will not always be possible. Likely practicable management practices will include sediment control, managing side-cast materials, minimizing tracking of equipment in habitat areas, mechanical control of invasive species, project timing (e.g., implementing ditch maintenance work when water is absent), and staging area planning.

⁹ Through a special rule under section 4(d) of the ESA a subset of routine maintenance activities on roadside rights-of-way of highways and roads are exempt from incidental take for Mazama Pocket Gopher subspecies (79 FR 19760-19796). However, other transportation maintenance activities that are not exempt from take will occur in these areas.

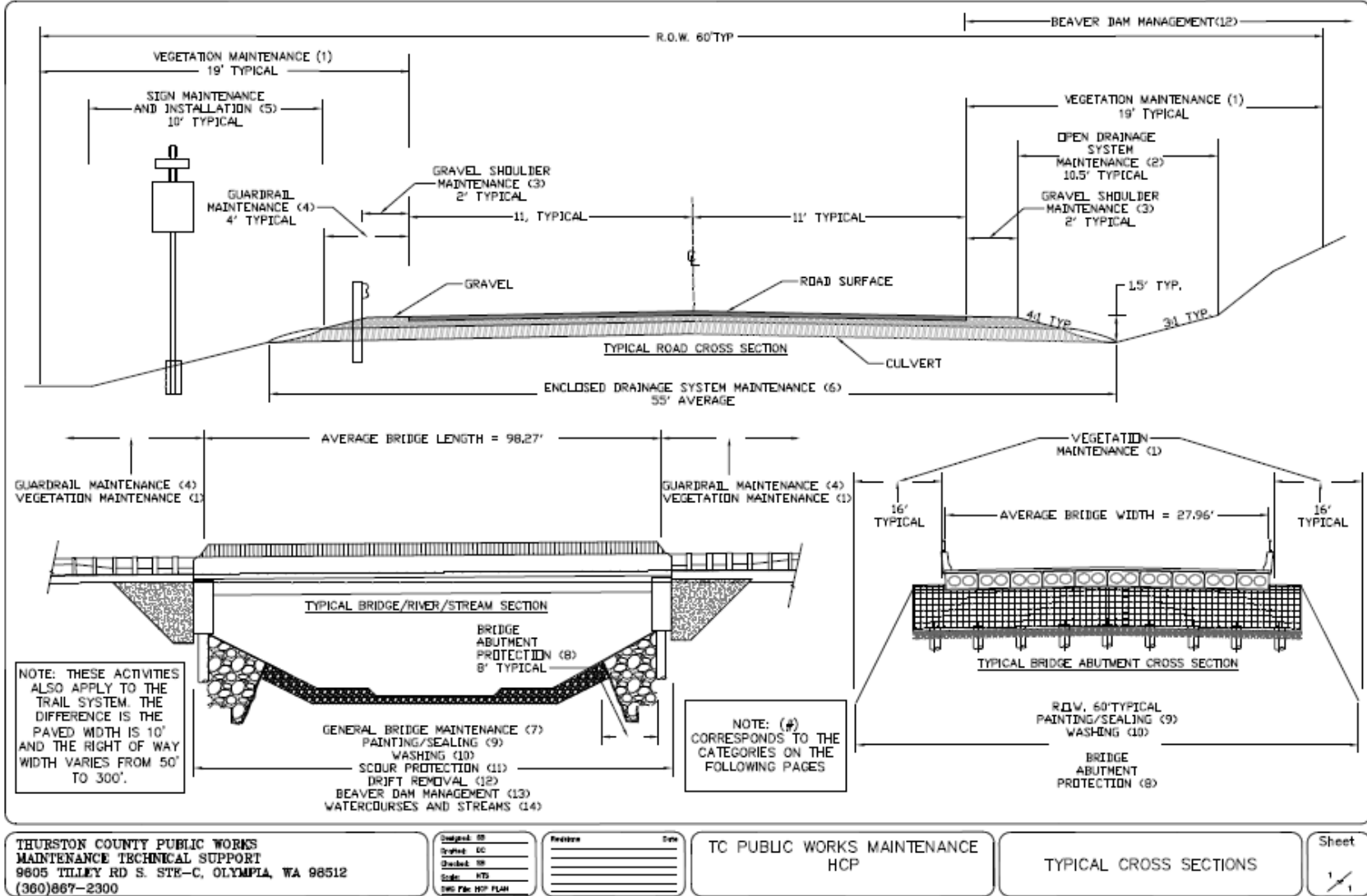


Figure 3.1 Typical road and bridge maintenance cross sections.

Table 3.8 Covered Activity summary for transportation maintenance.

Activity Component	Duration	Intensity	Frequency/Permanence of Impacts
Vegetation Maintenance	Year-round, primarily June-September	Shortening or removal of vegetation	Once per year/Temporary
Open Drainage Maintenance (Ditching)	Year-round, primarily June-September	Removal of vegetation, sediment, debris, and garbage	Entire ROW once per 30 years/Temporary
Existing Guardrail Maintenance	March-June	Disruption and removal of gravel and sediment	Incremental, occurring once per 30 years/Temporary
Sign Installation	March-June	Disruption and removal of gravel and sediment	Incremental, occurring once per 30 years/Temporary
Enclosed Drainage System Maintenance	Year-round, primarily June-September	Disruption and removal of vegetation, gravel, debris, and sediment that may alter water flow in right-of-way	Incremental, occurring once per 30 years/Temporary
Bridge Maintenance	Year-round	Variable	Incremental, occurring once per 30 years/Temporary
Beaver Dam Management	Year-round	Disruption/Removal of accumulated debris	Varies by occurrence
Watercourse and Stream Maintenance	Year-round	Disruption/Removal of accumulated debris	Incremental, occurring once per 30 years/Temporary

(1) Vegetation maintenance: This activity consists of mowing, trimming bushes/branches and tree removal, and occurs year-round, but primarily in the June - September growing season. All right-of-way in the Permit Area will require vegetation maintenance during the HCP Permit Term. Additional Information on existing vegetation management including Best Management Practices and mowing/brushing/trimming heights can be found in the RRMG Maintenance Category #15 (Vegetation Maintenance) and the Thurston County Integrated Vegetation Management Program (http://www.co.thurston.wa.us/health/ehipm/ipm_cntyimp.html).

- Mowing and trimming occurs from the outer edge of the gravel shoulder to the top of the back of the roadside ditch (average of 10.5 ft (3.2 m), Figure 3.1). Additional vegetation management includes inlets and outlets of culverts for making necessary repairs and inspections. Mowing is completed using a tractor mower deck not exceeding 8 ft (2.4 m) in diameter attached to a boom arm of heavy machinery (such as a backhoe excavator or large tractor) and cut to an average height of roughly 2-6 in (5-15 cm) high above the soil or

substrate. Trimming brush can be completed using a mower as described above or by an individual on-the-ground or in a bucket truck with small mechanical hand tools (i.e., chainsaw, weed eaters, etc.). Larger limbs and vegetation will be chipped in a large chipper truck and the resulting chips will either be returned to the road right-of-way or taken to an off-site facility. Occasionally mowing and trimming will extend to the right-of-way edge if there is a sight distance safety issue or if it is adversely affecting the stream channel adjacent to a bridge. Mowing and chipping will not occur in standing water.

- Herbicide spraying is used in right-of-way vegetation management in Thurston County over approximately 2 mi (3.2 km) of roadside in the Permit Area; these areas are treated in spring with a glyphosate herbicide to control vegetation on the roadside (Roger Giebelhaus, Thurston County Public Works, Personal Communication, June 2015). Site and weed specific spot application of broadleaf herbicide is used for control of invasive and/or problematic species periodically during May and June. No prohibited take of covered species is expected incidental to herbicide spraying consistent with the Mazama Pocket Gopher 4(d) Special Rule.
- Trees are typically only removed if found to be sight distance safety issue, if trees have potential to hit vehicles/pedestrians, if trees block traffic signs and if decaying trees create a hazard with the potential to fall as verified by a certified arborist. Trees are also removed if they divert stream water in a way that compromises the integrity of a bridge.

(2) Open Drainage System Maintenance (Ditching): This activity consists of re-establishing the flow of ditches, swales, and infiltration galleries.

- The ditches and swales accumulate sediment, garbage, and debris over time and the material needs to be removed to re-establish flow or the infiltration of a gallery. Before materials are removed vegetation maintenance as described above will be conducted to improve visibility and safety of this operation. The typical depth of soil removed is 6 in (15 cm). Material from the ditch will be removed by backhoe or other mechanical means. The material will be moved to an off-site location. No wetlands will be filled or drained as a result of this activity. All open drainage systems maintenance activities will follow standard road work safety operating procedures and Best Management Practices (Appendix C). The width affected by ditching is a 10.5 ft (3.2 m) wide section of the right-of-way.
- This activity occurs year-round, but primarily in the summer months when ditches are dry or have little to no standing water.
- Additional information on Open Drainage Systems Maintenance including Best Management Practices is located in the RRMG Maintenance Category #4. Per the Washington Department of Ecology National Pollutant Discharge Elimination System (NPDES) Phase 2 Permit for Thurston County section S.5.C5 subsection c.ii (2) when inspections identify maintenance needs the work is required to be performed within 6 months for open drainage systems within new developments/projects and 1 year for all other open drainage systems. Thurston County Public Works follows the maintenance standards established in the NPDES II permit, Thurston County Drainage & Design Manual (Thurston County 2009) and the RRMG.

- (3) **Guardrail Maintenance:** This activity consists of repairing guardrail after damage or as it ages.
- Posts are buried in the shoulder or slope adjacent to the shoulder at a depth of 3.5 to 8.5 feet. The soil around the posts (usually less than 3 ft (0.9 m) radius) may be disturbed during post replacement. This work is performed using a backhoe or excavator with auger attachment, a vactor truck and posthole diggers/shovels.
 - This activity occurs year-round as damaged by vehicles or as degradation is discovered. All guardrail sections will require maintenance at least once during the 30-year HCP.
- (4) **Sign Maintenance and Installation:** This activity consists of repairing signs after they are damaged by vehicles or installing new signs. Posts are buried in the shoulder or slope adjacent to the shoulder at a depth of 32 inches. The soil around the posts (usually less than 3 ft (0.9 m) radius) may be disturbed during post replacement. This work is performed using a truck mounted auger or posthole diggers and rock bars.
- This activity occurs year-round, and all signs to be replaced at least once during the 30-year HCP.
- (5) **Enclosed Drainage System Maintenance:** This activity consists of repair, replacement, installation, and maintenance tasks performed on enclosed drainage systems (Table 3.9).
- This activity occurs year-round, and the majority of culverts in Thurston County will require maintenance or replacement within the HCP term.
 - Additional Information on Enclosed Drainage System Maintenance including Best Management Practices are located in the RRMG Maintenance Category #2 & 3. Per the ECY NPDES Phase 2 Permit for Thurston County section S.5.C5.A subsection c.ii (2) when inspections identify maintenance needs the work is required to be performed within 6 months for catch basins and 1 year for all other drainage facilities.

Table 3.9 Drainage system types in Thurston County.

Drainage System Type	Description of Maintenance Activities
Retention/Detention facilities	Mostly vegetation maintenance (described in Section 3.1.7 above) and clearing debris/obstructions by hand with shovels.
Manholes/Catch Basins/Vaults	Vactor trucks and jetter trucks are used to clean and remove accumulated debris/materials that are then hauled to a County Decant Facility where there is no impact to habitat. Mini-excavators/backhoes are used occasionally to adjust, replace, or repair an inadequate structure.
Pipes/Culverts/Box Culverts	Jetter trucks and vactor trucks are used to clean and remove accumulated debris/materials that are then hauled to a County Decant Facility. Mini-excavators/backhoes are used occasionally to adjust, replace, or repair an inadequate structure.
Inlets/Outlets	Vactor trucks or hand work with shovels is used to remove accumulated debris/materials that are then hauled to a County Decant Facility or a County pit site. During high flow stormwater events a trash truck will be used to remove debris.
Low Impact Development Underground Injection System	Vactor trucks are used to clean and remove accumulated debris/materials that are then hauled to a County Decant Facility.

- (6) Bridge Maintenance: These activities include inspecting, testing, repairing, replacing, maintaining, painting, or resurfacing components of the bridge such as the electrical system, substructure, superstructure, surface footings, piers, supports, access roads, abutments, bridge rail, ramps, and vegetation management.
- Bridge repair, abutment repair, replacement, installation, and maintenance activities are performed to provide a safe roadway system for the traveling public, and to protect bridge infrastructure according to local, state, and federal regulations. This, in turn, protects the stream, riparian habitat, and stream bank by limiting the number of crossings through the habitat area.
 - In advance of abutment repair, a site inspection and reach assessment is conducted, which will determine the best engineering design to protect the bridge. Before work begins a Hydraulic Permit Approval (HPA) is obtained. Typically, Thurston County uses excavators or cranes for placing large rocks where it is able to reach, and in other areas rock is placed by hand. If a void exists beneath the bridge approach from scour, the asphalt is cut and the void is filled with clean dry fill.
 - Bridge scour protection consists of replacing or installing rock or pre-cast devices around bridge piers to prevent the erosion of material. If too much material erodes the bridge could fail. If water is present, Thurston County staff will use Maintenance Category #6 Stream Crossings Best Management Practices.
 - Drift removal involves removing built up branches and debris that have collected near or against the structure of the bridge. The debris is typically removed by boat using pole saws or from the bridge itself using a crane, trash truck, or an excavator; typically debris builds up around the piers and abutments. If left in place, the material could cause the bridge to fail or result in flooding issues.
 - Maintenance needs are discovered during annual inspections. The timing of these activities are determined by General Hydraulic Permit Provisions; each element has specific conditions. This activity occurs in June-August or other times if immediate attention is required. All bridges crossing waterways will require bridge abutment protection at least once during the 30-year HCP.
 - For additional information see the bridge cleaning, painting, general maintenance, and repair Hydraulic Project Approval in Appendix D: Bridge Maintenance Hydraulic Project Approval (HPA).
- (7) Beaver Dam Management: This activity consists of Beaver dam notching or removal and shall occur in a manner to ensure the gradual, slow release of impounded water.
- Frequently, Beaver dams block roadside ditch or stream areas and result in flooding of adjacent roads, creating a safety hazard. Work to reduce flooding includes using manual or mechanical means to loosen and remove woody material and debris, or use of a mechanical saw to create narrow paths through the dam to restore partial water flow through the dam to reduce flooding. Depending on site-specific conditions material and debris are usually placed to the side in riparian vegetation, or may be taken to the road for removal from the site and habitat. The area affected by Beaver dam removal varies with the Beaver dam. Specific guidance is

provided in Appendix C: Best Management Practices regarding Beaver Dams within the Oregon Spotted Frog Habitat Screen.

- Further information describing the County management of Beaver dams is included in the Beaver Dam Management Plan (Appendix E). This activity can occur year-round as needed.
- (8) Watercourse and Stream Maintenance: Repair, replacement, installation, and maintenance tasks are performed on watercourses or streams.
- These activities may include structural repair/replacement, slope stabilization, sediment removal, vegetation management, debris removal, access road maintenance, habitat maintenance and improvements (e.g., fish ladders, weirs, and large woody material). Some roadside ditches and stormwater facilities can be watercourses or streams.
 - Watercourses and streams can be located within the road ROW, on easements, tracts, and public property or on private property. Proposed maintenance activities within waters of the state will be reviewed prior to work with WDFW staff to ensure HPA compliance. In addition to project specific HPA requirements, road crews will adhere to the provisions of these Guidelines to ensure compliance with the Regional Program. Environmental support staff will review the planned work and contact WDFW to determine if the facility meets the definition above.
 - Ditches or stormwater facilities that are watercourses or streams are maintained when sediment, debris, or vegetation impede flows, or storage of water and sediment to a point where safety or the ROW structure is compromised.
 - Maintaining ditches or stormwater facilities that are watercourses or streams includes activities to preserve line and grade, depth and cross section, and inflow and outflow of culverts (in compliance with federal, state, and local regulations).
 - This activity can occur year-round as discovered during annual inspection or emergencies. Maintenance activities within waters of the state will be reviewed with WDFW, and permitted with an HPA, as necessary.

Emergency Response

County emergency management actions in response to traffic accidents, hazardous waste spills, spot flooding, illicit discharges, or other accidental and unpredictable events have the potential to impact Covered Species in County right-of-way.

The Best Management Practices described in Appendix C may be practicable in some emergency response situations, at the discretion of emergency personnel.

Emergency response activities may occur at any time of year, and at varying intensity, frequency, and permanence. Most impacts are expected to be temporary.

Utilities

Utility infrastructure includes overhead and underground facilities in right-of-way as well as on private property to the service meter (typically found on the side of the business or residential building). Common practices on installing underground utilities on private property are a combination of the following:

- Trench method: Excavation/trenching: Excavation typically uses a backhoe. Equipment is usually staged on the pavement and excavation spoils are directly loaded into trucks for disposal off site, either outside of HCP habitat or out of County. Excavations are minimized to the extent practical, both to control cost and minimize restoration requirements. Service installations and repairs are limited to minimal ground disturbance necessary for work.
- Bore method: Use of a bore machine, which involves a placing the boring machinery and initiating a bore pit where a bore head is inserted into the ground and a receive pit where the bore head ends. Communications cable and/or conduit is attached and pulled back through the hole created by the bore head.

Utility work in right-of-way activities may occur at any time of year, and at varying intensity, frequency, and permanence. Most impacts are expected to be temporary.

BMPs applicable to utility work in right-of-way are described in Appendix C, and include multiple measures specific to habitat suitable for the prairie species and to Oregon Spotted Frog, including, but not limited to, project timing (e.g., completing work when habitats are dry), sediment control, minimizing tracking of heavy equipment in habitat areas, and managing side-cast materials from excavation.

3.1.8 Landfill and Solid Waste Management

Waste management activities that will impact Covered Species through conversion of habitat to alternate uses include:

- Expansion of two recycling centers: This will include addition of graveled or paved area to existing facilities.
- Solid waste clean-up and remediation: This will include use of excavation equipment to remove affected soil.
- Construction of two new solid waste facilities (landfill or transfer stations): Facility construction will involve use of excavation equipment to remove excess material and stockpile on site, establishment of groundwater control trenches and placement of protective plastic liner and geotextile protector, placement of leachate pipe system, and establishment of a gravel layer prior to use. Roads, utilities, and staging areas are established as needed on site. Transfer stations are created by paving the area and establishing piles of materials and buildings on site for facility needs.

Best Management Practices applicable to landfill and solid waste management described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures to minimize

impacts through project siting and configuration. Specific practices which control invasive species and minimize sediment and foreign material discharge and runoff into habitats for the Covered Species, during and after construction, will help minimize impacts.

A summary of this Covered Activity is included in Table 3.10.

Table 3.10 Covered Activity summary for landfill and solid waste management.

Activity Summary – Landfill and Solid Waste Management	
Duration of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent
Location of Impacts	Throughout Permit Area

3.1.9 Water Resources Management

Water resources management-related Covered Activities include:

- Water conveyance, flow, runoff, treatment, retention flow control activities:
- Conveyance Upgrades
- Generally involves the replacement of storm pipes with newer and resized pipes. Such work typically requires excavation of existing conveyance and replacement of pipe.
- Installation or Repair of Runoff Treatment Facilities
- Treatment/Constructed Wetlands are placed to intercept stormwater running in roadside ditches before it discharges into a stream. Treatment wetlands are constructed by excavating a water storage area. Wetland vegetation is planted in the water storage area.
- Treatment vaults are large concrete structures with a filter canister. Installation involves excavation.
- Installation or Repair of Flow Control Facilities
- Infiltration facilities come in multiple forms; the most common is an underground infiltration piping system. Such a system is installed by excavating, placing a large diameter perforated pipe, then backfilling around the pipe with gravel. Water enters the pipe and slowly percolates out.
- Detention ponds are placed at the end of a water drainage path, with the purpose of holding water and slowly releasing it into a pipe or to stream. These structures are created by excavation with a backhoe.

- Roadside bioretention structures are constructed by excavating a roadside ditch to a wider width and in some cases installing under piping, back filling that excavation with gravel, adding filter fabric and a bioretention soil. This typically involves working in a 16 ft (4.9 m) wide strip of the right-of-way. The structures increase water infiltration, then pick up excess water in a drainpipe.
- Installation of water and sewer lines:
- Construction of water treatment system and related water reservoir near existing sewage treatment plants (e.g., the sewage treatment plant in Grand Mound).
- Installation of groundwater wells:
- Wells are typically drilled with a well drilling rig, and a concrete pad is placed over the top of the well. Impacts from this activity include compression of soil and vegetation by vehicles and equipment.

Best Management Practices applicable to water resources management described in Appendix C, will be implemented to the maximum extent practicable, and include multiple measures to minimize impacts through project siting and configuration. Specific practices which schedule work for times when work areas are dry and minimize sediment and foreign material discharge and runoff habitats for the Covered Species, will help minimize impacts. For Oregon Spotted Frog in particular, Best Management Practices will include avoiding and minimizing draining of seasonally flooded areas, avoiding creating barriers between breeding and overwintering and rearing areas, and that do not create ‘sink’ habitat that is unsustainable for the species.

A summary of this Covered Activity is included in Table 3.11.

Table 3.11 Covered Activity summary for water resources management.

Activity Summary – Water Resources Management	
Duration of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent
Location of Impacts	Throughout Permit Area

3.1.10 County Parks, Trails, and Land Management

Thurston County conducts management activities on parks and other county lands that may impact Covered Species during the Permit Term, including maintaining paved trails, constructing new trail, and implementing park improvements.

Trail maintenance includes ditch and stormwater conveyance system and bridge maintenance, which may involve disturbance of soil and vegetation outside the trail itself but within the trail right-of-way.

These activities are similar, but on a smaller scale, to those for roadside right-of-way maintenance. Trail maintenance includes mowing approximately 3 ft (0.9 m) on each side of the trail once per month in the growing season, spraying and/or wiping herbicides, tree removal, and tree plantings (including Oregon white oak trees) that can involve soil and vegetation disturbance (no prohibited take of covered species is expected incidental to herbicide use).

Construction of new trail is envisioned for the Gate-to-Belmore Trail, a trail connecting the Gate area in south Thurston County to the vicinity of Kenneydell County Park in Tumwater. The footprint of this multiuse path is a decommissioned railroad track, which is not considered habitat for Covered Species. Construction of the trail will involve stream crossings in the OSF Habitat Screen.

The County anticipates completing public park improvements, potentially adding a new picnic shelter and educational area at Glacial Heritage Preserve, plus potential small improvement projects at County Parks, such as expansion of parking areas, trail head facilities, or interpretive areas.

County parks, trails, and land management activities will be performed following the Best Management Practices described in Appendix C, to the maximum extent practicable. Likely practicable management practices will include sediment control, managing side-cast materials, minimizing tracking of equipment in habitat areas, mechanical control of invasive species, and project timing (e.g., implementing maintenance work when water is absent), and staging area planning.

A summary of this Covered Activity is included in Table 3.12.

Table 3.12 Covered Activity summary for County parks, trails, and land management.

Activity Summary – County Parks, Trails, and Land Management	
Duration of Impacts	Year-Round
Intensity of Impacts	Complete habitat loss
Frequency/Permanence of Impacts	Permanent (extremely frequent maintenance treated as permanent impact)
Location of Impacts	County trail system and County Parks

Chapter 4 Analysis of Impacts

4.1 Introduction

This chapter describes the methods and processes used to develop 30-year landscape-scale projections of the unavoidable impacts to Covered Species (incidental take) expected to result from the Covered Activities over the Permit Term.

Thurston County recognizes the difference between the methodologies used to estimate 30-year landscape-scale projections of impacts and the finer-grained calculations used to assign debits and credits at the site level during HCP implementation (described in Chapter 7). This difference is necessary for practical reasons. For the purposes of planning necessary to inform an estimate of the upper “ceiling” of impacts to use in developing the HCP, we used a long-term regional approach. It is not possible to know which parcels will be developed over the 30-year term of the HCP, and the precise amount of habitat impacts that cannot be minimized and avoided and would therefore require offset. Generalized patterns of regional growth and reasonable assumptions about future growth were used to establish this estimate. Conversely, during implementation, we will have site-specific information about development plans to inform a more precise calculation of debits that contribute to the prescribed impacts ceiling authorized by this HCP, and the number of credits required to offset those impacts.

Both approaches align with USFWS guidance. The County is confident that the 30-year landscape-scale projection of impacts is sufficiently inclusive of anticipated incidental take, although it is recognized that site-specific information could adjust the estimate of impacts through time. Impacts will be closely monitored over the term of the HCP.

Thurston County has applied for an Incidental Take Permit covering the impacts estimated in this section. Any impacts to Covered Species beyond this estimate will require consultation with USFWS, either for a new HCP, or an amendment to the Incidental Take Permit and HCP. This would include adding conservation measures to mitigate the impacts of the taking, along with possible additional NEPA review.

To project and estimate the impacts to a Covered Species from a future Covered Activity, it is essential to determine the location and extent of the area to be impacted, and also to describe the relative value of the location to be impacted for the Covered Species. These factors combine to calculate projected impacts to Covered Species.

- **Impact Area Location and Extent:** Projections of locations to be affected and impacted by Covered Activities, in acres (ac) on-the-ground, can be extrapolated from past County records and future County plans and existing analyses (e.g., development projections). These locations can then be intersected with the mapped extent for the Covered Species.
- **Habitat Value of Impact Area:** Identifying the habitat value of a given area for each Covered Species is critical to ensure valid projected impact estimates in this chapter, and later, during

HCP implementation, to ensure accurate and consistent tracking of impacts from Covered Activities and tracking of mitigation benefits from the HCP Conservation Program. The habitat value of a location is determined by a combination of the level of Covered Species occupancy or potential for occupancy, and the quality and function of the habitat (this includes species specific resource needs, such as soil type, vegetation type, vegetation structure, hydrology, etc.).

The acreage of impact area and habitat value of the impact area are used to calculate a functional acreage of impact to each Covered Species.

In an equation:

$$\text{Impact Area (extent in acres)} \times \text{Habitat Value (Scale of 0 – 1)} = \text{Functional Acres}$$

4.2 Covered Species Habitat Value

This section presents the important habitat characteristics and their habitat value (on a scale of 0-1) for the Covered Species. Habitat value is based on the specific resource needs for each Covered Species, e.g., presence of suitable soil types for Mazama Pocket Gopher subspecies or the presence of emergent plants in shallow slow-moving waters for Oregon Spotted Frog. We assume that greater amounts of resources and suitability equates to higher functionality for the species, and greater habitat value.

4.2.1 Mazama Pocket Gopher Subspecies

The value of habitat for Mazama Pocket Gopher subspecies can be identified using a combination of soil type (Mazama Pocket Gopher soil preference) and occupancy or proximity to lands known to be occupied by Mazama Pocket Gophers.¹⁰

Soil type is an important factor for determining the habitat value of a site for Mazama Pocket Gopher. The more preferred and less preferred categories indicate the relative preference of Mazama Pocket Gopher for these soils (list of soils and preference is included in Table 2.3). More preferred soils have a higher assigned habitat value. The map of Mazama Pocket Gopher soil preference is included in Figure 2.4.

The map of Mazama Pocket Gopher occupancy, as of the 2018 survey season, is included in Figure 2.5. This map will be updated at the time of HCP finalization, but for the purposes of impacts projection, this map is used. For the County-wide landscape-scale impact projection for this HCP, all portions of a site with known Mazama Pocket Gopher subspecies use detected at any point, on which soils are suitable, were considered occupied. Occupancy categories were assigned in relation to known occupancy on or near the site, known Mazama Pocket Gopher subspecies movement distances (656 feet (200 m)), and barriers to Mazama Pocket Gopher subspecies movement. Sites with known occupancy have the highest habitat value, sites adjacent or proximal to occupancy (within 200 m) have the next highest habitat value, and sites that are suitable, but less close to current Mazama Pocket Gopher subspecies occupancy have lowest habitat value. These values are based on USFWS guidance (August 2015 and January 2017).

¹⁰ When determining the value of habitat for MPG for mitigation, vegetation attributes are also utilized as added Performance Standards. This is described further in Chapter 7: Implementation.

Habitat values used for landscape scale projections for all Mazama Pocket Gopher subspecies are included in Table 4.1.

Table 4.1 Assigned occupancy-soil preference habitat values for Mazama Pocket Gopher subspecies habitat, based on occupancy and soil preference categories. A value of 1 = 100% value.

Occupancy Category	Definition of Category	Occupancy-Soil Preference Habitat Value	
		More Preferred Soils	Less Preferred Soils
Category 1: Occupied	Site is known to be occupied by Mazama Pocket Gophers.	1	1
Category 2: Adjacent or Proximal to Occupancy	Site occupancy is unknown, but site is within 656 ft (200 m) of an occupied area (Mazama Pocket Gopher subspecies soils are present on project site, and there are no barriers ¹¹ to Mazama Pocket Gopher subspecies movement between project site and occupied area).	0.95	0.75
Category 3: Suitable, Connected, but Less Close to Occupancy	Site occupancy is unknown, and site is more than 656 ft (200 m) of an occupied area (Mazama Pocket Gopher subspecies soils are present on project site, and there are no barriers to Mazama Pocket Gopher subspecies movement between project site and occupied area).	0.60	0.15

*The occupancy-soil preference value does not include the habitat value for vegetative condition.

4.2.2 Taylor’s Checkerspot Butterfly and Oregon Vesper Sparrow

Habitat values used in impact projections for Taylor’s Checkerspot Butterfly and Oregon Vesper Sparrow are defined by the composition and structure of the vegetation. In general, vegetation that provides more resources for the species is of higher quality and function and has a higher habitat value to the species. Occupancy is not used in the projections of landscape-scale impact estimates for these species but is included in the credit-debit methodology during implementation (described in Chapter 7).

Vegetation categories and habitat values for Taylor’s Checkerspot Butterfly and Oregon Vesper Sparrow were developed in conjunction with USFWS guidance and in line with processes in use within other jurisdictions. The categories of habitat quality and function for both species are described in Table 4.2, and include habitat characteristics which are critical for the life history of each species. Taylor’s Checkerspot Butterfly vegetation categories are built around the abundance of shrubs/trees, native herbaceous species, and the species richness of larval host and nectar species. Oregon Vesper Sparrow vegetation categories are built around the abundance of shrubs/trees and native herbaceous species, in addition to patterns of vegetation height during breeding season (May). In general, vegetation that

¹¹ MPG barriers shall include, large fully forested areas, large wetland complexes, major rivers, and arterial roadways

provides more resources for the species has a higher relative value. The habitat value of each habitat category defined in Table 4.2 is described in Table 4.3.

For the purpose of informing 30-year landscape-scale projections of impacts for the HCP, a default habitat value of 0.3 was assumed in the analysis for Taylor’s Checkerspot Butterfly and default habitat value of 0.4 for the Oregon Vesper Sparrow. This assumption is justified on the basis that the average grassland habitat condition in the Permit Area fits in the Degraded Grassland category. During HCP implementation, the Credit-Debit Methodology will be employed to assess debits and credits (for more information, see Chapter 7: Implementation).

Table 4.2 Categories of habitat quality and function for Taylor’s Checkerspot Butterfly (TCB) and Oregon Vesper Sparrow (OVS).

	TCB Habitat Attributes				OVS Habitat Attributes		
	Shrub/Tree Cover ^{1,2,3}	Native Herbaceous Cover ¹	Larval Host Species	Nectar species	Shrub/Tree Cover ¹	Native Herbaceous Cover ¹	Vegetation height in May (% between 6-20 in/15-51 cm)
Shrub-Dominated	Shrub cover ≥30%; Tree cover <5%	-	-	-	Shrub cover ≥50%; Tree cover <5%	-	< 50%
Degraded Grassland	Shrub cover <30%; Tree cover <5%	<10%	1 Larval Host species	< 4 Nectar species	Shrub cover >30%; Tree cover <5% or 15-25%	<10%	< 50%
Native Prairie	Shrub cover <15%; Tree cover <5%	10-30%	2-5 Larval Host species, At least 1 oviposition host	> 4 Nectar species	Shrub cover <30%; Tree cover <5% or 15-25%	10-30%	50-75%
High-Quality Native Prairie	Shrub cover <5%; Tree cover <5%	>30%	2-5 Larval Host species, At least 1 oviposition host	> 8 Nectar species, at least one with late flowering phenology	Shrub cover <15%; Tree cover <5%	>30%	> 75%

¹ Percent cover metrics are assessed using a grid of 25m x 25m sample cells; or, a conditionally approved alternative sample cell/unit configuration.

² Trees may not exceed 5% cover, unless native oak savanna (less than 25% cover of oaks, *Quercus garryana*).

³ Woody shrubs; excludes native oak and kinnikinnick (*Arctostaphylos uva-ursi*).

⁴ soils should be assessed with a conditionally approved sample cell/unit configuration.

Table 4.3 Assigned habitat values for Taylor’s Checkerspot Butterfly (TCB) and Oregon Vesper Sparrow (OVS), based on habitat quality categories. A value of 1 = 100% value.

Category	Habitat Value for TCB	Habitat Value for OVS
Shrub-Dominated	0.1	0.1
Degraded Grassland	0.3	0.4
Native Prairie	0.6	0.6
High-Quality Native Prairie	0.8	0.8

4.2.3 Oregon Spotted Frog

The OSF Habitat Screen is intended to encompass all areas with use by Oregon Spotted Frog in the Permit Area. However, the OSF Habitat Screen is known to include non-habitat in addition to a mix of known and potential habitat for the species. On-the-ground surveys for Oregon Spotted Frog in Thurston County to date have focused on areas immediately around known locations, and only limited exploration of other areas. Therefore, correction factors are needed and applied in the landscape-scale impact projection/estimate analysis for each Covered Activity. These correction factors include assumptions about whether areas within the OSF Habitat Screen are in fact habitat, depending on if the area in question is a wetland core or is in the riparian buffer.

During HCP implementation, prior to any Covered Activity occurring in the OSF Habitat Screen except routine right-of-way maintenance, an on-the-ground Oregon Spotted Frog habitat verification, potentially with a follow up species survey, will be completed. Debits will only be assessed where suitable Oregon Spotted Frog habitat is verified. See Appendix F: Oregon Spotted Frog Habitat Survey Protocol.

Compared to the other Covered Species, less detailed information is known about how to quantify the resources thought to define habitat value for Oregon Spotted Frog, which include water depth, flow characteristics, and dominance of short emergent vegetation. Therefore, to inform landscape-scale, 30-year impact projections, the entirety of the OSF Habitat Screen is treated as a surrogate for suitable habitat for Oregon Spotted Frog, and all projected impact areas are assumed to have full habitat value for the species (default relative habitat value of 1.0).

4.3 Approaches to Projecting Habitat Value of Impact Areas

The previous section (Section 4.2) identifies the habitat attributes that the HCP impacts projection process uses to identify the quality and function of habitat for the Covered Species. This section describes how the HCP impact projection process models the quality/function of areas to be impacted by the Covered Activities, which then allows the full projected impact (functional acres = area impacted × habitat value) to be calculated.

The precision and accuracy of information known about the on-the-ground distribution of Covered Species’ key habitat attributes and the Covered Activities’ future locations is quite variable. For example, for some Covered Species, the key habitat attributes are mapped on-the-ground already (e.g., MPG

soils), but for other Covered Species, the key habitat attributes are not mapped (e.g., the distribution of the habitat quality categories – Shrub-Dominated, Degraded Grassland, etc.). Likewise, for example, the specific location of some Covered Activities (e.g., a school expansion project) is known, but the location of others (e.g., a garage addition project) is not known. To add further complexity, for some Covered Activities, such as for transportation capital projects, a subset of project locations are known (e.g., via existing Capital Improvement Plans) and other project locations are unknown, but assumed to follow similar patterns across the County.

Recognizing this variability in information, but still needing to be as consistent and transparent as possible in showing how the 30-year landscape-scale projections of impacts were calculated, two approaches to projecting impacts (including their habitat value) are used in this impacts analysis to make the best estimate of the quantity of impacts to the Covered Species to be covered under the HCP. Each method is described below. One is used when the location of a Covered Activity is known (i.e., residential or commercial development). The other method is used when the location of a Covered Activity is not known and is expected to occur widely within the Permit Area (i.e., identified in the Thurston County Capital Facilities Plan¹²) during the proposed permit term. The output from each of these projection methods is further refined with analysis assumptions specific to Covered Species or Covered Activities. The refinement process is described further for each activity in Section 4.4.

It is important to remember that the purpose of the projection process is to establish the ceiling (maximum) for each Covered Activity's impacts. During HCP implementation, debits and credits will be calculated using location specific information.

4.3.1 Known Activity Location Projection Method Overview

This approach was implemented to calculate projected impacts from Covered Activities with locations already identified at the time of HCP development. The projected impact area(s) were overlain on the mapped extents for each Covered Species, to determine which species were likely to be impacted. This was completed by:

Mapping suitable soils and the National Land Cover Dataset define and identify habitats that consist of suitable soils and suitable cover types.

The available data¹³ was evaluated to assess and describe current occupancy and proximity at the scale of individual parcels.

- For Mazama Pocket Gopher, GIS was used to intersect the impact area (e.g., project area) with the occupancy-soil habitat value at the impact location (e.g., Mazama Pocket Gopher subspecies occupancy category and soil preference from Table 4.3, as determined by maps in Figure 2.4).

¹² Thurston County Capital Facilities Plan is Chapter 6 of the Thurston County Comprehensive Plan. This chapter evaluates population to prioritize projects that either provide or maintain infrastructure and services for the county and provides a broader planning perspective to work in conjunction with the Capital Improvement Program (Appendix G).

¹³ The data available was compiled from WDFW species lead surveys, PHS species information, data provided by USFWS species leads and information collected from species experts working with JBLM.

- For Taylor’s Checkerspot Butterfly, areas within the species’ mapped extent are assumed to have a default habitat value of 0.3 functional acres/acre impacted. .
- For Oregon Vesper Sparrow, areas within the species’ mapped extent are assumed to have a default habitat value of 0.4 functional acres/acre impacted.
- For Oregon Spotted Frog, areas within the OSF Habitat Screen are assumed to have a default habitat value of 1.0 functional acres/acre impacted.

The habitat values of each parcel and its projected impacts (acres) are summed across the HCP Permit Area, by covered activity and for each species/subspecies to provide model outputs (impacts/incidental take) as “functional acres”.

4.3.2 Proportional Habitat Projection Method Overview

This approach is used where locations of Covered Activities are not known at the time of HCP development but expected to occur. Therefore, best available information in County records or plans are used to extrapolate and inform landscape-scale projections. In this case, where specific impact locations cannot be intersected with Covered Species mapped extents or habitat categories, the analysis instead projects that these impacts will be distributed evenly across the County, and that the proportion of the overall impacted area in each Covered Species habitat will follow the proportion of the County in the mapped extent for each Covered Species.

Step 1: Identify the total affected area for an activity over the proposed 30-year permit term of the HCP.

- Project the number of times the covered activity occurs based on historical permitting records from the permitting area¹⁴.
- Multiply the number of occurrences of the covered activity by its projected impact area minus analysis assumptions (i.e., avoidance) described more fully in section 4.4 below. This calculates the activity’s total affected area.

Step 2: Identify the proportion of active permitting area that is likely habitat for each Covered Species.

- MPG Subspecies: The mapped extent of MPG (all spp) covers ~99,890 ac or 38% of the active permitting area. Of that area, the % of land occupied in each MPG Service Area, by soil preference and proximity, is shown in the table below. OSF Habitat Screen mapped extent covers ~39,493 ac or 15% of the active permit area.
- Taylor’s Checkerspot Butterfly mapped extent covers ~2,424 ac or 0.9% of the active permitting area.
- Oregon Vesper Sparrow mapped extent covers ~6,064 ac or 6% of the active permitting area.

¹⁴ Lands where County typically issues permits within its permitting jurisdiction which includes roughly 261,245 ac in the urban growth areas, rural, commercial, industrial, and long-term agriculture zoning districts (excludes long term forestry and military reservation).

Table 4.4 Distribution of MPG Subspecies Service Areas in the Active Permitting Area

	Category 1: Occupied	Category 2: Adjacent or Proximal to Occupancy	Category 3: Suitable, Connected, but Less Close to Occupancy	Grand Total
OPG				14%
More Preferred Soil	0.1%	0.6%	9.1%	
Less Preferred Soil	0.2%	1.0%	2.6%	
TPG				10%
More Preferred Soil	0.0%	0.0%	6.9%	
Less Preferred Soil	0.6%	0.4%	1.8%	
YPG N				20%
More Preferred Soil	0.0%	0.4%	9.8%	
Less Preferred Soil	0.3%	1.6%	8.0%	
YPG E				30%
More Preferred Soil	0.2%	0.9%	20.2%	
Less Preferred Soil	0.2%	1.1%	7.9%	
YPG S				26%
More Preferred Soil	0.0%	0.2%	6.1%	
Less Preferred Soil	1.3%	4.7%	13.6%	
Sum	3.0%	11.1%	86.0%	100%

Step 3: Determine the projected affected area per covered species

- Multiply the total affected area for the covered activity by the proportion of the active permitting area occupied by each covered species.

4.4 Projected Impacts Resulting from Covered Activities

A summary of the projected landscape-scale impact estimates for each Covered Species from each Covered Activity is presented in in Table 4.5 (for Olympia, Tenino and Yelm Pocket Gopher) and Table 4.6 (for Taylor’s Checkerspot Butterfly, Oregon Vesper Sparrow and Oregon Spotted Frog). Estimated impacts are reported in two sets of units: extent of acres on the ground (1 ac = 0.4047 ha), and in functional acres, which integrates extent and habitat value.

The impacts identified for each Covered Species in these tables is a landscape-scale projection estimate that is not to be exceeded during the Permit Term. During HCP implementation, the amount of actual impacts from each Covered Activity project will be assessed and tracked on a project by project basis, as described in Chapter 6: Implementation, but cannot exceed the total amount of take identified in this chapter.

A detailed summary of the landscape-scale impact projection process for each Covered Activity, including the projection method used, and all applicable analysis assumptions, is provided in the sections below.

Table 4.5 Summary of impact estimates¹⁵ (subtotal) for Olympia Pocket Gopher, Tenino Pocket Gopher, and Yelm Pocket Gopher (including Service Area for Yelm Pocket Gopher), projected to occur during the HCP Permit Term. “Fx” acres are functional acres.

Covered Activity	OPG		TPG		<i>(YPG N)</i>		<i>(YPG E)</i>		<i>(YPG S)</i>		YPG All		Subtotal (All MPG)	
	Ac Affected	Fx Acres	Ac Affected	Fx Acres	Ac Affected	Fx Acres	Ac Affected	Fx Acres	Ac Affected	Fx Acres	Ac Affected	Fx Acres	Ac Affected	Fx Acres
New Residential Development	654	306	216	101	2010	1054	1612	808	850	569	4472	2431	5342	2838
Added Accessory Structures	59	33	43	24	88	39	132	66	113	46	332	152	434	208
Septic Extension or Repair, Heating Oil Tank Decommission	31	17	23	13	46	21	70	35	60	25	176	81	230	110
Commercial/ Industrial	303	212	43	9	36	21	28	19	437	359	501	399	847	619
Public Service Facilities	11	5	1	1	12	3	4	2	106	100	122	105	134	111
Landfill/Solid Waste Management	2	1	1	1	3	1	4	2	45	28	52	31	55	32
Transportation Projects	33	18	12	7	97	44	25	12	92	38	214	94	258	118
Transportation Maintenance and Work in Right-of-Way	100	31	74	17	401	162	219	76	223	167	843	406	1017	453
Water Resources Management	17	9	12	7	25	11	38	19	33	14	96	44	126	60
County Parks, Trails, and Land Management	1	1	0	0	2	1	10	3	1	0	14	4	15	5
Total Acres Affected	1210		425		2720		2141		1960		6821		8456	
Total Fx Acres		632		178		1357		1043		1346		3747		4556

*One acre = 0.4047 hectare.

¹⁵ Estimates may not add up due to rounding of original data.

Table 4.6 Summary of impact estimates¹⁶ for Taylor’s Checkerspot, Oregon Vesper Sparrow, and Oregon Spotted Frog projected to occur during the HCP Permit Term, with subtotal of impacts to Mazama Pocket Gopher added. “Fx” acres are functional acres.

Covered Activity	TCB		OVS		OSF	Subtotal		Subtotal MPG (from Table 4.1)		Grand Total	
	Ac Affected	Fx Acres	Ac Affected	Fx Acres	Ac & Fx Ac	Ac Affected	Fx Acres	Ac Affected	Fx Acres	Ac Affected	Fx Acres
New Residential Development	18	5	34	9	235	287	249	5342	2838	5629	3087
Added Accessory Structures	11	3	26	7	26	63	36	434	208	496	244
Septic Extension or Repair, Heating Oil Tank Decommission	6	2	14	4	42	62	48	230	110	291	158
Commercial/ Industrial	0	0	0	0	44	44	44	847	619	891	663
Public Service Facilities	3	1	8	2	0	11	3	134	111	146	114
Landfill/Solid Waste Management	1	0	3	1	1	6	2	55	32	60	35
Transportation Projects	6	2	0	0	127	134	129	258	118	391	247
Transportation Maintenance and Work in Right-of-Way	4	1	0	0	115	119	116	1017	453	1135	569
Water Resources Management	3	1	8	2	3	14	6	126	60	139	66
County Parks, Trails, and Land Management	2	2	0	0	25	27	27	15	5	42	32
Total Acres Affected	54		93		618	765		8456		9221	
Total Fx Acres		16		25	618		659		4556		5216

*One acre = 0.4047 hectare.

¹⁶ Ibid., 14

4.4.1 Residential Development

Estimates of the amount of residential development to occur over the Permit Term in the HCP Permit Area relied on development projections from Thurston Regional Planning Council (TRPC 2012). TRPC data from 2014, 2015, 2020, 2025, 2030, and 2035 were used, and 2049 projections were extrapolated from 2035 zoning capacity. The County assumed build out would occur to 70% of capacity (within current zoning allowances). In 2014, the County was at 58% of capacity. Growth in the rural area of Thurston County has been occurring at a more modest pace than in previous periods. Only about 15% of total population growth has occurred in the rural county. Although the slower trend is expected to increase during the forecast period (2020-2045), the new population forecast in comparison to the 2012 forecast indicates an overall slower pace than the previously projected growth rate over the forecast period.

The estimated per unit affected area in projections for residential development impacts equates to development envelope. It includes the structure, driveway, well, accessory buildings and area likely to be disturbed during construction activity. Outside Urban Growth Areas (UGAs), the area of the development envelope, for projection/estimation purposes, is assumed to be a 1 ac (0.4 ha) area. This estimate was determined based on analysis of existing residential development in the Permit Area. Inside UGAs, the County assumed use of 100% of the parcel, since at the time of development, these lots are 1 ac (0.4 ha) or less, and lots are frequently completely graded and converted to residential use. For this Covered Activity, the known location projection method was used. Impacts to each Covered Species from new residential development were estimated by overlaying the mapped species extent with the TRPC's anticipated development capacity for individual parcels.

Specific assumptions used in the analysis of impacts are included by habitat type in the sections below. The resulting projected impact estimates from this Covered Activity are summarized in Table 4.5 and Table 4.6.

Residential Development Projection Assumptions for Prairie Species

The following assumptions were used for the landscape-scale projection of impacts:

- The NLCD prairie classification (as described in Section 2.2) was used as an additional overlay. Impacts were only projected to occur if they occurred within the habitat classes the County classified as prairie. The purpose of this assumption was to exclude areas from the impact projections with habitat types (e.g., coniferous forest, lakes, wetlands) that are unlikely to support the Covered Species residing in prairies.
- Where the Covered Species mapped extent (in NCLD prairie classes) occupied less than 30% of a parcel 5 ac (2 ha) or greater outside the UGA, it was assumed that the financial incentive to reduce mitigation costs and existing County CAO regulations to avoid critical areas would result in the impacts being avoided by siting the development footprint outside of habitat; this is based on the assumption that these parcels would have enough space outside habitat to allow flexibility to site the development to avoid impacts.

- Assume only 90% of NLCD prairie classes are in fact suitable, due to forest encroachment and other suitability factors not captured. Forest encroachment is a ubiquitous threat to prairie and other open habitats.
- Assume a 5% reduction in impacts overall for the financial incentive for development permit Applicants to avoid mitigation costs.
- To account for lands to be acquired for the HCP's Conservation Program, assume ~11% of Reserve Priority Area¹⁷ (RPA) land is acquired for mitigation purposes (based on projections of lands to be acquired; see Chapter 5), and current development capacity will not be realized as the lands are conserved, restored, and maintained.

Residential Development Projection Assumptions for Oregon Spotted Frog

The following assumptions were derived from County records and technical assistance from USFWS and WDFW, and included in the landscape-scale projection of impacts:

- Where OSF habitat intersects less than 10% of a parcel 5 ac (2 ha) or greater outside the City of Tumwater's UGA, it was assumed impacts will be avoided because there was enough space outside habitat to allow flexibility to site the development outside of habitat.
- 90% of the mapped wetland core areas (see Section 2.2.5) are suitable for OSF, and 95% of impacts will be avoided in those areas. Many of these core areas are flooded part of the year and unsuitable for construction, which in combination with existing wetland protections, will result in frequent avoidance of impacts.
- 50% of the wetland/riparian buffer areas (portions of the screen outside core wetlands) are suitable habitat for OSF or are within the 200 ft (61 m) setback from suitable habitat. This assumption is based on the inclusive buffering processes included in the development of the OSF Habitat Screen (see Section 2.2.5).
- In the wetland/riparian buffers, 80% of impacts will be avoided due to existing CAO regulations (CAO Chapter 24.30), and the financial incentive to avoid or reduce mitigation costs.

4.4.2 Added Accessory Structures for Residential Development

County staff projected the total number and average size of added accessory structures to occur during the Permit Term based on County-wide records for a 10-year period (2004-2014).

- In that period, an average of 339 structures were built per year in unincorporated Thurston County. This equates to a total of 10,176 structures to be constructed over a 30-year period. Using the proportional habitat projection method, the County projects of the following number of added structures during the HCP in each Covered Species mapped extent: 3,867 added structures in Mazama Pocket Gopher subspecies habitat, 93 added structures in Taylor's

¹⁷ RPAs are priority areas for Conservation Land acquisition or engagement/enrollment in the Conservation Program and are discussed in Section 5.1.

Checkerspot Butterfly habitat, 612 added structures in Oregon Vesper Sparrow habitat and 1497 added structures in Oregon Spotted Frog habitat.

- The average size of accessory structures constructed during the modeled period was 1,000 ft² (93 m²) each, and it was assumed that an additional area (buffer) extending a 30 ft (9 m) from the footprint of the accessory structures would be altered. Based on this analysis, for landscape-scale projection of impacts, the County assumed the affected area per structure to be 8,395 sq ft (0.19 ac) or 780 m² (0.078 ha).

Additional assumptions in the landscape-scale projection analysis included:

- On average, 50% of the added accessory structures and buffer would be located outside the building envelope of an existing structure or road, thus impacting a new area. It was assumed that the remaining 50% of the added accessory structures would have 20% of their footprint or buffer area within the building envelope of an existing structure or road, not requiring additional mitigation. These assumptions for landscape-scale projections are based on best professional judgement of County permitting.
- It was assumed the area affected by these structures was unforested (e.g., within NLCD prairie classes) 68% of the time, following the approximate proportion of the Permit Area on prairie soils that is also within the NLCD prairie classes.
- In prairie habitats (Mazama Pocket Gopher subspecies, Taylor's Checkerspot Butterfly, Oregon Vesper Sparrow) the County assumed there would be a 5% overall reduction in impacts due to the financial incentive for a development permit applicant to avoid mitigation costs.
- For Oregon Spotted Frog, it was assumed that verified habitat would be present only 50% of the time (as determined by on-the ground habitat verifications) – projected impact estimates were reduced by 50%. This assumption is based on the inclusive buffering processes included in the development of the OSF Habitat Screen (see Section 2.2.5).
- For Oregon Spotted Frog it was assumed 80% of impacts were avoided due to disincentive to build in seasonally flooded habitats and the financial incentive to avoid mitigation expense.

The resulting projected impact estimates from this Covered Activity are summarized in Table 4.5 and Table 4.6.

4.4.3 Septic Repair or Extension & Home Heating Oil Tank Removal

County staff projected the total number and average affected area for extended or repaired septic systems and decommissioned/removed home heating oil tanks to occur during the Permit Term based on County-wide records for a 10-year period (2004-2014).

The County estimates the following frequency of these activities over the HCP Permit Term, in the whole of unincorporated Thurston County:

- 4,300 extended septic systems will be placed. Using the proportional habitat projection method, this equates to a projection of the following numbers of extended septic system

placements within the Covered Species mapped extents: 1,634 in Mazama Pocket Gopher subspecies habitat, 39 in Taylor's Checkerspot Butterfly habitat, 258 in Oregon Vesper Sparrow habitat, and 645 in the OSF Habitat Screen.

- 6,200 septic systems will be repaired/alterd. Using the proportional habitat projection method, this equates to a projection of the following numbers of septic repair/alterations during the Permit Term in Covered Species mapped extents: 2,356 in Mazama Pocket Gopher subspecies habitat, 56 in Taylor's Checkerspot Butterfly habitat, 372 in Oregon Vesper Sparrow habitat, and 930 in the OSF Habitat Screen.
- 150 heating oil tanks will be removed. Using the proportional habitat projection method, this equates to a projection of the following number of heating oil tank removals in the Permit Term within the Covered Species mapped extents: 171 in Mazama Pocket Gopher subspecies habitat, 4 in Taylor's Checkerspot Butterfly habitat, 27 in Oregon Vesper Sparrow habitat, and 68 in the OSF Habitat Screen.

The affected area for each occurrence of these activities is estimated, based on County records, as follows:

- Extended septic systems: 2,500 ft² (232 m²)
- Repaired/alterd septic systems: 2,500 ft² (232 m²)
- Removed heating oil tanks: 150 ft² (13.9 m²)

Additional assumptions informing the landscape-scale projection of estimated impacts included:

- For OSF, it was assumed that verified OSF habitat would be present only 50% of the time (as determined by on-the ground OSF habitat verifications) – projected impact estimates were reduced by 50%. This assumption is based on the inclusive buffering processes included in the development of the OSF Habitat Screen (see Section 2.2.5).

The resulting projected impact estimates from this Covered Activity are summarized in Table 4.5 and Table 4.6.

4.4.4 Commercial and Industrial Development

The amount of commercial and industrial development to occur during the Permit Term was projected using the intersection of mapped habitat and TRPC's dataset for likely commercial, industrial, and mixed-use development (TPRC 2012b). In the TRPC dataset, the likelihood of development in parcels zoned for commercial or industrial use is assigned to categories (low, medium high, very high, and vacant) based on the existing amount of development per parcel and the ratio of assessed building value to land value. County Community Planning and Economic Development staff identified the medium, high, very high, and vacant development potential classes as likely for development during the HCP Permit Term.

The landscape-scale projection of estimated impacts assumes commercial/industrial development will affect 100% of habitat within a parcel based on aerial photography review of existing

commercial/industrial developments in Thurston County. Assumptions regarding level of build out and avoidance are otherwise consistent with estimation and projection methods for residential development.

The resulting projected impact estimates from this Covered Activity are summarized in Table 4.5 and Table 4.6.

4.4.5 Public Service Facility Construction

Schools

Anticipated school expansion, refurbishment, and construction were identified through consultation with each school district. Affected areas and habitat values were estimated using the known location method; probable locations for construction were intersected mapped Covered Species habitat. No impacts to Oregon Spotted Frog are anticipated. All affected areas were assumed to be fully impacted (no additional assumptions were applied).

Projected components of this activity include:

- School expansion is expected during the Permit Term at the Rochester Primary through High School complex, with a total affected area of up to 42.5 ac (17 ha);
- Refurbishment of existing schools (e.g., Littlerock Elementary, East Olympia Elementary) are expected to affect up to 12.6 ac (5 ha); and
- Newly constructed schools in the Tumwater UGA and Rochester District are anticipated to affect 63 ac (25.5 ha).

These projects sum to the following estimated affected areas: 8.7 ac (3.5 ha) for OPG, 9.6 ac (3.9 ha) for YPG N, and 102.5 ac (41.5 ha) for YPG S.

Using mapped locations to inform impact projection calculations, the projected impact estimate per Covered Species from this activity is: 3.7 functional acres for OPG, 1.4 functional acres for YPG N, and 98.9 functional acres for YPG S.

Fire Stations

The County projected the area to be affected by rural fire station construction based on the size of parcels on which fire facilities are currently established, which is an average of 1.9 ac (0.4 ha) in size, with a range from 0.9 to 7.0 ac (0.4 -2.8 ha).

Based on patterns of expected growth, the County projects that ten new rural fire stations (2 ac (0.5 ha) each) will be constructed, affecting 20 ac (8 ha) of habitat in the Permit Area. Specific locations are not known at this time, therefore the proportional habitat projection method was used to project impacts across the Covered Species residing in prairie habitat. No impacts to Oregon Spotted Frog are anticipated based on the existing wetland protections.

Additional projection analysis assumptions included:

- The area affected by fire facilities was unforested (e.g., within NLCD prairie classes), 68% of the time, following the approximate proportion of the Permit Area on prairie soils that is within NLCD prairie classes.

These projects sum to the following estimated affected areas: 1.9 ac (0.8 ha) for OPG, 1.3 ac (1.2 ha) for TPG, 2.7 ac (1.1 ha) for YPG N, 4.1 ac (1.7 ha) for YPG E, 3.5 ac (1.4 ha) for YPG S, 3.0 ac (1.2 ha) for Taylor’s Checkerspot Butterfly, and 8.0 ac (3.2 ha) for Oregon Vesper Sparrow.

The projected impact estimate per Covered Species from fire station construction is: 1 functional acre for OPG, 0.7 functional acres for TPG, 1.2 functional acres for YPG N, 2.1 functional acres for YPG E, 1.5 functional acres for YPG S, 1.0 functional acre for Taylor’s Checkerspot Butterfly, and 2.0 functional acres for Oregon Vesper Sparrow.

The projected impacts to the Covered Species from public service facilities, combining schools and fire stations, are described below and summarized in Table 4.5 and Table 4.6.

4.4.6 Transportation Capital Projects

Thurston County public works staff used information from regular work plans and their 20-year Capital Facilities Plan (CFP) to estimate the affected area from activities implemented or permitted by the public works division in the current CFP, and then extrapolated beyond those (150% of 20-year projections) to estimate the projected affected area over the 30-year Permit Term. Transportation projects in the current CFP are described in Table 3.6, with affected area estimates included in Table 4.5 and Table 4.6.

Table 4.7. Since the location of future projects was unknown, the proportional habitat projection method was used to estimate habitat values and calculate projected impacts.

The resulting projected impacts are summarized in Table 4.5 and Table 4.6.

4.4.7 Transportation Maintenance and Work in Right-of-Way

The impact of transportation maintenance and work in right-of-way activities on the Covered Species was projected based on an intersection of the County road infrastructure with the Covered Species extents; location of the right-of-way is known. The County assumed the entire right-of-way area would be affected by at least one component of transportation maintenance and work in right-of-way during the Permit Term. The extent of impact is as the width of the road right-of-way (both sides, outside the road surface/gravel prism), an average of 21 ft (6.4 m), multiplied by the length of road in each Covered Species extent.

The length of road right-of-way within the mapped extent of the Covered Species is as follows:

- 51.9 mi (83.4 km) in OPG
- 33.7 mi (54.3 km) in TPG
- 195.6 mi (314.8 km) in YPG N
- 95.6 mi (153.9 km) in YPG E; and
- 123.8 mi (199.2 km) in YPG S
- 0.4 mi (0.7 km) in Taylor’s Checkerspot Butterfly
- 90.0 mi (145.0 km) of right-of-way in the OSF Habitat Screen

Across all transportation maintenance and work in right-of-way, it was assumed that 50% of the right-of-way in the OSF Habitat Screen is suitable OSF habitat. The impacts from transportation capital projects were removed from transportation maintenance and work in right-of-way, to avoid double counting impacts.

The resulting projected impacts are summarized in Table 4.5 and Table 4.6.

Table 4.7 Projected affected area of Capital Facilities Plan transportation projects during the HCP Permit Term (1 acre = 0.4047 hectares).

Project Location in Thurston County	Acres Affected							
	MPG					TCB	OVS	OSF Habitat Screen
	YPG N	YPG E	YPG S	OPG	TPG			
153rd Ave SE (Vail Rd to Lawrence Lake Rd)	6.6							
183rd Ave SW - Old Hwy99 to SR12			22.0			4.2		
Albany Rd SW (James Rd to Littlerock Rd)			4.1					
Bald Hill Road Upgrade - Smith Prairie to Clear Lake Rd			19.9					
Black Lake - Belmore Rd. Upgrade 49th to Sapp Rd.				1.6				1.6
Delphi Road Upgrade - Phase 2/3 - 62nd to McLane Creek								1.7
Elderberry Rd Upgrade - SR 12 to 196th Ave			0.8					
Henderson Blvd. Upgrade - Old Hwy 99 to Tumwater Blvd.				5.3				
Kinwood Road Project (Pacific to Martin Way)	3.5							
Lawrence Lake Rd (153rd Ave to Bald Hill Rd)		4.7						
Littlerock Rd / 113th Ave.				0.7				10.0
Marvin Rd (Pac Ave/SR510 to Mullen)	16.6							
Maytown Rd. Upgrade SW - Littlerock Rd. to I-5				10.0				10
McCorkle Rd SE (113th Ave SE to Old Hwy 99) & 113th Ave SE (SR121 to McCorkle Rd SE)				4.05	6.6			10.7
Meridian Rd (Martin Way to I-5)	1.04							
Mullen Rd. Upgrade - Vicinity of 46th Ave. SE	1.56							
Mullen Road - W. City Limits to Marvin Rd	5.73							
Mullen Road Upgrade - Lacey City Limits to Carpenter Rd SE	5.7							
Old Hwy 99 / Tilley Rd. Intersection			0.6					
Old Hwy 99 Bridge O-7 Replacement			0.7					
Old Hwy 99 Rural Capacity Project (S. UGA Boundary to SR12)			3.7					
Pacific Ave Capacity Project (Unions Mills to SR510)	2.9798							
Rich Road SE (Rixie Rd - Yelm Hwy)	2.0661							
Rich Road Upgrade - Phase 2-89th to Normandy St.	1.9513							
Sargent Rd. Upgrade			8.1					0.8
SR12 Grand Mound West UGA Boundary to US99 - Access Road			1.2					
Steilacoom Road - Phase 1 - Pacific to Marvin/SR510	3.8567							
Steilacoom Road / Phase 2 - Marvin/SR510 to Duterrow	3.6697							
Tilley Road (T-2) Bridge Replacement Project					1.3			50.0
Vail Rd. Upgrade - 138th to Bald Hill Rd		5.8						
Vail Rd. Phase 2 (138th to 153rd)		5.9						
Yelm Hwy / Meridian Intersection	0.6887							
Yelm Hwy Capacity Project 4-Lacey City Limits to West of Meridian/Phase1 (O-12 Bridge)	8.827							
TOTAL 20-Year CFP	65	16	61	22	8	4	0	85
TOTAL 30-Year CFP: ESTIMATE (1.5 * 20 yr CFP)	97	25	92	32	12	6.3	0	127

4.4.8 Landfill and Solid Waste Management

Based on the County Capital Facilities Plan and past activities, County Public Works and Environmental Health staff estimated areas that would be affected by waste management-related Covered Activities implemented or permitted by the County. In this case, the County estimated the number of each type of project to occur on Mazama Pocket Gopher subspecies soils and in the OSF Habitat Screen, then the proportional habitat projection method was applied to estimate the impacts across the Mazama Pocket Gopher subspecies, Taylor's Checkerspot Butterfly, and Oregon Vesper Sparrow.

Where projects were anticipated to occur in the OSF Habitat Screen, impacts to OSF were reduced by 50% with the presumption that only 50% of locations would have OSF habitat verified (this presumption is based on the inclusive buffering processes included in the development of the OSF Habitat Screen (see Section 2.2.5)).

- Solid waste clean-up and remediation: The projected affected area is 5,000 ft² (464 m²) per site, and this activity is projected to occur at 66 sites in Mazama Pocket Gopher subspecies habitat, and 12 sites in the OSF Habitat Screen. Locations are unknown.
- Small solid waste facility construction: One small (5 ac (2 ha)) facility will be constructed. Locations are unknown.
- Large solid waste facility construction: One large (up to 40 ac (16 ha)) solid waste facility will be constructed. Location is unknown, but is expected to occur in YPG S. To project impacts for Yelm Pocket Gopher, the County estimated an even split of acres between more and less preferred Mazama Pocket Gopher subspecies soil categories 2 and 3 (Table 4.1; 10 acres of impact each).
- Expansion of recycling centers: The projected affected area is (1 ac (0.4 ha)) per center that is expanded. The County projects expansion of two centers, projected in YPG S (to be conservative, the analysis assumed these would be sited on more preferred Category 2 soils (Table 4.1)). Exact locations are unknown but are not expected to affect Oregon Spotted Frog.

The resulting projected impacts are summarized in Table 4.5 and Table 4.6.

4.4.9 Water Resources Management

County public works, water resources, and environmental health staff projected estimates of impacts from water resources (water and wastewater management) related Covered Activities implemented or permitted by the County. The projection was based on a scaling up (150%) of the County's current 20-year capital facilities program projects plan, future retrofit studies, and groundwater well proposals. The extent of activities in the current plan horizon was used to estimate activities for the 30-year Permit Term. In this case, the County estimated the number of each type of project to occur on Mazama Pocket Gopher subspecies soils and in the OSF Habitat Screen, then the proportional habitat projection method was applied to estimate the impacts across the Mazama Pocket Gopher subspecies, Taylor's Checkerspot Butterfly, and Oregon Vesper Sparrow.

Where projects were anticipated to occur in the OSF Habitat Screen, impacts to OSF were reduced by 50% with the presumption that only 50% of locations would have OSF habitat verified. This presumption

is based on the inclusive buffering processes included in the development of the OSF Habitat Screen (see Section 2.2.5).

Projects are anticipated to include:

- Water conveyance, flow, runoff, treatment, and retention flow control projects are projected to affect an estimated 118.8 ac (47.5 ha) of Mazama Pocket Gopher habitat across the subspecies, 2.9 ac (1.2 ha) of Taylor's Checkerspot Butterfly habitat, 7.0 ac (2.8 ha) of Oregon Vesper Sparrow habitat, and 2.3 ac (0.9 ha) of OSF habitat.
- Construction of water treatment systems and related water reservoirs is anticipated to affect 5.7 ac (2.3 ha) of Mazama Pocket Gopher habitat across the subspecies, 0.1 ac (0.04 ha) of Taylor's Checkerspot Butterfly habitat, and 0.3 ac of Oregon Vesper Sparrow habitat.
- Installation of groundwater wells (each well is estimated to affect up to 2,000 ft² (186 m²) each). County projections anticipate 25 wells to occur in Mazama Pocket Gopher habitat, affecting up to a total of 1.2 ac (0.5 ha) across the subspecies, and 25 wells to occur in the OSF Habitat Screen, affecting up to 0.6 ac (0.25 ha).

The resulting projected impacts are summarized in Table 4.5 and Table 4.6.

4.4.10 County Parks, Trails and Land Management

County public works and parks staff identified trail and park management activities expected to be implemented or permitted by the County over the requested 30-year Permit Term. Locations for this set of Covered Activities are known, and impacts were analyzed accordingly.

Trail maintenance impacts were projected by intersecting the trail right-of-way with the Covered Species mapped extents. Impacts are projected to affect 6 ft (0.9 m) width (total) along trail rights-of-way for the Chehalis-Wester Trail (11.3 mi long in Yelm Pocket Gopher habitat) and Yelm-Tenino Trail (10 mi in Yelm Pocket Gopher habitat). This is projected to affect a combined 2.2 ac (0.8 functional ac) of YPG N, 9 ac (2.9 functional ac) of YPG E, 1.45 ac (0.4 functional ac) of YPG S habitat. While segments of this trail run through areas of the mapped extent for Oregon Vesper Sparrow, the area within trail right-of-way is assumed to not be in use by the species.

Trail construction of the Gate to Belmore Trail section is projected to alter hydrology near the Mima Creek crossing and affect an estimated 25 ac (10 ha) of OSF habitat (Teal Waterstrat, USFWS, Personal Communication, April 27, 2016).

Public park improvements at Glacial Heritage Preserve are projected to affect 2 ac (0.8 ha) of habitat for Taylor's Checkerspot. This habitat was assumed to be high value, due to its location, equating to 0.8 functional acres/acre impacted for that species.

Small improvement projects at other County Parks (e.g., Kennydell, Monarch Sculpture park) are projected to affect 1.0 ac (0.4 ha) each of OPG and YPG E habitat, respectively. The OPG habitat is assumed to be occupied (1 functional acre/acre impact). The YPG E habitat is outside 200m from occupancy, and on less preferred soil, equating to an estimate of 0.15 functional acre/acre to potentially be impacted.

The resulting projected impacts are summarized in Table 4.5 and Table 4.6.

4.5 Indirect Effects

Indirect effects are those impacts that may occur at a different time or in a different place than the direct impacts (e.g., increased traffic, fragmentation of habitat, etc.). In many cases, the indirect effects are mostly or wholly beyond the control and authority of Thurston County.

Habitat degradation is expected to occur within areas developed or altered by the Covered Activities. This degradation may include increased noise and light disturbance, disturbance/displacement/trampling/predation by domestic animals, vehicular disturbance/displacement/crushing/strike, introduction or spread of diseases or non-native plant and animal species. Where human activity is increased by Covered Activities, trash dumping, compaction of soil from foot and vehicular travel, parking of vehicles, piling of wood or other materials, conversion of habitat to landscaping, or contamination from accidental spills of hazardous materials may occur. In aquatic habitats, habitat degradation may include altered hydrology, and water quality degradation from runoff. These impacts are likely temporary in nature but recurring.

Increased habitat fragmentation, as remaining patches of habitat are either made smaller due to losses from Covered Activities or are further separated from each other. Increased fragmentation may result in further genetic isolation of individuals. Habitat fragmentation effects are expected to be permanent in nature and increase in intensity as remaining habitat is developed.

Modification of habitat from the Covered Activities will result in loss of biological diversity as habitat loss and degradation occur and species may be removed from the area. Reductions in biological diversity have already occurred from existing development in Thurston County, and further reductions may indirectly (and directly) affect the Covered Species through decreasing the remaining overall ecosystem function.

Permanent conservation, restoration, and continued management and maintenance of reserves and preserves in the Conservation Lands System will protect those lands from habitat degradation, while also providing a framework for species and habitat connectivity within Thurston County. New Reserves and permanent Working Lands Easements will be located strategically within Reserve Priority Areas, which are specifically designed to result in functional species connectivity between new and existing preserves and conservation sites (see Chapter 5: Conservation Program).

4.6 Effects on Designated Critical Habitat

Critical habitat is designated by the USFWS for specific areas that have the physical and biological features essential to the conservation and recovery of listed species (Primary Constituent Elements: See Appendix G: Covered Species Critical Habitat PCEs).

As defined by the USFWS, designated critical habitat is the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species, and that may need special management or protection. Designated critical habitat may also include areas that were not occupied by the species at the time of listing but are essential to its conservation. The HCP's effect on designated

critical habitat must be evaluated during the USFWS review of the HCP and is summarized in the sections below.

Designated critical habitat for five of the species/subspecies covered by this HCP (OSF, Olympia Pocket Gopher, Tenino Pocket Gopher, Yelm Pocket Gopher, and Taylor's Checkerspot Butterfly) is found within the Permit Area. Designated critical habitat areas are high priority for habitat conservation and acquisition under the HCP or by partners and are often located within Reserve Priority Areas (see Chapter 5: Conservation Program). Impacts will be avoided or minimized as practicable through implementation of the Best Management Practices listed in Appendix C. Potential impacts on designated critical habitat are evaluated below and are expected to occur incrementally throughout the Permit Term.

4.6.1 Mazama Pocket Gopher Subspecies

In 2014, USFWS finalized critical habitat designations for the subspecies of Mazama Pocket Gopher addressed in this HCP (79 FR 19711).

Olympia Pocket Gopher

The Olympia Pocket Gopher has approximately 676 ac (273 ha) of designated critical habitat, which is entirely on land owned by the Port of Olympia at the Olympia Airport. These lands are not in the Permit Area and will therefore not be impacted by the Covered Activities.

Tenino Pocket Gopher

The Tenino Pocket Gopher has approximately 400 ac (162 ha) of designated critical habitat, located in the Rocky Prairie vicinity, and entirely within the Permit Area. Potential adverse impacts to designated critical habitat may occur from a subset of the Covered Activities, which are described below. Total designated critical habitat affected is estimated to be approximately 54.2 ac (21.5 ha), or 14% of the critical habitat for Tenino Pocket Gopher.

Development

The designated critical habitat is within a 593 ac (240 ha) privately owned tax parcel. County records indicate there is currently one dwelling, and projections (70% build out) through 2045 indicate 53 dwelling units could be added to this parcel during the Permit Term, with up to 53 ac (21 ha) of habitat affected.

Transportation Projects and Maintenance

Roadside maintenance activities are expected to have temporary effects to 1.2 ac (0.5 ha) of designated critical habitat for Tenino Pocket Gopher.

Yelm Pocket Gopher

The Yelm Pocket Gopher has two units of designated critical habitat, covering 533 ac (216 ha), of which roughly, 443 ac (179 ha) are in the Permit Area. Potential adverse impacts to designated critical habitat may occur from a subset of the Covered Activities, which are described below. Total designated critical habitat affected is estimated to be 41.6 ac (19.1 ha), or 8% of the critical habitat in the Permit Area.

Development

All 289 ac (117 ha) of subunit 1-YPG-A (Tenalquot Prairie area) is in the Permit Area. The critical habitat is spread over 9 lots. Three of the lots (135 ac (54.6 ha) of critical habitat) are protected by The Nature Conservancy as part of Tenalquot Prairie and will not have impacts covered under the HCP. The

remaining 6 lots have 154 ac (62.3 ha) of designated critical habitat, and under HCP projections and development assumptions, these lots could have a total of 21.3 dwelling units added in the critical habitat, affecting up to 21.3 ac (9 ha).

Approximately 154 ac (62.3 ha) of subunit 1-YPG-B (Rock Prairie vicinity) is in the Permit Area. The designated critical habitat is spread over 6 lots. A total of 16.7 dwelling units are projected for construction in the designated critical habitat, affecting 16.7 ac (6.8 ha).

Transportation Projects and Maintenance

Roadside right-of-way maintenance activities are expected to have temporary effects to 1.7 ac (0.69 ha) of designated critical habitat in 1-YPG-A and 1.9 ac (0.77 ha) in 1-YPG-B.

4.6.2 Taylor’s Checkerspot Butterfly

In 2013, USFWS designated 1,941 ac (785 ha) of critical habitat for Taylor’s Checkerspot butterfly (78 FR 61506-61584).

Seven subunits of designated critical habitat, covering approximately 1,053 ac (426 ha), are within the Puget Sound area, and the Permit Area. Potential impacts to designated critical habitat may occur from a subset of the Covered Activities, which are described below, and would affect a total of 25.1 ac (10 ha) or 2% of critical habitat in the Permit Area.

Development

Potential impacts from development to designated critical habitat are summarized across all subunits. Approximately 330 ac (133.5 ha) of subunit 1-D and 1-E (East and West) are on developable private lands in the Permit Area. Anticipated development in designated critical habitat, is approximately 23 dwelling units affecting 23 ac (9 ha).

Transportation Projects and Maintenance

Roadside maintenance activities are expected to have temporary effects to 0.6 ac (0.24 ha) of subunit 1-B and 1.8 ac (0.7 ha) of subunit 1-D.

Table 4.8 Anticipated potential effects to Taylor’s Checkerspot butterfly designated critical habitat from development covered under the HCP.

SUBUNIT	Total Acres* Critical Habitat Outside City and Federal	Landowner	Projected Dwelling Units	Affected Critical Habitat (acres)*
1-A (Rocky Prairie)	15	DNR	--	--
1-A (Rocky Prairie)	28	Wolf Haven	--	--
1-B (Tenalquot Prairie)	135	TNC	--	--
1-C (Glacial Heritage)	545	Thurston County	--	--
1-D (Rock Prairie)	154	Private	16.7	16.7
1-E (Bald Hill)	176	Majority private	6	6
Total	1,053	--	22.7	22.7

* 1 acre = 0.4047 hectare

4.6.3 Oregon Spotted Frog

In May 2016, USFWS designated critical habitat for OSF (81 FR 29335 29396).

There are approximately 4,773 ac (1,931 ha) of designated critical habitat (polygon) and 7.5 linear miles (12.1 km) of designated critical habitat in the Permit Area. All critical habitat lies within the OSF Habitat Screen. Potential adverse impacts to critical habitat may occur from a subset of the Covered Activities, which are described below, and would affect approximately 76 ac (31 ha) or 1.6% of critical habitat in the Permit Area.

Development

Designated critical habitat in the Permit Area intersects 434 lots. Of those, 85 lots are under Conservation Easement or public ownership and will not have impacts covered under the HCP.

Of the remaining 349 lots with designated critical habitat, 62 have development capacity of one or more dwelling units (filtered as a projected development capacity of 0.95 ac or greater). Within those lots, the County estimated potential impacts to designated critical habitat (distinguishing impacts in and out of the wetland core areas) to apply proportionally. In designated critical habitat, the County further assumed 95% of impacts in the wetland cores would be avoided, and 80% of impacts in the remainder (i.e., wetland buffer, frequently flooded, high ground water areas) of the designated critical habitat would be avoided, similar to the avoidance assumptions described for residential development in OSF habitat in Section 4.4.1.

In an example, if a parcel is expected to develop four dwelling units during the HCP, at 1 acre each (total of 4 ac of affected area), and 50% of the parcel is in designated critical habitat, of which 25% of the parcel is in wetland core of designated critical habitat, the County assumed two of the potential dwelling units would be outside the designated critical habitat, and two would overlap the designated critical habitat, one of which would overlap wetland core. Then, after applying avoidance assumptions, this was reduced to a projected impact of a total of 0.25 ac of impacted designated critical habitat (sum of 0.05 ac and 0.20 ac).

In the 62 lots, there was a total of 196 units of potential development. Based on the proportional distribution of habitat on the lots, 141.4 units are expected to occur outside the designated critical habitat, 36.5 units are expected to overlap wetland cores in the designated critical habitat, and 18.1 units are expected in the designated critical habitat (outside wetland cores). After assumptions of avoidance, the County projects a total of 6.5 ac (2.2 ha) of designated critical habitat to be impacted by residential development during the Permit Term. This impact is expected to remove Primary Constituent Elements, or PCEs from the designated critical habitat. For more information on PCEs, see Appendix G.

Transportation Projects and Maintenance

Transportation projects (Tilley Road Bridge replacement, Maytown Road Upgrade) are anticipated to permanently affect 1.6 ac (0.6 ha) of designated critical habitat. In addition, regular roadside maintenance is expected to have temporary, recurring effects to 5.6 ac (2.3 ha) of designated critical habitat (polygon mapping) (11,689 ft (3,562 m) of roads at 21 ft (6.4 m) width of combined right-of-way). Road maintenance may also affect an additional 0.83 ac (0.34 ha) of linear designated critical

habitat (6 road crossings at an affected area of 0.14 ac (0.06 ha) each (calculated as 60 ft (18 m) right-of-way (ROW) width intersecting 100 ft (30 m) estimated linear designated critical habitat path). This activity may affect refugia if large woody debris is being removed and mowing down to the substrate occurs (cover removed).

Parks and County Land Management

The Gate to Belmore Trail will modify an existing railroad line, intersecting roughly 2.5 mi (4 km) in designated critical habitat (polygons) and two intersections (100 ft (30 m) each) with linear designated critical habitat. Work is not anticipated to affect PCEs. Specific conservation measures for this project are included in Chapter 5: Conservation Program.

4.7 Projected Impacts of the Taking

The overall effect of this HCP on the Covered Species can be described as the portion (percent) of the entire species population (or the percent of the species population in Thurston County) that is impacted by the Covered Activities. Accurate information describing the number of individuals of the Covered Species occurring within the Permit Area is not available, nor is accurate information describing the number of individuals to be potentially impacted over the course of the HCP. In the absence of this information, the overall projected effects of the impacts on each Covered Species from all Covered Activities was calculated as the percent of current (2018) mapped habitat area for each Covered Species in the HCP Permit Area that the County projects could be impacted by each Covered Activity (Table 4.9). Total current habitat for the Covered Species in the Permit Area was estimated as follows:

- Olympia, Tenino, and Yelm Pocket Gopher: The area in each Mazama Pocket Gopher subspecies Service Area with MPG soils that is also within an NLCD prairie class. All road right-of-way was assumed to be open habitat equating to NLCD prairie class habitat.
- Taylor's Checkerspot Butterfly: The area within dispersal distance of known populations in the Permit Area.
- Oregon Vesper Sparrow: The area mapped for potential Oregon Vesper Sparrow occupancy in the Permit Area.
- Oregon Spotted Frog: The area of the OSF Habitat Screen (Figure 2.6).

The County assumes that the primary impact to the Covered Species will be habitat loss, though direct injury or mortality to non-mobile individuals may occur (e.g., Taylor's Checkerspot eggs, larvae or Oregon Vesper Sparrow eggs, or unfledged young in nests). Habitat loss will result in a reduced ability for the Covered Species to forage, feed, and reproduce.

Table 4.9 Summary of the effect of the impacts in the HCP on the Covered Species, as described by the percent of habitat in the Permit Area for each Covered Species affected by the Covered Activities.

Effect of the Taking: Estimated % of Habitat for each Covered Species in Permit Area Affected						
	OPG	TPG	YPG	TCB	OVS	OSF
Total estimated acres* habitat in Permit Area	9,271	6,669	52,047	2,424	6,064	39,493
Percent of acres* habitat affected by HCP	13.0%	6.3%	13.0%	22.8%	7.7%	1.4%
Total estimated functional acres in Permit Area	4,657	3,218	33,269	675	1,651	n/a
Percent of functional acres affected by HCP	13.5%	5.5%	11.2%	2.4%	1.5%	n/a

* 1 acre = 0.4047 hectare

4.8 Expected Benefits of the Conservation Program

The expected benefits of the Conservation Program are described in Chapter 5, and further quantified in Chapter 7.

Best Management Practices in the HCP will promote avoidance and minimization of direct impacts to the Covered Species from the Covered Activities. Outreach from the County, emphasizing the Best Management Practices, will also promote a reduction in indirect effects to the Covered Species, including those that may occur on residential lots after development occurs, through offering current information about the Covered Species, their needs, and methods to minimize impacts.

The habitat lost from HCP impacts, which is on average expected to be degraded in habitat quality and biodiversity, to possess varying levels of species occupancy, and to be fragmented in distribution, will be compensated with an equal functional amount of habitat on Conservation Lands that is occupied by the Covered Species and also protected, restored, and managed in perpetuity. The increased amount of protected, restored, and managed habitat is expected to result in increases in the overall function and ecological value of habitat for the Covered Species in the Permit Area, both due to reduction in habitat fragmentation and removal of threats from land use conversion, but also due to increases in the quality of vegetation condition and overall native biodiversity. The structure of the Conservation Lands System will promote growth of existing Covered Species populations and allow for future range expansions, supported by greater habitat connectivity, as preserves and reserves are located within designated Reserve Priority Areas that are occupied by the Covered Species. Long-term habitat protection, restoration and management will increase suitable breeding habitat, provide sites ready for species reintroduction, promote increased numbers of offspring and enhanced survival of adults, and ultimately reduce threats to the Covered Species.

Overall, the Conservation Program is expected to increase the sustainability and stability of the Covered Species populations in Thurston County, and contribute significantly to the recovery (downlisting, delisting, or elimination of the need to list) of the Covered Species.

4.9 Net Effect to Covered Species

The net effects are an accounting of the impact of take in comparison to the benefits of the HCP's Conservation Program. This calculates the expected end or net result of implementation of the HCP. Per the USFWS, in an equation:

$$\text{Negative impact of the taking} + \text{Benefits of the Conservation Program} = \text{Net effect of HCP}$$

Accounting of the net effect of the HCP is included in Table 4.10. Calculation of future expected impacts and benefits are described in Chapter 7: Implementation.

Table 4.10 Accounting of the net effect of the Thurston County HCP to the Covered Species (Fx Ac = Functional Acre).

Covered Species	Negative Impact of the Taking: <i>Habitat Lost</i>	Benefits of Conservation Program: <i>Habitat protected, restored, and managed</i>	Net Effect of HCP
Olympia Pocket Gopher	632 Fx Ac of fragmented and degraded quality habitat is lost. Less than 5% of habitat has confirmed species presence.	632 Fx Ac of habitat is protected, restored, and managed for occupancy in perpetuity. Lands prioritized for location, connectivity, and extent.	The HCP will fully offset and mitigate for the impacts of the taking with a focus on permanently protecting, conserving, and maintaining well connected, occupied habitats. This will result in a net increase in habitat quality, occupancy, and stability. Higher functioning habitat will be delivered to offset losses of low quality and fragmented habitat elsewhere.
Tenino Pocket Gopher	178 Fx Ac of fragmented and degraded quality habitat is lost. Less than 10% of habitat has confirmed species presence.	178 Fx Ac of habitat is protected, restored, and managed for occupancy in perpetuity. Lands prioritized for location, connectivity, and extent.	
Yelm Pocket Gopher	3747 Fx Ac of fragmented and degraded quality habitat is lost. Less than 10% of habitat has confirmed species presence.	3747 Fx Ac of habitat is protected, restored, and managed for occupancy in perpetuity. Lands prioritized for location, connectivity, and extent.	
Taylor’s Checkerspot Butterfly	16 Fx Ac of fragmented and degraded quality habitat is lost. Habitat lost is not known to be occupied, but within dispersal distance for intermittent use.	16 Fx Ac of habitat is protected, restored, and managed for occupancy in perpetuity. Lands prioritized for location, connectivity, and extent.	
Oregon Vesper Sparrow	25 Fx Ac -of fragmented and degraded quality habitat is lost. Habitat lost is not known to be occupied, but within potential dispersal distance from populations on JBLM, and may receive some intermittent use.	25 Fx Ac of habitat is protected, restored, and managed for occupancy in perpetuity. Lands prioritized for location, connectivity, and extent.	
Oregon Spotted Frog	618 Acres	618 Acres of habitat is protected, restored, and managed for occupancy in perpetuity. Lands prioritized for location, connectivity, and extent.	

Chapter 5 Conservation Program

5.1 Overview

This section presents the overall HCP Conservation Program, including the Biological Goal and Conservation Objectives, minimization, and mitigation measures — all of which are designed to meet the regulatory requirements of the ESA and to be consistent with state species and habitat requirements. The Conservation Program will build on and work in concert with existing local, state, and federal conservation actions in the County. The intent is to contribute to the recovery of the HCP Covered Species in Thurston County. Monitoring and adaptive management of the Conservation Program is described in Chapter 6.

Central to the Conservation Program are mitigation measures to build the Thurston County Conservation Lands System, expanding on the existing network of protected lands that are managed for the Covered Species and their habitats. The Conservation Lands System identifies the priority places, tools, and processes to protect, restore and manage the habitats important to the Covered Species. Conservation Lands will be prioritized for acquisition using criteria described in Section 5.4, and through working with the HCP Implementation Team. The role of the HCP Implementation Team is described in Chapter 7: Implementation.

Conservation Lands System terminology is described below, and currently identified Reserve Priority Areas are mapped in Figure 5.1:

- **Reserve Priority Areas**¹⁸ (RPAs) are specific areas within where biological and physical conditions are favorable for the conservation of Covered Species and where HCP conservation actions will be directed. One or more RPAs are identified in each Service Area for each subspecies of Mazama Pocket Gopher and in the area of the OSF Habitat Screen.
- **Reserves** consist of individual and adjacent parcels in each RPA that are protected (e.g., as HCP Conservation Lands). Reserves are assemblages of permanently protected parcels, composed of core areas and connecting corridors that are of sufficient collective size and connectivity to enable the Covered Species survival in numbers adequate for long-term sustainability.

¹⁸ Development of RPAs discussed in Reserves for Mazama Pocket Gopher Conservation Considerations for the Thurston County HCP.

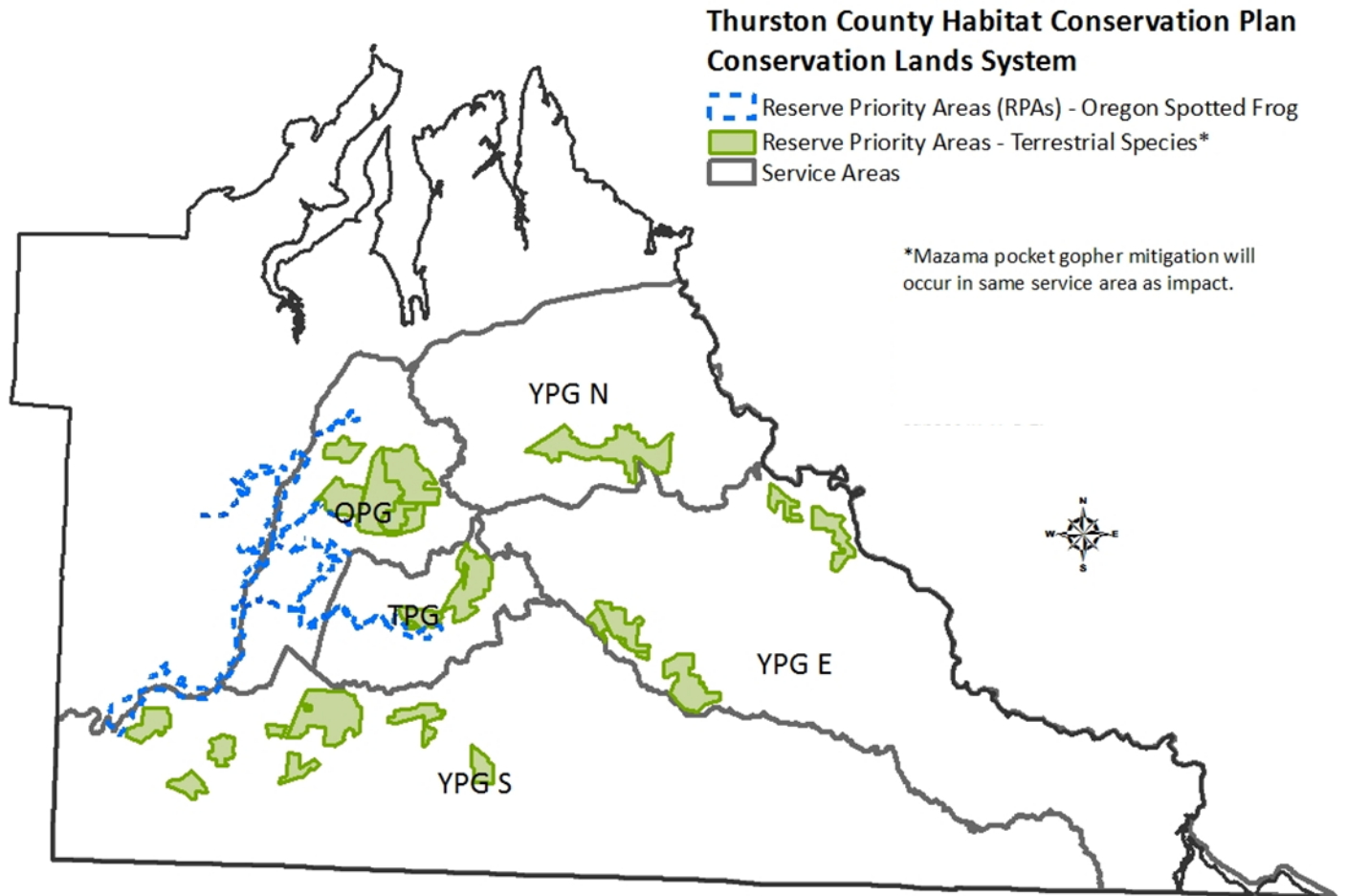


Figure 5.1 Reserve Priority Areas and Service Areas in the Thurston County HCP Conservation Lands System.

5.2 Biological Goal and Conservation Objectives

The Biological Goal, Conservation Objectives, and Conservation Measures are intended to illustrate the vision and commitments of the Conservation Program. The Biological Goal describes what the Conservation Program will accomplish by the end of the incidental take permit duration. The Conservation Objectives serve as benchmarks by which to measure progress in achieving goals for each Covered Species, across temporal and spatial scales. Conservation Measures are specific measurable actions that will be implemented to meet the Conservation Objectives and achieve the Biological Goal.

The Biological Goal of the HCP is to:

Maintain, in perpetuity, populations of each of the Covered Species within Thurston County, through strategic habitat acquisition, conservation, enhancement, and management in advance of, unavoidable impacts to the Covered Species from the Covered Activities.

Conservation Objectives to meet the Biological Goal are:

1. **Minimize** direct and indirect impacts to the Covered Species, through application of Best Management Practices to the maximum extent practicable and outreach to the community;
2. Acquire, from willing sellers, **New Reserves** to secure, stabilize, and expand species strongholds, while also contributing to Covered Species recovery. Habitat on each permanently protected parcel will be enhanced and funded for long-term management.
3. Secure permanent **Working Lands Easements**, via Conservation Easements with willing landowners, to conserve, stabilize, and expand species distributions. Enrolled land must demonstrate land uses are compatible with the Covered Species. Habitat on each permanently protected parcel will be maintained with funding for long-term management; and
4. **Enhance the Habitat for Covered Species Populations at Existing Preserves** with current or historical populations of the Covered Species, through funding habitat restoration, enhancement, and long-term maintenance on existing¹⁹ protected reserves. This will increase the long-term habitat stability and conservation benefit of these lands and provide essential support for their Covered Species populations.

The protection, restoration, and management of habitat for the Covered Species in Conservation Objectives 2, 3, and 4 will generate mitigation credits to offset the impacts from the Covered Activities as described in Chapter 4 and in Table 4.5 and Table 4.6. The information is summarized in Table 5.1, and discussed in Section 5.3. Acres projected to be enrolled in the Conservation Program can be found in Table 7.7.

Table 5.1 Projected mitigation credits to be generated through the Conservation Program.

PROJECTED MITIGATION CREDITS GENERATED PER CONSERVATION OBJECTIVE (ACRES)									
	YPG N	YPG E	YPG S	OPG	TPG	TCB	OVS	OSF	Total
Objective 1: Minimize Impacts	-	-	-	-	-	-	-	-	-
Objective 2: New Reserves	1,357	730	943	632	133	0	0	618	4,413
Objective 3: Working Lands Easements	0	261	337	0	44	0	25	0	667
Objective 4: Enhanced Existing Preserves	0	52	67	0	0	16	0	0	136
TOTAL	1,357	1,043	1,346	632	178	16	25	618	5,216

¹⁹ An Enhanced Existing Preserve is any site already in conservation at the time it is engaged/enrolled in the HCP Conservation Program. It does not have to be already under protected status at the time of HCP development or finalization.

5.2.1 Conservation Objective 1: Minimize Impacts to the Covered Species

Conservation Measure 1-1: Implement Best Management Practices (Best Management Practices; Appendix C) to the maximum extent practicable to minimize impacts to the Covered Species from the Covered Activities.

Tasks:

- 1-1.1. The County and its permittees will implement Best Management Practices to minimize impacts to the maximum extent practicable. If Best Management Practices cannot be implemented, County and its permittees will provide justification and a plan for mitigating unavoidable impacts. Best Management Practices will be reviewed and updated as necessary, as new information becomes available, at least every 5 years.
- 1-1.2. The County will minimize impacts from the construction of trails, interpretive structures, and other recreation related facilities such as restrooms, picnic areas, and parking lots.
- 1-1.3. The County identifies Special Management Areas for Oregon Spotted Frog in County roadside right-of-way that supports or is proximal to known OSF locations, and will apply Best Management Practices for Special Management Areas, including actions under emergency conditions (e.g., road flooding), and non-emergency conditions (regular activities).
- 1-1.4. Maintain a Beaver Dam Management Plan (Appendix E: Beaver Dam Management Plan) where transportation or stormwater facility maintenance creates neutral to positive effects for Oregon Spotted Frog and helps ensure transportation safety and protection of private property from flood damage.

Conservation Measure 1-2: Promote management to control and reduce invasive non-native plant species on private lands throughout the County, but especially in the RPAs. The County will not use this broad invasive species control program to offset take from impacts but expects the control program may be important to manage the long-term costs and effectiveness of the Conservation Program.

Tasks:

- 1-2.1. Provide landowners technical assistance to control problem species in prairie and wetland habitat—especially Scotch broom, reed canarygrass, tall oatgrass, and encroaching Douglas-fir. Coordinate technical assistance with USFWS, WDFW, and other prairie restoration practitioners to adaptively update control strategies for use in areas with Covered Species.
- 1-2.2. Update County Noxious Weed Program list for County-owned property to include Scotch broom, reed canarygrass, tall oatgrass, and other non-native plants that have disproportionate impacts to native prairies in Thurston County.
- 1-2.3. Continue to hold workshops about invasive species management for private landowners within Reserve Priority Areas.
- 1-2.4. Maintain the County's current Noxious Weed Program's website, which provides information about species biology and control.

Conservation Measure 1-3: Implement the Critical Areas Ordinance (CAO) provisions for avoidance and minimization.

Tasks:

- 1-3.1. Update and continue implementation of avoidance and minimization provisions in the CAO and monitor consistent implementation of these measures.

Conservation Measure 1-4: Implement outreach to build community awareness of prairie and wetland/riparian habitat and facilitate voluntary prairie and wetland/riparian restoration activities in the County to minimize impacts from habitat degradation due to increased development in the Permit Area. These actions will not be used as mitigation.

Tasks:

- 1-4.1. The County will maintain information on its website regarding Covered Species, prairie and wetland/riparian habitats, conservation measures, and programs. The website will be updated at least every 12 months.
- 1-4.2. The County and partners will host an annual workshop/field day on prairie or wetland/riparian habitat management for landowners.
- 1-4.3. The County will provide permittees who have prairie habitat early information on how best to avoid and minimize impacts to habitat and offer opportunities to participate in conservation programs.
- 1-4.4. The County will encourage landowners near Taylor's Checkerspot Butterfly sites or any HCP Conservation Lands to engage with the USFWS via a Safe Harbor Agreement with Assurances or the Partners for Fish and Wildlife Program. The County will also encourage the USFWS/WDFW programs implementing rare or listed species introductions to promote and ensure careful and timely communication to adjacent private landowners.
- 1-4.5. The County will encourage landowners within the RPAs to participate in Thurston County's Voluntary Stewardship Program as enabled by the Growth Management Act, RCW 36.70A.700, or the state enabled Open Space Tax Program that provides a reduced tax assessment for Conservation Lands (Chapter 84.34 RCW).

5.2.2 Conservation Objective 2: Protect, Enhance, and Maintain New Reserves

Conservation Measure 2-1: The County will permanently protect and manage New Reserves within the RPAs to offset the unavoidable direct and indirect impacts caused by the Covered Activities. A total of 4,413 credits are anticipated to be generated from New Reserves over the Permit Term, including credits for Yelm Pocket Gopher, Olympia Pocket Gopher, Tenino Pocket Gopher, and Oregon Spotted Frog. New Reserves will be large parcels, managed to promote biodiversity, enhance connectivity, and reduce habitat fragmentation.

Tasks:

- 2-1.1. The County will acquire via fee title from willing landowners, New Reserves for the Conservation Lands System. New Reserves will generate mitigation credits for a subset of Covered Species in advance of permitted impacts. Lands for acquisition will be prioritized based on the criteria identified in Section 5.4.
- 2-1.2. A Site Management Plan (Appendix I; summarized in Section 7.7) will be developed for each New Reserve within 12 months of securing the land. No credits can be released until the Site Management Plan has been approved by the County and according to an approved credit release schedule (see Section 7.8).
- 2-1.3. Non-wasting stewardship endowments will be established to fund habitat management, restoration/enhancement, monitoring, and maintenance in perpetuity (including contingencies). A not-for-profit conservation organization that has experience in stewardship endowment management, will hold any stewardship endowment established by the County pursuant to this HCP (see Table 7.9).
- 2-1.4. The site will be restored and enhanced then managed and maintained in accordance with the Site Management Plan in perpetuity.

5.2.3 Conservation Objective 3: Secure and Maintain Working Lands Easements

Conservation Measure 3-1: The County will protect, via Conservation Easement (including retirement of development rights), and manage working lands with prairie habitat within the RPAs to offset the unavoidable impacts caused by the Covered Activities. A total of 667 credits are anticipated to be generated from Working Lands Easements over the Permit Term, including credits for Yelm Pocket Gopher (YPG E & YPG S), Tenino Pocket Gopher, and Oregon Vesper Sparrow.

Tasks:

- 3-1.1. The County will secure, from willing landowners, permanent Conservation Easements on working farm and ranch lands to mitigate and impacts to the Covered Species. Lands for acquisition will be prioritized based on the criteria identified in Section 5.4.
- 3-1.2. A Site Management Plan (Appendix I; summarized in Section 7.7) will be developed for each Working Lands Easement within 12 months of securing the easement. No credits can be released until the Site Management Plan has been approved by the County and according to an approved credit release schedule (see Section 7.8).
- 3-1.3. Non-wasting stewardship endowments will be established to fund habitat management/enhancement, monitoring, maintenance, and adaptive management in perpetuity (including contingencies). A not-for-profit Conservation Organization that has experience in stewardship endowment management, will hold any stewardship endowment established by the County pursuant to this HCP (see Table 7.9).
- 3-1.4. The site will be restored and enhanced then managed and maintained in accordance with the Site Management Plan in perpetuity.

5.2.4 Conservation Objective 4: Enhance and Maintain Existing Preserves

There are Existing Preserves that support Covered Species or include suitable habitat but lack funding for habitat enhancement and management endowments. These areas are often located adjacent to the RPAs. The County will fund and implement habitat enhancement activities, including prescribed burning, targeted herbicide application, invasive species management, mowing, and seeding. The County will also establish and fund non-wasting endowment(s) for the long-term management. Mitigation credit will only be generated by County actions that improve upon the baseline condition of the existing protected land (e.g., via enhancing habitat quality and habitat extent).

Conservation Measure 4-1. The County will fund and implement habitat enhancement activities and establish and fund non-wasting endowments for the long-term management of existing reserves with the Covered Species. A total of 136 credits are anticipated to be generated from Enhanced Existing Preserves over the Permit Term, including credits for Yelm Pocket Gopher (YPG E and YPG S), and Taylor's Checkerspot.

Tasks:

- 4-1.1. The County will identify Existing Preserves where habitat enhancement via HCP mitigation is possible. Lands for engagement/enrollment will be prioritized based on the criteria identified in Section 5.4. The County must secure a legally enforceable instrument with the landowner (or Interlocal Agreement pursuant to 39.34 RCW, if with a public agency) that ensures mitigation activity will occur and be sustained in perpetuity.
- 4-1.2. A Site Management Plan (Appendix I; summarized in Section 7.7) will be developed (or modified from an existing plan) for each Enhanced Existing Preserve within 12 months of engaging/enrolling the land. The Site Management Plan must demonstrate the desired future condition lift above baseline. The Site Management Plan also needs to clearly document A) the funding sources used to fund protection and any habitat enhancement, B) the habitat value requirements from those funding sources, C) the baseline habitat conditions, and D) the additional habitat value provided by the mitigation measures generating credit. No credits can be released until the Site Management Plan has been approved by the County and according to an approved credit release schedule (see Section 7.7).
- 4-1.3. Non-wasting stewardship endowments will be established to fund habitat management, enhancement/restoration, monitoring, and maintenance, in perpetuity (including contingencies). A not-for-profit conservation organization that has experience in stewardship endowment management, will hold any stewardship endowment established by the County pursuant to this HCP (see Table 7.9).
- 4-1.4. The site will be restored and enhanced, then managed and maintained in accordance with the Site Management Plan in perpetuity. All creditable mitigation measures must be above baseline conditions, as described in the Site Management Plan. Mitigation measures must also be above any existing management commitments (e.g., where a landowner already had a plan to enhance habitat, the available credits are enhancements beyond the existing plans). Exceptions to this would be where the existing plan is not required by any agreement, or the existing agreement did not carry funding to implement the management.

5.3 Mitigation within the Conservation Lands System

5.3.1 Overview

The Conservation Lands System concept and priorities for land acquisition were developed by Thurston County in consultation with WDFW and USFWS, based on the best available science and professional judgment of agency personnel knowledgeable in the areas of species biology, conservation biology, species recovery, and ESA regulations. The Conservation Lands System represents the places where:

- Avoiding and minimizing impacts provide the greatest conservation benefit;
- Thurston County will prioritize conservation incentives and voluntary conservation measures in work with private landowners; and
- Protection, restoration, enhancement, management, and maintenance of New Reserves, Working Lands Easements, and Enhanced Existing Preserves for mitigation will have the greatest benefit to the Covered Species.

The implementation logistics of credit computation, verification and release are included in Chapter 7: Implementation and Appendix H: Credit-Debit Methodology. Credit release is informed by Covered Species status and Performance Standards that describe the habitat quality and function at Conservation Lands. The projected quantity of mitigation credits to be generated for each Covered Species by each Conservation Objective (New Reserves, Working Lands Easements, Enhanced Existing Preserves) is further described in Table 5.1. The totals represent a maximum not to exceed amount, and the specific contribution from each Conservation Objective to the total may be fine-tuned during the Permit Term.

In brief, all Conservation Lands, including New Reserves, Working Lands Easements, and Enhanced Existing Reserves (and any lands dedicated in lieu of Mitigation Fees (see Section 7.6) will:

- Be prioritized for acquisition or engagement/enrollment based on the criteria included in Section 5.4;
- Be acquired from willing sellers or engaged/enrolled via willing collaborators;
- Have baseline documentation completed prior to completing the acquisition (see Chapter 7 for more information);
- Have Site Management Plans developed (Appendix I: Site Management Plan Template);
- Be restored, enhanced, and then managed and maintained in perpetuity;
- Implement monitoring and reporting; and
- Have habitat management, restoration/enhancement, monitoring, and maintenance, funded in perpetuity via a non-wasting stewardship endowment.

5.3.2 Species Specific Mitigation Guidelines

Mitigation for Olympia, Tenino, and Yelm Pocket Gopher will occur on Conservation Lands close to sites where impacts occur. Mitigation for Olympia and Tenino Pocket Gopher will occur within the same Service Area as impacts (see Figure 5.1 for Service Area map). For Yelm Pocket Gopher only, should the debit be mitigated in a different Yelm Pocket Gopher Service Area than the impact (e.g., an impact in YPG S Service Area mitigated in YPG N Service Area), an Out of Service Area Multiplier of 1.25 will be applied (see Appendix H: Credit-Debit Methodology) This multiplier is applied to the debit-side of the formula only. Mitigation for one Pocket Gopher subspecies may not occur in the Service Area for another Pocket Gopher subspecies (e.g., Olympia Pocket Gopher mitigation may not occur in Yelm Pocket Gopher or Tenino Pocket Gopher Service Areas). Mitigation for Olympia, Tenino and Yelm Pocket Gopher will be an incremental process, taking place as impacts occur. Precise timing of when impacts will occur is unknown, but mitigation will stay ahead of impacts.

Mitigation for Taylor's Checkerspot Butterfly or Oregon Vesper Sparrow will occur in the nearest RPA with suitable habitat, which may or may not be within the same Mazama Pocket Gopher Service Area as the impact. Due to the limited extent of impacts for these species, and their limited distribution in Thurston County, the County anticipates approaching mitigation programmatically and at a single site, rather than on an incremental impact by impact basis.

Oregon Spotted Frog impacts will be mitigated within the OSF Habitat Screen, prioritizing USFWS designated critical habitat and WDFW identified population polygons as described Section 5.4. This will be an incremental process, as impacts occur. Precise timing of when impacts will occur is unknown, but mitigation will stay ahead of impacts.

5.4 Criteria for Selecting Conservation Lands

Lands to support the Conservation Program of the HCP will be prioritized for acquisition or acceptance of land in lieu (Section 7.6) using a combination of the criteria below and the need to mitigate impacts for each Covered Species within designated Service Areas. The prioritization criteria were drawn from several sources, including, but not limited to, the Mazama Pocket Gopher reserve design process led by USFWS and WDFW, and the preserve criteria set by the Sentinel Lands working group.

Candidate Conservation Lands for acquisition will be prioritized first using the general criteria, then by applying the species-specific criteria, while also addressing the need to offset the geographic distribution of impacts within Service Areas. General criteria and species-specific criteria are discussed below.

5.4.1 General Criteria for Selecting All Conservation Lands

- **Species presence:** High priority sites will have greater abundance and distribution of Covered Species. Several of the Covered Species have extremely limited distributions (e.g., Oregon Vesper Sparrow and Taylor's Checkerspot Butterfly). If no sites with occupancy can be selected for conservation actions, then sites with the best potential for achieving occupancy will be selected based on historical or likely use, habitat factors, and/or location.

- **Species adjacency or connectivity:** High priority sites will be adjacent or connected to offsite populations, or targeted for reintroduction²⁰ of the Covered Species, with few to no barriers to species movement or dispersal among protected sites and within RPAs. The best available information describing species specific dispersal distances are included in Table 2.2.
- **Parcel size:** Larger parcels will be given high priority and parcel conglomerates will be sought, especially where combined tracts of protected land are 300 ac (121 ha) or more. Conservation Lands will be a minimum of 50 ac (20 ha), or if smaller, adjacent to an already-conserved land managed for Covered Species. However, some smaller parcels may be important and will be considered for particular Covered Species, such as Oregon Spotted Frog, Oregon Vesper Sparrow, and Taylor’s Checkerspot Butterfly (see species-specific criteria).
- **Current habitat quality and potential for habitat improvement:** In general, high priority sites will have attributes that equate to high-quality and function for the Covered Species to be conserved. This may be high cover and diversity of native plants (both forbs and grasses) and low cover of invasive species or cover of less problematic invasive species. Or, this may be specific soil types, vegetation structure, or hydrology. High priority sites will also have vegetation composition, soils, topography, or hydrology that suggest the potential for successful habitat enhancement.
- **Habitat location or connectivity:** High priority sites will, in order of preference, be within, adjacent, functionally connected to (within species dispersal distance, if known (Table 2.2)), or provide functional connection to, in order of preference, designated critical habitat for a Covered Species, permanently conserved land managed for the Covered Species, species strongholds (e.g., areas with documented populations of Covered Species for multiple years), or lands identified in RPAs.
- **Surrounding land use:** High priority sites will be surrounded by compatible land uses that minimize factors such as pesticide drift, predation risk, invasive species, or disturbance. Such factors can contribute to sites becoming species sinks – that is, areas that attract Covered Species, but where their populations cannot survive.
- **Management feasibility:** High priority sites must have reasonable and reliable long-term and year-round accessibility for habitat restoration equipment and staff. Location in a setting that would permit use of herbicides for habitat restoration and prescribed fire for vegetation management is preferred. Sites with control of access and defensibility are also preferred.
- **Site resiliency:** High priority sites will be resilient to environmental variation, climate change, and extreme events, as possible. Sites with a variety of soil depths and drainages, topographic aspects, vegetative cover, and structure, and those that include ecotones between differing habitat types (e.g., transitions from riparian to wet prairie or upland prairie to oak savanna) are preferred. Such sites are likely to be the most beneficial to species survival over time.

²⁰ Reintroduction efforts are not part of the Thurston HCP, but refers to efforts by state and federal wildlife agencies.

5.4.2 Criteria for Selecting Conservation Lands for Olympia, Tenino, and Yelm Pocket Gopher

Conservation Lands for Mazama Pocket Gopher subspecies will be at least 50 ac (20 ha) in size or adjacent to protected lands managed for Mazama Pocket Gopher subspecies. Conservation Lands for mitigation will, in order of preference, be located:

Priority 1: On parcels occupied by Mazama Pocket Gopher subspecies;

Priority 2: On parcels with a predominance of more-preferred Mazama Pocket Gopher subspecies Soils (Table 2.3) and adjacent to areas occupied by the species or within federally designated critical habitat for the species;

Priority 3: On parcels with the same soil types as adjacent (within 656 ft (200 m)) areas occupied by Mazama Pocket Gopher subspecies; and

Priority 4: On parcels with a predominance of more preferred soils, and within 656 ft (200 m) of areas occupied by Mazama Pocket Gopher subspecies.

5.4.3 Criteria for Selecting Conservation Lands for Taylor's Checkerspot Butterfly

Unless recommended otherwise by the HCP Implementation Team, sites for Taylor's Checkerspot Butterfly conservation shall be selected within areas that include current wild, introduced, or recent historical populations of the species. In general, sites will be greater than 50 ac (20 ha) in size, unless they are adjacent to other conserved land, are occupied by Taylor's Checkerspot Butterfly, or have 5 ac (2 ha) or more of area occupied by larval host plants. Stepping-stones of habitat (butterfly host or nectar species) within a corridor can facilitate movement in and through RPAs, when Conservation Lands must be separated by distances greater than typical dispersal distances (1,312 ft (400 m)) from extant populations. Higher-quality native grassland is prioritized because of the cost and difficulty of prairie restoration. If prairies with other conditions become easier to restore in the future, priority may be adaptively managed.

Conservation lands for Taylor's Checkerspot Butterfly mitigation will, in order of preference, be located:

Priority 1: On sites which currently support or lie within federally designated critical habitat for Taylor's Checkerspot Butterfly;

Priority 2: On sites which recently supported Taylor's Checkerspot Butterfly or where there are plans by wildlife agencies for reintroduction of the species;

Priority 3: On sites with High-Quality Native Prairie for Taylor's Checkerspot Butterfly (as defined by Table 4.2) less than the species dispersal distance (1,312 ft (400 m)) from extant populations;

Priority 4: On sites with High-Quality Native Prairie in close proximity (less than 0.5 mi (0.8 km)) to conserved lands;

Priority 5: On sites with High-Quality Native Prairie greater than 0.5 mi (0.8 km) from extant Taylor's Checkerspot Butterfly populations or conserved lands, but which may be prioritized as opportunities for future introductions of the species; and

Priority 6: On sites without High-Quality Native Prairie but that are adjacent (preferred) to, or in close proximity (less than 0.5 mi (0.8 km)) to, extant Taylor's Checkerspot Butterfly populations or conserved lands.

5.4.4 Criteria for Selecting Conservation Lands for Oregon Vesper Sparrow

Preferred habitat for Oregon Vesper Sparrow is upland prairie/grassland or savanna or appropriate agricultural types (i.e., light to moderately grazed pasture or weedy Christmas tree farms 2-5 years old). These areas tend to have less than 15% tree and shrub cover (scattered and not in fencerows or forming barriers), with some bare ground (5-15% of the area). The vegetation structure should include multiple levels (e.g., variable height between grasses and forbs) and be diverse in its plant species composition. Herbaceous forb species should make up at least 15% of the ground cover. Vegetation height during mid to late May should be between approximately 6 – 20 in (15- 51 cm) (Altman 2017).

Conservation lands for Oregon Vesper Sparrow mitigation will be at least 20 ac (8 ha), or adjacent to lands managed for Oregon Vesper Sparrow, and in order of preference, be located:

Priority 1: On sites which currently support breeding populations of Oregon Vesper Sparrow are highest priority, with larger sites preferred over smaller sites;

Priority 2: On sites not occupied by Oregon Vesper Sparrow, with > 20 ac (8 ha) of suitable open grassland habitat, and adjacent to or within 2 miles of an occupied site;

Priority 3: On sites not occupied by Oregon Vesper Sparrow with > 20 ac (8 ha) of suitable open grassland habitat that are adjacent to unoccupied but suitable habitat; and

Priority 4: On sites not occupied by Oregon Vesper Sparrow with > 20 ac (8 ha) of open suitable grassland habitat that are surrounded by unsuitable habitat.

5.4.5 Criteria for Selecting Conservation Lands for Oregon Spotted Frog

The location of potential habitat for Oregon Spotted Frog in Thurston County is not as well-known. Conservation Lands for the species as a whole will include a range of habitat types to support non-breeding, breeding, rearing, and overwintering life stages. All sites secured for Conservation Lands for Oregon Spotted Frog must be in the OSF Habitat Screen and within the Black River watershed. These criteria will be adjusted through HCP adaptive management to support species recovery goals if needed. Conservation Lands for Oregon Spotted Frog will be at least 5 ac (2 ha), or adjacent to lands managed for the species, and in order of preference, be located:

Priority 1: On sites with known oviposition sites for Oregon Spotted Frog that are within federally designated critical habitat;

Priority 2: On sites with confirmed occupancy of Oregon Spotted Frog, and within or immediately adjacent to WDFW identified Population Polygons (Hallock 2019; Figure 2.6);

Priority 3: On sites with confirmed occupancy of Oregon Spotted Frog;

Priority 4: On sites with verified suitable habitat that are adjacent, both adjoining property lines and hydrologically connected, to sites supporting Oregon Spotted Frog populations;

Priority 5: On sites with verified suitable habitat and hydrologically connected to sites supporting Oregon Spotted Frog populations within 1.5 mi (2.5 km), or on sites that can be enhanced to suitable habitat and are adjacent to sites supporting the species; and

Priority 6: On sites with suitable habitat in the OSF Habitat Screen and the Black River watershed.

Chapter 6 Monitoring & Adaptive Management

6.1 Introduction

Monitoring and adaptive management are required elements of all HCPs. They provide the information needed to:

- Confirm the governing body (Thurston County) is in compliance with the terms of the Incidental Take Permit and HCP;
- Document that progress is being made towards meeting the HCP's biological goal and objectives;
- Demonstrate that the HCP's Conservation Program is effective in minimizing and mitigating unavoidable impacts; and
- Identify when there is a need to make changes to improve the Conservation Program.

6.2 Monitoring

6.2.1 Monitoring for Baseline Information

All Conservation Lands engaged/enrolled will have baseline conditions documented via a Baseline Documentation Report at the time of acquisition as part of the due diligence process to purchase the easement or title. The report will document a property's existing physical conditions, natural and humanmade, at the time the Conservation Easement is executed, and in the case of the HCP, the time when a Conservation Land is acquired. The information provides the baseline for measuring future changes in the property's Conservation Value for the Covered Species. The contents of a Baseline Documentation Report depend on the terms of the Conservation Easement, the features of the Conservation Land, and the Conservation Objective for which the Conservation Land was acquired.

The Conservation Values of the site will be described in the baseline condition of the site for the Covered Species. This value to the Covered Species is identified using the methods described in the Credit-Debit Methodology (Appendix H). The baseline monitoring data gathered, and subsequent run of the Credit-Debit Methodology will serve as the site's baseline inventory.

The Baseline Documentation Report will include:

I. General Contents

- Purpose of the Conservation Easement;
- Date baseline was prepared and date site visits and photographs;
- Baseline authorship and authorship qualifications;

- Landowner and manager contact information (name, address, phone numbers);
- Physical address of the property; and
- Directions to the property from the nearest town or major highway.

II. Property Description

The property description will include, but is not limited to, the following:

- The property size described in acres, and the Conservation Easement size described in acres;
- Township, Range, Section, tax lot numbers, and legal description for the property and Conservation Easement;
- Physical setting;
- Historical land ownership and land use, and present land use;
- Appurtenances, including any access easements and water rights that benefit the property, and encumbrances on the property's title;
- Improvements/infrastructure (i.e., known structures, access/field roads, wells, pipelines, fencing, etc.);
- Conservation Values – the ecological features and conditions that will be protected by the Conservation Easement. Covered Species occupancy, habitat quality and function, with associated acreages, , and calculated consistently with the HCP Credit-Debit Procedures (Appendix H); and
- Documentation of any observed threats to the Conservation Values.

III. Photographs

- Photographs of the easement area including improvements/infrastructure, Conservation Values (to the extent practicable), and ongoing uses of the property, together with GPS coordinates and directional notations.

IV. Maps

- An aerial-photo-based map, depicting easement boundaries and features;
- Map depicting the location of photo points;
- Map of the Conservation Easement area in the context of the larger property;
- Map of easement zones or other easement areas with special allowances or restrictions; and
- Topographical and soils map.

IV. Acknowledgment of Condition

- The baseline report shall be acknowledged and included as part of the Conservation Easement as an exhibit.

6.2.2 Effectiveness Monitoring to Support Ongoing Conservation Decisions

The purpose of Effectiveness Monitoring is to determine the success of the implementation of the HCP's Conservation Program. It will be implemented at both the program and site level.

Program level Effectiveness Monitoring will include tracking the effectiveness of the HCP conservation measures (for example, the effectiveness of the Best Management Practices in minimizing impacts to the Covered Species). Specific program level attributes to be monitored, which will also be addressed in the HCP's adaptive management framework, are included in Section 6.3 Adaptive Management.

Site level Effectiveness Monitoring will occur on all Conservation Lands. It will identify the success of habitat enhancement and management, as measured by tracking Covered Species status (including distribution and abundance²¹) and habitat condition relative to the Performance Standards. This monitoring will provide the data to document the progress of a site from baseline conditions towards the desired future conditions identified in the Site Management Plan (Appendix I), and also provide the data to verify that habitat quality and function meet Performance Standards (see Section 7.4 Performance Standards), as necessary for the release of mitigation Credits.

Effectiveness monitoring commitments and schedules will be integrated into each Conservation Land's Site Management Plan. Monitoring shall be conducted at the appropriate seasonal timing for the Covered Species relevant to the site. This may vary by multiple weeks per year due to weather conditions, and differences in site conditions (elevation, aspect, etc.). Once baseline conditions have been established, periodic re-sampling (monitoring) will occur at a minimum of every three years. If significant management activities (e.g., prescribed fire) are implemented, Effectiveness Monitoring should be conducted at a greater frequency (e.g., to collect pre-and post-treatment data) if needed to supply data for adaptive management, then return to regular monitoring cycles. Intervals for Effectiveness Monitoring may vary with the phase of management²², needs for credit release, and the stability of trends concerning the habitat and species at the site.

Monitoring shall be conducted by qualified biologists or natural resource specialists and be in possession of any permits required by regulatory agencies (state or federal) for the monitoring activities they are conducting. The County will maintain a list of qualifications required. Biologists and specialists may be County staff or their designees.

Effectiveness Monitoring Protocols

For prairie species, site level Effectiveness Monitoring protocols are included as the Procedures for Quantifying Credits in the Credit-Debit Methodology (described further in Section 7.5, and Appendix H). In summary, the procedure describes the office preparation, GIS mapping, and field survey to collect monitoring data. The field data collection consists of a census of habitat quality and function within a grid of 0.1544-acre (625 m²) cells distributed contiguously across the prairie at a site. Percent cover of tree, shrub, native herbaceous vegetation, non-native vegetation, invasive or noxious weeds, and bare ground is visually estimated by category and the presence of species or specific habitat or indicators

²¹ Methods to track abundance is currently unknown for all species. Future research is needed to develop these methods.

²² Phase of management is the amount of time needed to achieve target performance standards needed for credit release.

(e.g., Pocket Gopher mounds, nectar/host plants for Taylor's Checkerspot Butterfly, habitat structure for Oregon Vesper Sparrow) is recorded within each cell. These data are then used to categorize each cell as to its habitat type and presence or potential for Covered Species.

Monitoring protocols for Oregon Spotted Frog also follow the Credit-Debit Methodology for the species (described further in Section 7.5.4), and will follow the procedures identified in the "Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington" manual (Hruby 2012). Overlain on the wetlands crediting procedure to evaluate overall habitat will be evaluation of the performances standards measures and metrics (Table 7.2) including habitat quality and function attributes specific to Oregon Spotted Frog, including abundance of native emergent and submergent vegetation, area of native shrub cover to provide wintering habitat, area of emergent vegetation to provide breeding habitat, and open water depth.

Effectiveness Monitoring Data Management

Proper data management, analysis, and reporting are critical to the success of the monitoring and adaptive management program. Monitoring data, including metadata and analysis outputs/results, will be managed and stored in a County database, and made available to interested parties including, but not limited to, County staff, any technical advisors, USFWS, and WDFW. A database and clear reporting procedure are also required for Incidental Take Permit compliance. Further information about data management is available in Chapter 7: Implementation. The data will be managed to ensure accurate and up-to-date information is available for making management decisions.

Effectiveness Monitoring data will be submitted from each Conservation Land to Thurston County by January 31 of the year following data collection. Lands will not be monitored every year. The County and HCP Implementation Team will evaluate the data relative to site baseline inventory, site status, credit release schedule, and Performance Standards/Targets as described in the Site Management Plan. County staff will consider team evaluation and verify and release credits to ensure Performance Standards/Targets are achieved prior to crediting. Effectiveness Monitoring data will also be evaluated by the HCP Implementation Team in the context of the adaptive management framework. Effectiveness Monitoring data, when available, will be included as part of the HCP Annual Report.

6.2.3 Monitoring to Evaluate Compliance with Permit Terms and Conditions

Compliance Monitoring is the means by which Thurston County will evaluate its compliance with the terms and conditions of its Incidental Take Permit. Thurston County will monitor the implementation of the HCP, maintain a database of the information, and report information to the USFWS on an annual basis in the HCP Annual Report. Attributes to be monitored include, but are not limited to, the following:

- Covered Activities: Projects implemented and affected area, stratified by Covered Species/Service Area
- Impacts: Stratified by Covered Activity and Covered Species/Service Area, total impacts (debits) assessed
- Development Permitted in RPAs (stratified by Service Area)

- Designated Critical habitat (Impacts stratified by critical habitat unit, Covered Activity, Covered Species/Service Area)
- HCP Conservation Program Implementation, stratified by Conservation Objective and Covered Species/Service Area and RPA, including, but not limited to:
 - Acres and cost of Conservation Land acquisition activities implemented
 - Acres and cost of Conservation Land restoration and enhancement activities implemented
 - Acres and cost of Conservation Land management and maintenance activities implemented
 - Adaptive Management Actions
 - Stewardship Endowments
 - Funding status for Conservation Lands
 - Annual and five-year return on investment
 - Credits released and per credit cost (stratified by Conservation Objective, Covered Species/Service Area)
 - Balance of credits and debits for each Covered Species/Service Area
 - Overall and incremental
 - Non-compliance issues and resolution

6.3 Adaptive Management

The U.S. Department of Interior defines adaptive management as a structured approach to decision making in the face of uncertainty that makes use of the experience of management and the results of research in an embedded feedback loop of monitoring, evaluation, and adjustments in management strategies (Williams et al. 2009). Adaptive management helps modify implementation actions to improve the progress of the Conservation Program toward the HCP Biological Goal. In this way, adaptive management is a tool to address uncertainty in the conservation of a Covered Species. Uncertainties may include a lack of biological information for the Covered Species, a lack of knowledge about the effectiveness of an avoidance, minimization practice, the uncertainty regarding how a species or habitat will respond to habitat restoration, enhancement, or management techniques.

Adaptive management is a required component of HCPs that allows for the incorporation of new information into conservation and mitigation measures during HCP implementation. Effective implementation of this approach requires explicit identification of key uncertainties, monitoring data, measurable triggers, and clearly identified and time limited actions are to be taken in response to triggers. Adaptive management measures do not generally activate the need for an amendment of the HCP. However, if revisions are needed, they can be completed via the process described in Chapter 7: Implementation.

Adaptive management functions at both the program level (entire HCP), and site (e.g., individual Conservation Land) level. Both levels are described in the sections that follow. The HCP Implementation Team will review annual monitoring information for the program level adaptive management triggers and make recommendations for Conservation Program improvement to County staff no less than annually in years 1-5 of the HCP, and no less than every five years in years 5-30 of the HCP. The adaptive management framework will also be evaluated at a minimum of a five-year cycle, including a review of adaptive management actions and triggers. Triggered adaptive management actions are included in the HCP Annual Report.

6.3.1 Program Level Adaptive Management

Program level adaptive management will generally address areas of uncertainty affecting the overall Conservation Program that are monitored with compliance and Effectiveness Monitoring. Example sources of uncertainty to be addressed by HCP program-level adaptive management include the effectiveness of County outreach in promoting impact avoidance during residential development via the Best Management Practices, and the availability of lands (New Reserves, Working Lands Easements, Enhanced Existing Preserves) to be engaged/enrolled in the Conservation Lands System (e.g., Conservation Objectives 2, 3, and 4) within the Reserve Priority Areas. Key uncertainties, monitoring attributes, triggers, and actions of the HCP's program level adaptive management are included in Table 6.1.

6.3.2 Site Level Adaptive Management

Site level adaptive management on Conservation Lands will address uncertainty related to the response of Covered Species and associated habitat to restoration, enhancement, management, and maintenance activities. Through adaptive management, land managers will detect declines in Covered Species status or in habitat quality and function (e.g., increasing invasive shrub species populations) and adjust management practices within the Site Management Plan to restore habitat quality and function. In response to Effectiveness Monitoring data, the County will work with the HCP Implementation Team to recommend and approve minor adaptive adjustments to Site Management Plans, acquisition criteria, monitoring frequency, or other factors. Such changes will be included in the HCP Annual Report.

Examples of key uncertainties and adaptive management actions that may be triggered at the site scale are outlined in Table 6.2. Information will be reviewed for these site level adaptive management triggers during each Effectiveness Monitoring cycle.

Table 6.1 Program level adaptive management framework of the Thurston County HCP.

Category	Key Uncertainty	Monitoring Attribute	Trigger	Action
BMPs	What is the frequency, timing, and extent of Beaver dam management in OSF Habitat Screen?	Activity frequency - how many times is a given Beaver dam modified on a yearly basis, what is the time of year?	If a given dam is managed more than once in a 5-year period.	Work with HCP Implementation Team to identify a different approach.
BMPs	What is the frequency and scale of conflict/disagreement between BMPs for other listed aquatic species (fish) and Oregon Spotted Frog?	Event is the overlap of fish, OSF, and a Covered Activity of the HCP.	Risk identified to both fish and OSF.	Meeting with NOAA, County, USFWS, WDFW to resolve.
BMPs	In prairie habitat, how effective are County outreach and financial incentive in promoting impact avoidance via BMPs?	Success rate: Where mapped (prairie) Covered Species habitat represent less than 30% of a parcel (5 acres or larger in size), rate (percent) of permits where impacts to Covered Species are fully avoided.	Success rate is less than 75%.	County reviews subset of unsuccessful cases, evaluates outreach with permittee, refines County procedures where applicable.
BMPs	In prairie habitat, how effective are County outreach and financial incentive in promoting impact minimization via BMPs?	Success rate: Where mapped (prairie) Covered Species habitat represent more than 30% of a parcel (5 acres or larger in size), rate (%) of permits where impacts to Covered Species are minimized (siting or reduced development envelope extent).	Success rate is less than 75%.	County reviews subset of unsuccessful cases, evaluates outreach with permittee, refines County procedures where applicable.

Category	Key Uncertainty	Monitoring Attribute	Trigger	Action
BMPs	In OSF habitat, how effective are County outreach and financial incentive in promoting impact avoidance via BMPs?	Success rate: Where mapped or verified OSF habitat wetland cores represent less than 10% of a parcel (5 acres or larger in size), rate (%) of permits where impacts are fully and successfully avoided.	Success rate is less than 75%.	County reviews subset of unsuccessful cases, evaluates outreach with permittee, refines County procedures where applicable.
BMPs	In OSF habitat, how effective are County outreach and financial incentive in promoting impact minimization via BMPs?	Success rate: Where mapped or verified more than 10% of a parcel (5 acres or larger in size), rate (%) of permits where impacts are minimized (through siting or reduced development envelope extent).	Success rate is less than 75%.	County reviews subset of cases, evaluates outreach with permittee, refines County procedures where applicable.
Mitigation	Effectiveness of Conservation Objective blend - which strategy should be further prioritized - New Reserves, Enhanced Existing Preserves, Working Lands Easements, lands dedicated in lieu.	Credits earned/released by strategy/species, and per credit cost.	Credits earned by strategy/species/ Service Area not within 5% of projected blend in HCP (assuming even pace over HCP), or average per credit costs differ from projections by more than 5% for consecutive years.	For Covered Species with a blend of planned strategies, adjust blend of Conservation Objectives used for credits, reducing planned credit generation via less effective or less cost-efficient strategies, and increasing planned credit generation via more effective and cost efficient strategies.

Category	Key Uncertainty	Monitoring Attribute	Trigger	Action
Mitigation	Will the Conservation Lands program for OSF improve and/or protect more occupied lands than the Covered Activities will impact? Assumption is yes.	Use available information (PHS, USFWS, etc.) to determine occupancy at impact and conservation sites at a gross scale.	If assumption is true, no action needed. If assumption is false and no occupied lands were available for purchase, no action needed. But if false and occupied lands were available, adaptive management triggered.	Adjust Conservation Lands program moving forward to increase focus on acquiring more occupied OSF lands.
Mitigation	Will sufficient lands remain available for conservation in the RPAs in each Service Area?	Development permitted in RPAs per Service Area relative to % of land planned for conservation acquisition.	Development approaching (within 10% of) projected needs for conservation.	Increase acquisition efforts, consider proactively managing development until needed lands are engaged/enrolled.
Mitigation	By what margin will credit generation be able to stay ahead of debit requests (for each Covered Species)?	At the close of each year of the Permit Term, Thurston County will ensure that earned and released credits exceed the cumulative incidental take by at least 10% (for each Covered Species).	Earned and released credits do not exceed cumulative incidental take by 10% (for each Covered Species).	Increase acquisition efforts, consider proactively managing development until needed lands are engaged/enrolled.
Monitoring	Will more effective monitoring methods or survey protocols be developed for the Covered Species?	New best available information.	USFWS adopts new protocol for documenting MPG or other Covered Species occupancy or abundance.	If/when the FWS adopts, with input from the management/scientific community, a new protocol(s) for documenting MPG or other species occupancy or abundance, Thurston County may consider if and how it/they can be implemented in support of the HCP's goals and objectives.

Category	Key Uncertainty	Monitoring Attribute	Trigger	Action
Performance Standards	Are species specific resource needs different from those identified in Performance Standards	New best available information.	New information in a Recovery Plan, SSA, or WDFW technical document.	Where the County deems practicable and within projected costs, County may revise Performance Standards, to include newly identified resource information, subject to approval from USFWS. Credits released with existing Performance standards are still valid.
Reserve Priority Areas	Are RPAs in the most effective areas for conservation of the Covered Species?	New best available information.	New information in a Recovery Plan, SSA, or WDFW technical document.	Where the County deems practicable and within projected costs, County may revise map of Reserve Priority Areas, to include USFWS newly identified priorities, in consultation with technical guidance. Existing RPAs are still valid.
Conservation Program Finance	Were estimates of stewardship endowment performance (annual and long-term return on investment) accurate?	5 year average of return on investment.	Return on investment exceeds or falls below projections for consecutive years.	The County reviews financial model and adjusts credit costs as necessary. See Section 8.4.3 for further details.
Conservation Program Finance	What is the accuracy/longevity of land acquisition, habitat restoration and management cost projections used in finance model for prairie species and OSF?	Cost per acre by species or Service Area and strategy.	Greater than 5% increase or decrease in a projected cost demonstrated over a cost averaged over 2-year period.	The County reviews financial model and adjusts credit costs as necessary. See Section 8.4.3 for further details.

Table 6.2 Site level adaptive management framework of the Thurston County HCP.

Category	Key Uncertainty	Monitoring Attribute	Trigger	Action
Effectiveness of Conservation Land Management	Will covered species on Conservation Lands respond positively to habitat management toward Performance Standards?	OPG/TPG/YPG: Occupied area; TCB: Population estimate and occupied area; OVS: Population estimate, nest #.	OPG/TPG/YPG: Occupied area decreases by 5% from prior year; TCB: Population estimate decreases relative to 5 yr. geomean by more than 15%; OVS: Population estimate, nest # decline relative to prior monitoring event.	County and site manager will evaluate trends at sites vs program/County-wide trends, consult with HCP Implementation Team, and consider revision to habitat management prescriptions and cycle within Site Management Plan(s).
Effectiveness of Conservation Land Management	Will new or existing invasive species infestations interfere more with Performance Standards than previously expected?	Invasive species cover estimate at site.	New invasive species population discovered, or greater than 5% increase in abundance of existing population of invasive species at a site detected from prior monitoring event.	Immediate eradication efforts will be undertaken. Management history of site evaluated relative to commitments in Site Management Plan. Additional monitoring will take place the first season following treatment.
Effectiveness of Conservation Land Management	Will vegetation management achieve the desired Performance Standards?	Native species cover and shrub cover at site.	Native species cover decreases by > 5% or shrub cover increases by > 5% from prior monitoring.	Evaluate site management, including mowing and prescribed fire frequency/timing, and non-native species control mechanisms.

Category	Key Uncertainty	Monitoring Attribute	Trigger	Action
Effectiveness of Conservation Land Management	Will unexpectedly large natural disturbances create setbacks to meeting Performance Standards?	Site overview; unexpected natural disturbance.	Significant windfall, erosion, or change in hydrology detected.	Evaluate remedial site management actions, determine if changes to Site Management Plan are needed.
Effectiveness of Conservation Land Management	Will unauthorized anthropogenic (human) use result in setbacks towards Performance Standards?	Site overview; unexpected anthropogenic disturbance.	Any signs of unauthorized use, including new trails, camping, or other trespass.	Evaluate management of public use, and revise outreach (including interpretive signs), increase management of access points as needed.
Effectiveness of Conservation Land Management	How will climate change affect the site's performance in short- and long-term scenarios?	Site-specific attributes included in Site Management Plan.	Site-specific attributes indicate detrimental effect of climate change.	Evaluate site management actions, determine if changes to Site Management Plan are needed.

Chapter 7 Implementation

7.1 Introduction

This section describes the roles and responsibilities of Thurston County in implementing the HCP.

7.2 Roles and Responsibilities of Thurston County

For the duration of the Incidental Take Permit, Thurston County will provide the staff and resources necessary to fully implement the Conservation Program described in this HCP. The Thurston County Board of Commissioners (Board) is responsible for implementing the Conservation Program described in this HCP. An HCP Implementation Team will be formed (see Section 7.2.3), staffed by the County's HCP Coordinator, and will serve to advise the Board.

The responsibilities outlined below may change over time as do department names, responsibilities, and staffing appointments and levels. Thurston County will inform USFWS of any changes.

7.2.1 Thurston County Board of Commissioners

Many of the tasks to be performed by the County will be delegated to staff, particularly to an HCP Coordinator position to be housed in the department of Community Planning and Economic Development. The following tasks will be performed by the Board, or its designee:

- Conservation Program Supervision;
- Review and approve Resolution for Adoption of HCP and Implementing Ordinance on issuance of the Incidental Take Permit;
- Review and approve proposed amendments to the HCP for USFWS review and approval.;
- Provide guidance and approval for acquisition or engagement/enrollment of Conservation Lands;
- Biennially, Thurston County will prepare a budget and work plan for implementation of the HCP. Each department with responsibility for implementation of the HCP will submit their budgets to the County's budget office. The Board has the overall responsibility for adopting the County's budget. The budget will be completed consistent with the current County budget process or cycle which may be annually or biennially; and
- Adopting final code amendments to meet requirements of the HCP.

The Board shall by ordinance amend the County's Development Code, to include procedures and requirements for implementation of the HCP and Incidental Take Permit. The ordinance will be finalized and adopted no later than one year after issuance of the Incidental Take Permit by USFWS. The HCP will

not be in effect until this ordinance is adopted. The ordinance may be amended over time based on HCP amendments and changes to applicable federal and state laws.

7.2.2 Community Planning and Economic Development Department

The Community Planning and Economic Development Department will designate a staff person to be the County's HCP Coordinator with the task of providing overall program implementation oversight.

Implementation tasks and responsibilities, will include:

- Conservation Program management;
- Review field surveys;
- Review/Develop Site Management Plans;
- Issue and record Certificates of Inclusion;
- Contractor management;
- Data management;
- Compliance and Effectiveness Monitoring;
- Reporting;
- Grant applications;
- HCP amendments;
- Coordination with land management partners;
- Conservation Land acquisition/engagement/enrollment;
- Baseline Documentation Report preparation;
- Permitting;
- Staff training;
- Coordination with other County departments;
- Staff support to the HCP Implementation Team;
- Drafting work plans and budgets for BOCC approval;
- Drafting code revisions for Planning Commission and BOCC approval; including public review of amendments
- Maintain and provide to permittees links to up-to-date survey protocol;
- Application of Best Management Practices and other measures to minimize impacts;
- Work with Applicants to reduce impacts through site design;
- Manage and execute legally enforceable instruments (i.e., conservation easement, inter local agreement) with landowner for on-site mitigation;
- Oversee establishment and maintenance of a non-wasting endowment for each property; and
- Consider alternative mitigation proposals on a case-by-case basis using the County's Expanded Review process.

Real Estate Activities

The County will conduct relevant financial and legal analyses to guide the selection of parcels for the Conservation Lands System. It will also conduct or manage appraisals and transactions. The County may hire or contract with a specialist with expertise in real estate to fulfill the fiduciary duties of the County for the acquisition of properties. This specialist will work in coordination with the HCP Coordinator and Board to acquire properties. An existing County department may already have staff members with these skills; the HCP Coordinator may coordinate with such department personnel to conduct the work. The County may also hire contractors or consultants to provide these functions under the direction of the Board.

7.2.3 HCP Implementation Team

An HCP Implementation Team will be assembled within 12 months of Incidental Take Permit issuance, convened regularly by staff in the department of Community Planning and Economic Development to provide science and technical guidance to help implement the HCP and the terms of the Incidental Take Permit. The HCP Implementation Team will be composed of County staff and three to five members who are biologists, ecologists, or hydrogeologists who collectively have experience with conservation agricultural practices and the Covered Species and their habitat types. Representatives from the wildlife agencies may also participate as liaisons. The HCP Implementation Team will be tasked with:

- Helping the County adaptively manage the criteria for selecting Conservation Lands (see Section 5.4);
- Reviewing proposed changes to defined Performance Standards and Site Evaluation Protocol (Appendix K) providing recommendation to Thurston County Board prior to discussion with USFWS;
- Reviewing the County's progress toward meeting HCP commitments and Incidental Take Permit conditions and review HCP Annual Reports prior to submission;
- Reviewing and providing guidance for Conservation Land restoration, management, and monitoring, including in participating in credit verification and adaptive management;
- Coordinating, as requested, with County staff to provide input, guidance, and recommendations on Conservation Measures and tasks, Conservation Land issues, and Covered Species needs;
- Providing guidance for integration with other monitoring and research efforts in the region by other state, federal, and local entities; and
- Making program improvement recommendations for HCP Implementation to County staff and the Board.

The HCP Implementation Team's role in the Thurston County Prairie HCP is advisory only. The team will make recommendations to the Board through the HCP Coordinator. The Board will retain authority to approve all work related to HCP Implementation.

7.2.4 Public Works Department

Responsibilities of the Public Works Department regarding implementation of the HCP for Public Works activities will include:

- Implementing Best Management Practices for County-funded or implemented Capital Improvement Projects that are Covered Activities;
- Field Surveys;
- Contractor Management;
- Reporting of Covered Activities completed and extent of impacts;
- Permitting;

- Coordination with other County departments;
- Reporting Activities to the HCP Coordinator;
- Staff training on mitigation and the avoidance/ minimization measures of the Best Management Practices; and
- Coordinate with HCP Coordinator on real estate acquisition from willing sellers.

7.2.5 Public Health and Social Services Department

Responsibilities of the Public Health and Social Services Department, particularly the Environmental Health Division, regarding HCP implementation will include:

- Implementing the Best Management Practices for County-funded or implemented sewer/septic repair and extension;
- Permitting;
- Coordination with other County departments;
- Reporting of Covered Activities completed and extent of impacts; and
- Staff training on mitigation and the avoidance/ minimization measures of the Best Management Practices.

7.2.6 Thurston GeoData

The Thurston County GeoData department will coordinate with all departments to analyze and maintain spatial data related to the HCP, including, but not limited to impact areas, survey records, Conservation Land boundaries and habitat management actions.

7.2.7 Public Information Personnel

County public information personnel, guided by the County's HCP Coordinator, will be responsible for working with other Thurston County departments in the dissemination of information about the HCP and about prairie, wetland, and riparian conservation in general.

7.2.8 Prosecuting Attorney's Office

The Prosecuting Attorney's Office is responsible for reviewing legal documents to ensure sufficiency as to form. The Prosecuting Attorney's Office is also responsible for legal representation of the County in the event the County is appealed during its implementation of the HCP, or if an enforcement case is referred to the Prosecuting Attorney's Office, it will make attempts to obtain judicial relief.

7.2.9 Public Participation and Outreach

The public has demonstrated strong support for and involvement in conservation of natural resources, as well as in the development of the HCP. Transparency through early and continuous public participation is a guiding principle of Thurston County's HCP implementation. Maintaining this public support is vital to the County's ability to fulfill the commitments made in this HCP. This participation means that the public provides an oversight function of the County's HCP implementation. Examples of

public participation that Thurston County intends to pursue include collaborative partnerships (below) and public outreach. For the latter, Thurston County staff will be available for presentations at public or special interest group meetings to report on the program and its progress (i.e., Planning Commission and Agricultural Advisory Committee). Thurston County will also prepare reports, fact sheets, maintain space on Thurston County's website for HCP information for landowners and others who may participate, and make use of other forms of media to communicate information about the County's HCP. Ten-year reviews will also have significant involvement by the public.

Thurston County may also use interested citizens (citizens scientists) to monitor sites and collect data on the condition of resources. At this time, Thurston County will not commit to include this effort in the HCP, but such an effort would be in keeping with our commitment to advance the goals of the HCP through education, outreach, and participation.

7.2.10 Collaborative Partnerships

Thurston County will continue to seek out partnership opportunities, such as the JBLM-Sentinel Landscape Partnership, in support of implementing the goals of the HCP on a landscape-scale, thereby extending its effectiveness beyond the boundaries of the Permit Area.

Thurston County will also foster partnerships with other local jurisdictions within the County and will support their habitat conservation planning and implementation efforts, particularly the HCP of the City of Tumwater/Port of Olympia (Bush Prairie HCP) or other municipalities. Thurston County will also foster cooperation to those partners that contribute to the implementation of the County HCP. The County will foster partnership with the Washington State University, The Evergreen State College, and other public and private schools in order to maximize effectiveness of research and education efforts pertaining to the HCP goals.

Thurston County will pursue partnering opportunities in association with private landowners and non-profit organizations with common conservation goals (i.e., land trusts and conservation districts). Such partnering efforts may include, but are not limited to:

- Shared or collaborative staffing;
- Matching or other shared funding of land acquisitions and/or Conservation Easements;
- Joint efforts in management activities;
- Public information, outreach, and environmental education efforts and materials; and
- Coordination and use of local contributions, including land, trusts, volunteer support, and other in-kind services.

7.3 Process to Obtain Incidental Take Coverage

7.3.1 Overview

The County will issue Certificates of Inclusion (a template is included in Appendix J) to the County Incidental Take Permit to those needing a County permit for Covered Activities resulting in unavoidable impacts to the Covered Species (including its own Departments). This process will be similar for private

landowners and County partners, such as county schools and rural fire districts. The County is working actively to integrate the terms of this HCP with existing building and other permitting processes—providing as seamless a path as possible for both economic development and conservation actions.

A Certificate of Inclusion will be incorporated with County development permits and authorizations (including those issued to the County's Departments), and will:

- Describe the proposed project is a Covered Activity;
- Identify and quantify impacts to the Covered Species (following the process described in Appendix H: Credit-Debit Methodology); and
- Set forth the requirements of the parties, including minimization and mitigation commitments (following the process described in Appendix H: Credit-Debit Methodology) and costs.
- Document decisions and implementation of process leading up to certification, including actions identified in Figure 7.1
- Clearly condition County's approval of development upon satisfaction of HCP minimization and mitigation requirements.

The County will work with all permit Applicants to ensure appropriate Best Management Practices (Appendix C) are implemented also that, that the amount of take is minimized and mitigated to the maximum extent practicable for all Covered Activities. The County will also work with Applicants to inform them how siting activities differently (e.g., clustering development, or locating activities outside high value habitat) will reduce impacts and their mitigation obligations and resulting Mitigation Fees.

At any time during the term of the HCP, if there is no remaining incidental take authorization, or no mitigation credits are available for the County to allocate, no Certificate of Inclusion will be issued and the permit Applicant may need to seek independent HCP coverage from the USFWS. In this case the County may elect to amend its Incidental Take Permit (see Section 7.14). The County reserves the right to refuse a Certificate of Inclusion to any party or may restrict, or prioritize, the amount of take coverage available to individual parties, if at any time the County's estimated growth appears to be on a course that may exceed the total mitigation available under this plan, or based on other criteria published by the County.

County staff will provide Covered Species information in the HCP Basemaps (maps of Covered Species extents), on paper or as GIS files from Thurston Geodata that allows development permit Applicants to identify potential habitat within their site proposed for development. If the proposed project will not impact Covered Species or their respective habitats, the permit issuance process moves forward without additional review. Applicants proposing to engage in Covered Activities that may impact Covered Species may seek HCP coverage through Thurston County's land use and environmental review processes and receive a Certificate of Inclusion (Appendix J), as part of the county approval process see Figure 7.1.

The permit process for Mazama pocket gopher subspecies, Taylor's checkerspot butterfly, and Oregon vesper sparrow will not require field survey.

The permit review process for Oregon spotted frog may require a field survey and is described in the following sections and in Appendix F: Oregon spotted frog Habitat Survey Protocol.

Projects which have been reviewed following the procedures as set forth in the 2018 USFWS Guidance for Assessing Potential Take of Mazama Pocket Gophers in Thurston and Pierce Counties are not subject to the HCP permit review process as outlined in Section 7.3.2 below if the project meets the following:

- The review was complete and concluded with negative screening results, and
- The screening negative results are valid per the 2018 USFWS Guidance²³, or
- The negative determination remains valid pursuant to any applicable County ordinance that addresses the development or land use activity in questions.

7.3.2 Olympia, Tenino and Yelm Pocket Gopher Permit Review

County permit Applicants seeking take authorization for Olympia, Yelm, or Tenino Pocket Gopher from the County may follow one of two paths for the permit review process: Standard or Expanded. The Standard Permit Review process for these species is completed entirely in the office, with no field survey required, and is strongly preferred. The optional Expanded Review process requires field survey during a specific survey window (see Appendix K: Site Evaluation Protocol) . Once a permit Applicant has selected the Expanded Permit Review process, they may not revert to the standard permit review process. The Standard and Expanded Permit Review processes are described below.

Standard Permit Review Process - Olympia, Tenino, and Yelm Pocket Gopher

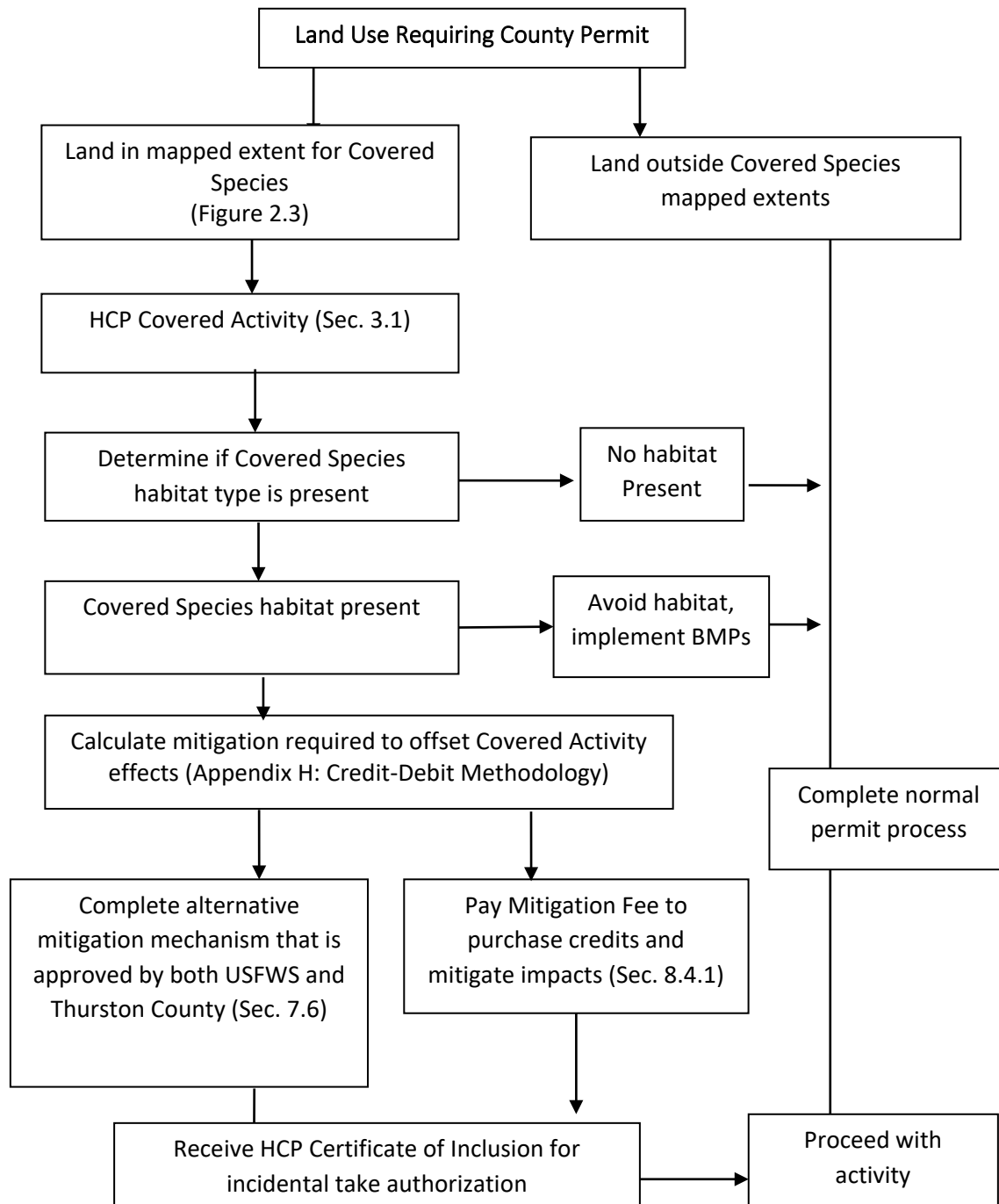
1. When a permit application is submitted, County staff will identify projects that lie within the mapped extent for the Mazama Pocket Gopher subspecies using aerial maps and the mapped Covered Species extents from Thurston County GeoData.²⁴
2. Staff will review the proposed project to ensure avoidance and minimization BMPs (Appendix C) are implemented to the maximum extent practicable. Where needed, staff will work with the Applicant to identify opportunities to minimize impacts from their proposed project.
3. After seeking to avoid and minimize impacts to fullest extent practicable, County staff will identify the habitat area and value unavoidably impacted by the Covered Activity. County staff will assign a functional acre quantity of impact, a debit, using the procedure for calculating debits included in Appendix H: Credit-Debit Methodology and described in Section 7.5 Areas fully forested, with hard/impervious surface²⁵ and approved septic drainfields will be excluded from debits. For Olympia, Tenino, or Yelm Pocket Gopher, debits are calculated based on soils, species occupancy, and habitat quality and function.
4. The permittee will be notified by the County of the required Mitigation Fee amount to be paid to the County (see Chapter 7 for more on costs and financing), to secure the credits needed to offset the identified debit.

²³ 2018 USFWS Guidance for Assessing Potential Take of Mazama Pocket Gophers in Thurston and Pierce Counties.

²⁴ Species surveys will no longer be conducted or accepted on sites for development.

²⁵ Hard or impervious surfaces installed prior to 2014 will be excluded from debit calculation.

5. The permittee may also be able to dedicate land as mitigation or purchase mitigation credits from a USFWS approved Conservation Bank for impacts instead of paying a Mitigation Fee (see Section 7.6: Mitigation Mechanisms).
6. Once the Mitigation Fee has been paid, the permittee continues any remaining County permitting processes to obtain permits/authorization with conditions and HCP Certificate of Inclusion.
7. The County records the impact and reports permitted impacts and commensurate mitigation to USFWS on an annual basis as part of the HCP Annual Report.



*For prairie species, this involves GIS assessment of property. For OSF, this involves a field survey.

Figure 7.1 Thurston County HCP Certificate of Inclusion Diagram.

****All projects need to meet other normal County permitting requirements. Land use projects that do not require a county permit or are not a covered activity, but may impact Covered Species, shall work with USFWS to determine whether a proposed project or action is likely to result in take.**

Expanded Permit Review Process - Olympia, Tenino, and Yelm Pocket Gopher

1. When a permit application is submitted, County staff will identify projects which lie within the mapped extent for the covered prairie species using aerial maps and the mapped Covered Species extents from Thurston County GeoData.
2. Staff will review the proposed project to ensure avoidance and minimization BMPs (Appendix C) are implemented to the maximum extent practicable. Where needed work with the Applicant to identify opportunities minimize impacts from their proposed project.
3. The permit Applicant may choose to complete a site-specific soils survey rather than relying on mapped USDA soil series data for Olympia, Tenino, or Yelm Pocket Gopher. The survey needs to be conducted by a County-approved, certified professional soil scientist as defined in Appendix K: Site Evaluation Protocol.
4. The soil scientist shall use the methods approved by the County (see Appendix K: Site Evaluation Protocol) and for parcels 1 acre or less the entire parcel shall be surveyed. For parcels greater than an acre only 1 acre around the proposed development needs to be surveyed.
5. After seeking to avoid and minimize impacts to fullest extent practicable, County staff will identify the habitat area and value unavoidably impacted by the Covered Activity. County staff will assign a functional acre quantity of impact, a debit, using the procedure for calculating debits included in Appendix H: Credit-Debit Methodology and described in Section 7.5 Areas fully forested, with hard/impervious surface²⁶ and approved septic drainfields will be excluded from debits. For Olympia, Tenino, or Yelm Pocket Gopher, debits are calculated based on soils, species occupancy, and habitat quality and function.
6. The County HCP Coordinator will review the survey results and adjust any mitigation or minimization requirements based on increased or decreased habitat area.
7. The permittee will be notified by the County of the Mitigation Fee amount to be paid to the County. (see Chapter 8 for detail on costs and financing).
8. The permittee may also be able to dedicate land as mitigation or purchase species specific mitigation credits from a USFWS approved Conservation Bank for impacts instead of paying a Mitigation Fee (see Section 7.6: Mitigation Mechanisms).
9. Once the fee has been paid or an approved land dedication has been completed, the permittee continues with remaining County permitting processes to obtain permits/authorizations any conditions and HCP Certificate of Inclusion.
10. The County records the impact and reports permitted impacts and commensurate mitigation in the HCP Annual Report.

7.3.3 Taylor's Checkerspot and Oregon Vesper Sparrow Permit Review

1. When a permit application is submitted, County staff will identify projects which lie within the mapped extent for Taylor's Checkerspot and Oregon Vesper Sparrow using aerial maps and the mapped Covered Species extents from Thurston County GeoData.
2. Staff will review the proposed project to ensure avoidance and minimization BMPs (Appendix C) are implemented to the maximum extent practicable. Where needed work with the Applicant to identify opportunities minimize impacts from their proposed project.

²⁶ Hard or impervious surfaces installed prior to 2014 will be excluded from debit calculation.

3. After seeking to avoid and minimize impacts to fullest extent practicable, County staff will identify the habitat area and value unavoidably impacted by the Covered Activity. County staff will assign a functional acre quantity of impact, called a debit, using the procedure for calculating debits included in Appendix H: Credit-Debit Methodology and described in Section 6.4. Areas of complete forest canopy cover will be excluded from debit calculations. For Taylor's Checkerspot and Oregon Vesper Sparrow, debits are calculated based on habitat quality and function alone.
4. Where Taylor's Checkerspot or Oregon Vesper Sparrow impacts overlap with Mazama Pocket Gopher impacts the applicant must pay the mitigation fee for only the impacts to Mazama pocket gopher. The Taylor's Checkerspot or Oregon Vesper Sparrow have much smaller specific mapped extents and very limited occupancy in Thurston County, the County has elected to address their mitigation only in the circumstances described above without any further obligation from the permit Applicant, beyond avoiding and minimizing impacts to the extent practicable. The permittee will receive a Certificate of Inclusion with the County for the overlap impact to Taylor's Checkerspot or Oregon Vesper Sparrow but will not pay a separate Mitigation Fee.
5. In situations where Taylor's Checkerspot or Oregon Vesper Sparrow impacts do not overlap with Mazama pocket gopher impacts the permittee will be notified by the County of the Mitigation Fee amount to be paid to the County. (see Chapter 8 for detail on costs and financing).
6. The permittee may also be able to dedicate land as mitigation or purchase species specific mitigation credits from a USFWS approved Conservation Bank for impacts instead of paying a Mitigation Fee (see Section 7.6: Mitigation Mechanisms).
7. Once the fee has been paid or an approved land dedication has been completed, the permittee continues with remaining County permitting processes to obtain permits/authorizations any conditions and HCP Certificate of Inclusion. The County records the impact and reports permitted impacts and commensurate mitigation to USFWS on an annual basis as part of the HCP Annual Report.

7.3.4 Oregon Spotted Frog Permit Review

Oregon Spotted Frog habitat is known to occur in wetlands and wetland buffers in the greater Black River watershed of Thurston County. Permit applications which overlap the OSF screen will be processed as follows:

1. When a permit application is submitted, County staff will identify projects which lie within the OSF Habitat Screen using aerial maps and OSF screen layer in Thurston County GeoData. The application will be flagged for OSF site survey and routed to the appropriate County planner.
2. Using application materials, photos, and GIS system, the County planner will determine whether the project requires an onsite OSF screening by following the procedures set forth in Appendix F: Oregon Spotted Frog Habitat Survey Protocol.
3. If a project cannot be excluded in-office, a site visit will be conducted by County staff to verify:
 - Whether the property supports suitable OSF habitat using the field screening protocol as described in Appendix F: Oregon Spotted Frog Habitat Survey Protocol. Generally, screening is to be conducted between January 1st – April 15th and,

- If the property contains wetland; a wetland delineation, conducted by a qualified professional, will be required using the methodology described in Thurston Code Chapter 24.30, Wetlands as amended.
- The location of the landward extend of the wetland shall be depicted on a boundary survey completed by a professional surveyor. The flagged location shall be mathematically tied to established control points describing the bounds by bearing and distance and include acreage.

NOTE: Where applicable, OSF habitat determination will occur concurrently with an assessment for wetlands.

4. Wetland rating documentation will be completed using the Washington State Wetland Rating System for Western Washington to determine the appropriate buffer width pursuant to Chapter 24.30, as amended.
5. A critical area report shall be submitted which contains information required in TCC 24.35, impacts shall follow the mitigation sequencing described in TCC 24.01. (TCC Chapter 24.30, TCC 24.45). The report must also demonstrate impact have been minimized to fullest extent practicable following the Best Management Practices as set forth in Appendix C.
6. If Oregon Spotted Frog site screening verifies suitable OSF habitat, and impacts are unavoidable, after seeking to avoid and minimize impacts, the Department of Ecology Western Washington Wetland Compensatory Mitigation Credit-Debit System will be applied to determine mitigation requirements (Hruby 2012). Should the OSF habitat extend landward of a CAO qualified wetland, the mitigation shall be no less than a 1:1 ratio.

7.4 Performance Standards

Performance Standards describe the habitat conditions necessary to earn and release mitigation credits from New Reserves, Working Lands Easements, and Enhanced Existing Preserves (inclusive of any lands dedicated in lieu of mitigation that feed into one of these Conservation Objectives) in the Conservation Lands System during the phases of their habitat enhancement and management. Management phases (e.g., initial, intermediate, final) are specific to each and site depending upon the time needed to achieve certain targeted performance standard. The end of each phase will be a credit release (only if target performance standards are met). Performance Standards are tied to site-specific targets in habitat quality and function within the configuration of different habitat types, habitat qualities, and soil types; this relationship and specific performance standards will be documented and identified in the Site Management Plan for each Conservation Land (see Appendix I: Management Plan Template).

Variables included in Performance Standards are unique to each Covered Species and are described in the sections below. These Performance Standards were developed from performance measures and metrics provided by the USFWS (USFWS 2019) and are intended to be applied within a Site Management Plan, and used to inform Compliance Monitoring, Effectiveness Monitoring, and credit release schedules for the Covered Species.

The Performance Standards identified in this section are intended to be defaults. It is possible that site-specific Performance Standards may be integrated within specific Site Management Plans, then reviewed by the HCP Implementation Team and approved by the County.

7.4.1 *Prairie Species Performance Standards*

The Performance Standards, measures, and metrics for prairie Covered Species include criteria that the best available science indicates are primary determinants of prairie habitat quality and function and species use. These components are described below:

- **Percent Cover Woody Vegetation (Trees and Woody Shrubs):** Prairies have a patchy distribution across the Puget Trough ecoregion or physiographic province. This ‘patchiness’ reflects the influence of several interacting factors, among them soil type/characteristics and climate. Natural patterns of succession in prairie plant communities, encroachment of woody shrubs and trees, and loss of historically and ecologically important disturbance regimes (e.g., landscape scale fire) also contribute to the ‘patchiness’ observed today across the Puget Trough. Percent cover woody vegetation (trees and woody shrubs) is a primary determinant of prairie habitat quality and function. Puget Trough prairie mitigation sites must achieve Performance Standards for percent cover woody vegetation in order to ensure that low statured, early seral, herbaceous vegetation (i.e., native grasses and forbs) remains a permanent and dominant feature, and woody/shrubby invasive species (e.g., Scotch broom) are continuously managed.
- **Percent Cover Native Herbaceous Vegetation:** Non-native and invasive plants present serious challenges to effective, long-term dry prairie conservation, restoration, and management. If not proactively controlled and managed, non-native and invasive plants will frequently outcompete native herbaceous vegetation (i.e., native grasses and forbs). Non-native and invasive plants (e.g., Scotch broom, tall oatgrass) alter abiotic and biotic conditions to the detriment of native herbaceous vegetation. Percent cover native herbaceous vegetation is a primary determinant of dry prairie habitat quality and long-term function. Thurston County prairie mitigation sites must achieve Performance Standards for percent cover native herbaceous vegetation to ensure that low-statured, early seral, herbaceous vegetation (i.e., native grasses and forbs) remains a permanent and dominant feature.
- **Prairie Plan Diversity:** Diverse prairie plant communities support and provide high functioning habitat for species listed under the federal Endangered Species Act, are more resilient over time, and provide the habitat and refugia that may and likely will be needed to ensure that additional sensitive Puget Trough species (plant and animal) can be conserved into the future. Thurston County prairie mitigation sites must ensure the long-term health and resilience of diverse prairie plant communities.
- **Host and Nectar Plants:** A summary of currently identified host and nectar plants for Taylor’s Checkerspot is included in Table 2.4. Research describing the importance of nectar for Taylor’s Checkerspot and quantifying the optimal amount of nectar needed is lacking. Likewise, information regarding the relative preference of the butterfly for different nectar species or host species, and the sugar content of nectar from different species is not available. In the absence of such information, Site Management Plans for Conservation Lands to mitigate Taylor’s Checkerspot Butterfly should prioritize native host and nectar species as primary components of native cover targets. For example, in High-Quality Native Prairie, the $\geq 30\%$ native herbaceous cover should be comprised of the native species listed in Table 2.4. As new

information becomes available, this component of the Performance Standards may be updated through adaptive management.

There is some complexity in the relationship among the host plants for Taylor's Checkerspot. Specifically, harsh paintbrush (*Castilleja hispida*) should not be planted within at least 1 km of golden paintbrush (*Castilleja levisecta*); this is due to concerns related to hybridization between the rare golden paintbrush and more common harsh paintbrush (USFWS, WDFW, DNR, 2021). Additionally, non-native *Plantago* species should not be seeded, planted, or introduced to sites where it does not already exist.

- **Vegetation Structure:** The height and configuration of layers of vegetation is important for Oregon Vesper Sparrow. Specifically, vegetation structure should include multiple levels (e.g., variable height between grasses and forbs) and be diverse in its plant species composition. Vegetation height during the breeding and nesting period of Oregon Vesper Sparrow is also critical to successful reproduction of the species.

The Performance Standards for Covered Species in prairies are included in Table 7.1.

Table 7.1 All prairie species vegetation Performance Standards comparison table.

	Taylor's Checkerspot Butterfly				Oregon Vesper Sparrow			Mazama Pocket Gopher	
	Shrub/Tree Cover ^{2,3,4}	Native Herbaceous Cover ²	Larval Host Species	Nectar Species	Shrub/Tree Cover ²	Native Herbaceous Cover ²	Cover of Veg. Between ~ 6-20 in (15- 51 cm) in Height During May	Shrub/Tree Cover ^{2,3,4}	Native Herbaceous Cover ²
Shrub-Dominated	Shrub cover ≥30%; Tree cover <5%	-	-	-	Shrub cover ≥50%; Tree cover <5%	-	< 50%	Shrub cover ≥25%; Tree cover <5%	-
Degraded Grassland	Shrub cover <30%; Tree cover <5%	<10%	1 Larval host species	< 4 Nectar species	Shrub cover >30%; Tree cover <5% or 15-25%	<10%	< 50	Shrub cover ≤25%; Tree cover <5%	<10%
Native Prairie	Shrub cover <15%; Tree cover <5%	10-30%	2-5 Larval host species, At least 1 oviposition host	> 4 Nectar species	Shrub cover <30%; Tree cover <5% or 15-25%	10-30%	50-75%	Shrub cover ≤10%; Tree cover <5%	10-30%
High-Quality Native Prairie	Shrub cover <5%; Tree cover <5%	>30%	2-5 Larval Host species, At least 1 oviposition host	> 8 Nectar species, at least one with late flowering phenology	Shrub cover <15%; Tree cover <5%	>30%	> 75%	Shrub cover ≤10%; Tree cover <5%	>30%

¹ The Performance Standards define four categories of overall prairie habitat quality; mitigation sites and proposals should realize benefits in the form of long-term restoration and enhancement of dry prairie habitat functions (functional lift).

² Percent cover metrics are assessed using a grid of 25m x 25m sample cells; or a conditionally approved alternative sample cell/unit configuration.

³ Trees may not exceed 5% cover, unless native oak savanna (less than 25% cover of oaks, *Quercus garryana*).

⁴ Woody shrubs; excludes native oak and kinnikinnick (*Arctostaphylos uva-ursi*).

7.4.2 Oregon Spotted Frog Performance Standards

The following Performance Standards, measures, and metrics were developed based on technical guidance from USFWS and using the *Wetland Mitigation in Washington State Part:2 Developing Mitigation Plans* from ECY. Performance standards are observable or measurable physical standards (including hydrological), or biological attributes that are used in determining if a compensatory mitigation site meets its objectives. Key determinants of wetland quality for the Oregon Spotted Frog includes habitat that are, 1) stable patterns of hydrology that coincide with the stages of Oregon Spotted Frog life history, 2) minimal cover of woody vegetation, except wintering habitat where scrub-shrub habitat may be allowed to a greater extent than breeding habitat, and 3) appropriate vegetative structure of emergent and submergent plants.

Preferred vegetation composition and structure in Oregon Spotted Frog habitat varies from site to site. The species is the most aquatic of northwest frogs and rely on year-round areas of still or slow-moving water and seasonally flooded areas that can be expansive or immediately adjacent to permanent water. Generally, habitat is to consist of large continuous areas of herbaceous emergent or submergent wetland vegetation connecting the upper end of seasonally flooded areas with permanent water areas, clumped or widely spaced wetland shrubs, and few if any deciduous late-leaving trees. Oregon Spotted Frog habitat consists of four, often spatially and temporally overlapping habitat types: Nonbreeding, Breeding, Rearing, and Overwintering.

Specific Performance Standards for a Conservation Land will depend on the type, scale, and scope of the proposed project and will be outlined in detail in the Site Management Plan developed for each property, parcel, or easement area. As new information becomes available, components of Performance Standards may be updated through adaptive management. In general standards for Oregon Spotted Frog are:

- Ephemeral habitat areas hydrologically connected by surface water to a permanent water body;
- Breeding/oviposition habitat inundated for a minimum of 4 months per year (on average beginning as early as February) that connects through habitat to deeper persistent water;
- Less than 15% tree and shrub cover (scattered or small clumps spaced >50 ft apart);
- Vegetation structure in breeding habitat should include short-stature emergent vegetation and vegetation no greater than 12 in above water surface when inundated during the breeding season;
- Gradual topographic gradient (less than 3% slope) from shallow water toward deeper, permanent water; and
- Shallow water areas in winter months have high solar exposure (approximately >75%).

Performance standards developed are to ascertain whether credit is being created in the context of those functions. Credits will be measured by the mitigation assessment method from “Calculating Credits and Debits for Wetland Compensatory Mitigation in Wetlands of Western Washington” (Hruby 2012). Each site will have a unique baseline condition and desired future condition identified in its Site Management Plan. Desired future condition is expected to vary across the different types of Conservation Lands. In general, desired future conditions will align with the targets identified in Table 7.2.

Table 7.2 Performance standards, measures, and metrics for Oregon Spotted Frog habitat.

	Phase III	Phase IV	Phase V	Phase VI
Native Emergent and Submergent Vegetation	20% native emergent and submergent vegetation cover	30% native emergent and submergent vegetation cover	50% native emergent and submergent vegetation cover	65% native emergent and submergent vegetation cover
Native Shrub Cover to Provide Wintering Habitat		15% cover of native shrub widely spaced/clumped (>50 feet)	15% cover of native shrub widely spaced/clumped (>50 feet)	10% cover of native shrub widely spaced/clumped (>50 feet)
Emergent Vegetation to Provide Breeding Habitat	20% cover of emergent vegetation no greater than 12 inches above surface in breeding habitat	50% cover of emergent vegetation no greater than 12 inches above surface in breeding habitat	50% cover of emergent vegetation no greater than 12 inches above surface in breeding habitat	80% cover of emergent vegetation no greater than 12 inches above surface in breeding habitat
Open Water Depth	Open water with a maximum seasonal depth <12 inches or water of this depth over vegetation in deeper water during breeding season.	Open water with a maximum seasonal depth <12 inches or water of this depth over vegetation in deeper water during breeding season.	Open water with a maximum seasonal depth <12 inches or water of this depth over vegetation in deeper water during breeding season.	10% open water cover with a maximum seasonal depth <12 inches or water of this depth over vegetation in deeper water during breeding season.

7.5 Overview of Credit and Debit Calculations

As stated in Chapter 4, Thurston County recognizes the difference between the methodologies used to estimate 30-year landscape-scale projections of take and the finer-grained calculations used to assign debits and credits at the site level during HCP implementation. Both approaches align with USFWS guidance. The County is confident that the 30-year landscape-scale projection of take is sufficiently inclusive of anticipated impacts, although it is recognized that site-specific information could adjust the estimate of debits through time. The pace of debits will be closely monitored over the life of the HCP.

The methods to be employed in credit and debit calculations are described in detail in Appendix H: Credit-Debit Methodology.

7.5.1 Credit-Debit Methodology for Olympia, Yelm, and Tenino Pocket Gopher

For Olympia, Yelm, and Tenino Pocket Gopher, debits and credits will be computed based on soils, occupancy, or incremental/increased occupancy, and habitat quality and function.

To calculate debits, available data (e.g., Basemaps - mapped extent for the Mazama Pocket Gopher subspecies and the mapped Covered Species extents from Thurston County GeoData) are evaluated to assess and describe current occupancy and proximity, in addition to soil type(s) (more or less preferred soils). Occupancy, proximity, and soil type place the impact area(s) in one or more of the six categories identified in Table 4.1. Accordingly, the appropriate/corresponding assigned habitat values (from Table 4.1) are summed for the impact(s). Also, for debits, a second value (prairie quality) for habitat quality and function is added. Prairie quality are described with the Performance Standards (Table 7.1), and the habitat values for each have been assigned (Table 7.3). On-the-ground surveys are not required and will not be accepted for pocket gopher impacts and the prairie habitat quality value is assumed to be a default of "intermediate" between Shrub-Dominated and Degraded Grassland, or 0.6 (debits/acre). For Yelm Pocket Gopher only, if the debit will be mitigated outside the Service Area where impacts occurred, an out-of-Service Area multiplier of 1.25 will be applied. This multiplier is applied to the debit-side formula only.

When credits are calculated on Conservation Lands, Mazama Pocket Gopher (all subspecies) occupancy and habitat values will be generated based on field surveys during Effectiveness Monitoring. These on-the-ground field surveys will identify the extent of Mazama Pocket Gopher use of habitats across a site to describe occupancy, per the categories in Table 4.1. On-the-ground surveys will also evaluate the vegetation composition across the site, collecting the data needed to assign acres of habitat at the site to the categories of prairie quality identified in the Performance Standards (Table 7.1) and calculate a second value for habitat quality and function using Table 7.3. Occupancy and habitat quality values are summed for a total credit value (functional acres). The release of these credits is described in Section 7.8: Credit Release Schedules.

Table 7.3 All prairie species habitat quality value comparison table.

Habitat Category	Habitat Quality Value (companion to vegetation Performance Standards table)		
	TCB	OVS	MPG
Shrub-Dominated	0.1	0.1	0.5
Degraded Grassland	0.3	0.4	0.7
Native Prairie	0.6	0.6	0.9
High-Quality Native Prairie	0.8*	0.8*	1.0

*If High-Quality Native Prairie becomes occupied by TCB or OVS, the habitat value becomes 1. Occupancy is the true test of the suitability of habitat.

7.5.2 Credit-Debit Methodology for Taylor’s Checkerspot

For Taylor’s Checkerspot, debits and credits are calculated based on habitat quality and function, or incremental/increased habitat quality and function. Occupancy is not included in debits, as it is assumed, and defined by butterfly dispersal distance from known locations. Occupancy is included in credits, as described below.

For calculation of debits for Taylor’s Checkerspot Butterfly, the habitat quality and function of the prairie quality categories of the Performance Standards (Table 7.1) are assigned relative values as identified in Table 7.3. Because on-the-ground surveys are not required for prairie impacts, the habitat quality value is assumed to be a default of Degraded Grassland, or 0.3 debits/acre.

When credits are calculated on Conservation Lands for Taylor’s Checkerspot, habitat values will be generated based on field surveys implemented as part of Effectiveness Monitoring. On-the-ground surveys will evaluate the vegetation composition across the site, collecting the data needed to assign acres of habitat at the site to the categories of prairie quality (Table 7.1). Where data identify the presence of High-Quality Native Prairie, and survey data confirm the site is occupied, a full value of 1 credit/acre may be achieved. For this purpose, Taylor’s Checkerspot occupancy is defined as a concentration of individuals greater than eight individuals per hectare detected in a single 25 m spaced survey (USFWS 2017).

The release of these credits is described in Section 7.8: Credit Release Schedules.

The methods to be employed in credit and debit calculations for Taylor’s Checkerspot Butterfly are described in detail in Appendix H: Credit-Debit Methodology.

7.5.3 Credit-Debit Methodology for Oregon Vesper Sparrow

For Oregon Vesper Sparrow, debits and credits will be computed based on occupancy, or incremental/increased occupancy, and habitat quality and function.

To calculate debits for Oregon Vesper Sparrow, available data (e.g., Basemaps) are evaluated to assess and describe current occupancy and proximity. Occupancy and proximity place the impact area(s) in one or more of the categories identified in Table 4.1. Accordingly, the appropriate/corresponding assigned relative occupancy habitat values (from Table 7.4) are summed for the impact(s). Also, for debits, a value for habitat quality and function is added. Though the categories of prairie quality are described with the Performance Standards (Table 7.1), and the relative values for each have been assigned (Table 7.3), because on-the-ground surveys are not required for prairie impacts, this habitat quality value is assumed to be a default of Degraded Grassland, or 0.4 (debits/acre).

Table 7.4 Assigned occupancy values for Oregon Vesper Sparrow habitat. A value of 1 = 100% value.

Occupancy Category	Definition of Category	Relative Occupancy Values
Category 1: Occupied	Site is known to be occupied by Oregon Vesper Sparrow	1
Category 2: Adjacent or Proximal to Occupancy	Site occupancy is unknown, but site is located on a parcel adjacent to a site known to be occupied by Oregon Vesper Sparrow	0.8
Category 3: Suitable, not adjacent to occupancy	Site occupancy is unknown, and site is not located on a parcel adjacent to a site known to be occupied by Oregon Vesper Sparrow	0

When credits are calculated on Conservation Lands, Oregon Vesper Sparrow occupancy and habitat values will be generated based on field surveys during Effectiveness Monitoring, and best available data on occupancy. Occupancy data will be evaluated to assign the occupancy, per the categories in Table 4.1. On-the-ground surveys will also evaluate the vegetation composition across the site, collecting the data needed to assign acres of habitat at the site to the categories of prairie quality identified in the Performance Standards (Table 7.1) and calculate a value for habitat quality and function using Table 7.3. Occupancy and habitat quality values are summed for a total credit value (functional acres).

The release of these credits is described in Section 7.8: Credit Release Schedules.

The methods to be employed in credit and debit calculations for Oregon Vesper Sparrow are described in detail in Appendix H: Credit-Debit Methodology.

7.5.4 Credit-Debit Methodology for Oregon Spotted Frog

For Oregon Spotted Frog, debits and credits will be computed using the [Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington](#). The Oregon Spotted Frog through its life cycle relies upon wetland habitat which including, lakes margins, marshes, and emergent wetlands as well as some riparian area. The Department of Ecology has created a rapid assessment tool to be able to determine the functions and values for these types of freshwater vegetated wetlands. The credit-debit tool considers water quality, hydrologic functions, and habitat functions (e.g., accounting for providing of habitat for federally listed species) through the assessment process. The tool also accounts for indirect effects of landscape-scale impacts (e.g., urbanization). The tool is based on the best available information and is the only peer reviewed “rapid” method available and calibrated to wetlands in the State.

If Oregon Spotted Frog habitat is delineated in an area that does not meet the Washington State definition of a wetland, the habitat will be mitigated for at a 1:1 ratio. The Oregon Spotted Frog Performance Standards and Oregon Spotted Frog credit release schedule will still be utilized, except Phase II will be combined with Phase III in the credit release schedule.

7.6 Mitigation Mechanisms

7.6.1 Mitigation Fee in Lieu of Land Dedication

Habitat mitigation credits will be secured in advance of impacts occurring to the Covered Species. Credits will be secured via the conservation measures within the Conservation Objectives described in Chapter 5: Conservation Program (New Reserves, Working Lands Easements, Enhanced Existing Preserves). Each site generating credits will, at a minimum:

- Provide for permanent habitat protection of the site through fee title acquisition or a permanent Conservation Easement (e.g., Appendix L: Model Conservation Easement);
- Develop a Site Management Plan (e.g., Appendix I: Site Management Plan Template) for the site; and
- Provide financial assurances, in the form of a non-wasting stewardship endowment to fund habitat management/enhancement, monitoring, maintenance, and adaptive management in perpetuity (including contingencies). Non-wasting endowments are further described in Section 8.3.

Applicants will access credits made available through the above-described mitigation, by applying for an appropriate review for the development and paying a Mitigation Fee to the County. This fee will be deposited into a dedicated County account that funds Conservation Program implementation, including establishment of non-wasting endowments. (HCP Costs and Funding are discussed in Chapter 8).

7.6.2 Mitigation via Land Dedication

An applicant may request to mitigate on an unaffected portion of the property where impacts will occur or mitigate on other lands he/she owns (land dedication). To ensure that implementation of the HCP will not substantially compromise the assigned role (or contribution) that designated critical habitat must

fulfill to achieve both survival and recovery in the wild for each Covered Species, impacts to any Covered Species occurring within designated critical habitat will be mitigated via land dedication within the same designated critical habitat unit as the impact. Thurston County will determine whether lands are eligible for use as mitigation by land dedication under the HCP as follows:

- Conservation of the mitigation site must contribute to the Biological Goal and Conservation Objectives of the HCP Conservation Program, benefit the Covered Species to be mitigated, and meet the Conservation Land selection criteria (see Section 5.4).
- Mitigation site must meet the minimum size requirement specified for each species in Section 5.4. In general, sites must be a minimum of 50 ac (20 ha), for TCB or MPG, a minimum of 20 acres for OVS, and a minimum of 5 ac for OSF. If mitigation area proposed is smaller, then it must be adjacent to an already-conserved land with like habitat and similar land management.
- The mitigation site must be identified as a New Preserve, Working Lands Easement, or Enhanced Existing Preserve²⁷.
- In all cases, the mitigation site must be under a permanent Conservation Easement held by the County or approved nonprofit conservation organization with third party enforcement right bestowed to County. The Easement must include protection of the Covered Species and Conservation Values. The process to establish the easement will include due diligence, such as a Phase 1 Environmental Site Assessment, appraisal, and title search.
- The mitigation site must have an approved Site Management Plan (see Appendix I: Site Management Plan Template) that includes but is not limited to, performance standards, the schedule for expected achievement of Performance Standards, mitigation and long-term maintenance, in addition to monitoring and reporting requirements.
- The mitigation site must be supported by a non-wasting stewardship endowment to fund habitat management/enhancement, monitoring, maintenance, and adaptive management of the property in perpetuity (including contingencies). Non-wasting endowments are further described in Section 8.3.
- Baseline inventory of site conditions at the time of acquisition must document that the site is of sufficient habitat quality and function, and occupancy/proximity of the Covered Species to provide the mitigation required. Baseline documentation calculations of site credit capacity will utilize the HCP Performance Standards and Credit-Debit Methodology for the Covered Species to be mitigated.
- The mitigation site requirements listed above will be incorporated into permit conditions.

²⁷ Use of an Enhanced Existing Preserve for land dedication is expected to be uncommon.

7.6.3 Use of an Independent Conservation or Mitigation Bank

Applicants may elect to purchase mitigation credits from an independent conservation or mitigation bank that sells credits for the Covered Species (and Service Area, for Mazama Pocket Gopher subspecies) to be impacted. Mitigation banks and the credits they release for sale must be fully approved by USFWS. For such credits to be used as part of the process to obtain a Certificate of Inclusion under the Thurston County HCP, adequate documentation of credit equivalency and consistency with the HCP (inclusive of Performance Standards and criteria for Conservation Lands acquisition) must be provided by the Applicant and approved by the County, and any additional fees required be paid to the County.

7.7 Conservation Lands Site Management Plans and Targets

For each Conservation Land, including New Reserves, Working Lands Easements, and Enhanced Existing Preserves (inclusive of lands dedicated in lieu of mitigation), a Site Management Plan will be developed (see Appendix I: Site Management Plan Template). An existing Management Plan may be updated for Enhanced Existing Preserves. Each Site Management Plan will describe factors including but not limited to:

- Property description and management zones to be applied at the site, if appropriate;
- Summary of the site's habitat and Covered Species inventory and analysis (in each zone, if appropriate);
- Description of desired future conditions;
- Habitat restoration and enhancement and management prescriptions;
- Description of overall site management and coordination (including coordination with third parties);
- Restoration, enhancement, management, and maintenance activities, projected costs (with contingencies), and endowment calculations;
- Performance Standards and Performance Targets, credit release schedule, and endowment funding schedule;
- Description of monitoring and adaptive management protocols and parameters; and
- Site Management Plan, amendment process, transfer, and notices.

Each Conservation Land will have a unique baseline condition and desired future condition identified in its Site Management Plan. Desired future conditions are expected to vary across the different types of Conservation Lands, and in general, will align with the targets identified in Table 7.5. The County will not approve Site Management Plans that seek to establish and maintain a significant Shrub-Dominated component as part of the desired future conditions.

For Working Lands Easements, the County recognizes that not all working land settings and practices will provide and maintain the same kind of habitat function and value for the Covered Species. However, along the continuum of working land practices, some (e.g., diversified cropping systems with no till) may establish the conditions that correspond to low-functioning Mazama Pocket Gopher subspecies habitat (i.e., Degraded Grassland), and some others (e.g., livestock pasturing at sustainable stocking rates with rotational grazing and spring deferral) may establish the conditions that correspond to higher-functioning habitat for multiple Covered Species (i.e., Native Prairie, or even High-Quality Native Prairie). The County recognizes and reinforces a practical and inclusive approach to habitat restoration on Conservation Lands of the HCP.

Table 7.5 Desired future conditions at Prairie sites within the Conservation Lands System.

HCP Conservation Land Type	Target Desired Future Prairie Condition*
New Reserves	Native Prairie and High-Quality Native Prairie
Working Lands Easements	Degraded Grassland minimum, with areas of Native or High-Quality Native Prairie
Enhanced Existing Preserves	Enhancement of baseline conditions, which are expected to be Degraded Grassland at a minimum, with lift to Native Prairie or High-Quality Native Prairie. Note that no credits can be taken for baseline condition on these lands – only for increases in habitat value.

**The County will not approve Site Management Plans that seek to establish and maintain a significant Shrub-Dominated component as part of the desired future conditions.*

7.8 Credit Release Schedules

7.8.1 Overview

Credits for each Covered Species may be earned incrementally and will accrue over time but cannot be released and used for the purpose of off-setting debits until net benefits are convincingly demonstrated. Each Conservation Land will be unique, as will the desired future conditions of the site and the schedule of achieving specific Performance Standards. The Site Management Plan for each Conservation Land, for all Covered Species, will include a projected credit release schedule for the site. Site Management Plans are reviewed by the HCP Implementation Team and approved by the County.

Approved Site Management Plans must include an endowment funding schedule. Endowment funding contributions must, at a minimum, track the percentage of total projected credits released except for the initial release in which the endowment will be funded within one year of the initial release. For example, if the total endowment funding requirement is \$100,000, then \$15,000 must be paid into the endowment prior to the Phase I release of 15% of total projected credits. An additional \$15,000 must be paid into the endowment prior to the Phase II release of an additional 15% of total projected credits, etc.

At New Reserves and Working Lands Easements, initial credits can be earned and released after successful completion of the administrative milestones, such as acquisition of the site or easement, completion of Baseline Documentation Report, establishment of easements, (or other assurances provided through the County), and approval of a Site Management Plan. Initial credits are calculated from the habitat quality/function and species occupancy documented in the baseline inventory in the Baseline Documentation Report. Additional credits can then be earned with successful attainment of ecological milestones, such as restoration and enhancement that result in improvement in prairie quality/function and increases in species occupancy during the active management period.

At Enhanced Existing Preserves, establishment of a legally enforceable instrument with the Landowner or Manager (where necessary), establishment of Baseline Documentation Report, completion of an approved Site Management Plan that includes a schedule of credit release and stewardship endowment funding, and habitat restoration that achieves functional lift above baseline must be completed in advance of initial credit release. The following stages of credit release are consistent with the process of New Reserves and Working Lands Easements. At any and all Phases, for credits to be verified and released at Enhanced Existing Preserves, clear documentation must identify and distinguish that credits are earned via funding provided by the HCP Conservation Program, and not from state or federal funds designated to the Existing Preserve.

Ultimately, the fullest attainment of enhanced Conservation Value and credit will depend on achieving the Performance Standards and desired future conditions for the site (including species occupancy), and the maintenance of those desired future conditions in perpetuity.

Credits will be verified and released from each Conservation Land. This process will include documentation containing all the necessary information (e.g., Baseline Conditions, achievement of Performance Standards and Targets representing enhanced ecological functions and 'functional lift', administrative milestones including endowment funding schedule, etc.). Credits will be released as soon as the metrics identified above have been met and verified or validated. Where habitat enhancement is achieved, additional credits will also be released, when required conditions have been met. The geographic area generating credits will be mapped via GIS after USFWS review and distributed to both parties. Table 7.6 identifies milestones for credit release.

Upon the final release of credits, the Conservation Land moves beyond the period of active management. However, the enhanced values of the site (improved habitat conditions, beneficial response) must be monitored and adaptively managed to ensure their durability. The agreed-upon desired future conditions and final Performance Standards (as described in each approved Site Management Plan) must be maintained in perpetuity. Approved Site Management Plans will include monitoring beyond the period of active management, to inform effective adaptive management.

7.8.2 *Prairie Species*

A generalized credit release schedule for the Covered Species in prairie habitat is included in Table 7.6.

Table 7.6 Generalized credit release schedule for Covered Species in prairie habitat on HCP Conservation Lands in Thurston County.

Event or Milestone	Credit Release – New Reserves, Working Lands Easements	Credit Release- Enhanced Existing Preserves
Purchase of Conservation Easement or purchase of property in fee title and execution of a Conservation Easement on the property. Completion of baseline documentation and an approved Site Management Plan. Site Management Plan includes Performance Targets and schedule of endowment deposits.	Initial release: Credits corresponding to baseline condition	n/a
Establishment of an enforceable agreement with Landowner/Manager of Enhanced Existing Preserve (where necessary), and approved Site Management Plan, which includes Performance Targets and schedule of endowment deposits.	n/a	No Credit Release
Habitat restoration progresses; Accomplishment of Phase I Performance Targets	Interim Release: Additional credits released as computed from functional lift (habitat and occupancy)	Initial Release: Credits released as computed from functional lift above baseline (habitat and occupancy)
Habitat restoration progresses; Accomplishment of Phase II Performance Targets	Interim Release: Additional credits released as computed from functional lift (habitat and occupancy)	
Habitat restoration progresses; Accomplishment of Phase III, IV, V (...) Performance Targets	Interim Release: Additional credits released as computed from functional lift (habitat and occupancy), not to exceed final 15% of credits anticipated	
Final Phase; Endowment fully funded	Release of final 15% of credits as computed from functional lift (habitat and occupancy)	

7.8.3 Oregon Spotted Frog

Wetland credits shall be released for transfer to County Departments and/or County permittees according to the procedure and schedule described below. The actual number of credits released shall be determined based on conservation objective, initial site condition, and desired future condition; this will be on a site by site basis. The credit release schedule may be accelerated commensurate with performance.

Approved Site Management Plans must include an endowment funding schedule must, at a minimum, track the percentage of total projected credits released except for the initial release in which the endowment will be funded within one year of the initial release. For example, if the total endowment

funding requirement is \$100,000, then \$15,000 must be paid into the endowment prior to the Phase I release of 15% of total projected credits. An additional \$15,000 must be paid into the endowment prior to the Phase II release of an additional 15% of total projected credits, etc. No credit transfer shall occur until the applicable credit release has occurred. Credits shall be released as follows:

1. 15% of the total anticipated wetland credits upon completion of Phase I which includes:
 - a. Purchase of a Conservation Easement, or purchase of property in fee title and execution of a Conservation Easement on the property; or
 - b. Establishment of a legally enforceable document with landowner/manager of Existing Preserve; and
 - c. Completion of Baseline Documentation Report and County approved Site Management Plan. Site Management Plans include performance standard targets and schedule of endowment deposits; and recordation of the approved restrictive covenant or other approved site protection mechanism.
2. 15% of the total as-built wetland credits upon successful completion of Phase II where physical and biological wetland restoration/enhancement work is completed in accordance with the approved Site Management Plan. The initial physical and biological improvements must be completed no later than the first full growing season following initial debiting from the mitigation site.
3. 20% of the total as-built wetland credits upon attainment of the Performance Standards in Phase III.
4. 20% of the total as-built wetland credits upon attainment of the Performance Standards in Phase IV.
5. 15% of the total as-built wetland credits upon attainment of the Performance Standards in Phase V.
6. 15% of the total as-built wetland credits upon attainment of the Performance Standards in Phase VI.

7.9 Land and/or Conservation Easement Acquisition

7.9.1 Overview and Logistics

Protection, enhancement, and management of habitat supporting the Covered Species is paramount to achieving the Biological Goal of the HCP.

Thurston County will prioritize proposed Conservation Lands for acquisition based on the criteria established in Section 5.4. All mitigation lands will be secured by adequate legal, real estate (e.g., the execution of Conservation Easements on all enrolled lands), and financial protections to ensure the success of the mitigation and meet Performance Standards. All lands will have a Site Management Plan (Appendix I: Site Management Plan Template) reviewed by the HCP Implementation Team. Each Site Management Plan will set site-specific objectives for habitat enhancement, Performance Standards, and management actions to protect Covered Species and their habitat.

The estimated acres of Conservation Lands to be engaged/enrolled in the Conservation Program for each Covered Species or Service Area is included in Table 7.7. The acres per Conservation Objective are designated based on the County’s initial assessment of the feasibility of engaging/enrolling lands in each aspect of the Conservation Program, which will be reassessed and adaptively managed over the term of the HCP. The acres per Conservation Objective were calculated based on assumptions regarding desired future conditions and associated credit yield from the lands engaged/enrolled in each Conservation Objective (summarized in Table 7.8). These assumptions will be adjusted as Conservation Lands are acquired and progress towards Performance Standards is tracked through Effectiveness Monitoring.

Table 7.7 Projected acres of Conservation Lands to be engaged/enrolled in the Conservation Program.

	Projected Conservation Lands Engaged/Enrolled (Acres)								Total
	YPG N	YPG E	YPG S	OPG	TPG	TCB (in YPG S)	OVS (in YPG E)	OSF	
New Reserves	744	400	516	346	73	0	0	618	2,698
Working Lands Easements	0	163	210	0	28	0	31	0	433
Enhanced Existing Preserves	0	130	168	0	0	40	0	0	339
TOTAL	744	693	895	346	101	40	31	618	3,469

Table 7.8 Projected average credit (functional acre) yield per acre for each Covered Species within each HCP Conservation Objective.

	OPG, TPG, all YPG	TCB	OVS	OSF
New Reserves	1.83	0.8 ¹	0.8 ¹	1
Working Lands Easements	1.6	0.6 ¹	0.8	n/a
Enhanced Existing Preserves	0.4	0.4	0.4 ¹	0.5 ^{1,2}

¹ These Conservation Objectives are not currently used in the projections in table 6.3 but could be used over the Permit Term for this Covered Species.

² Projected average credit per acre. However, actual credit may vary as the credits earned will be based on the lift provided.

A summary of logistics (differentiated by Conservation Objective) in Conservation Lands acquisition, including roles of ownership, holding of easements and endowments, implementing restoration, management, maintenance, and monitoring, is included in Table 7.9. Thurston County’s HCP Coordinator will coordinate the acquisition of Conservation Lands and Conservation Easements with oversight from the Board of Commissioners. The County will work from the projected acres of Conservation Lands to be engaged/enrolled through the Conservation Program identified in Table 7.7, in concert with modeling of population, real estate and permitting trends in the RPAs, to develop a schedule to pursue land acquisitions for each Covered Species and Service Area.

Table 7.9 Summary of Conservation Lands System logistics for the Thurston County HCP, including land ownership, holding easement and endowment, habitat restoration, habitat maintenance, monitoring, and reporting.

Ownership	Easement Holder	Stewardship Endowment Holder	Restoration, Enhancement, Maintenance Implementation	HCP Compliance Monitoring & Reporting	Biological Effectiveness Monitoring & Reporting
County	NCO	NCO or NFWF	NCO, Contractor, funded by endowment	County	County-Contractor/NCO
NCO ¹	County	NCO or NFWF	NCO, Contractor, funded by endowment	County	County-Contractor/NCO
Private Landowner	County	NCO or NFWF	Landowner, or NCO or Contractor funded by endowment	County	Contractor/NCO, funded by Landowner
Private Landowner	NCO ²	NCO or NFWF	NCO, Contractor, funded by endowment	County	County-Contractor/NCO
State/Land Trust	N/A, by MOU/ Site Management Plan, land already has dedicated for conservation purpose	NCO or NFWF	On behalf of state, funded by County	County	County-Contractor/NCO

¹The definition of Nonprofit Conservation Organization (NCO), contained in the glossary to this HCP, incorporates the definition of nature conservancy corporation contained in RCW 64.04.130 and 84.34.250.

²May vary with landowner preference, must align with limitations on federal funds.

The County will maintain information regarding Conservation Lands acquisition on its website. On an as-needed-basis, the County will issue a call for specific Conservation Lands opportunities (New Reserves, Working Lands Easements, Existing Preserves). Anyone is welcome to respond to that call (e.g., land trusts, private conservation banks, individual landowners, homebuilders, etc.). The process will follow these steps:

- County issues a call for HCP Conservation Lands and mitigation credit needs by Service Area (Figure 5.1) and Conservation Objective (New Reserves, Working Lands Easements, Enhanced Existing Preserves);
- The County conducts outreach and provides technical assistance to increase interest in participation;
- Interested parties submit letters of inquiry describing site location, habitat type, habitat objectives, project cost, and estimated credit types and quantities;
- County will review letters of inquiry to invite a subset of eligible projects for full proposals;
- Proposals are selected and proponents enter into a binding agreement with the County. The agreement might simply be a credit purchase agreement from a USFWS-approved private conservation bank, or a conservation easement to enhance or develop New Reserves, Working Land Easements, or Enhanced Existing Preserves;
- The County will review and approve, in consultation with the HCP Implementation Team, Site Management Plans and Performance Standards;
- The County will record all habitat mitigation credits and report those credits to USFWS in the HCP Annual Report;
- Securing Working Lands Easements will be overseen by the County but implemented in close coordination with contractors familiar to landowners and farmers; and
- The County and its designees will work with willing landowners to develop Site Management Plans, complete Baseline Documentation Reports; and Enter into Conservation Easement Agreements.

Voluntary permanent Conservation Easements (hereafter referred to 'Conservation Easements') on private lands are an important tool, one that the County will use together with fee title acquisition from willing sellers to fulfill the land conservation commitments. Conservation Easements are voluntary, legally binding agreements between a landowner and an easement holder that restrict certain uses of the land to protect Covered Species and other Conservation Values while the landowner maintains fee title ownership of the property. Under the HCP, the conditions of Conservation Easements must provide sufficient protection of a sufficient amount of land to achieve the biological goal and objectives of the HCP. A number of entities may hold HCP Conservation Easements (e.g., the County, land trusts). If an entity other than the County holds the Conservation Easement, the County, and the USFWS must be made third-party beneficiaries for enforcement of the Conservation Easement, and have a right of access for monitoring (see the model Conservation Easement in Appendix L). Although Conservation

Easements can include a variety of restrictions and stewardship commitments, only those that are permanent and meet statutory and regulatory requirements, including specific substantiation requirements, are considered viable tools for implementing land conservation under the HCP.

The primary purpose of Conservation Easements on private lands under the HCP will be to provide the combined benefit of conservation for Covered Species and other Conservation Values, while allowing the property owner continued, compatible grazing and agricultural uses. The County will achieve most of its conservation through Conservation Easements. Easements the County purchases from willing landowners on agricultural lands will allow the use of agricultural practices that are compatible with the conservation of the covered species.

The County will use Conservation Easements as an important tool in HCP implementation in two ways:

- Conservation Easements purchased from a private party and placed on the land that remains in the ownership of that private party (i.e., as an alternative to fee title acquisition); and
- Conservation Easements placed on land acquired in fee title by the County to secure credit under the Plan (see Section 7.9: Land and/or Conservation Easement Acquisition).

In all cases, the terms included in Conservation Easements executed in furtherance of the Conservation Land System will be consistent with the requirements of this HCP and the Model Conservation Easement contained in Attachment L. The section below describes the process for developing acceptable Conservation Easements in all cases.

Easements on Private Lands

The HCP assumes that the County will purchase land for the Conservation Lands System and secure Conservation Easements. Conservation Easements are appropriate where landowners wish to retain ownership and some control of the property and the County can meet the HCP conservation goals with a Conservation Easement. The Conservation Easements purchased by the County are intended to preserve, and in some cases enhance, Covered Species and other Conservation Values that exist on a property. The County will only release credits from portions of properties that meet one or more of the goals of the HCP toward the conservation commitments outlined in the Conservation Program.

Easements Acquired for or by the County

If the County purchases land, or receives a donation of land, for the Conservation Lands System, a Conservation Easement must be placed on the land area proposed for mitigation to ensure permanent protection. The Conservation Easement will be held by the County or NCO.

For lands engaged/enrolled for the Conservation Lands System, but owned by state or local government or an NCO as defined in this document, permanent protection must also be ensured by a Conservation Easement or other enforceable documents (see Table 7.9), consistent with the requirements herein and held by the County.

The County, or partners who acquire Conservation Easements on behalf of the County with HCP funding, will use the guidelines described below.

All Conservation Easements acquired to fulfill the requirements of the HCP and Incidental Take Permit will be in perpetuity and in accordance with applicable Washington State law, including Washington Revised Code Section 64.04.130²⁸. All Conservation Easements will be acquired voluntarily. As illustrated in Table 7.9, the County or another qualified NCO (e.g., a land trust) may own or hold the Conservation Easement, provided the holder meets and complies with all provisions of applicable law that dictate the qualifications of Conservation Easement holders.

After acquisition of an easement interest in qualifying lands, the County may transfer its interest in such lands by a recorded instrument to a state agency, or a private nonprofit nature conservancy corporation (as defined in RCW 64.04.130 or 84.34.210) Alternatively, the County may contract with one or more of the foregoing entities to exercise the County's management authority over the qualifying lands. Any such contract will include provisions fully advising the contracting party of the rights of the landowner under this chapter and the conveyance instrument. The County shall notify the landowner of any transfer of its interest in the qualifying lands or any transfer of management responsibilities over those lands, provided failure to so notify the landowner shall not affect the validity of the transfer. An objective of the easements is to have consistency in enforcement, monitoring, and maintenance. For land owned by the County, the easement must be held by another qualified conservation organization.

If Thurston County contracts with a landowner subject to the terms of a Conservation Easement or another party to manage property for conservation of Covered Species, Thurston County may employ third-party monitoring to ensure compliance with the terms of the Conservation Easement.

USFWS will be named as a third-party beneficiary on all Conservation Easements. The USFWS will rely on the County and other Conservation Easement holders to verify and enforce all easement terms. The USFWS, as a third-party beneficiary, would have the right to access the property to verify compliance with the easement terms, and to enforce those terms, in the highly unlikely event that a Conservation Easement's terms are not being enforced.

To ensure compliance with the HCP, all Conservation Easements will follow the Model Conservation Easement in Appendix L as closely as is reasonably possible²⁹. Non-substantive deviations from the model may be needed to address site-specific constraints. The County and USFWS must review and approve any substantive deviations from the model conservation easement according to Section 7.14.

It is the responsibility of participating landowners to abide by the terms of these Conservation Easements. Subject to the limitations stated in the preceding paragraph, the landowner and the County will negotiate the terms and, where applicable, the prices of Conservation Easements on a case-by-case basis. The specific terms of the Conservation Easement will be based on site conditions, landowner site management preferences and/or operations, and species and habitat values on the property. Some landowners may wish to reserve a portion of their property for a home site or other approved use. In those cases, the Conservation Easement may either exclude the incompatible site or apply to the entire

²⁸ This section of Washington law allows placement of restrictions on the use of land for conservation purposes that is binding on all successive owners of the land.

²⁹ The Conservation Easement template is likely to be modified over the course of HCP implementation, subject to approval by the USFWS, through the minor modification process described in Section 7.14, Amendments).

property but define the portion of the site in which the incompatible uses are allowed.³⁰The County will only release credits from portions of properties that meet one or more of the goals of the HCP toward the conservation commitments outlined in the Conservation Program. Each Conservation Easement for the property or portion of the property that will be incorporated into the Conservation Lands System will be substantially consistent with the Model Conservation Easement contained in Appendix L, and will without limitation:

- Ensure that the property will be kept in compatible grazing and/or agricultural uses that support the Covered Species and other Conservation Values, or, for properties that will not be used for the production of crops or livestock, in its natural or existing condition (all or portions of the site may also be enhanced or restored);
- Protect the existing, enhanced, and/or restored Conservation Values of the property in perpetuity;
- Require compliance with the approved Site Management Plan for the property.
- Designate USFWS, and their respective successor or assigns, as third-party beneficiaries to the Conservation Easement for enforcement purposes.
- Ensure that the Conservation Easement can only be extinguished by court order, and in compliance with any applicable provisions of state and federal law, and with the prior written consent of the County, and the third-party beneficiary
- Consistent with the requirements of the HCP and Incidental Take Permit, restrict the uses of the property to those activities that do not interfere with and that support the protection, management, or enhancement of Covered Species and other Conservation Values; and
- Prevent any use of the property that would impair or interfere with the Conservation Values of the property.

The Conservation Easement will describe the Conservation Values of the property. Associated Site Management Plans will describe Conservation Values, at a minimum, using the land cover types and Covered Species habitat described in Section 2.2, Covered Species and Habitat, and Appendix B: Covered Species Descriptions. A legal description and map must be included in the easement.

Each Conservation Easement will prohibit certain activities, as described in the template provided in Appendix L, except as necessary to meet the biological goal and objectives of the HCP (including reserve infrastructure required to support monitoring, management, and maintenance). The County will describe these allowances in the site-specific Site Management Plan that the County will develop in coordination with the landowner, consistent with the Site Management Plan template provided in Appendix I: Site Management Plan Template. In addition, all Conservation Easements will be recorded

³⁰ There may be advantages to having the Conservation Easement apply to the entire site (e.g., to avoid cost boundary surveys to define the Conservation Easement more narrowly than the property boundary).

with the Thurston County Auditor, and will, without limitations, include or incorporate by reference the items listed below:

- The initial pre-acquisition assessment, or baseline report, of Covered Species and other Conservation Values present.
- A detailed list of the allowable uses and use restrictions on the parcel, consistent with the minimum requirements stated above.
- Mandatory terms and conditions to protect, maintain, and enhance (if any) the Conservation Values, pursuant to Chapter 5 of the HCP; detailed site prescriptions in this regard will be include in the approved Site Management Plan, which will be incorporated by reference into the Conservation Easement.
- Provisions for reasonable access, upon prior notice, by the USFWS and the County or their designees, to monitor compliance with the terms of the Conservation Easement and to carry out all applicable management, enhancement, and monitoring requirements described in Chapter 5 and Chapter 6.
- Conservation Easements on grazing lands will state whether grazing is allowed. If so, the Site approved Site Management Plan that is incorporated by reference in the Conservation Easement, will establish conditions for grazing at the site. These desired conditions and grazing limitations may be allowed to fluctuate if specified in the Site Management Plan. The Conservation Easement will describe a baseline condition to provide a benchmark and measure habitat enhancement on the site.
- Provisions for enforcement and available remedies for the County or appropriate other party in the event that title holder or a third party violates the terms of the Conservation Easement.
- If the easement boundaries are different from the parcel boundaries, a legal description and map of the easement boundaries will also accompany the easement.
- When a site-specific Site Management Plans is prepared for Conservation Easements that encumber private property, the easement will indicate where that the site-specific Site Management Plan may be found and that the terms of such site-specific Site Management Plan shall be incorporated by reference in the Conservation Easements, and maintained at the USFWS and the County offices. The initial Site Management Plan shall be recorded with the land deed, as an exhibit to the CE to ensure that the site-specific approved Site Management Plan will be tied to the Conservation Easement in the event property ownership changes. This shall also ensure management of the site in perpetuity, according to the provisions of the approved Site Management Plan and Conservation Easement. Subsequent modification or amendments to the Site Management Plan need not be recorded but shall be maintained and held by the County at a known location.

To approve and accept a Conservation Easement, the County must have the following documentation:

- A pre-acquisition assessment of the property, or Baseline Documentation Report, that summarizes the baseline biological conditions, of Covered Species and habitat condition;
- A preliminary title report and legal description of the property;

- Evidence of all other easements, covenants, restrictions, reserved rights (including mineral rights), and property interests (including water rights);
- A Phase 1 Environmental Site Assessment to identify potential environmental contamination if there are indications that a property may have previously included uses that have the potential for contamination; and
- A map of the parcel and a description of its physical condition (e.g., roads, buildings, fences, wells, other structures) as well as its relation to other components of the reserve system and other properties that are subject to other permanent protections for conservation purposes.

Conservation Easement Minimum Requirements

This section describes, in general terms, the required content of a Conservation Easement and some of the significant restrictions that must be included in a Conservation Easement for it to contribute toward the goals of the HCP. See the Model Conservation Easement included in Appendix L for more detailed information.

Content of an HCP Conservation Easement

Each HCP Conservation Easement deed is a recorded in-perpetuity deed restriction instrument that is conveyed to the County or other appropriate entity (e.g., an NCO, an accredited land trust) to restrict the uses of the subject property in a manner that achieves the intended conservation goals and objectives. The stated intent of each HCP Conservation Easement is the perpetual protection, management, enhancement, and monitoring of Covered Species and other Conservation Values. The following describes important content of each HCP Conservation Easement:

1. **Conveyance Form.** This section of the easement contains the identification of the parties, a description of the parcel(s), required words of conveyance, and a statement of consideration. All persons with ownership interest in the property must be a party to the deed.
2. **Recitals.** The recitals identify the nature of the agreement and describe the intent of the parties in establishing the Conservation Easement. They also identify the Conservation Values that warrant protection and the statutory foundation for the transaction.
3. **Easement Holder's Rights.** This section must grant the County or the NCO easement holder (as applicable) the right to enforce the restrictions of the easement and the right to access the land for monitoring purposes. Ancillary rights related to these two primary functions of the holder are also granted.
4. **Third-Party Beneficiary Rights.** The USFWS, their successors and assigns, will be granted third-party beneficiary status, which affords them the right to enforce the Conservation Easement, and provides them with access to the lands covered by the easement.
5. **Restrictions and Reserved Rights.** This section identifies the land use restrictions, allowable and prohibited uses and activities, the requirement for prior approval of certain activities by the Conservation Easement holder, and those rights reserved by the landowner. All rights and restrictions will be directly relevant to the conservation purposes of the easement.

6. **Administrative Provisions.** This section must include all provisions that establish the Conservation Easement holder's and the County's rights and remedies in case of a violation. The easement must include an environmental indemnity to ensure that the easement holder will not be liable under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 United States Code [U.S.C.] Sections 9601 et seq.) or the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. Sections 6901 et seq.), and Washington State dangerous waste regulations (Chapter 173-303 WAC). Additional administrative clauses that govern, among other items, procedures for enforcement, notices, and required approval may be included.
7. **Signatures of Necessary Parties.** All Landowners (Grantors) and the Conservation Easement holders (Grantees) must sign the Conservation Easement. Signatures must be notarized.
8. **Exhibits.** The legal description of the property and the initial Site Management Plan is incorporated by reference in, and appended as exhibits at the end of, the Conservation Easement. The easement may also be clarified by attaching maps and other relevant information.

Minimum Restrictions of a Thurston County HCP Conservation Easement

This section applies to all Conservation Easements for lands enrolled in the Conservation Land System, whether they are held by Thurston County, or an NCO (e.g., an accredited land trust). The County will develop Performance Standards and minimum Conservation Easement requirements for HCP Conservation Easement properties. In particular, the County will identify standard restrictions on allowable uses and develop a list of inconsistent uses for each conveyed easement to clearly identify the intended objectives, methods, and assurances that each Conservation Easement is expected to provide for achieving the Conservation Objectives of the property. These Performance Standards will represent the minimum Conservation Easement requirements. The County may negotiate additional requirements and restrictions with each property owner on a case-by-case basis. Where an NCO (e.g., an accredited land trust) holds the Conservation Easement, the County or its designee will develop the approved Site Management Plan in consultation with the NCO. At minimum, the Restrictions and Reserved Rights section of each Conservation Easement (or, in some instances, the Site Management Plan) must:

1. Identify the Conservation Values, including the Covered Species, the natural communities, and habitat for Covered Species that are addressed by the Conservation Easement;
2. Identify the conservation actions that may be implemented by the Conservation Easement holder, and their successors, assigns, contractors, and agents, on the property (e.g., habitat improvements, control of non-native species, monitoring and data collection);
3. Identify the grazing and agricultural uses that are allowable under the Conservation Easement, and/or the practices that are not allowable under the easement, as applicable for the Easement Area;
4. Grant in-perpetuity protection of the Easement Area and the Conservation Values found thereon, from all potentially adverse uses of the property;
5. Allow the County, the NCO (e.g., accredited land trust) to designate a successor or easement holder at its discretion;

6. With the exception of development deemed necessary to support habitat restoration activities, and grazing and agricultural activities that protect the Conservation Values and are allowable under the Conservation Easement and associated Site Management Plan, and Development Envelopes in a Conservation Easement, no development may occur and all future surface and subsurface development rights within the Easement Area will be extinguished.
7. The ability to change the pace of use, abandon, sever or transfer any water rights from both the Easement Area and Development Envelopes will be extinguished;
8. Allow the Conservation Easement holder and County, and their successors, assigns, contractors, designees, and agents, access to the property to determine compliance with and to enforce the Conservation Easement;
9. Allow the Conservation Easement holder and County, and their successors, assigns, contractors, designees, and agents, access to the property to conduct HCP required biological monitoring and documentation of conditions, implement habitat improvements covered under the Conservation Easement, and control non-native species;
10. Incorporate by reference the approved Site Management Plan for the Conservation Easement;
11. Provide standards for Conservation Easement enforcement, amendments, and modification procedures;
12. Provide a clear set of restrictions and/or limitations on allowable grazing and agricultural uses in the Easement Area; grazing, agricultural, educational, and recreational uses must not interfere with or prevent the protection of the Covered Species and Conservation Values;
13. Clearly describe activities and actions by the landowner that require prior consent from the Easement Holder;
14. Describe generally the extent to which removal, filling, or other disturbances to the soil surface, as well as any changes in topography, surface or subsurface water systems, wetlands, or natural habitat, may be allowed without approval by the Easement Holder; except for any portions of the Easement Area where normal grazing and farming practices will continue, and the Conservation Easement will identify the allowable (or, alternatively, prohibited) grazing and agricultural practices (and specify any additional prohibitions);
15. Declare that all terms and conditions of the easement run with the property and shall be enforceable against the landowner or any other person or entity holding any interest in the property;
16. Provide for the notification of the County at least 90 working days prior to the transfer of title to the property; and
17. Prohibit use of any pesticide or herbicide that, in the sole judgment of the County or the USFWS may negatively impact Covered Species or other Conservation Values.

Allowable Activities on Thurston County HCP Conservation Lands System

The following discretionary and non-discretionary activities may be conducted on HCP Conservation Lands. In many instances, these activities will involve both the continuation of ongoing activities on properties and new activities related to implementation of HCP conservation measures. Within the restrictions on allowable uses detailed in Conservation Easement deeds, approved Site Management Plans, and the HCP, the following activities may be allowable on HCP Conservation Lands at the discretion of the County:

- Habitat management activities, as provided for in Chapter 5 Conservation Program, and described in an approved Site Management Plan (Template in Appendix I).
- Biological and physical resources monitoring, as described in Chapter 6: Monitoring and Adaptive Management.
- Directed studies or surveys that support the HCP adaptive management framework and non-HCP related research approved by the County.
- Controlled passive recreational uses (e.g., hiking, bird watching, and non-commercial fishing and hunting) and minor facilities to support such uses (e.g., trails, check-in kiosks, and interpretive signs), as approved within Site Management Plans and County approved Conservation Easements. If there are trails or permanent structures, however, this acreage will not count toward the HCP conservation commitments. If new trails or structures are built, this acreage will be counted as part of the jurisdiction's take. The County expects that most Conservation Easements will preclude public access.
- Access for emergencies and public safety (e.g., fire suppression, flood control, and emergency response).
- Use of existing, non-public roads on reserve lands to provide land manager and local landowner access to adjoining lands, provided that there is no added or additional impacts to Covered Species, and no impacts to or additional losses of other Conservation Values identified in the Baseline Conditions Report.
- Access to and maintenance of existing road and utility infrastructure (e.g., maintenance of below and above ground electric transmission lines, below and above ground cable and telephone lines, and underground pipelines) on reserve lands, consistent with pre-existing easements and any other pre-existing and recorded road or utility encumbrances attached to property titles.
- Grazing practices (including rotation practices that are necessary to maintain production over time), as allowable under County-approved Conservation Easements.
- Use of approved pesticides, herbicides, and other agro-chemicals in accordance with U.S. Environmental Protection Agency (EPA) labels; for land application, the recommended application shall not be harmful to mammals, reptiles, and amphibians (use of these chemicals is not a Covered Activity under the HCP).
- Educational tours of reserve lands (e.g., school science classes), as authorized by the County

With respect to all allowable uses of Conservation Lands, the County must ensure that the intended conservation benefits and Conservation Values of the Conservation Lands, as stated in the HCP Conservation Program, are not compromised.

7.9.2 *Willing Sellers*

Properties or Conservation Easements acquired as part of the HCP will only be acquired from willing sellers. Thurston County will not condemn land to satisfy the conservation measures in the HCP, nor will the County partner with any organization to condemn land for the HCP, including contributing funding towards condemnation.

7.9.3 *Gifts of Land*

Thurston County may accept land or Conservation Easements as a gift or charitable donation. The County will evaluate the conservation benefit of the lands donated relative to the Biological Goal, Conservation Objectives, and requirements of the HCP. Donated land not contributing to these Biological Goal, Conservation Objectives, and requirements may be sold or exchanged, subject to any restrictions imposed by the donating entity, to enable acquisition of land or Conservation Easements that do contribute to the HCP Biological Goal and Conservation Objectives, and requirements.

7.9.4 *Public Access*

Public access to properties with Conservation Easements will only be allowed with the Conservation Easement holder's and landowner's consent, and where access and use does not adversely affect the Covered Species and other Conservation Values. Public access will be specifically addressed in each Conservation Easement and approved Site Management Plan.

7.10 Data Management

Thurston County will maintain a data management system to track Incidental Take Permit compliance, monitoring data, and all appropriate aspects of the HCP. The data repository will be updated as needed and queried for annual reporting to the USFWS. The County will ensure quality assurance/quality control of the data and provide adequate metadata documentation for all data (i.e., why, how, and where data were collected). Spatial data will be maintained by Thurston GeoData. The primary types of information to be included in the County's data management system for the HCP include, but are not limited to, compliance and Effectiveness Monitoring data, and the information needed for the HCP Annual Report (see Section 7.15).

Thurston County will comply with Washington State RCW 40.14 Preservation and Destruction of Public Records regulations. More specifically, the County will continue to comply with the file retention and storage standards pursuant to the Local Government Common Records Retention Schedule and Land Use Planning and Permitting Records Retention Schedule as approved and amended by the Washington Office of the Secretary of State. Additionally, GeoData stores County enterprise data, which includes the Gopher and prairie data, in a SQL Server ESRI Geodatabase. This database is archived and records all edits, back to 2012 when it was implemented. The layers stored inside the geodatabase can be pulled for any timeframe since the archiving was implemented.

7.11 Schedule

Milestones for HCP implementation are outlined in Table 7.10. This schedule does not prevent Thurston County from accomplishing these milestones earlier than anticipated.

Table 7.10 Milestones for HCP implementation.

<p>Year 1</p> <p><u>Program Operation:</u></p> <ul style="list-style-type: none">• Pass local resolution and ordinance to implement HCP (the County cannot utilize the HCP or issue Certificates of Inclusion until this is complete);• Train staff on HCP requirements, particularly Best Management Practices for County actions and permit issuance; and• Establish databases. <p><u>Conservation:</u></p> <ul style="list-style-type: none">• Create Site Management Plans and review Baseline Documentation Reports for Conservation Lands acquired since the listing decision date for MPG, OSF, TCB, and OVS and establish legally enforceable instruments (where necessary) with land managers for credits;• Create Site Management Plans for Working Lands Easements, Enhanced Existing Preserves, New Reserves;• Acquire properties and Conservation Easements from willing sellers and donors to establish HCP Conservation Lands and prepare and approve associated Site Management Plans;• Conduct public outreach activities; and• Begin Effectiveness and Compliance Monitoring. <p><u>Covered Activities:</u></p> <ul style="list-style-type: none">• If/when credits are secured for release, begin receiving and reviewing requests for Certificates of Inclusion. Mitigation must be completed in advance of impacts.
<p>Years 2-4</p> <p><u>Program Operation:</u></p> <ul style="list-style-type: none">• Implement data management and prepare HCP Annual Reports. <p><u>Conservation:</u></p> <ul style="list-style-type: none">• Acquire new Conservation Lands from willing sellers, establish Conservation Easements, and prepare associated Baseline Documentation Reports and Site Management Plans;• Conduct public outreach activities;• Implement habitat restoration and enhancement projects at newly secured HCP Conservation Lands; and• Continue Effectiveness and Compliance Monitoring. <p><u>Covered Activities:</u></p> <ul style="list-style-type: none">• Continue receiving and reviewing requests for Certificates of Inclusion; and issue Certificates of Inclusion where credits are available for release.

Years 5-30

Program Operation:

- Implement data management and prepare HCP Annual Reports.

Conservation:

- Acquire properties and Conservation Easements from willing sellers to establish new HCP Conservation Lands and prepare and approve associated Site Management Plans;
- Conduct public outreach activities;
- Implement habitat restoration, management, and maintenance at HCP Conservation Lands;
- Complete Effectiveness and Compliance Monitoring;
- Follow management guidelines at HCP Conservation Lands and update Site Management Plans and guidelines as needed through Adaptive Management; and
- Complete 5-year review of Adaptive Management actions, including efficacy of adaptive management triggers (minimum of every 5 years).

Covered Activities:

- Continue receiving and reviewing requests for Certificates of Inclusion; and issue Certificates of Inclusion where credits are available for release.

7.12 Changed Circumstances

The term “changed circumstances” is defined in 50 C.F.R. 17.3, and means changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated by plan or agreement developers and the Service and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events). When additional conservation and mitigation measures are deemed necessary to respond to changed circumstances, and are provided for in an HCP, the permittee must implement the measures specified in the HCP (50 C.F.R. 17.22(b)(5)(1)). If circumstances change, Thurston County may update its actions to address such changes. Possible changed circumstances are summarized in Table 7.11.

Table 7.11 Summary of possible changed circumstances during the term of the Incidental Take Permit.

Event	Major Amendment Needed?	Remedial Action	Cost Projection
Additional, Non-HCP Covered Species Listed Under the ESA in the HCP Covered Plan or Permit Area	Yes	County will evaluate the HCP conservation program practices and ensure take avoidance for newly listed species. implementation	If additional permit coverage is required, that action is outside the scope of the current HCP.

Event	Major Amendment Needed?	Remedial Action	Cost Projection
Covered Species is Delisted	In limited circumstances	A delisted species would be considered a covered, unlisted species and Thurston County would continue to implement and associated species-specific conservation strategies. Thurston County and USFWS may consider a permit amendment to remove the delisted species from coverage under the Thurston County HCP.	There are not meaningful costs anticipated. A permit modification is outside the scope of the HCP.
Involuntary loss conservation land area within Conservation Land System (CLS) (e.g., exercise pre-existing mineral right, eminent domain, hazardous spill, etc.).	No	Loss of land area may result in the loss of mitigation credit. If the mitigation credit is needed to offset mitigation impacts which have already occurred, the lost CLS mitigation value will be replaced in full through commitment of additional CLS lands.	No meaningful cost anticipated. Assume an off-set thorough proponent causing the loss of conservation lands mitigation action.
New soil identified with use by one or more MPG subspecies, or soil series are modified by NRCS	No (unless insufficient take is available)	County extends take coverage to new soil areas.	There are not meaningful costs anticipated beyond updating County databases and overlays.
Natural Catastrophes - Severe drought, wildfire or windstorm on HCP Conservation Lands on a multi-site or program level	No	Evaluate damage and modify mitigation Site Management Plans as needed.	Costs will vary with severity of event. These costs are taken into consideration through contingency cost planning.
Toxic or hazardous spill	No	Render assistance to responding agencies. Seek post-spill remedies from the responsible parties through regulating agencies.	These costs are taken into consideration through contingency cost planning.
New designation or revision to federal critical habitat	No	County will coordinate with USFWS to determine if new determination and existing ITP are in conflict.	If additional permit coverage is required, that action is outside the scope of the current HCP.

7.12.1 Additional Federally Listed or State Listed Species

USFWS may list additional species as threatened or endangered under the Federal ESA that are not HCP covered species. If USFWS lists a species that is not covered by the Thurston County HCP, the provisions of this changed circumstance will be automatically triggered.

Upon a new listing of a species under federal endangered species law, Thurston County will undertake the following measures:

- Evaluate the potential impacts of the conservation programs practices on newly listed species and assess the presence of suitable habitat in areas of potential effect and,
- Implement measures to avoid take of the newly listed species until such time as Thurston County HCP and permit have been amended to include the newly listed species as a covered species.

Alternatively, Thurston County may receive take authorization for the newly listed species as needed on a project-by-project basis through individual incidental take authorizations (i.e., not under the Thurston HCP).

Should additional species not covered by the HCP be listed, proposed, or petitioned for listing, Thurston County may choose to request a major amendment to the Incidental Take Permit to provide coverage for incidental take that may result from the Covered Activities described in this plan, or from additional Covered Activities that may result in take. To determine whether to make this request, Thurston County may consider whether the species is present in the Permit Area covered by the HCP and if it is likely to be affected by the Covered Activities. If incidental take coverage is desired by Thurston County, the County will seek to amend the Incidental Take Permit and HCP. Alternatively, Thurston County may apply for a new and separate Incidental Take Permit. Procedures for amending the HCP are outlined in Section 7.14. Alternatively, the County may elect to refer affected parties seeking a County permit to the USFWS.

7.12.2 Covered Species Delisting

In the event that a Covered Species is recovered and delisted by USFWS, Thurston County may consider a permit amendment to remove the delisted species from coverage under the Thurston County HCP. However, the delisted species would be considered a covered, unlisted species and Thurston County would continue to implement and associated species-specific conservation strategies until a permit amendment, if determined to be warranted, is issued. Thurston County will continue to manage, monitor, and maintain Conservation Lands where mitigation has been completed for the species in accordance with the sites' Site Management Plans and Conservation Easements, in perpetuity.

7.12.3 Involuntary loss of land within Conservation Land System

Should the County lose land area within the Conservation Land System (CLS) either partially or totally, resulting in the loss of mitigation credit needed to offset mitigation impacts which have already occurred. Reasonably foreseeable loss may result from changed circumstances including those identified in 7.12.5 and 7.12.6 below. In the event of a loss, the lost CLS mitigation value will be replaced in full through commitment of additional CLS lands or rehabilitation of the impacted site.

7.12.4 Soil Changes for Mazama Pocket Gopher Subspecies

If research identifies a new soil with use by a Mazama Pocket Gopher subspecies, or soil maps are otherwise substantively revised, the County will be able to extend Incidental Take Permit coverage to the new areas within the Permit Area. If such a change results in insufficient take being available, the County will evaluate how to proceed via an HCP amendment or referral of Certificate of Inclusion Applicants to USFWS.

7.12.5 Natural Catastrophes

A number of natural catastrophes could occur, including flooding, drought, wildfires, and windstorms.

Flooding

If any HCP Conservation Lands are flooded beyond regular seasonal flows during the Permit Term, Thurston County will evaluate the site during the field season following the flood to determine any negative effects the flooding may have had on the site, and the County will take appropriate action, with technical assistance from USFWS, to determine effectiveness of restoring or enhancing the site.

Drought

Extreme and prolonged drought may threaten drinking water, water supplies for fire suppression, water-dependent agriculture, industry, and fish, wildlife, and plants. Drought is a serious problem for all Covered Species, but particularly for Taylor's Checkerspot Butterfly. If its host or nectar sources do not produce sufficient food at the right time, mortality of butterfly adults and larvae occur. During drought conditions some plants do not produce seed, which could further affect the continued existence of the population of that species. If drought conditions threaten Covered Species in Conservation Lands, Thurston County, in collaboration with the HCP Implementation Team and the conservation land manager(s), may determine if water is reasonably available elsewhere and coordinate to transport it to the affected sites for drought abatement in key restoration areas. Thurston County, in collaboration with the HCP Implementation Team and the conservation land manager(s), may also consider enhancing populations of more drought-tolerant plants.

Wildfires

When managed, prescribed fires are a useful tool for conserving or enhancing native prairie species. However, uncontrolled wildfires may negatively affect Covered Species populations either directly by burning the organisms or indirectly through firefighting actions (trampling of plants, eggs, or larvae; potential harm from fire retardants). If a fire occurs and firefighters attempt to control it, human health and safety will take precedence over protection of Covered Species. Within one year of a wildfire affecting HCP Conservation Lands, the County will determine the status of the site and the need for restoration and/or enhancement efforts. Any restoration/enhancement work needed will be performed pursuant to the contingency measures in the Site Management Plan (Appendix I: Site Management Plan Template).

Windstorms

The Pacific Northwest may experience strong windstorms in the fall and winter months. These windstorms can damage trees, buildings, and structures. Following a windstorm, Thurston County will assess the damage to the HCP Conservation Lands within six months. Any fallen trees negatively

affecting the Covered Species will be removed with care to minimize further impacts to the species. Sites will be restored or enhanced, as needed.

7.12.6 Toxic or hazardous spill

Thurston County will where appropriate render assistance to responding agencies. The County will seek post-spill remedies from the responsible parties through the appropriate regulating agencies (e.g., Department of Ecology through the Model Toxic Control Act). If it is determined by USFWS or the spill results in the loss of mitigation credit needed to offset mitigation impacts which have already occurred. The county will implement requirements as described in 7.12.3 above.

7.12.7 New Designation or Revision to Federal Critical Habitat

In the event that new federal critical habitat is designated for one of the Covered Species, or the existing designation is revised, the County and USFWS will evaluate the intersection with the HCP. The USFWS will determine if the new designation and existing Incidental Take Permit are in conflict. If additional Incidental Take Permit coverage is advisable, the County will determine the best course of action.

7.13 Unforeseen Circumstances and “No Surprises” Assurances

Unforeseen circumstances defined by Federal regulation (50 CFR §17.3), are changes in circumstances affecting a species or geographic area covered by an HCP that could not reasonably have been anticipated by the Applicant or the USFWS at the time of an HCP’s development, and that result in a substantial and adverse change in the status of the Covered Species. The USFWS is responsible for determining if an unforeseen circumstance has occurred and notifying Thurston County. In the event of an unforeseen circumstance, Thurston County will not be required to increase the amount of mitigation required under the HCP. USFWS and the County may work together to identify opportunities to re-allocate resources in an appropriate manner, but only if measures are limited to modifications within covered habitat areas, if any, or the HCP’s operational Conservation Program for the affected species, and if such measures maintain the original terms of the HCP to the maximum extent possible (50 CFR 17.22).

The County requests assurances consistent with federal No Surprises Regulation that USFWS will not:

- Require the commitment of additional land, water, or financial compensation by the Permittees in response to unforeseen circumstances other than those agreed to elsewhere in the HCP; or
- Impose additional restrictions on the use of land, water, or natural resources otherwise available for use by the Permittees under the original terms of the HCP to mitigate the effects of the Covered Activities or in response to unforeseen circumstances.

As described in the No Surprises Regulation, it is USFWS’ responsibility to demonstrate the existence of unforeseen circumstances using the best scientific and commercial data available. For the purpose of this plan, “unforeseen” circumstances are circumstances that are highly unlikely and not reasonably foreseeable to occur and thus will not be funded by this Plan.

The federal No Surprises Regulation does not limit or constrain the USFWS or any federal, state, local, or tribal government agency, or private entity, from taking additional actions at its own expense to protect or conserve Covered Species. The federal No Surprises Regulation also does not prevent USFWS from asking the Permittees to voluntarily undertake additional mitigation on behalf of the affected species.

7.14 Amendments

The County requests an Incidental Take Permit with a 30-year duration based upon implementation of this HCP. During that period the County or the USFWS may propose minor or major amendments to the HCP or the Incidental Take Permit. The party proposing the amendments shall provide the other parties with a written statement of the reasons for the amendments and analysis of the effects of the amendments on (1) the Covered Species, and (2) implementation of the HCP or the Incidental Take Permit. The Incidental Take Permit may be amended in accordance with all applicable laws and regulations in place at the time of the amendment.

7.14.1 Minor Amendments

Thurston County may request minor amendments to the Incidental Take Permit or HCP. Minor amendments to the HCP or Incidental Take Permit do not require amendment of the County's Implementing Ordinance. Minor amendments do not include actions:

- Resulting in obligations under the modified HCP significantly different from those analyzed in connection with the original HCP;
- Resulting in adverse effects on the environment significantly different from those analyzed in connection with the original HCP;
- Allowing additional take not analyzed in connection with the original HCP; or
- Reducing the number of mitigation credits (functional acres) required.

In that context, minor amendments may include, but are not limited to, the following:

- Correction of any maps or exhibits to correct errors;
- Clarification of described methods for calculations or procedures;
- Modifications to or adoption of additional conservation measures likely to improve the conservation of Covered Species;
- Modifications related to the approved adaptive management framework;
- Clarification of components of the Incidental Take Permit or HCP;
- Updates/ corrects to land cover or other resource maps and/or species occurrence data;
- Minor changes in the reporting protocol; and
- Other proposed changes to the Thurston County HCP that have been determined to be insubstantial and appropriate for implementation as a minor modification by USFWS.

The party proposing the amendment must provide the other parties with written notice, except when another process is specifically identified under the terms of the HCP with respect to a particular amendment. The parties agree to use their best efforts to respond to proposed amendments within sixty (60) days of receipt of such written notice. The amendment shall be approved upon written agreement of both parties. A minor amendment of the HCP does not require an amendment of the Incidental Take Permit but requires approval from both parties before being implemented. If the parties agree to a minor amendment, the USFWS will authorize such approval in writing in accordance with applicable regulations and policies. The modifications will be considered effective on the date of USFWS' written authorization. A record of any minor amendments to the HCP or Incidental Take Permit shall be documented in writing by the County.

7.14.2 Major Amendments

A major amendment to the HCP is a change affecting the impact analysis, need for additional incidental take coverage, or the Conservation Measures. Major amendments require amending the HCP or the Incidental Take Permit following a formal review process similar to that used for the original HCP and Incidental Take Permit, including USFWS review, NEPA review and internal USFWS Section 7 consultation.

Major amendments to the HCP or Incidental Take Permit may require amendment of the County's Implementing Ordinance pertaining to the HCP or Incidental Take Permit.

Major amendments may include, but are not limited to, the following:

- Adding or removing a Covered Species;
- Increasing the amount of take allowed under the Incidental Take Permit;
- Adding one or more activities to the list of Covered Activities; and
- Modifying a conservation measure outside of the adaptive management program framework.

Thurston County will submit requests for major amendments to the USFWS. The request shall include a description of the proposed amendment, the need for the amendment, and an assessment of its impacts.

7.15 Annual Reporting

Thurston County will submit an HCP Annual Report to the USFWS within 90 days of the close of each reporting year. This report will provide the information to demonstrate to USFWS that the HCP is being implemented in line with its terms and conditions, propose any modifications to HCP implementation, and identify administrative or other minor changes to improve success.

At a minimum, the Annual HCP Report will include reporting year and cumulative (from the start of the Permit Term) information:

1. Summaries of or a list of the Covered Activities implemented.
2. Quantify the impacts from Covered Activities.

3. Quantify and describe the extent of take for each Covered Species as a result of the Covered Activity.
4. Description of how the conservation commitments of the HCP Conservation Program (e.g., Conservation Measures) were implemented and their results (including debit and credit ledgers).
5. Description of the monitoring results and survey information:
 - Outputs from Monitoring and Evaluation:
 - Annual reports must document the status of plan compliance including:
 - land acquisition/protection activities implemented (including copies of completed Conservation Easements, Baseline Documentation Reports and approved Site Management Plans),
 - management activities implemented,
 - monitoring activities implemented, and
 - funds expended for implementation.
 - Annual reports should document the effectiveness of plan implementation in meeting stated biological goal and objectives, including:
 - status and trends of resources (e.g., Effectiveness Monitoring data on Covered Species, habitat quality and function),
 - status and trends of known threats, and
 - effects of management actions in achieving the desired condition.
6. Description of any circumstances that made adaptive management actions necessary at both the program level and site level and how it was implemented.
7. Description of any changed or unforeseen circumstances that occurred and explain how they were addressed.
8. Summarize funding expenditures, balance, and accrual.
9. Summarize any minor or major amendments.
10. Description of any non-compliance issues and how they were resolved.
11. Include any other information as required by the permit or HCP.

7.16 HCP and Incidental Take Permit Renewal

Incidental take coverage will be available over the life of the requested 30-year Incidental Take Permit duration. Thurston County is requesting an Incidental Take Permit. If a written request for renewal is on file with USFWS at least 30 days prior to the HCP/ Incidental Take Permit expiration, the Incidental Take Permit will continue to be valid while the renewal request is processed. The renewal request must certify the statements and information in the original HCP are correct or include a list of changes. The renewal request must also specify what take has occurred under the Incidental Take Permit /HCP and

the Covered Activities still likely to occur during the renewal time period. The USFWS will process the renewal application in accordance with then applicable statutes and regulations.

7.17 Enforcement

The provisions in this HCP are enforceable through the terms and conditions of the Incidental Take Permit, Conservation Easements, and applicable statutes, regulations, and policies.

7.18 Notice

Any notice required to be given by USFWS to the County pursuant to the terms and conditions of the HCP and Incidental Take Permit must be given to the Thurston County Board of Commissioners by personal delivery or by certified mail/return receipt requested as described in the Incidental Take Permit.

7.18.1 Suspension/Revocation

The USFWS may suspend or revoke the Incidental Take Permit if Thurston County fails to implement the HCP in accordance with the terms and conditions of the Incidental Take Permit or federal law. Suspension or revocation of the Incidental Take Permit, in whole or in part, by the USFWS shall be in accordance with (50 CFR Section 13.27 and 13.28 and other applicable statutes and regulations) in force at the time of suspension.

Chapter 8 Costs and Funding

One of the key requirements for an Incidental Take Permit is identification and pursuit of reliable funding sources to implement the Conservation Program set forth in the HCP. Thurston County understands that failure to ensure adequate funding of the Conservation Program outlined in the HCP is grounds for full or partial suspension of the Incidental Take Permit. This section addresses the estimated costs of implementing the HCP and identifies sources of funds for implementation.

Thurston County is fully committed to fund and implement the HCP in its entirety. Although the funding measures may be modified during the term of the Incidental Take Permit, the County shall ensure that adequate, reliable funding is in place to fund its HCP commitments.

8.1 Cost to Implement the Conservation Program

The cost analysis is based on the County's vision of 30-year implementation of the Conservation Program. Cost estimates were based on the best available information and represent average unit costs in 2019 dollars. The costs of individual items will fluctuate above and below these averages. Therefore, costs should be considered planning-level estimates. Cost estimates are for the 30-year Permit Term of the HCP assuming 5,216 functional acres of habitat impact and the commensurate mitigation credits required. If not all impacts occur, cost projections will require adjustment through adaptive management.

Table 8.1 summarizes the likely costs to implement the HCP, within the following four categories:

- Conservation Program administration;
- Conservation Lands acquisition;
- Conservation Lands initial habitat restoration and enhancement (active phases); and
- Conservation Lands management and maintenance (long-term).

8.2 Cost Estimate Methodology

This section provides an explanation of each cost category and the methods that were used to develop the Conservation Program cost estimate.

Table 8.1 Projected HCP costs by category and implementation period (2019 dollars).

Cost Category	Implementation Period (Years)		
	Annual costs	5-year costs	30-year costs
Conservation Program Administration & Reporting	\$400,000	\$2,000,000	\$12,000,000
Conservation Lands Acquisition and Easements	\$2,350,706	\$11,753,530	\$70,521,181
Habitat Enhancement	\$358,021	\$1,790,104	\$10,740,622
Conservation Lands Management and Maintenance (includes endowments)	\$1,063,240	\$5,316,198	\$31,897,188
Totals	\$4,171,966	\$20,859,832	\$125,158,991

8.2.1 Conservation Program Administration

Conservation Program administration costs involve the support of employees, facilities, equipment, and vehicles to implement the program. Administration also includes the required data collection and reporting. Annual program administration costs are estimated to be, on average, \$400,000 during the Permit Term (Table 8.1). The County may choose to assign some of its HCP administration functions to designees. Employee costs comprise the annual salaries for program administration personnel. For the purposes of the cost estimate, it is assumed that the following positions would be staffed within the County: HCP Coordinator (Program Lead) and HCP Conservation Associate. A standard Thurston County salary multiplier was used for each employee (program administration and non-program administration staff) to include the cost of standard County employee benefits such as health insurance, payroll taxes, training, and a retirement plan.

Conservation Program administration also includes the operational costs of land acquisition transactions, which are only expected during the 30-year Permit Term. Land transaction costs include landowner recruitment, due diligence, Baseline Documentation Preparation, and initial site improvements. The process of investigating a parcel of land before acquiring it is considered due diligence. Due diligence costs include the costs for appraisal, preliminary title report, Phase 1 Environmental Site Assessment, and legal description. Due diligence costs may include the cost of a boundary survey and documentation, if necessary. To determine the cost of boundary surveys and other costs that are dependent on parcel size, an average parcel size and perimeter length was developed using GIS analysis. Baseline surveys will include land cover type, vegetation quality characterization, soils, and Covered Species populations. The cost of these surveys is based on the estimated number of hours per acre required to gather data and hourly rates for contracting biologists.

8.2.2 Conservation Land Acquisition

Total land acquisition costs for the Conservation Program are estimated at approximately \$70,521,181 (\$2,350,706 annually) over 30 years. Land values were estimated based market land value data for the 2020 tax assessment year pulled directly from the Thurston County Assessor’s Office, accessed on

8/16/2019, 8/22/2019, and 11/07/2019. The analysis included 9,000 parcels of greater than 5 acres (2 ha) in size within RPAs, stratified by each Service Area, and 1,991 parcels of greater than 5 acres in size in the OSF Habitat Screen. The estimated average cost of land per acre is summarized by Service Area in Table 8.2. All land value estimates represent average planning-level estimates. Actual sales prices of individual properties will vary. Land acquisition costs are an area of uncertainty and will be adaptively managed during the HCP.

Table 8.2 Estimated average land acquisition value (fee simple acquisition) per acre in the Service Areas and the OSF Habitat Screen (2019 dollars).

Service Area	YPG N	YPG E (Includes OVS)	YPG S (includes TCB)	OPG	TPG	OSF Habitat Screen
Average Land Cost/Acre	\$22,543	\$18,643	\$12,142	\$78,928	\$10,787	\$12,253

OVS = Oregon Vesper Sparrow, TCB = Taylor’s Checkerspot Butterfly

Acquisition costs for permanent Working Lands Easements were estimated at the \$10,000/acre maximum used by USDA Natural Resources Conservation Service for habitat for threatened and endangered species (Dave Kreft, NRCS, personal communication January 12, 2016). The share of acquisition costs paid by a given project proponent will be proportional to the debit (impact) of the project.

Fee title and Conservation Easement land acquisitions are assumed to occur evenly through time over the course of the Permit Term, staying ahead of the actual rate of development impacts. Land costs will likely increase over time; mechanisms for addressing these increases are described in Section 8.4.

8.2.3 Conservation Land Habitat Restoration and Enhancement

Initial habitat restoration and enhancement over the 30-year HCP is estimated to cost a total \$10,740,622 (\$358,021 annually; Table 8.1). Restoration and enhancement costs for prairie and OSF Conservation Lands are an area of uncertainty and will be adaptively managed during the HCP.

Prairie Conservation Lands

Costs were estimated using a tool created by University of Idaho Extension (Painter 2020). The 2020 Prairie Habitat Restoration Budgets tool is a budgeting framework in which variable prices are inputs (e.g., costs of fuel, seed, plant plugs, pesticides, adjuvants, infrastructure construction, labor, machinery), and units needed are estimated on a per parcel (Thurston County used a standardized size of 50 acres, as this is the minimum identified for Conservation Lands) and per acre basis, over a multi-year schedule. The County recognizes that each Conservation Land will be unique and pose different habitat restoration and enhancement challenges.

The County expects that the initial investment for restoration and enhancement will vary across New Reserves, Working Lands Easements, and Enhanced Existing Preserves. New Reserves are expected to have the greatest investment, followed by Enhanced Existing Preserves, and Working Lands Easements

are expected to have the lowest initial restoration and enhancement costs. This expectation is justified based on the level of starting (baseline) and restored habitat quality (Performance Targets) projected for each of these Conservation Program objectives.

To develop landscape-scale estimates of habitat restoration and enhancement costs at New Reserves, the County used the scenario of a newly acquired 50 ac (20 ha) site that has 25-50% Scotch broom cover and few native prairie plant species present. The activities projected to occur on the site, and the associated costs are summarized in Appendix M: Sample Conservation Land Restoration Schedule and Costs. The County estimates a cost of \$4,000/acre, which includes estimated contingency costs, for the active restoration and enhancement phase (typically expected to be the first 5-10 years after property acquisition) for habitat restoration and enhancement at New Reserves. These costs may be condensed into a faster paced schedule (five years) or extended over a longer period (10 years or more). The schedule for restoration of any given Conservation Land will be identified in the Site Management Plan. In the scenario the County used to project costs, the initial restoration phase was projected over nine years, with an annual average cost of \$435/acre. The restoration and enhancement activities included labor, equipment, and materials for the following (here reported for a 50 ac site):

- Public outreach and communication (32 hours annually at \$35/hour);
- Full credit-debit monitoring in years 3, 6, 9 (80 hours at \$35/hour);
- Scouting/assessment at 32 hours annually (8 hours/quarter at \$35/hour);
- Planning/reporting at 80 hours first year (Site Management Plan), 48 hours in years 4 and 7 (reporting and adaptive management process after full monitoring), 32 hours all other years (all at \$55/hour);
- Initial mowing of Scotch broom (Year 1; 50 hours at \$28/hour);
- Contract prescribed burns (each half of each site burned every third year, for a total of 6 burns at \$6,000/burn, assuming one burn missed with weather);
- Invasive species control (grass-specific and broadleaf, differentiated by burned and unburned areas, 52-65 hours /year at \$28/hour); and
- Seeding and planting in most years (native grass, native forb mix, and plugs).

On Working Lands Easements, the County assumed that initial restoration and enhancement costs would be half of that on New Reserves and an estimated total of \$2,000/acre, with an annual average estimated cost of \$218/acre for the active phase of restoration and enhancement (i.e., the first 5-10 years after establishment of the easement). This cost assumption includes contingency costs and the decrease is justified on the basis that Performance Targets are expected to be lower for Working Lands Easements, which will reduce input costs for pesticides, prescribed burns, and labor.

In the case of Enhanced Existing Preserves, active phase habitat restoration and enhancement costs are projected to be 75% of that on New Reserves or a estimated total of \$3,000/acre, with an annual average estimated cost of \$326/acre for the active phase; i.e., the first 5-10 years). These cost totals per

acer also includes contingency costs. The lower cost is based upon the assumption that on average, the baseline habitat condition at Existing Preserves, as lands already in conservation, will be higher quality than for New Reserves, and will not be Scotch broom dominated, thus requiring a lower initial restoration and enhancement investment.

OSF Conservation Lands

Restoration and enhancement costs for Conservation Lands with OSF are expected to be lower than for prairie Conservation Lands. This assumption is based on the prioritization criteria for OSF Conservation lands identifying that that lands acquired from OSF will already support the species or contain verified suitable habitat. The County does not anticipate it will be completing major hydrological projects to establish suitable OSF habitat on Conservation Lands.

The cost projections include active phase restoration and enhancement costs \$875/acre, or if a 5-year schedule of initial restoration and enhancement is assumed, \$175/acre/year. This includes funds for the similar planning, scouting/assessment, outreach, and monitoring activities as described for prairie Conservation lands (roughly an average of \$110/year), as well as additional funds for annual invasive species control (e.g., reed canarygrass) and contingency costs.

8.2.4 Conservation Land Long-Term Management and Maintenance

After the initial phase of habitat restoration and enhancement, Conservation Lands will be managed and maintained at their restored and enhanced condition in perpetuity. This perpetual management and maintenance will be funded by non-wasting stewardship endowments that are established and funded during the HCP Permit Term for all Conservation Land. Full funding of the anticipated non-wasting endowments for all Conservation Lands to be acquired is estimated at a total of \$31,897,188 (\$1,060,178 annually over the 30-year HCP; Table 8.1). Long-term costs for prairie and OSF Conservation Land management and maintenance are an area of uncertainty and will be adaptively managed during the HCP.

Prairie Conservation Lands

For prairie Conservation Lands, long-term land management and maintenance cost calculations based on the following estimates:

- New Reserves: Long-term annual per acre management and maintenance cost of \$400 and annual per acre contingency cost of \$200.
- Working Lands Easements: Long-term costs are approximately 50% of the costs of maintaining New Reserves, or long-term annual per acre management and maintenance cost of \$200 and annual per acre contingency cost of \$100.
- Enhanced Existing Preserves: Long-term costs are approximately 75% of the costs of maintaining New Reserves, or long-term annual per acre management and maintenance cost of \$300 and annual per acre contingency cost of \$150.

For all prairie Conservation Lands, the activities to occur during long-term maintenance and management are the same as for initial restoration and enhancement. Prairies are known to be ecological systems which are disturbance-dependent, meaning that they require ongoing management

to maintain them as prairie. The difference (moderate reduction) in annual per acre cost for long-term management and maintenance compared to the restoration and enhancement in 8.2.3 is expected to result from utilizing slightly longer fire return-intervals (five to six year intervals rather than three year intervals), lower native species seeding and planting rates (as native vegetation is more strongly established), and somewhat reduced invasive species control labor, materials, and equipment costs. The contingency costs are expected to be necessary for costs relating to infrastructure (e.g., fencing), and other needs. Overall, per acre costs are expected to decrease with economies of scale as the number of Conservation Lands gets larger.

OSF Conservation Lands

The cost of long-term land management and maintenance of OSF Conservation Lands was estimated to be the same as active phase restoration and enhancement, at \$175/acre/year.

8.2.5 Adaptive Management

Adaptive management activities with the Conservation Land System (CLS) include any change in the management of the CLS necessary to meet the biological goals and objectives described in Chapter 5, *Conservation Program*. Monitoring described in Chapter 6, *Monitoring and Adaptive Management* informs these changes.

As currently designed, the adaptive management decisions making process is part of the regular land management duties. Therefore, the assumed costs associated with the adaptive management decision making process are allocated between restoration/ enhancement and long-term management/maintenance and the conservation program management.

8.2.6 Remedial Measures for Changed Circumstances

As described in Section 7.2 Changed Circumstances, The County is required to implement remedial actions if any of the changed circumstances occur. The County will maintain sufficient financial reserves to fund remedial action described in Section 7.2 when they arise. At the time the County will annually assess its funding reserves and supplement the reserves to fund implementation of remedial actions in the coming year, base on historic events and frequency. Funds used to supplement these financial reserves could come from outside the County or with in the County budget (i.e., funds shifted from other HCP users). This approach will ensure that the adequate funds are available immediately in the event of a changed circumstance occurring.

Annual funding for remedial measures will grow each year in proportion of the Conservation Land System, with substantial funding for remedial reserves generated later in the permit term. The changed circumstances described in Section 7.2, are more likely to occur on a larger scale in the permit term because of the greater size of the Conservation Land System and the expected effects of climate change.

The cost assumptions are made for planning purposes and will not limit the County's obligation to respond to these changed circumstances. Remedial measures for the Conservation Land System not required after the permit term; therefore, these costs are assumed to apply only during the permit term.

8.3 Stewardship Endowments

For all Conservation Lands, inclusive of dedicated lands, land management/enhancement, monitoring, maintenance, and adaptive management will be required in perpetuity. The An NCO that has experience in stewardship in endowment management will held stewardship endowment established by the County pursuant to the HCP (see Table 7.9) The full cost of the above described management and maintenance including contingency costs is based on establishing non-wasting stewardship endowments.

For the projections estimated here, Thurston County assumed a 3.2% annual inflation rate, a 1% endowment administration fee and an average of 8.5% rate of return (gross) over time³¹. Uncertainty in stewardship endowment rates of return will be addressed via adaptive management.

The Site Management Plan developed for each Conservation Land will include information regarding the stewardship endowment. Each Site Management Plan will include a PAR©³² (Property Analysis Record) or similar output that describes the estimated costs of management, restoration and/or enhancement, maintenance, monitoring, contingencies, adaptive management responses, and responses to changed circumstances (Section 8.4.3). This information is used to calculate the required stewardship endowment amount for each engaged/enrolled Conservation Land. Each Site Management Plan will also include a schedule for funding the stewardship endowment, which will relate to the planned credit releases from the site.

HCP Annual Reports during the Permit Term will include a status report of endowment fund(s), including receipts, disbursements, earnings, and balance.

8.4 Conservation Program Funding Sources and Assurances

This section describes methods for assembling the estimated \$4,171,966/year needed to implement the Conservation Program. Funding to implement the Conservation Program will come from sources in two primary categories (Table 8.3):

- **Mitigation Fees.** These include Land Use permit applicant's mitigation fees and the costs paid by Thurston County for capital projects to purchase credits to mitigate debits from its own Covered Activities (e.g., transportation projects).
- **Other Local Funding.** This will include contributions from Conservation Futures (funded from property tax). Other possible local sources of local funding could be identified during the Permit Term.

³¹ These estimates are based on actual experience of conservation endowment managers in Thurston County and incorporated information provide by National Fish and Wildlife Foundation

³² Property Analysis Record is a tool developed by Center for Natural Lands Management that has been widely used to estimate various costs for phased enhancement and restoration and determine an endowment amount.

Several alternative funding sources were explored as part of this financial analysis. Those sources were determined not to be feasible or preferred at the time the HCP was submitted but could be revisited over time.

Table 8.3 HCP estimated annual revenue by funding source.

Funding Source	Revenue	Percent of Cost
Mitigation Fee	\$3,671,966	88%
Conservation Futures	\$500,000	12%
TOTALS	\$4,171,966	100%

8.4.1 Mitigation Fees

The County plans to use the voluntary payment by developers authorized in Washington code (RCW 82.02.020) to implement a Fee In Lieu of land dedication (Mitigation Fee). Development permit applicants who require a Certificate of Inclusion can choose to pay a Mitigation Fee in Lieu of setting aside land to secure the needed mitigation credits required to offset debits (See Section 7.6 for review of mechanisms for mitigation).

On a per-project basis, Thurston County will also pay the same Mitigation Fees to secure mitigation credits to offset debits from County Implemented Covered Activities.

In all cases, Mitigation Fees will be direct and proportional to the impact of the project.

Calculation of Mitigation Fee/Mitigation Credit Cost

Mitigation Fees are driven by impact extent and credit costs. Credit costs will differ by Covered Species and Service Area. Each Covered Species and Service Area has a specific blend of Conservation Objectives (e.g., credit generation from New Reserves, Working Lands Easements, and Enhanced Existing Preserves) that drives total expense, and resulting credit costs.

The cost per mitigation credit for each Covered Species or Service Area was calculated using the following steps:

- (1) Sum the costs described in Section 8.2 (Program administration, land acquisition, habitat restoration and enhancement, land management, and maintenance) for the projected blend of Conservation Objectives identified for each Covered Species or Service Area. Conservation Program administration costs were allocated to Covered Species and Service Areas in proportion to the number of acres of Conservation Lands to be acquired (see Table 7.7) for the Covered Species or Service Area relative to the rest of the Conservation Program.
- (2) Reduce the values calculated in (1) by the anticipated funding from local sources (e.g., Conservation Futures – see Section 8.4.2). The reduction will be proportional to the number of acres of Conservation Lands acquired (New Reserves or Working Lands Easements) for the Covered Species or Service Area relative to the rest of the Conservation Program.
- (3) Divide the value calculated in (2) by the total number of mitigation credits to be generated per Covered Species or Service Area.

Estimated mitigation credit costs for each Covered Species and Service Area to be used in Year 1 of the HCP are included in Table 8.4.

Collection of Mitigation Fees

All Mitigation Fees paid by County applicants or revenue from mitigation credits purchased for County activities will be placed into a reserve account and may only be expended to fund the mitigation of the permitted impact. The reserve account will be administered by the County. Records of all fee payments collected will be kept by the County, provided to USFWS in the HCP Annual Report and made available to the public upon request.

Adjustment of Mitigation Fees

The dynamic nature of the costs associated with Conservation Program implementation, including costs for land acquisition, habitat restoration, enhancement, maintenance, and management, requires a flexible approach to funding through time. Mitigation fees will be subject to adjustments over the 30-year permit term.

To ensure that the Mitigation Fees are adequately covering their share of Conservation Program costs, the County will complete a cost review of the Mitigation Fees in years 2, 3, 6, 10, 15, 20, and 25, where year one is the first full calendar year of Conservation Program implementation. The cost review process will include a review of both actual costs and the underlying assumptions that were developed as part of this original funding analysis. If Mitigation Fees are found to be lower than needed to offset the Mitigation Fee share of actual costs, that Mitigation Fee will be increased. If Mitigation Fees are found to be higher than needed to offset the Mitigation Fee share of actual costs, Mitigation Fees may be reduced.

In years the County doesn't conduct a full cost review, the Mitigation Fee is subject to the County's current practice of an automatic adjustment on January 1 by the percent increase in the April Consumer Price Index³³ for the previous year. The years the automatic adjustment occurs the maximum increase shall be 3.5%.

Updated fee schedules will be provided to USFWS in the County's HCP Annual Report. This schedule was developed to balance the need for frequent assessments with the need to accumulate enough data on which to base a meaningful assessment.

Timing of Mitigation Fee Payment

Mitigation Fees are required to be paid before a covered activity may commence. Generally, prior to the issuance of the permit or authorization for the proposed covered activity, or if the development is phased, the proportional mitigation fee will be paid prior to commencement of each phase approval or permit for which there are proposed impacts. For Covered Activities that do not require land use permits mitigation fees must be paid prior to the start of the Covered Activity. Certificates of Inclusion are issued with the permit or authorization. Mitigation fees for development will be proportional to the functional value of the habitat and total area of impact (see Section 4.2 Quantifying habitat value and area).

³³ "Consumer Price Index" for the purposes of this section shall mean the Urban Wage Earners and Clerical Workers Index for the Seattle-Tacoma-Bellevue area. Fees are rounded to the nearest \$1.00.

Table 8.4 Estimated Mitigation Fees (cost per mitigation credit or functional acre) for the initiation of the HCP.

Species/Service Area	YPG N	YPG E	YPG S	OPG	TPG	TCB	OVS	OSF	Total
Total Program Expense	\$31,003,121	\$20,570,281	\$23,199,518	\$33,973,698	\$2,774,118	\$611,622	\$669,835	\$12,356,798	\$125,158,991
<i>Administration</i>	<i>\$2,572,807</i>	<i>\$2,398,447</i>	<i>\$3,096,471</i>	<i>\$1,198,367</i>	<i>\$348,298</i>	<i>\$138,998</i>	<i>\$108,782</i>	<i>\$2,137,830</i>	<i>\$12,000,000</i>
<i>Land Acquisition</i>	<i>\$16,766,186</i>	<i>\$9,087,125</i>	<i>\$8,374,398</i>	<i>\$27,342,389</i>	<i>\$1,064,264</i>	<i>\$0</i>	<i>\$314,465</i>	<i>\$7,572,354</i>	<i>\$70,521,181</i>
<i>Habitat Restoration/ Enhancement</i>	<i>\$2,974,970</i>	<i>\$2,317,082</i>	<i>\$2,991,426</i>	<i>\$1,385,688</i>	<i>\$347,269</i>	<i>\$120,544</i>	<i>\$62,893</i>	<i>\$540,750</i>	<i>\$10,740,622</i>
<i>Habitat Management/ Maintenance</i>	<i>\$8,689,157</i>	<i>\$6,767,627</i>	<i>\$8,737,222</i>	<i>\$4,047,254</i>	<i>\$1,014,288</i>	<i>\$352,080</i>	<i>\$183,695</i>	<i>\$2,105,864</i>	<i>\$31,897,188</i>
Conservation Futures Offset of Acquisition Costs	\$3,564,159	\$2,697,886	\$3,483,056	\$1,660,121	\$482,503	\$0	\$150,698	\$2,961,576	\$15,000,000
Mitigation Credits Needed	1,357	1,043	1,346	632	178	16	25	618	5,216
Estimated Cost/Credit	\$20,215	\$17,137	\$14,644	\$51,111	\$12,910	\$38,054	\$20,636	\$15,203	--

8.4.2 Local Funding

Currently anticipated local funding sources that will support the Conservation Program are described below. Additional local funding sources may be developed and implemented over the course of the HCP.

Conservation Futures

Conservation Futures funds are generated by a County property tax and are restricted to use for Capital Improvements (e.g., land acquisition). The County anticipates \$500,000/year available in Conservation Futures revenue for the HCP. These funds can be used to acquire New Reserves or Working Lands Easements.

8.4.3 Funding Adequacy

Funding sources will meet all expected costs of the Conservation Program. This section discusses some contingencies in case costs are higher than expected.

Costs could be higher than anticipated if some of the following conditions occur:

- Short- or Long-term management costs increase (e.g., new invasive species);
- Endowment returns are lower than expected (e.g., prolonged, low rates on invested endowment monies); or
- Land acquisition prices increase significantly.

In the event that HCP funding is insufficient, or is projected to be insufficient, to cover both short and long term HCP costs during the permit of the permit, thereby creating a risk that HCP and Incidental Take Permit requirements cannot be met, the County will promptly correct the actual or projected deficiency by employing one or more of the following measures:

- Raise Mitigation Fees to cover some or all additional costs;
- Reduce take authorization limits, Covered Activities, or permit duration;
- Develop and implement alternative strategies for short- and long-term funding; and
- Slow or stop local permit issuance under the HCP until additional funding is secured.

8.4.4 Additional Sources of Funding for Conservation

The U.S. Congress and the State of Washington have determined that conserving species and their natural habitats is an issue of both national and state importance. Federal and state agencies will continue to fulfill their responsibilities for conservation in Thurston County during the HCP Permit Term. Their actions may include assisting local governments and property owners to assemble, manage, and monitor lands to conserve species. While this will not contribute to the mitigation required for this HCP, such conservation may contribute to recovery of listed species in Thurston County, result in fewer impacts from Covered Activities (as lands are put into conservation) and reduce or avoid the need to list additional species as threatened or endangered.

Chapter 9 Alternatives

An HCP is required to describe “what alternative actions to such taking the Applicant considered and the reasons why such alternatives are not being utilized” (ESA §10(a)(2)(A)(iii)).

The only alternative that would completely avoid impacts to the Covered Species would be to not complete the Covered Activities where the Covered Species may occur. Thurston County has decided not to select this alternative since it would strongly limit economic growth, development, and sustainability within the County and inhibit maintenance of County transportation infrastructure.

The Covered Activities are otherwise lawful activities, and the County developed this HCP and will apply for an Incidental Take Permit so that these activities may be conducted over the term of the requested permit.

There are no final plans or construction timelines for the majority of the proposed Covered Activities at this time. The County anticipates that some Covered Activities will be able to be completed in a manner that will avoid impacts to listed species or their habitats, however there is no way to know at the current time how each activity will eventually be completed throughout the County.

To facilitate the greatest flexibility, the County has proposed Conservation Measures intended to mitigate for the incidental take of Covered Species and their habitats where Covered Activities are completed, with the understanding that impacts will be avoided to the extent possible.

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Chapter 11 Glossary

Action: An activity or program of any kind authorized, funded, or carried out, in whole or in part, by a federal agency in the United States.

Adaptive Management: A cyclical process whereby managers treat actions as experiments from which they improve management actions.

Assessment Area: Is that portion of the Development Envelope which overlaps with Covered Species.

Biological Goal: What the Conservation Program will accomplish by the end of the Incidental Take Permit duration.

Candidate Species: Candidate species are plants and animals for which the U.S. Fish and Wildlife Service has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

Certificate of Inclusion: This is a document issued by Thurston County as part of a development permit or authorization for purposes of documenting coverage under the county's Incidental Take Permit.

Community: A group of interacting plants and animals inhabiting a particular area.

Compliance Monitoring: An evaluation of whether the process did what it said it would accomplish.

Conservation: As defined by Section 3 of the ESA, to use and the use of all methods and procedures necessary to bring any endangered or threatened species to the point at which the measures provided are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resource management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, regulated taking.

Conservation Easement: A Conservation Easement is a voluntary, legal agreement that permanently limits uses of a property or defined portion of a property in order to protect its Conservation Values.

Conservation Measure: A specific conservation tool employed in a specific location. May include, but is not limited to, habitat acquisition and habitat restoration.

Conservation Objective: Benchmarks by which to measure progress in achieving Biological Goal for each Covered Species, across temporal and spatial scales.

Conservation Values: Conservation Values are defined for individual conservation properties and typically include unique or high quality natural habitat or species, prime farmland or soils, or historically significant areas.

Consultation: The process required of a federal agency under Section 7 of the ESA when any activity authorized, carried out, or conducted by that agency may affect a listed species or designated critical habitat. Consultation is with the U.S. Fish and Wildlife Service (or National Marine Fisheries Service) and may be formal or informal.

Covered Activity: These are activities that are included in the HCP and covered for incidental take by the Incidental Take Permit.

Covered Species: These are species that are included in the HCP and covered for incidental take by the Incidental Take Permit.

Credits: Quantified, verified, and tradable units of environmental benefit from conservation or restoration action. Credits equate to one functional acre for a given Covered Species.

Critical Areas Ordinance: Is a set of regulations that govern how land is developed in environmentally sensitive areas and in areas where development would pose a threat to humans or wildlife. Critical areas include important fish and wildlife habitat areas (prairies, rivers, streams); wetlands; aquifer recharge areas; frequently flooded areas; and geologically hazardous areas. The state Growth Management Act (Chapter 36.70A RCW) requires protection of these areas.

Critical Habitat (federally designated): Specific areas within the geographic area occupied by the species on which are found those physical and biological features essential to the conservation of the species and which may require special management considerations or protection.

Debits: Quantified, verified, and tradable units of environmental impact, calculated as the difference between the functional scores of the pre-project and anticipated post-project conditions. Debits equate to one functional acre of impact for a given Covered Species.

Delist: To remove a plant or animal species from the list of endangered or threatened species.

Development: means any human-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, clearing, paving, excavation or drilling operations, storage of equipment or materials, or any other activity which results in the disturbance of soil, removal of vegetation, or in any alteration of natural site characteristics including subsurface alterations.

Development Envelope: Means the designated boundaries as depicted on the site plan indicating where building, access roads, septic systems, and other development are located or will be located.

Development Proposal: means any of the activities relating to the use and/or development of land requiring a permit or approval from Thurston County.

Development Proposal Site: means the legal boundaries of the parcel or parcels on which an applicant has applied for authority from Thurston County to carry out a development proposal.

Ecology: The study of the inter-relationship among organisms and between organisms and between all aspects, living and nonliving, of their environment.

Ecoregion: A relatively large land and water area containing geographically distinct assemblages of natural communities, with approximate boundaries. These communities share a large majority of their species, dynamics, and environmental conditions, and function together effectively as a conservation unit at the continental and global scales.

Ecosystem: A discrete unit that consists of living and nonliving parts, interacting to form a stable system.

Effectiveness Monitoring: Monitoring to determine whether the restoration or enhancement techniques are meeting the management objective.

Endangered species: Those species threatened with extinction throughout all, or a significant portion, of their range. Species can be listed as endangered or threatened for a number of reasons, including disease or predation. Natural or human factors affecting chances for survival: over utilization for commercial, scientific, or recreational purposes, or current or threatened destruction of habitat or range.

Federal Register: The official daily publication for actions taken by the Federal government, such as rules, proposed rules, and Notices of Federal agencies and/organizations, as well as Executive Orders and other Presidential documents.

Frequently flooded: means lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year or areas within the highest known recorded flood elevation, or within areas subject to flooding due to high ground water. This includes all areas within unincorporated Thurston County identified on flood insurance rate maps prepared by the Federal Insurance Administration, as supplemented by "The Flood Insurance Study for Thurston County," dated November 17, 1980, as amended. (These maps and the referenced report shall be on file with the department at the Thurston County Permit Assistance Center). Frequently flooded areas may include special flood hazard areas as defined in Chapter 14.38 TCC or high ground water flood hazard areas, where high ground water forms ponds on the ground surface, or may overlap with other critical areas, such as streams, rivers, lakes, coastal areas, and wetlands.

Graminoids: Grasses, sedges, and rushes.

Habitat: The living place of a species or community characterized by its physical or biotic properties.

Habitat Conservation Plan (HCP): HCPs are planning documents required as part of an application for an Incidental Take Permit. They describe the anticipated effects of the proposed taking; how those impacts will be minimized or mitigated; and how the HCP is to be funded. HCPs can apply to both listed and non-listed species, including those that are candidates or have been proposed for listing.

Harass: To intentionally or negligently, through act or omission, create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns such as breeding, feeding, and sheltering.

Harm: To perform an act that kills or injures wildlife; may include significant modification of habitat or degradation when it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Historic range: The geographic area where a species was known to or believed to occur within historic time.

Host plant: A particular plant species required of butterflies during egg laying and for food during the larvae and pupae life stage.

Impacts: Impacts may be negative or positive. Negative impacts are ecological stresses to a species and the source of that stress. Positive impacts are impacts whose net effect is beneficial to the species, and may include such activities as mowing or burning.

Incidental take: Take that results from, but is not the purpose of, carrying out an otherwise lawful activity.

Incidental Take Permit: A Permit issued under section 10(a)(1)(B) of the ESA to a non-federal party undertaking an otherwise lawful project that might result in the “take” of a threatened or endangered species. An application for an Incidental Take Permit is subject to certain requirements, including preparation of habitat conservation plan.

Indirect effect: An effect caused by a proposed action taking place later in time than the action but is still reasonably certain to occur (Section 7 of ESA).

Interlocal Agreement: chapter 39.34 RCW Interlocal Cooperation Act, authorizes public agencies to contract with other public agencies via interlocal agreements that enables cooperation among the agencies to perform among the agencies to perform governmental activities and deliver public services. The Act also allows the creation of nonprofit corporations to carry out these ends.

Larvae: the active immature form of an insect, especially one that differs greatly from the adult and forms the stage between egg and pupa, e.g., a caterpillar.

Listed species: A species, subspecies, or distinct population segment that has been added to the federal list of endangered and threatened wildlife and plants.

Mitigation: The offset of an environmental impact on a Covered Species with a compensatory environmental benefit for the Covered Species, typically generated through ecological protection, restoration, or enhancement and verified through a crediting program.

Monitoring: Repeated measurements carried out in a consistent manner so that observations are comparable over time.

Native species: Those species present in part or all of a specified range without direct or indirect human intervention, growing within their native range and natural dispersal potential.

Nectar Plant: A particular plant species required of adult butterflies for food/energy.

Nonprofit Conservation Organization (NCO): means, for the purpose of the HCP, a nonprofit corporation, a charitable trust or nonprofit organization founded for the purposes of promoting the protection and preservation of natural resources including species conservation and meets the definition of nonprofit nature conservation corporation in RCW 64.04.130 or RCW 84.34.250.

Non-native species: Those species present in a specified region only as a direct or indirect result of human activity.

Occupancy: See “Species Occupancy”

Persons: Includes individuals, corporations, partnerships, limited liability corporations, limited liability partnerships.

Performance Standard: Performance standards describe the habitat conditions necessary to earn and release mitigation credits from Conservation Lands during the phases of their habitat enhancement and management. Performance standards are tied to specific targets in habitat quality and function.

Performance Target: Estimated acres at a given Performance Standard at a given phase of a Conservation Land.

Petition: A formal request from an interested individual or organization to list, reclassify, or delist a species, or to revise critical habitat for a listed species.

Population: A group of individuals of a species living in certain areas maintaining some degree of reproductive isolation.

Public agency: Means any agency, political subdivision, or unit of government of Washington state including, but not limited to municipal corporations, quasi municipal corporations, special purpose districts, and local service districts; any agency of the state; any agency of the United States; any Indian tribe recognized as such by the federal government; and any political subdivision of another state.

Range: The geographic area a species is known to or believed to occupy.

Recovery: A reduction of the risk of extinction to the point that, based upon best available science, it is reasonably sure that the species will remain secure into the foreseeable future.

Recovery Plan: A document drafted by U.S. Fish and Wildlife Service serving as a guide for activities to be undertaken by federal, state, or private entities in helping to recover and conserve endangered and threatened species.

Secured: Habitat of local populations are (1) owned or managed by a government agency or private conservation organization identifying maintenance of the species and its habitat as the primary management objective for the site, or (2) private land is protected by a long-term or permanent Conservation Easement committing the landowner to conservation of the species.

Species: A group of organisms resembling one another, and includes subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate, fish, or wildlife that interbreeds when mature.

Species Occupancy: The parcel is considered occupied by a Covered Species if the County’s has information on record that indicates a Covered Species was observed through a species survey. The species survey may have been conducted by County staff, a state or federal wildlife agency, or other qualified environmental professional that resulted in positive finding. Positive finding includes, without

limitation, gopher mounds and audible calls by birds. *Note:* Parcels that are subdivided after a species survey was completed are considered occupied if the species survey resulted in positive findings for the larger parcel (i.e., parent parcel).

Subspecies: A taxonomic rank below species, usually recognizing individuals with certain heritable characteristics distinct from other subspecies of a species.

Take: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct; may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, and sheltering.

Terms and conditions: Required actions described in an Incidental Take Permit under section 10 or Incidental Take Statement intended to implement the Reasonable and Prudent Measures under section 7.

Threatened species: A species that is likely to become endangered in the foreseeable future.

Viable: A viable population has a sufficient number of individuals, reproduction by those individuals, and habitat conditions to persist over time.

Watershed: An area of land draining to a common point.

Appendix A: HCP Outreach Summary

Date	Event	Description
August 19, 2015	Thurston Planning Commission	Presentation to planning commission, summarizing draft HCP process and status.
May 21, 2015	Stakeholder workshop	Presentations about HCP to Virgil Adams Re Estate and Thurston County Storm and Surface Water
November 19, 2015	HCP Focus Group Meeting 1, with local interested parties, including wildlife agencies, Conservation organizations, developers, builders, realtors, private landowners, local municipalities, utilities.	Briefing on draft HCP concepts and status.
February 24, 2016	Working Lands Outreach Meeting	Overview of draft HCP, including specific strategies around working lands.
February 24, 2016	Conservation Organization Outreach Meeting	Overview of draft HCP, including conservation program and financing
February 25, 2016	HCP Focus Group Meeting 2 with local interested parties, including wildlife agencies, Conservation organizations, developers, builders, realtors, private landowners, local municipalities, utilities.	Follow up from Focus Group Meeting 1, to revisit covered activities, development projections and working lands concepts, in addition to sharing options for HCP finance strategies.
February 26, 2016	Real Estate Organizations Out Reach Meeting	Overview of draft HCP, including conservation program and financing
April 1, 2016	Meet with upcoming new Real Estates Associations President	Work session on education and handout materials
April 15, 2016	HCP Information Session	Presentation to Nisqually River Council, summarizing draft HCP process and status.
September 27, 2016	HCP Information Session	Presentation to Conservation District Board, summarizing draft HCP process and status.

February 23, 2017	HCP Information Briefing	Educational briefing to Thurston County Board of County Commissioners (2 new commissioners).
May 25, 2017	HCP Focus Group Meeting	Discussion about what activities to cover in HCP and associated costs.
December 5, 2018	Mini-Focus Group Work session	Discussion about types of communication tools
February 13, 2019	HCP Informational Board Briefing	Status update regarding USFWS technical review and general areas where revision needed
September 27, 2019	Board Work Session	<ul style="list-style-type: none"> • Financial Plan Discussion • Mitigation Land Purchase Process - Discussion
February 19, 2020	Local Permitting Experience - Stakeholder Meeting	A select group of stakeholders with local experience with HCPs and permitting around gopher habitat was invited to meet and discuss the current draft HCP and provide feedback and questions staff can consider in progressing HCP development.
July 16, 2020	Thurston County Agriculture Advisory Committee HCP Presentation	Overview of HCP and Conservation Program – focus on Working Lands Easements
October 16, 2020	Press Release	Environmental Impact Statement Scoping Notice
October 26 & 28, 2020	Public Informational Meeting - Environmental Impact Statement Public Scoping	Presented on the proposed scope of the EIS. Completed Q&A with public.
September 2020	HCP overview with WDFW	Presented overview of HCP and answered questions for Wildlife and Habitat Section staff
May 26, 2021	HCP Presentation Economic Development Committee	Overview of HCP and Q&A session
June 18, 2021	HCP Presentation Chamber of Commerce	Overview of HCP and Q&A session
September 24, 2021	Stakeholder Meeting	HCP overview- focus on Conservation Program
October 12 & 14, 2021	Public Informational Meeting – Draft EIS	Draft Environmental Impact Statement Presentation and Q&A
January 19, 2022	Planning Commission	Presentation Overview of the Thurston County HCP

Appendix B: Covered Species Descriptions

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Taylor's Checkerspot Butterfly (*Euphydryas editha taylori*, W.H. Edwards, 1888)

Conservation Status

Taylor's Checkerspot Butterfly (*Euphydryas editha taylori*) was listed as an endangered species on October 3, 2013, throughout the subspecies range in Washington, Oregon, and British Columbia (78 FR 61452 [October 3, 2013]). Taylor's Checkerspot Butterfly has been listed as endangered by the State of Washington since 2006. In British Columbia, Canada, it is classified as an endangered species under the Species at Risk Act (COSEWIC 2011). For additional summaries of the status of Taylor's Checkerspot Butterfly, see the Federal listing rule (78 FR 61452), the Washington State Department of Fish and Wildlife's (WDFW) Status Report for Mazama Gopher, Streaked Horned Lark and Taylor's Checkerspot Butterfly (Stinson 2005), or WDFW's Periodic Status Review for Taylor's Checkerspot (Potter 2016).

Population Trends and Distribution

Taylor's Checkerspot Butterfly was historically found at approximately 80 locations across the Puget Trough ecoregion in British Columbia, Washington, and Oregon (Potter 2016). The actual number of previously known locations is difficult to determine. Stinson (2005) had reported 70 locations, 20 on Vancouver Island, 13 in Oregon, and 37 in Washington. More recently, Potter (2016) reported 45 historically documented sites in Washington; one each in San Juan and Island Counties, 11 in Clallam County, and 32 on south Puget Sound prairies, oak woodlands, and other open habitats (Lewis, Mason, Pierce, and Thurston Counties). Figures created by Stinson (2005) and Potter (2016) suggest that many of those historical locations were in Thurston County. In either case, these sources probably underestimate the true historical distribution of the subspecies.

The number of sites where Taylor's Checkerspot Butterfly remained extant (still in existence) drastically declined into the 2010's when reintroduction programs and conservation programs began to halt and, in some cases, reverse the decline. Stinson (2005, pp. 78, 106) described 10 extant sites in Washington and 13 extant sites across the range of the species in 2005, the Service (78 FR 61455) described 14 extant sites across the range in 2013, and Potter (2016) described 11 extant sites across the range in 2016). There is no 'precise' number of populations extant in 2020 because it depends on what is considered a population (or site) and whether incomplete reintroductions and translocations count towards the total. The largest populations of Taylor's Checkerspot Butterfly in the Washington are in Pierce County at Joint Base Lewis McChord (JBLM)- including the very large population at Range 74-76 which has been the source for captive breeding and reintroductions in the south Puget Sound. In Thurston County in 2020, Taylor's Checkerspot Butterflies are extant at Scatter Creek Wildlife Area and Tenalquot Preserve. Scatter Creek Wildlife Area supports a large population that is the result of a successful reintroduction effort (Linders et al. 2020). Tenalquot Preserve is the focus of the latest reintroduction attempt by WDFW and their partners. That release began in winter 2020. "One adult checkerspot was observed at Glacial Heritage in 2019, although no formal surveys were conducted. Releases were discontinued at [Glacial Heritage] in 2018 and will not resume without a better understanding of the factors affecting success, which may include the condition of food plants, availability of microsites, pesticide residues or other unidentified factors" (Linders et al. 2020).

Life History and Ecology

Taylor's Checkerspot Butterfly is a brightly colored, medium-sized butterfly with a striking checkered pattern of orange to brick red, black, and cream. On south Puget Sound prairies, no other butterfly resembles it. Females are larger than males, though both have the same checker-patterned wings.

Taylor's Checkerspot Butterfly is univoltine, completing 1 life cycle annually. They are sedentary insects, inhabiting their sites year-round as an egg, larva, pupa, and adult. In the south Puget Sound, adults (butterflies) typically begin to emerge from their chrysalids (pupae) in April to June depending on site and weather conditions, though this and all other life stage dates for this butterfly can vary significantly due to weather conditions (Linders 2006, Potter 2016). Although individual butterflies may live only a few days, the entire adult flight period in the south Puget Sound often lasts through late May (Linders 2006, Olson and Linders 2010, Linders 2012, Linders et al. 2015). Butterflies in this region have been observed as early as late March and as late as early-June (Hinchliff 1996, Linders 2012).

Males use two strategies for mate-finding: perching and patrolling (Bennett et al. 2011). In perching, males select specific sites to perch and then dart out at passing butterflies to determine if it is a female of its species. In patrolling, males search for females by almost constant flying, often along a regular route or territory. Females lay eggs in clusters, low on their host plants, which in the south Puget Sound are the non-native English plantain (*Plantago lanceolata*) and native harsh paintbrush (*Castilleja hispida*) (Char and Boersma 1995, Hays et al. 2000, Severns and Grosboll 2011, Grosboll 2011).

Male and female butterflies feed by using their long proboscis to explore flowers and sip floral nectar. Annual variation in plant phenology and condition affects availability of nectar resources thereby causing variation in plant species use among years. An early pollination study on south Puget Sound prairies (Jackson 1982) found Taylor's Checkerspot Butterflies nectaring solely on camas (*Camassia quamash*). Hays et al. (2000) observed (but did not quantitatively study) Taylor's Checkerspot Butterfly nectar habits on a south Puget Sound prairie and found them primarily using common camas and nine-leaved lomatium (*Lomatium triternatum*). Other nectar sources regularly used by Taylor's Checkerspot Butterfly in the south Puget Sound region include deltoid balsamorhiza (*Balsamorhiza deltoidea*), spring gold (*Lomatium utriculatum*), wholeleaf saxifrage (*Saxifraga integrifolia*), and seablush (*Plectritis congesta*) (Linders 2012, Linders et al. 2015, Potter 2016).

Taylor's Checkerspot Butterflies generally do not disperse very far from their colony of origin. They are not migratory. Dispersal movements in checkerspots have rarely been found to exceed 2–3 km (Wahlberg et al. 2004, p. 223). In general, mark-recapture studies with other checkerspot butterflies in Finland documented that they generally flew less than 1,640 ft (500 m), studies of dispersal indicates that 95 percent of colonizations have been within 2.3 km of the nearest source, and the longest recorded colonizations were within 4 to 5 km of source populations (Singer and Hanski 2004). Research conducted in California on other Edith's checkerspot butterflies indicate the species is relatively sedentary, with over 96 percent of individuals marked recaptured in the area of previous capture; and dispersal of individuals between closely situated populations (less than 1 km) is rare even though the occupied patches were well within potential dispersal distance for the species (Hellmann et al. 2004). A mark-recapture study conducted in Oregon showed that dispersal distance was short (less than 984 ft (300 m) (Kaye et al. 2011) and that Taylor's Checkerspot Butterflies tended to move to the nearest open patch, or from poor resource patches to rich resource patches, although rates of recapture were low (Kaye et al. 2011). The USFWS generally use one quarter mile (400 meters) as an estimate for Taylor's

Checkerspot Butterfly dispersal. This is not to say that dispersal beyond one quarter mile is extremely unlikely, but simply to assume that the vast majority of dispersing individuals stay within one quarter mile of their prairie of origin.

Several scientists have observed Taylor's Checkerspot Butterfly egg masses and larvae extensively in the south Puget Sound, but their phenology in the wild has not been studied completely (Severns and Grosboll 2011). Careful and detailed phenological data for Taylor's Checkerspot Butterfly larvae has been collected by the Oregon Zoo as part of a captive-rearing program (Barclay et al. 2010). James and Nunnallee (2011) provide detailed descriptions and photographs of the species life stages. Eggs hatch in 8-9 days (James and Nunnallee 2011); eggs within a cluster typically hatch in synchrony (Barclay et al. 2010). The resulting caterpillars (larvae) create webbing and feed communally through the spring on the host plant species on which eggs were deposited, continuing to grow and shed their skins to expand, in what are referred to as instar stages. Larvae enter a dormant phase (diapause) in late-June or early-August when host plants are senescing and no longer provide palatable vegetation. Larvae often diapause in a sheltered location under rocks, logs, or litter (Guppy and Shepard 2001), and in some cases in tunnels of ground-nesting bees and ants or in soil cracks (Fimbel 2009, Potter 2016). Diapausing larvae develop a thick exoskeleton that helps prevent dehydration (Scott 1986). The diapause phase lasts for many months, until early the following spring (January to March in the south Puget Sound depending on site conditions). Upon breaking diapause, Taylor's Checkerspot Butterfly larvae reinitiate feeding on a broader array of plant species. Plant species that held egg masses remain a major component of their diet, but additional post-diapause food sources (sea blush (*Plectritis congesta*), blue-eyed Mary (*Collinsia parviflora*), and dwarf owl-clover (*Triphysaria pusilla*) as available, also are used. Larvae pupate in late-March to early May (Potter 2016).

Habitat Characteristics

The Taylor's Checkerspot Butterfly inhabits short-stature grasslands in low-elevation prairies and meadows, coastal meadows and stabilized dunes, and montane meadows and balds. Balds are shallow-soiled, grass, herbaceous vegetation, or lichen and moss dominated sites, typically less than 5 ha (12.5 ac), that occur within forested lands (Chappell 2006, Potter 2016). A few studies of Taylor's Checkerspot Butterfly habitat have been conducted outside of the south Puget Sound region, including in Oregon (Severns and Warren 2008), British Columbia (Page et al. 2009), and the north Olympic Peninsula (Severns and Grosboll 2011, Grosboll 2011). Egg-laying (oviposition) habitat is often studied with this and other butterflies because it is a limiting factor, determines the site of pre-diapause larvae, and influences the location of diapause, post-diapause, and pupation. Severns and Warren (2008) found that Taylor's Checkerspot Butterflies selected habitat for egg-laying that occurred within high cover of short-stature native bunchgrasses and adult nectar resources, indicating that females select egg-laying sites based on habitat condition. Page et al. (2009) found the most common activity of post-diapause larvae was basking and perching, demonstrating the importance of thermal habitats in this life stage. The British Columbia study population had multiple host plant species available and females' selection of egg-laying sites in this environment was influenced by host plant phenology and condition (Page et al. 2009). A characteristic of egg-laying habitat consistently identified in the British Columbia and 3 Olympic Peninsula populations was the abundance of host plants (number or percent cover) (Page et al. 2009, Severns and Grosboll 2011, Grosboll 2011).

Within the south Puget Sound region, the butterfly has been found on prairies and balds. Habitat selection by egg-laying females has been studied in 1 population (JBLM Artillery Impact Area – Range 76)

by Linders et al. (2009), Severns and Grosboll (2011), and Grosboll (2011). All researchers found that females selected habitat with high host plant density for oviposition. Grosboll (2011) determined that the butterfly selected for host plant patches with >10,000 cm³ volume. Severns and Grosboll (2011) found that the butterfly laid eggs more frequently along 2-track road edges than the open prairie, and explained this may be due to the strong association between the host plant at this site (English plantain) and the roadbeds.

Although there has been no quantitative study of Taylor's Checkerspot Butterfly nectar plant use or preference, several plants have been identified as key nectar sources in south Puget Sound populations (common camas, deltoid balsamroot, sea blush, wholeleaf saxifrage, nine-leaved lomatium, and spring gold) (Jackson 1982, Hays et al. 2000, Linders 2012). Because annual variation in plant phenology and condition determines the availability of nectar resources and causes variation in availability (and therefore use) among years, variety of nectar sources is an important habitat component.

Threats/Reasons for Decline

The primary reasons for listing included extensive habitat loss through conversion and degradation of habitat, particularly from agricultural and urban development, successional changes to grassland habitat, military training, and the spread of invasive plants; inadequate existing regulatory mechanisms that allow significant threats such as habitat loss; and, other factors, including low genetic diversity, small or isolated populations, low reproductive success, and declining population sizes (78 FR 61452). For additional information on threats to Taylor's Checkerspot Butterfly, see the Federal listing rule or the WDFW Status Review (Potter 2016).

Mazama Pocket Gopher (*Thomomys mazama* Merriam, 1897)

Conservation status

The subspecies of the Mazama Pocket Gopher (*Thomomys mazama*) in Washington have been Candidates for listing under the federal Endangered Species Act since 2001 (USFWS 2001); three subspecies in Thurston County, and one in Pierce County were listed as Threatened in 2014 (USFWS 2014). The Mazama Pocket Gopher was listed as a state Threatened species by the Washington Fish and Wildlife Commission in 2006. The species had been listed as a Candidate for state listing as threatened, endangered, or sensitive in Washington since 1996. Prior to that time, the Roy (*T. m. glacialis*), Tenino (*T. m. tumuli*), Tacoma (*T. m. tacomensis*), Shelton, (*T. m. couchi*), and Cathlamet (*T. m. louiei*) subspecies had been state Candidates since 1991. As a state Threatened species, unlawful taking of Mazama Pocket Gophers is a misdemeanor under RCW 77.15.130. The western (Mazama) pocket gopher is a Species of Local Importance in the Critical Areas Ordinances of Thurston and Pierce counties.

Distribution and Population Trends

Mazama Pocket Gophers were historically more widespread and abundant on the glacial outwash prairies of the south Puget Sound region. They also occur on subalpine meadows of the Olympic Mountains (Stinson 2005, Stinson 2013). Several populations are sufficiently distinct to be described as separate subspecies, particularly those that were geographically isolated. Other subspecies of Mazama Pocket Gophers are found in parts of western Oregon and in northern California. The species is currently represented in Washington by six extant subspecies: one in Clallam; one in Mason; three in Thurston, and one in Pierce counties. They were also historically found around Tacoma and in Wahkiakum County. The subspecies found in Thurston County are described here.

Gophers are seldom found in densely developed areas, or sites with very rocky soil (Steinberg 1996, Steinberg and Heller 1997, Stinson 2005, Stinson 2013). There are perhaps 3-4 large (i.e., 1,000s) Mazama Pocket Gopher populations in Thurston/Pierce counties. The largest populations appear to be found on the Olympia and Shelton Airports, Scatter Creek Wildlife Area, and Joint Base Lewis McChord. Many surviving gopher subpopulations are small (<50) and appear to be isolated from other subpopulations, although there are few data on dispersal to help delineate genetically connected populations (Stinson 2005, Stinson 2013). Small subpopulations are unlikely to persist for long without at least occasional demographic and genetic recharge by dispersing individuals from other nearby populations. Re-colonization becomes less likely as habitat is fragmented and populations isolated. Large populations, or clusters of subpopulations close enough and with land conditions that permits exchange of dispersers, may be important for the persistence of each subspecies and for the species (Stinson 2013).

Most of the Mazama Pocket Gophers in the southern Puget Sound region currently occur in ~10 general areas in Pierce, Thurston, and Mason counties. These concentrations of known gopher occurrences and prairie soil types are separated by distance or rivers, and vary widely depending on soils present and the land-use history. What is known about abundance and distribution for the subspecies in Thurston County is summarized below (Stinson 2005, Stinson 2013).

- **Olympia Pocket Gopher.** What is probably the largest population of Mazama Pocket Gophers is found in the loamy sand soils at the Olympia Airport and surrounding areas in Tumwater on the

historical Bush Prairie. Gophers are scattered over several hundred acres of maintained grassland at the airport, where they are relatively unmolested by humans or domestic animals. Gophers are also found in vacant lots, yards, and pastures in nearby locations on both sides of Interstate 5. In 2005, McAllister and Schmidt (2005) derived a crude population estimate of 6,040 for the airport, but no trapping was done to determine how closely this approximated the number of actual gophers.

Chambers Prairie, extending from about Ward Lake to Lake St. Clair, is the largest area of Nisqually soil type (3,700 ac (1497 ha)), and probably historically supported an extensive gopher population. Most of the area has residential development of various densities. Chambers Prairie has gophers scattered in vacant lots, roadsides, and rural and agricultural sites, but no large extensive populations like the airport are known. The northwestern half of the area is within the urban growth areas of Olympia and Lacey, and much is densely developed such that likelihood of extensive local extirpation is elevated. The southeastern half of this area also has turf, Christmas tree, and berry farms, and other smaller farms and pastures.

Little Chambers Prairie and Hawks Prairie contain substantial areas of loamy sand soils, but most of the suitable habitat is heavily developed, with dense residential neighborhoods, roads, and businesses. Small pockets of habitat with gophers exist on some less developed or undeveloped lands, but these appear to be small and isolated, and may not persist in the long-term.

- **Tenino Pocket Gopher.** Rocky Prairie, south of East Olympia and north of Tenino, totals about 2,200 ac (890 ha). Within this area, WDFW West Rocky Prairie Wildlife Area (WLA) includes 270 ac (109 ha) of mounded and terraced prairie. No gopher population appeared to be present at West Rocky WLA until a translocation project established a gopher population using gophers captured at the Olympia Airport (Olson 2011b). A 750 ac (304 ha) area adjacent to West Rocky Prairie WLA is owned by a sand and gravel company. East of West Rocky Prairie WLA, Wolf Haven International maintains 38 ac (15 ha) of native mounded prairie with a small Mazama Pocket Gopher population established by translocation (Linders 2008). North of Wolf Haven International is a large area (600 ac (243 ha)) of mounded prairie on private lands with Spanaway-Nisqually complex soil that was once a ranch. It supported a significant population of gophers in the early 1990s; current status of gophers at this site is unknown. West of this property is Rocky Prairie Natural Area Preserve (NAP) where very small numbers of gophers are detected occasionally. The translocation projects (2005-2008, 2009-2011) moved gophers from the Olympia Airport and two Tumwater sites, both within the range of Olympia Pocket Gopher, and established populations in the range of Tenino Pocket Gopher. The population status of Tenino Pocket Gopher may have been tenuous, as Steinberg (1996) was unable to find any, and only very small numbers of gophers had been detected in the area since then. Any future translocations will maintain separation of subspecies, unless genetic analysis indicates taxonomic distinction is not warranted.
- **Yelm Pocket Gopher.** Mound Prairie, near Grand Mound, is bisected by Interstate 5 (I-5). West of I-5, north and south units of Scatter Creek Wildlife Area (WLA) support significant gopher presence. After 2004, when Scotch broom (*Cytisus scoparius*) control became widespread and intensive, gophers spread throughout the northern two thirds of the north unit, where they hadn't been observed previously. Scatter Creek WLA contains about 600 ac (243 ha) of prairie, and is mostly Spanaway-Nisqually complex soils. The north unit has about 80 ac (32 ha) of Nisqually soil and the south unit has about 8 ac (3.2 ha) of Nisqually soil. Most of the land west

of I-5 near Scatter Creek WLA is subdivided into 5 ac (2 ha) parcels, with some higher density, including the Grand Mound Urban Growth Area.

Rock Prairie, an area of ~1,200 ac (486 ha) of private lands, is located southwest of Tenino. The area still supports Mazama Pocket Gophers on two large ranches (Steinberg 1996), and one ranch has a 500 ac (202 ha) Grassland Reserve Program easement with management guidelines that protect prairie vegetation and maintain conditions suitable for gophers. Some of the remaining private lands have not been surveyed for gophers.

The historical Tenalquot Prairie area includes Weir Prairie (Upper, Lower, and South Weir), and Johnson Prairie, which are in the Rainier Training Area of JBLM, and Tenalquot Prairie Preserve. Most of the area is Spanaway soil types. This area also includes private lands south of the Rainier Training Area. The Weir Prairie Research Natural Area consists of Upper Weir Prairie (547 ac (221 ha)) and Lower Weir Prairie (440 ac (178 ha)), and is protected from the most destructive forms of military training, such as off-road vehicle maneuvers and digging. A WDFW research team found a density of ~2 adult gophers/ac on Lower Weir Prairie during 2010 and 2011. Johnson Prairie is about 194 ac (79 ha) of native and semi-native grassland and is among the highest quality Puget prairies. It supports a substantial population of Mazama Pocket Gophers (Steinberg 1995, WDFW data), as well as a high diversity of plants, butterflies, Oregon Vesper Sparrows, and western toads (Remsburg 2000, Altman 2003). Past activities have primarily been foot maneuvers, parachuting, and limited vehicle use (Remsburg 2000). No tracked or wheeled vehicle use is allowed off established roads, because the site is designated a Secondary Research Natural Area. Civilian recreational impacts are an increasing concern on Johnson and Weir prairies because unauthorized off-road vehicle use has increased in recent years. These areas also are used frequently for hunting and horseback riding.

Tenalquot Prairie Preserve is a 125 ac (51 ha) preserve south of South Weir owned by The Nature Conservancy; WDFW has a Conservation Easement on the property. It is being restored to high-quality prairie by Center for Natural Lands Management. Gophers are present in low numbers in the Spanaway soils of the area.

Life History and Ecology

Description. Mazama Pocket Gophers are small fossorial rodents with stocky, short-necked bodies generally less than 5.5 in (~14 cm) long, with tails 2.5 in (~ 6.3 cm) long, and small ears and eyes. They have cheek pouches which are used to transport food, and which can be turned inside-out to empty contents (Stinson 2005, Stinson 2013). Pocket gophers use their strong claws and rootless, chisel-like incisors for tunneling and foraging, and can close their lips behind their incisors to avoid getting soil in their mouths. In the process of tunneling, pocket gophers periodically push soil behind them from angled lateral tunnels, either turning around to use their palms and blunt noses or pushing soil beneath them and using their hind legs; this creates irregular, fan or kidney-shaped mounds with soil that is characteristically finely sifted. They also plug their tunnel entrances, and the plugs are often visible when viewing their mounds (Verts and Carraway 1998, Stinson 2005, Stinson 2013). Pocket gophers spend most of their time within their system of burrows (Stinson 2005; Stinson 2013). Gophers are believed to be generally solitary and exclude other gophers from their burrows except when breeding and when females have litters (Chase et al. 1982, Stinson 2005, Stinson 2013). When pocket gophers have established a territory, they generally remain there, although they will shift their home range in response to seasonally wet soils.

Pocket gophers adjust their annual cycle of activity to the seasonal changes of weather, soil, and plant growth where they occur (Cox and Hunt 1992). Pocket gopher territory (i.e., burrow systems) sizes vary with habitat quality and reproductive status. Using radio-telemetry, Witmer et al. (1996) estimated that the late winter-early spring home range of Mazama Pocket Gophers on a fallow field averaged 1,163 ft² (108 m²) for four males (range 73–143 m²), and 1,044 ft² (97 m²) for four females (range 506–1,625 ft² (47–151 m²)). WDFW personnel captured an average of 9 gophers/ac in a 22 ac (8.9 ha) plot at Olympia Airport, but some gophers remained in the plot (G. Olson, unpubl. data).

Mazama Pocket Gophers attain sexual maturity by the breeding season after their birth, when ~ 9 mo old and rear a single litter of ~5 (2-7) pups per year (Witmer et al. 1996, Verts and Carraway 2000, Stinson 2005). Gopher populations can increase dramatically in the summer after the dispersal of young of the year, and may increase to 3–4 times the spring adult population. In addition to this annual influx of young-of-the-year, gopher populations also fluctuate year-to-year due to environmental conditions. Pocket gopher populations are characterized by local extinction and recolonization (Baker et al. 2003). Territoriality and extreme weather may influence pocket gopher populations more than any other factors.

Pocket gophers have been called ‘keystone species’ and ‘ecosystem engineers’ because they affect the presence and abundance of plants and other animals (Vaughan 1961, 1974; Reichman and Seabloom 2002). Their extensive excavations affect soil structure and chemistry; food caches and latrines enrich the soil, affecting plant community composition and productivity. Mazama Pocket Gophers are an important prey species for many predators, including hawks, owls, coyotes, and weasels; their burrows provide retreats for salamanders, western toads, frogs, lizards, small mammals, and invertebrates (Stinson 2005, Stinson 2013).

Habitat Characteristics

Mazama Pocket Gophers live on open meadows, prairies and grassland habitats of the glacial outwash plain where there are porous, well-drained soils (Dalquest 1948, Johnson and Cassidy 1997, Stinson 2005, Stinson 2013). Historically, Mazama Pocket Gophers are believed to have resided in high-quality prairies dominated by native vegetation; in current times, remaining gopher populations are known to live in a wide range of grasslands, particularly if they include a significant component of fleshy-rooted forbs such as clover, lupines, dandelions, false dandelions, and camas (Stinson 2005, Stinson 2013). Enhancement of remnant prairies from degraded to high-quality may prove the difference between Mazama Pocket Gophers barely surviving versus thriving. In addition to remnant prairies, occupied sites in Washington include grassy fields at airports, pastures, fields, Christmas tree farms, and occasionally clearcuts (Stinson 2005, Stinson 2013).

Although most of the populations are found in grasslands on land that historically was prairie, they will move into sites with well-drained soil where forest cover has been removed, including recent clearcuts. Gophers are known to populate sites after timber harvest and become common for a few years while grasses and forbs are available, but decline as the area regenerates to forest. This has been observed most frequently in Mason County (Stinson 2005, Stinson 2013). They are otherwise essentially absent from forest habitats in Washington, particularly those with well-developed shrub understory. Mazama Pocket Gophers occur in open woodland in Oregon, particularly in ponderosa pine communities, but they are absent from dense forest (Verts and Carraway 1998). Gophers also are rare where grassland

has been taken over by dense Scotch broom (Steinberg 1996, Olson 2011b), but have been to at least temporarily persist among lower-density Scotch broom (Olson 2011b).

Perennial forbs are preferred for food over grasses, and fleshy roots and bulbs, such as camas, are important when green vegetation is not available. The availability of forbs may provide nutrients important for gopher growth and reproduction (Stinson 2005, Stinson 2013). Gophers also eat fungi and disseminate the spores of species that have an important role in facilitating plant growth.

The distribution and abundance of pocket gophers are greatly affected by soils. Soil characteristics that affect gophers include depth and texture, particularly rock and clay content that affects burrowing ability, permeability that can result in periodic flooding of burrows, and water-holding capacity and fertility that affect growth of plant foods. In general, pocket gophers prefer deep, light-textured, porous, well-drained soils, and do not occur in peat or heavy clay soils (Chase et al. 1982, Baker et al. 2003).

Distribution of Mazama Pocket Gophers appears correlated with prairie soil types, but they are not found on all remnant prairie sites. They rarely occur where soil is very rocky (Steinberg 1996, Olson 2011b). There are local populations in non-prairie loam, sandy, and gravelly soil types (e.g., Indianola loamy sand, Grove, Everett) that may have been unused by gophers historically due to forest cover. These occurrences often are adjacent to more typical prairie soils (e.g., Nisqually soils). They may be able to occupy any site that supports herbaceous vegetation, does not have significant tree cover, and is well-drained sandy, loamy, or gravelly soil. Mazama Pocket Gophers in Washington have not been found in clay, and there are few records in silt soils. In sum, deep, well-drained, sandy loam or loamy sand with sufficient fertility and water holding capacity to support desired forbs appears to provide optimal habitat (Baker et al. 2003).

Threats/Reason for Decline

Much of the Mazama Pocket Gopher habitat in the south Puget Sound has been lost to development, agriculture, and succession to forest, and what remains continues to be degraded by invasion of Scotch broom and other non-native plants (Stinson 2005, Stinson 2013). Residential development that becomes high density has been particularly destructive to prairie habitat, and probably led to extinction of one subspecies of Mazama Pocket Gopher: *T. m. tacomensis*. Habitat loss has eliminated most of the prairie vegetation, though significant areas remain in grassland. Though Mazama Pocket Gophers are generally protected in recent years by state, county, and local regulation, development may result in some unavoidable habitat loss and additional fragmentation and isolation of habitat patches. Degraded sites may often represent habitat that can support young that have dispersed, but offer inadequate food to consistently support reproduction. Pocket gophers may not persist in high density residential areas due to effects of frequent mowing, herbicides, impervious surfaces, and perhaps elevated mortality rates resulting from predation by cats and dogs and illegal trapping or poisoning of gophers (Stinson 2005, Stinson 2013). Most occupied habitat on public lands is affected by non-conservation uses including military training and recreation. Gopher populations at airports can be affected by development of airport-related facilities and businesses and management of the vegetation around airport runways and taxiways. Gopher populations at airports benefit from mowing which prevents invasion of the extensive grassland by woody vegetation.

Trends in the human population suggest that amount and quality of habitat will continue to decline without protection and careful management of conflicting uses. Thurston County is projected to have

significant numbers of additional people and to need substantial numbers of added single-family housing units and multi-family units in the near future. As the habitat patches become smaller, fewer, and farther apart, the likelihood of each patch continuing to support grassland-dependent species declines as intervening habitat patches are lost. These trends generally affect gophers negatively.

The persistence of Mazama Pocket Gophers on roadsides, vacant lots, lightly grazed pastures, and within commercial timberland suggests that they are relatively resilient, and may be able to persist in rural and low density developed areas. However, recent extinction of the Tacoma pocket gopher indicates that life for gophers in high density residential and commercial areas is hazardous and recruitment and re-colonization is inadequate to maintain local populations. The last possible records of the Tacoma pocket gopher were animals that were killed by domestic cats (*Felis catus*) and identified as gophers by homeowners (Ramsey and Slipp 1974). It is not known if the mortalities from these sources have a significant effect on gopher populations, particularly in less densely settled areas. Domestic dogs (*Canis lupus familiaris*) also are known to kill pocket gophers, but are probably less often free-roaming in unfenced areas. Pocket gophers can damage young trees and, like moles, their diggings can be an untidy nuisance to landowners desiring attractive lawns. They can also be a problem in vegetable gardens and at Christmas tree, berry, and vegetable farms in the area. Mazama Pocket Gophers are currently protected from killing without a permit; the frequency that they might be trapped or poisoned is unknown. When larger populations are suppressed by these methods, they readily recover if habitat remains suitable, but for small and isolated populations, mortality from persecution added to other hazards may lead to extirpation.

Livestock grazing. Gophers may survive in pastures in rural residential areas, but studies in California indicate that gopher density tends to decrease in heavily grazed pastures (Eviner and Chapin 2003). *T. mazama* has persisted on well-managed ranches in Thurston County.

Gravel mining. South Puget Sound prairies are located on glacial outwash gravels. Some of these glacial gravel deposits are very deep and valuable for use in construction and road-building, and prairie sites of significant size may be destroyed by gravel mining. One of the historic sites where Tacoma pocket gophers were collected became a large gravel pit, and 2 gravel pits have been opened on occupied gopher habitat in Pierce County south of Roy, and on historical Rock and Rocky prairies in Thurston County. These sites may be restorable to suitable condition for gophers when gravel removal operations have ceased if adequate layers of friable well-drained subsoil and topsoil are restored.

Airport Management and Development. Pocket gophers occur in grasslands surrounding airport runways and adjoining lands at Olympia and Shelton. Airport safety considerations require that the vegetation be mowed to maintain visibility, eliminate cover for large animals that might pose a hazard for aircraft, and provide a safety margin should aircraft overshoot or land short of the runway. This management benefits gophers by keeping out woody vegetation and maintaining the grassland. Development of aviation facilities and the surrounding port lands at the Olympia Airports pose a potential threat of habitat loss for what may be the largest populations of Mazama Pocket Gophers. The Olympia Airport designated 8.6 ac (3.5 ha) as a Mazama Pocket Gopher habitat conservation area in an interlocal agreement with WDFW as part of the Airport Five Year Development Plan, and any additional development would be subject to Tumwater Critical Area Ordinances. The Port of Olympia is currently updating their master plan. The Plan projects significant future land developed for general aviation (~114 ac (46 ha)), aviation related/compatible industry (~245 ac (99 ha)), and additional area for parallel taxiways (Barnard Dunkelberg & Co. 2011).

Military Training. The presence of Fort Lewis (part of Joint Base Lewis-McChord) has prevented the loss of habitat to agricultural and residential development for some of the largest remaining Mazama Pocket Gopher populations. The gophers exist primarily on prairies where vehicular traffic is currently restricted to established roads, but there are no specific restrictions on training to protect gophers (J. Foster, pers. comm.). The number of Army personnel stationed at JBLM has increased and additional increase is planned (Ft. Lewis Directorate of Public Works 2010). Steinberg (1995) speculated that military training by mechanized units may have negatively affected some gopher populations by compacting the soil. The increase in training needs is likely to increase impacts on grasslands and pocket gophers, but the most damaging training has been concentrated on the same areas, so some less-used prairies have been maintained in good condition. Since gophers do not require native vegetation, the effect of degraded vegetation on gopher populations is uncertain. Changes that decreased the cover of perennial forbs would likely have a negative effect on gophers. Areas damaged by military training are repaired by the Land Rehabilitation and Maintenance program.

Fires that burn the vegetation, whether as part of restoration activities or as a side-effect of training during the summer, help reduce invasion by Douglas-fir (*Pseudotsuga menziesii*) and Scotch broom and have maintained some of the highest quality prairie sites on JBLM. However, smaller portions of the AIA seem to burn too frequently, have a low percentage of native species, and a cover of mostly exotic annual grasses (Tveten and Fonda 1999).

Succession and invasive plants. The fire regime established and perpetuated by Native Americans maintained the south Puget Sound prairies for the past 4,000 years, or more. Fire suppression allows succession by native and exotic flora, and without vegetation management the native prairies would probably disappear. Fire suppression allows fire-sensitive species to invade and allows an unusual build-up of fuels that can lead to very hot fires, harming the normally fire-tolerant native species (Tveten 1997). The largest remaining prairie (91st Division) is maintained by prescribed and accidental fires, but large portions of these areas are also subject to disturbance during military training.

Fire suppression allows Douglas-fir to invade and overwhelm prairie. Disturbances such as grazing and vehicle traffic may accelerate colonization by Douglas-fir because Douglas-fir seed germination is enhanced by disturbance that increases mineral soil contact, while native plants may decline with the loss of the moss carpet. Prairie areas where Douglas-fir control has been conducted in recent years include Johnson Prairie and Weir Prairie RNA on JBLM, Mima Mounds and Rocky Prairie NAP, Thurston County's Glacial Heritage Preserve, and Scatter Creek WLA.

Scotch broom is the most visible invasive species that can cover prairies relatively rapidly. Olson (2011a) reported that Scotch broom negatively affected the probability of gopher site occupancy and plot use; the model suggested that plot use appears to decline as Scotch broom cover approached 10%. Parker (2002) reported that the glacial outwash prairie ecosystem is readily invaded by Scotch broom and that simply reducing soil disturbance and fires would not stop broom invasion (Parker 2002). Rook et al. (2011) noted that Scotch broom has long lasting effects on the soil that reduces germination and success of some native species. Scotch broom is killed through burning, hand pulling, or herbicide, but control requires an ongoing program because the plants produce abundant seeds that remain viable in the soil for several decades. Regular mowing can prevent additional Scotch broom seed production. Fire often stimulates germination of broom seeds in the soil, so a second burn, or herbicide is needed to kill the abundant seedlings. Portions of the Artillery Impact Area on JBLM are broom free, indicating that frequent burning prevents broom establishment, but this can also affect native species. All control methods can be detrimental to native species if not well planned.

There are numerous invasive exotic plants that degrade native prairies in the south Puget Sound region, in addition to Scotch broom. Techniques for restoration of the prairies and oak woodlands of the Willamette Valley-Puget Trough-Georgia Basin ecoregion are reviewed in Dennehy et al. (2011), Dunwiddie and Bakker (2011), Hamman et al. (2011), and Rook et al. (2011).

Implications of habitat loss for populations. Pocket gophers are vulnerable to local extinctions because of the small size of local breeding populations (Steinberg 1999). Low effective size of local populations and relatively large genetic differences between populations may be typical of gopher populations (Daly and Patton 1990). Pocket gophers have probably persisted by continually re-colonizing habitat after local extinctions; the loss of habitat patches and increases in hazards such as busy roads may have inhibited the re-colonization that historically occurred. Where additional habitat exists within a few hundred meters, some dispersal and resulting gene flow probably occurs between local populations, and vacant habitat is rapidly colonized. However, as habitat patches become smaller, fewer, and further apart, the likelihood of each patch continuing to support pocket gophers declines.

Oregon Vesper Sparrow (*Pooecetes gramineus affinis* Miller, 1888)

Conservation Status

The Oregon Vesper Sparrow (*Pooecetes gramineus affinis*) is a subspecies of conservation concern across its range in western Washington and Oregon. The American Bird Conservancy considers Oregon Vesper Sparrow to be a priority for conservation and have been documenting its status over the last two decades (Altman 2000, 2011, 2015, 2017). In British Columbia, where it is called the 'Coastal Vesper Sparrow,' it was listed as endangered in April 2006 (COSEWIC 2006) and has likely been extirpated as a breeding species (S. Beauchesne, pers. comm. in Altman et al. 2020, p. 2). The USFWS was petitioned by The American Bird Conservancy to list Oregon Vesper Sparrow under the Endangered species Act in November 2017 (American Bird Conservancy 2017). The USFWS made a finding that that petition was substantial in June 2018 (USFWS 2018) and the subspecies is current awaiting a 12-month review that will determine if listing is warranted. WDFW completed a status assessment for Oregon Vesper Sparrow in May 2020 that recommended endangered status for Oregon Vesper Sparrow in Washington (Altman et al. 2020). WDFW is scheduled to present the findings and recommendation to the Washington Wildlife Commission in October 2020.

Population Trends and Distribution

The breeding range of Oregon Vesper Sparrow previously extended from southwestern British Columbia through western Washington, western Oregon, and into the northwestern tip of California (Campbell et al. 2001; Jones and Cornely 2002; Altman 2003), but the breeding range has since contracted in the north and south (Altman et al. 2020, pp. 6-7). "Oregon Vesper Sparrows are migratory and overwinter in California, west of the Sierra Nevada Mountains and south of San Francisco Bay, and historically into northwestern Baja California, Mexico (Erickson 2008). Regular wintering areas extend from Sutter County southward, primarily through the low foothills surrounding the Sacramento and San Joaquin valleys, to the foothills and valleys of southwestern California (Erickson 2008)" (Altman et al. 2020, p. 2).

In Washington, Oregon Vesper Sparrow occur in lowland areas west of the Cascade Mountains (Jewett et al. 1953, Smith et al. 1997; Mlodinow 2005). Although nesting records are few, historical breeding range is believed to have extended from northern Skagit County, the San Juan Islands, and Clallam County (Dungeness and Sol Duc) south through southern Puget Sound (including Thurston County) and probably included Clark County (Camas and Vancouver) (Altman et al. 2020, p. 2). The current breeding population in Washington is now limited almost entirely to remnant prairies in Thurston and Pierce Counties. Outside of Thurston and Pierce counties small numbers still breed in near Shelton in Mason County (Smith et al. 1997; Mlodinow 2005; G. Slater pers. comm. in Altman et al. 2020, p. 9). Oregon Vesper Sparrow recently occupied San Juan Island in San Juan County but have not been detected in several years (S. Vernon pers. comm. in Altman et al. 2020, pp. 9, 11, 28).

Breeding season presence in Thurston County during the past 20 years has been recorded at Scatter Creek, Mima Mounds, West Rocky Prairie, Weir Prairie, Johnson Prairie, Tenalquot Prairie, the Olympia airport, Glacial Heritage Preserve, north of Bucoda, Goodard Road SW, and unspecified sites in Grand Mound, Rainier, Lacey, Tumwater, and Nisqually (WDFW WSDM internal database; not publicly accessible). The vicinity of Yelm was once considered a prime area for the subspecies (Jewett et al.

1953), but is no longer occupied. Current breeding season records in Thurston and Pierce County are focused around the prairie habitats of JBLM. Oregon Vesper Sparrow territories also straddle the boundaries between JBLM, CNLM, and private properties on Tenalquot and Weir prairies (G. Slater in litt. 2020). Multiple years of observations at these boundaries suggest that there are at least a few private properties that contain breeding Oregon Vesper Sparrow in Thurston County (Altman 2017, p. 24; G. Slater in litt. 2020). Recent observations of Oregon Vesper Sparrow at Scatter Creek where Oregon Vesper Sparrow were previously considered extirpated (EBird 2020) suggest that Oregon Vesper Sparrow breeding season presence in Thurston County is not fully understood and is not likely to be entirely static in the near future.

Vesper sparrow populations have been declining throughout North America since at least the 1960s (Jones and Cornely 2002). Recent trends in Oregon Vesper Sparrow abundance and distribution continue to reflect that trend, with declines evident across the breeding range (Beauchesne 2006; Altman 2011; Altman 2017; Altman et al. 2020, pp. 28-30). In Washington, the subspecies was originally described as “fairly common” to “rather abundant” in localized areas of western Washington (Altman 2011), but apparently was never common over a widespread area. Larrison and Sonnenberg (1968) reported it as being of limited abundance and range by the mid-1960s. It was “rare and local....in remnant prairie areas” by the 1990s (Smith et al. 1997), with the exception of 91st Division Prairie on JBLM, where about 100 singing males were on established territories in 1998 (Rogers 2000). Altman (2011) previously estimated that there were 250-300 birds in the Puget Lowlands and 50-100 birds on islands along the lower Columbia River. As of 2015, numbers of Oregon Vesper Sparrows in Thurston County were quite small (i.e., zero to a few birds each) at Mima Mounds, Scatter Creek, and West Rocky Prairie (Altman 2015). Oregon Vesper Sparrow are now probably locally extirpated at several places where they were known to breed in the last 15 years, including Mima Mounds, West Rocky Prairie, and the Olympia Airport. “The estimated population of Oregon Vesper Sparrows in Washington is approximately 300 birds, with most (~75%) of them on a single site, JBLM’s 91st Division Prairie” (Altman et al. 2020, p. 19).

Life History and Ecology

Vesper sparrows have narrow streaks on their breasts, whitish bellies, notched brown tails, pinkish legs, and dusky brown bills with pinkish lower mandibles (Rising 1996; Altman 2017). Oregon Vesper Sparrow is a medium- to large-sized bird, with a chestnut or rufous shoulder patch, white edges on its outer tail feathers, and white-ringed eyes (Altman 2017). In general, Oregon Vesper Sparrow are somewhat larger and longer-tailed than other sparrows (Jones and Cornely 2002; Altman 2017). Oregon Vesper Sparrow is accepted as a taxonomically distinct unit based on morphological measurements (Ridgeway 1901; American Ornithological Union 1957; Paynter 1970; Pyle 1997; *in* Altman et al. 2020, p. 1). There has not yet been a genetic assessment conducted of the Vesper Sparrow subspecies.

Oregon Vesper Sparrow are present in western Washington mainly from early April through late September (Mlodinow 2005; Altman et al. 2020, p. 4). Males arrive a week or two earlier than females (Best and Rodenhouse 1984; Altman et al. 2020, p. 4) and begin singing and establishing territories. After nesting concludes, Vesper sparrows typically gather in small groups until fall migration (Bailey and Niedrach 1965). Fall migration through western Washington is primarily from mid-August to late September, with fewer records extending into October (WDFW WSDM internal database; not publicly accessible). Migration usually occurs at night, with most individuals joining small flocks of up to 10 birds (Rising 1996; Jones and Cornely 2002). The species sometimes migrates with Horned Larks (*Eremophila alpestris*) and Savannah Sparrows (*Passerculus sandwichensis*) (Berger 1968; Hyde 1979).

Birds begin singing after arriving at their breeding sites (Altman 2003). Singing occurs most frequently early in the morning, subsides during the day, and then increases again from sunset to dusk (Jones and Cornely 2002). Singing is typically performed from elevated perches, such as fences, trees along the edges of fields, shrubs, grass, and the stalks of forbs, but may be conducted from the ground when perches are lacking (Berger 1968; Wiens 1969; Castrale 1983; Jones and Cornely 2002; Altman 2003).

The diet of Oregon Vesper Sparrow is comprised of grass and forb seeds year-round, but is heavily supplemented with insects (especially grasshoppers, beetles, and caterpillars) and other arthropods during the breeding season (Berger 1968, Rotenberry 1980, Jones and Cornely 2002). Most foraging occurs on the ground, but birds will hop and hover to glean food from vegetation.

“In recent years, the Oregon Vesper Sparrow is generally found in large grasslands (e.g. >50 ac) in Washington, but not in small patches of similar habitat (S. Pearson, pers. comm.). In the Willamette Valley, they have been recorded breeding in relatively small areas of 20 acres (8 hectares), but are also absent from many more areas of suitable habitat of that same-size (B. Altman, pers. obs.). Breeding territory size throughout its range averaged 3.6 ac (1.45 ha; n=88; Altman 2016), and likely varies with habitat quality (Jones and Cornely 2002, Altman 2016). On JBLM, average territory size was 2.5 ac (1 ha; n=4) in 2013, and 3.3 ac (1.3 ha; n=7) in 2015 (Altman 2015, 2016). Minimum patch size of grassland has been noted as an important factor in site selection for Vesper Sparrows (Kershner and Bollinger 1996, Vickery et al. 1994)” (Altman et al. 2020, p. 4).

Vesper sparrows become sexually mature a year after hatching and are seasonally monogamous (Jones and Cornely 2002). Average lifespan of Vesper sparrows is unknown, but a maximum of 7.1 years has been recorded for a banded individual in the wild (Klimkiewicz 1997). Females construct the nest alone (Rising 1996). Nests are made from grasses in the shape of a shallow bowl and have an outer diameter of 3-4 in (8-10 cm) (Berger 1968, Godfrey 1986, Peck and James 1987). Nests are placed on flat ground or in a shallow depression, and are usually located next to a clump of vegetation, crop residue, dirt clod, or at the base of a shrub or tree (Jones and Cornely 2002; Altman 2003; Altman 2015; Altman 2017). “Fledging rates were 2.8 young/successful nest and 2.2 young/active nest in the south Puget lowlands in 1996 (n=6 nests; S. Pearson pers. comm.), and 3.4 young/successful nest and 1.6 young/active nest in the south Puget lowlands in 2017-2019 (n=34 nests; G. Slater, pers. comm.)” (Altman et al. 2020, p. 5).

Oregon Vesper Sparrow nest from about late April to mid-July (Bowles 1921, Altman 2003, Beauchesne 2006, Altman et al. 2020, p. 4). Oregon Vesper Sparrow has been observed to start a second brood (re-nest) following a successful first nesting (B. Altman unpubl. data, Altman 2017, Altman et al. 2020, pp. 1, 5). Eggs measure 20 mm (0.8 in) long by 15 mm (0.6 in) wide on average (Jones and Cornely 2002). Clutch size for Vesper sparrows (including Oregon Vesper Sparrow) is usually 3-5 eggs (range = 2-6 eggs). Incubation averages 12-13 days and is performed mostly by the female. Both parents feed the chicks, although primary responsibility of the first brood may fall to the male if the female begins a second brood (Berger 1968). Young fledge from the nest after 9-10 days on average and remain dependent on the parents for another 20-29 days (Perry and Perry 1918, Dawson and Evans 1960).

Vesper sparrows in general exhibit high site fidelity. For example, Best and Rodenhouse (1984) reported that about half of breeding adults return to their nesting site the following year. Oregon Vesper Sparrow, however, exhibit a particular significant site fidelity that challenges their ability to colonize or recolonize suitable habitat. High fidelity to breeding locations of Vesper Sparrows also limits the demographic and genetic interchange between sites (Altman et al. 2020, p. 16). Altman and others (2020, pp. 4, 15-6) emphasized the importance of site fidelity for Oregon Vesper Sparrow in Washington.

Gary Slater, quoted in Altman et al. 2020 (p. 4), noted that none of the 19 banded Oregon Vesper Sparrow have returned to a different breeding location. Anecdotal information suggests this is possible though. Compared E-bird data and surveys suggest that Oregon Vesper Sparrow were extirpated from Scatter Creek Wildlife Area but may have returned in 2020 (Altman et al. 2020, p. 29; EBird 2020).

Habitat Characteristics

Vesper sparrows inhabit a variety of grassland types, including shortgrass and tallgrass prairie, desert and semi-desert grasslands, shrub-steppe, croplands, hay fields, pastures, weedy fence rows and roadsides, and woodland edges (Campbell et al. 2001, Jones and Cornely 2002, Altman 2015). Preferred areas for breeding territories typically have short, sparse and patchy grassy and herbaceous cover, some bare ground, low to moderate shrub or tall forb cover, and low tree cover (Reed 1986, Campbell et al. 2001, Dechant et al. 2002, Jones and Cornely 2002). Some structural diversity of vegetation appears to be an important factor in site selection, with shorter vegetation chosen for foraging and scattered taller plants used for cover and singing perches (Davis and Duncan 1999, Beauchesne 2006).

Oregon Vesper sparrows also show some variation in breeding habitat. In western Washington, the subspecies was originally widespread in prairies and pastures (Jewett et al. 1953), but had become restricted to the edges of open prairies by the 1990s (Rogers 2000, Mlodinow 2005). Breeding habitat in the state remains poorly quantified. Clegg (1998, 1999) reported that all breeding territories (n = 23) at JBLM were in areas of high-quality prairie supporting intact Idaho fescue (*Festuca idahoensis*) located near prairie edge. Size of the prairie appears to be an important factor in current site selection, with only large prairies occupied now. As noted above, “in recent years, the Oregon Vesper Sparrow is generally found in large grasslands (e.g. >50 ac) in Washington, but not in small patches of similar habitat (S. Pearson, pers. comm.)” (Altman et al. 2020, p. 4).

In strong contrast to western Washington, nearly all detections of Oregon Vesper sparrows in Oregon’s Willamette Valley are in young Christmas tree farms (i.e., 2-5 years after planting) with extensive grass and weed cover, or in lightly grazed pastures with scattered shrubs and grass heights of less than 30-60 cm (1-2 ft) high (Altman 1999, 2003). Habitats avoided include cultivated grass fields, highly manicured Christmas tree farms, and fallow fields with grass heights exceeding 2 ft (60 cm) high. In southwestern British Columbia, the subspecies originally bred in pastures, agricultural land, and airport fields with patches of grasses and weeds (Campbell et al. 2001), then only in grasslands next to hayfields, which contain native and non-native plants (Beauchesne 2006), and now Oregon Vesper Sparrow appears to be extirpated in Canada (S. Beauchesne, pers. comm. in Altman et al. 2020, p. 2).

The only study characterizing the microhabitat of nest locations of Oregon Vesper sparrows reported that nests in the Willamette Valley were built in areas with relatively reduced grass cover (49%) and sizable amounts of bare ground (24%) and litter/ residue (21%), compared to other locations within territories (Altman 1999, 2000). Woody vegetation also was regularly present near many nests. Rogers (2000) reported reduced vegetation heights (average = 6-8.5 in (15-21 cm)) and densities at foraging locations compared to random sites in prairies in Pierce and Thurston counties, Washington. Altman (2017, p. 47) suggested that suitable breeding habitat for Oregon Vesper Sparrow has less than 10% tree cover, less than 15 % shrub cover, 5 to 15% bare or sparsely vegetated ground cover, more than 15% forb cover, and herbaceous cover that is structurally and compositionally diverse with mean graminoid height in mid to late May of 6 to 20 in (with more than 40% of that less than 12 in (30 cm) height, less than 40 % of that 12-24 in (30-60 cm), and less than 20% of that greater than 24 in (60 cm) tall).

Threats/Reasons for Decline

In a recent summary of Oregon Vesper Sparrow status in Washington, Altman and others (2020, p. 14) wrote: “The primary factor responsible for historic declines in Oregon Vesper Sparrows in Washington is likely habitat loss and degradation. The primary factor(s) affecting continued existence are less certain. Habitat degradation is probably still an issue, but several other potential factors include higher nest predation in fragmented habitat, human disturbance during the nesting season, genetic and demographic factors associated with small population size, and possibly neonicotinoid pesticides (Smith et al. 1997, Altman 1999, 2003, 2011, Rogers 2000, Beauchesne 2006, Eng et al. 2016, Frankham et al. 2017).”

Two major factors contributing to the declines of Vesper Sparrows in much of their North American range are habitat loss through conversion of native grasslands and shrublands to unsuitable types of agriculture, and the shift in farming practices to more intensive tillage and greater use of chemicals (Jones and Cornely 2002). Grazing impacts on Vesper Sparrows vary with grazing intensity and soil type, but locations exposed to heavy grazing typically support lower breeding densities than sites with moderate and light grazing (Kantrud and Kologiski 1982, Altman 1999). In addition to habitat modification, grazing can result in trampling of nests (Altman 1999).

Declining populations of Oregon Vesper Sparrow result primarily from habitat loss and degradation, and potentially from increased predation and human disturbance (Smith et al. 1997, Altman 1999, 2003, 2011, Rogers 2000, Beauchesne 2006). South Puget Sound prairies originally covered an estimated 60,470 ha (149,360 ac), but had declined in size by 90% by the mid-1990s, with only 3% remaining in intact prairies (Crawford and Hall 1997). During this period, the number of prairies in south Puget Sound fell from 233 to 29 sites and average size decreased from 641 to 433 ac (260 to 175 ha). This decline was driven by urban conversion, encroachment of Douglas-fir forests caused by fire control, and conversion to farmland (Chappell and Kagan 2001). Many remaining prairies are degraded by the invasion of Scotch broom and other non-native plants (Chappell and Kagan 2001).

Oregon Vesper Sparrows also may be experiencing increased predation from species associated with semi-urban and residential areas such as feral and domestic cats, raccoons (*Procyon lotor*), American crows (*Corvus brachyrhynchos*), and opossums (*Didelphis virginiana*) (Altman 1999, Rogers 2000, Pearson 2003, Stinson 2005, Beauchesne 2006). “Vander Haegen et al. (2002) and Vander Haegen (2007) reported that real and simulated songbird nests in a fragmented landscape in Washington were nine times more likely to be depredated than those in continuous landscapes” (Altman et al. 2020, p. 16).

“The main threat on the wintering grounds is likely human and agricultural development of relatively open, flat ground at low elevations (e.g., the development of the Los Angeles basin and San Fernando Valley) (Erickson 2008). This includes agricultural pressures, especially a proliferation of vineyards, and development particularly from Ventura County south. Chemically treated seed in existing cropland in wintering areas may also be an important potential threat” (Altman et al. 2020, p. 15). “Some recent studies suggest the widespread use of neonicotinoids is correlated with declines in grassland birds (Mineau and Palmer 2013, Mineau and Whiteside 2013, Hallmann et al. 2014). Turfgrass seed and oil seeds are produced on substantial acreage in the Willamette Valley which has also seen a dramatic decline in Oregon Vesper Sparrows (Myers and Kreager 2010). Seeds of canola, corn, wheat, and turf grasses are routinely treated with neonicotinoid insecticides and/or fungicides, and some neonicotinoids

are sufficiently toxic to small birds such that ingestion of a few treated seeds can cause death, inhibit normal reproduction, or affect migratory ability (Goulson 2013, Mineau and Palmer 2013, Gibbons et al. 2015, Eng et al. 2017). Eng et al. (2017) reported that during captive trials, White-crowned Sparrows (*Zonotrichia leucophrys*) consuming the equivalent of four imidacloprid-treated canola seeds per day over three days suffered significant weight loss and failed to orient normally for migration” (Altman et al. 2020, p. 17).

“Environmental events, such as severe droughts, fires, or disease can decimate small populations. Genetic problems can occur with small isolated populations and can interact with demographic and habitat problems, leading to a population’s extinction (Frankham et al. 2017). Inbreeding and poor genetic diversity can result in weak immune systems (Allendorf and Ryman 2002), reduced reproductive fitness (Höglund et al. 2002), low hatchability of eggs (Briskie and Mackintosh 2004), and the reduced ability to adapt, all of which increases extinction risk (Brook et al. 2002, Frankham et al. 2017). Also, chance shifts in sex ratios or age distributions can affect breeding and recruitment (Foose et al. 1995). Preliminary data on low egg hatch rates in the Puget lowlands (S. Pearson, pers. comm., G. Slater, pers. comm.) and Willamette Valley (B. Altman, unpubl. data) suggest cause for concern” (Altman et al. 2020, p. 16).

Oregon Spotted Frog (*Rana pretiosa* Baird and Girard, 1853)

Conservation Status

The Oregon Spotted Frog (*Rana pretiosa*) is listed by the USFWS as Threatened (USFWS 2014b), and was listed as endangered in Washington in 1997. The species persists in seven Washington subbasins/watersheds (79 FR 51663). In Thurston County, Oregon Spotted Frogs occur in the Black River drainage. The Oregon Spotted Frog population on Beaver Creek (a tributary of the Black River) occurs adjacent to West Rocky Prairie and is the only remaining population in the south Puget Sound Lowlands associated with native prairie. Washington State status has been reported (McAllister and Leonard 1997, <http://wdfw.wa.gov/publications/00382>). Information herein relies heavily on information gathered for the Draft Washington State Recovery Plan for the Oregon Spotted Frog (Hallock 2013).

Population Trends and Distribution

The Oregon Spotted Frog is a Pacific Northwest endemic historically distributed from southwestern British Columbia, Canada (Matsuda et al. 2006, Hallock 2013) to northeastern California, USA (Hayes 1997a), including the Puget Trough-Willamette Valley, and East Cascades-Modoc Plateau ecoregions. Oregon Spotted Frog populations have declined throughout the range and have been extirpated from large portions of their historical distribution. Range loss based on historical site analysis is estimated to be 79%, but may approach 90% (Hayes 1997a, Haycock 2000, Hallock 2013). Available evidence indicates the species has been extirpated from the southern portion of its range in California and the lowland Willamette Valley in Oregon; the fate of populations at the northern extreme of the range in Canada is precarious (Hayes 1997a, Haycock 2000).

Locations of Oregon Spotted Frog populations in Washington went largely undocumented historically (Hallock 2013). McAllister and Leonard (1997) reviewed museum records from major herpetological collections of North America. These specimens reveal an historical distribution in the Puget Trough lowlands and southern Washington Cascades (McAllister 1995, McAllister and Leonard 1997) with nine

widely separated populations verified by specimen records (McAllister and Leonard 1990, 1991, McAllister et al. 1993). McAllister and Leonard (1997) identified 2 additional historical localities, Pattison Lake and Kent, based on reports by Professor James Slater and Warren Jones. In 2011 and 2012, Oregon Spotted Frogs were found in the South Fork Nooksack River, Samish River, and Chilliwack River drainages (Gay and Bohannon 2011, Bohannon et al. 2012). Assuming that watersheds currently occupied were also occupied historically, Oregon Spotted Frogs occupied at least 14 watersheds in Washington. All Washington sites, historical and extant, are found below 634 m (2,080 ft). Six extant occurrences persist in Washington including populations in the lower South Fork Nooksack River (Whatcom Co.), lower Chilliwack River (Whatcom Co.), upper Samish River (Whatcom & Skagit Cos.), upper Black River (Thurston Co.), lower Trout Lake Creek (Klickitat and Skamania Cos.) and Conboy Lake in Outlet Creek (Klickitat Co.) (Hallock, 2013).

In 2020, Oregon Spotted Frog distribution in the Upper Chehalis sub-basin is limited to habitat in the Black River watershed including tributaries to the Black River above River Mile 10. Surveys for Oregon Spotted Frog in seemingly suitable habitat within the upper Chehalis sub-basin have not detected the species outside the Black River Watershed (Hallock 2016, p. 61; Hayes *et al.* 2017, p 3). Currently Oregon Spotted Frogs are known to occupy wetlands in the floodplain and tributaries of the upper Black River drainage between Black Lake and Mima Creek. There are 13 breeding populations. Oregon Spotted Frog habitat in this sub-basin is managed by a variety of owners, including USFWS Nisqually National Wildlife Refuge-Black River Unit, WDFW, land conservancy groups, private companies, and private individuals.

Oregon Spotted Frogs are currently known to occur at four locations within the Black River floodplain ("Pipeline" near the confluence of Dempsey Creek, Blooms Ditch near 110th Avenue Bridge, near 123rd Avenue, and the confluence with Mima Creek) and in four tributaries: Dempsey Creek, Salmon Creek (including Hopkins Ditch), Allen Creek, Bloom's Ditch, and Beaver Creek (Hallock 2013, pp. 29-32; WDFW 2019, unpublished data). In 2012, 2013, and 2018 new breeding locations were detected along the Fish Pond Creek system, which flows directly into Black Lake, not Black River. Oregon Spotted Frog breeding areas in the Black River may be isolated from each other by roads, distance, and areas of unsuitable habitat. Sites associated with Fish Pond Creek may be similarly isolated from sites in the Black River due to the human alteration of the Black Lake drainage pattern, habitat issues, non-native fish, and non-native bullfrogs. The Black River adult breeding population was comprised of at least 1,748 breeding adults in 2012 (Hallock 2013, p. 27), 3,330 breeding adults in 2013, and an estimated 1,816 breeding adults in 2019 (WDFW 2019, unpublished data). Like sub-basins farther north in Washington State, access to private lands was limited, resulting in a likely underestimate in number of breeding adults. Since listing, a number of locations in the Black River and Lake Watersheds have been identified on private lands east of I-5 and as far south as Mima Creek along Black River. Therefore, further survey efforts are needed to determine the full extent of the Oregon Spotted Frog's distribution, abundance, and trend in the Black River.

Life History and Ecology

The Oregon Spotted Frog is a medium-sized, aquatic, ranid frog. It is named for the black spots covering the head, back, sides, and legs. These spots have ragged edges and light centers, and become larger, darker, and increasingly ragged-edged as the frogs age. An additional characteristic includes upward-oriented, yellow-green eyes, pointed snout, white lip line, and eye mask (Nussbaum et al. 1983, Stebbins 2003, Jones et al. 2005, USFWS 2011, Hallock 2013). Oregon Spotted Frogs aggregate to breed following the coldest weeks of winter. Breeding frogs gather in seasonally flooded margins and shallows of

emergent wetlands in areas that receive minimal shading from the surrounding vegetation. Frogs use the same breeding areas every year and, depending on topography and site conditions, may lay eggs at the same site. Orientation to the breeding site is poorly understood, but seems to involve a combination of non-vocal and vocal cues (Licht 1969, Risenhoover et al. 2001a). Due to their lacking vocal sacs (Hayes and Krempels 1986), the male advertisement call sounds like faint, rapid, low-pitched tapping (Stebbins 2003; Hallock 2013). Calling occurs at the water surface and subsurface (Licht 1969, Bowerman 2010). The surface calls orient females to the egg deposition (oviposition) site (Licht 1969). Initiation dates of egg deposition vary by year depending on spring conditions (Licht 1969). In general, oviposition commences when subsurface waters are 45-48°F (7-9°C) and minimum water temperatures rarely fall below 41°F (5°C) (Licht 1971, Hayes et al. 2000, McAllister and White 2001). Other cues also may be involved.

Breeding occurs in February or March at lower elevations (such as Thurston County) and between early April and early June at higher elevations (Leonard et al. 1993). Once initiated, breeding is “explosive” with many pairs breeding during a short time period (Licht 1969, Nussbaum et al. 1983, Briggs 1987). Most frogs spawn mid-day (Licht 1969), but nocturnal spawning also has been detected using wildlife cameras (J. Tyson & M. Hayes, WDFW, pers. comm.). Within a breeding area, multiple bursts of egg deposition may occur over a 2-3 week period.

Oregon Spotted Frogs may have a serially monogamous mating system with each female laying a single clutch per year that is fertilized by a single male, and each male breeds with only one female (Phillipsen et al. 2009). Fertilization is external. The male clasps the female around the upper body with his forearms in an embrace called amplexus. This embrace aligns the vents of the male and female in close proximity for spawning. The first pair of frogs to lay eggs selects the oviposition site (Hallock 2013). Each female lays a single, compact, globular egg mass that expands to the size of a softball, ~5 to 8 in (12 to 20 cm) in diameter when fully expanded (Nussbaum et al. 1983, Hallock 2013). Additional females subsequently deposit their egg masses on top of or immediately adjacent to the initial egg mass. Eggs are deposited in shallow water typically up to 12 in deep (≤ 15 cm but up to 30 cm) (Licht 1969, Hayes et al. 2000, Lewis et al. 2001, McAllister and White 2001, Risenhoover et al. 2001a). Oregon Spotted Frogs occasionally lay egg masses on floating mats of prostrate reed canarygrass (*Phalaris arundinacea*) in waters that are deeper than typically used (> 12 in (30 cm) (McAllister and White 2001; M. Bailey, USFWS, pers. obs. and L. Hallock, WDFW, pers. obs.). When a communal egg mass cluster is established, males call from near it and on top of it (Licht 1969). Licht (1969) showed the significance of the egg mass clustering behavior by moving the initial egg mass. All subsequent females laid their eggs on the communal cluster at or near the new location and no females laid at the original location. At a low elevation site in British Columbia (Canada), females bred every year, averaging 643 eggs (range 249-935) in each mass (Licht 1974).

Egg laying habits and certain aspects of the globular egg mass shape are adaptations for rapid development. The large egg mass retains more heat than smaller egg masses (Hassinger 1970, Duellman and Trueb 1986, Hallock 2013) and communal egg deposition produces higher daytime temperatures for the developing embryos (Licht 1971, Duellman and Trueb 1986, McAllister and White 2001, Hallock 2013). The clustering of egg masses also may provide the majority of embryos protection from temporary stranding events, freeze damage, and egg predators. The placement of egg masses in the comparably warmer shallow waters and the selection of sites that receive minimal shading from the surrounding vegetation also speed development rates. Non-shaded habitat quickly warms on sunny days limiting potential freeze damage from cold nights. Embryos do not survive freezing (Licht 1971, Hallock 2013). Non-shaded habitat also enhances development of algae that live symbiotically in the eggs and

may be critical for oxygen delivery to and removal of nitrogenous waste from the innermost embryos in communal clusters (Pinder and Friet 1994, Hallock 2013).

Embryo development to hatching can occur in as little as 10-14 days with 18-30 days being the typical development time (Lewis et al. 2001, McAllister and White 2001, Risenhoover et al. 2001a, Bowerman and Pearl 2010, Hallock 2013). The free-swimming larvae disperse from communal egg mass clusters a week or so after hatching. The tadpoles are primarily herbivorous feeding on algae, decaying vegetation, and detritus (Licht 1974); this life stage is dedicated to eating and growth. The tadpole stage lasts about 4 months (Licht 1974). In late summer, the tadpoles metamorphose into fully-formed, small frogs about 1.3 in (33 mm) snout-vent length (Nussbaum et al. 1983, Hallock 2013).

Metamorphosed frogs prey primarily on invertebrates (Licht 1986b). Growth is rapid until adult sizes are achieved 1 to 2 years following metamorphosis (Licht 1975). At a low-elevation site in Thurston County, adult males continued to grow an average of 0.09 in (2.2 mm) per year and adult females grew 0.24 in (6.2 mm) per year (Watson et al. 2000). Longevity > 9 years was documented for a PIT-tagged Oregon Spotted Frog (K. McAllister, WA Department of Transportation, pers. comm.); longevity for most Oregon Spotted Frogs likely is shorter (Licht 1975, McAllister and Leonard 1997, Hallock 2013). Oregon Spotted Frogs do not have a prolonged period of hibernation (<1 month; Hayes et al. 2001, Hallock and Pearson 2001, Risenhoover et al. 2001b, Watson et al. 2003, Shovlain 2005) and they can be active under ice (Leonard et al. 1997, Hallock and Pearson 2001). Oregon Spotted Frogs rarely move long distances and have not been recorded moving > 2,360 m (7,750 ft; Forbes and Peterson 1999, McAllister and Walker 2003).

Oregon Spotted Frogs suffer mortality mainly from predators and chance environmental events (Hallock 2013). Freezing temperatures and stranding of egg masses are the main threats to developing Oregon Spotted Frog embryos. An entire cohort can be lost in years when water retreats after breeding is underway (Licht 1974, Hallock 2013). Freeze damage is a cause of embryonic mortality in years where temperatures drop below freezing after breeding is underway. The highest rates of embryo mortality are observed in years when the egg masses became temporarily stranded due to a period without precipitation that coincides with freezing night temperatures (Hallock 2013). Significant mortality also can result when tadpoles become isolated in breeding pools away from more permanent waters (Licht 1974, Watson et al. 2003).

In terms of predators, tadpoles are most vulnerable to predation when small (Licht 1974, Hallock 2013). In southwestern British Columbia, Licht (1974) found predators on Oregon Spotted Frog tadpoles to be mostly invertebrates. Fish also are likely predators on tadpoles (Hayes and Jennings 1986, McAllister and Leonard 1997, Hayes 1997a, Pearl 1999). The frogs are preyed on by a variety of vertebrate predators including native (Licht 1974) and non-native amphibians (e.g., American Bullfrogs, *Lithobates catesbeianus* formerly *Rana catesbeiana*; McAllister and Leonard 1997, Pearl et al. 2004), Common Garter Snake (*Thamnophis sirtalis*; Licht 1974, Hayes 1997a, McAllister and Leonard 1997, Forbes and Peterson 1999, Pearl and Hayes 2002, Watson et al. 2003, Hallock 2013), birds such as Sandhill Cranes (*Grus canadensis*; Hayes et al. 2006) and Great Blue Herons (*Ardea herodias*; Licht 1974), and mammals such as Mink (*Neovison vison*; Bowerman and Flowerree 2000; Watson et al. 2000, Hallock and Pearson 2001, Hallock 2013) and river Otters (*Lontra canadensis*; Hayes et al. 2005). Adult annual survival of a study population at Dempsey Creek (Thurston County) was 38% (Watson et al. 2000).

Habitat Characteristics

Washington's remaining populations of Oregon Spotted Frogs occupy still-water wetlands connected by riverine systems. The perennial creeks and associated network of intermittent tributaries provide aquatic connectivity between breeding sites, active season habitat, and overwintering habitat (Hallock 2013). Additionally, perennially flowing waters may provide the only suitable habitat during extreme summer drought or during winter when oxygen levels drop in still-waters under ice and snow. Associated wetlands have a mix of dominance types including aquatic bed, emergent, scrub-shrub, and forested wetlands. The seasonally inundated wetland margins are frequently hay fields and pasture. The less disturbed sites have wet meadows and prairie uplands (Hallock 2013). Some occupied sites are formed by American Beaver (*Castor canadensis*) activity. All the remaining Oregon Spotted Frog sites have moderate to severe habitat alteration including a history of cattle grazing and/or hay production as well as encroaching or established rural residential development. Hydrology has been altered to some extent at all sites (Hallock 2013).

Watson et al. (2003) stressed that the most important features for microhabitat use were water depth, flow characteristics (still water was used over flowing water), and a high degree of water surface exposure (i.e., 50-75% water) or conversely, a low to moderate degree of emergent vegetation (i.e., 25-50%). The predominant use of shallow water habitat by Oregon Spotted Frogs was illustrated by Watson et al. (1998, 2003), who found Oregon Spotted Frogs selected water depths of 4-11.7 in (10-30 cm) with less emergent vegetation and more submergent vegetation than adjacent habitats (Hallock 2013).

Oregon Spotted Frogs select breeding sites in seasonally flooded wetland margins adjacent and connected to perennial wetlands (Licht 1971, Hayes et al. 2000, Pearl and Bury 2000, Watson et al. 2000, Hallock and Pearson 2001, Lewis et al. 2001, McAllister and White 2001, Risenhoover et al. 2001a, Watson et al. 2003, Pearl and Hayes 2004, Hallock 2013). Full solar exposure also seems to be a significant factor in breeding habitat selection (McAllister and White 2001, Pearl and Hayes 2004, Hallock 2013). Oviposition sites are in shallow waters with low vegetation structure that does not shade the eggs. Typically these locations are near shore but can also be in areas with extensive shallows. Low vegetation structure is typical of early successional vegetation stages but also can result from cattle grazing, haying, and mowing. Heavy snowpack also can flatten emergent vegetation providing suitable oviposition conditions (Hallock 2013).

Post-breeding habitat use is the least studied of Oregon Spotted Frog habitat associations in Washington. During the summer drought (July to September), frogs in Thurston County were restricted to remnant pools that persisted during this time (Watson et al. 2003, Hallock 2013). At a site in Oregon, habitat use was primarily near-stream with frogs showing high micro-site fidelity (Shovlain 2005, Hallock 2013). During the coldest months, Oregon Spotted Frogs require well-oxygenated waters (Hallock and Pearson 2001, Hayes et al. 2001, Tattersall and Ultsch 2008, Hallock 2013) and sheltering locations protected from predators and freezing conditions (Risenhoover et al. 2001b, Watson et al. 2003, Hallock 2013). This is especially important during the coldest periods when activity of this ectotherm is expected to be the lowest.

Slipp (1940) reported Oregon Spotted Frogs to be associated with prairie lakes and streams in the area between Tacoma and the Nisqually River (Tacoma Plateau/Nisqually Plains). Oregon Spotted Frogs require breeding habitat with low vegetation structure and full solar exposure (McAllister and White

2001, Pearl and Hayes 2004). Puget Sound prairies would have provided such habitat within an otherwise densely forested landscape.

Threats and Reasons for Decline

The decline of Oregon Spotted Frogs is attributable to several related factors. Among the most significant is the loss and alteration of wetland habitat. Oregon Spotted Frogs have life history traits, habitat requirements, and population characteristics that make them vulnerable to such loss and limit their distribution. These include 1) a completely aquatic life history; 2) communal reproduction concentrated on the landscape with the same localized breeding areas used annually; 3) high levels of population fluctuation; 4) dispersal limited to aquatic corridors; 5) relatively large permanent wetlands (> 4 ha, 10 ac) that include shallow, warm-water habitats; 6) breeding habitats that have shallow water (≤ 30 cm, 12 in), short vegetation, and full sun exposure with relatively stable hydrology and aquatic connectivity to permanent waters; and 7) overwintering habitats that provide adequately oxygenated water and shelter from freezing conditions and predators (Hallock 2013). Additional threats include geographic isolation of Oregon Spotted Frog populations, loss of natural processes that set back vegetation succession (e.g., beaver activity), invasion of exotic grasses into shallow wetland habitats, colonization of wetlands by non-native predators, and increase of water-borne pollutants and emerging diseases. This list of threats is neither exhaustive nor independent, as a number of factors are interconnected. Climate change is a further concern because it involves potential changes that are likely to increase effects of the above factors on Oregon Spotted Frog habitat (Hallock 2013).

Based on conservative estimates, Washington lost over 33% of its wetlands between pre-Euro-American settlement condition and the 1980s (Canning and Stevens 1990, Hallock 2013). This percentage accounts for complete loss from draining or filling, but does not account for alteration or degradation. Freshwater marshes and forested wetland experienced the greatest losses. Snohomish County estimated wetland losses of 180 acres (72 ha) per year during the 1990s. Assuming a similar rate, losses for the 8 urbanized counties with similar growth projections plus King and Pierce counties would be 1,800 acres (728 ha) per year (Canning and Stevens 1990, Hallock 2013). These counties are primarily in the Puget Sound Ecoregion where the majority of the historic distribution of Oregon Spotted Frogs in Washington State had been documented (McAllister and Leonard 1997, Hallock 2013). More specifically, case studies in Washington showed losses of freshwater wetland acreages reflected on U.S. Geological Survey quadrants to be 55% for Tenino and Yelm (south Thurston County), 82% for Tacoma South (Pierce County), and 70% for Lake Washington (King County) (Boule et al. 1983, Hallock 2013). Data on wetland changes in Washington since 1995 are lacking.

Invasive wetland species that alter wetland structure and function impact Oregon Spotted Frog habitat. reed canarygrass is present at all Washington sites and is the invasive plant of greatest concern due to the potential loss of Oregon Spotted Frog habitat from shading and impenetrable thatch (Hallock 2013). The grasses' high rate of transpiration and ability to outcompete native plant species also are of concern for Spotted Frog habitat. In the south Puget Sound, reed canarygrass is especially problematic because there is no snowpack to compress it and the vertical structure shades breeding habitat (Hallock 2013).

South Puget Sound prairies. The south Puget Sound prairies were reduced to about 10% of their former abundance primarily due to agriculture and development (Crawford and Hall 1997). This likely affected the associated wetlands, especially seasonally flooded areas that would have been easily drained and converted to uplands. Historically, depressions and low areas of Thurston County, when drained, were

better suited to hay and pasture than most of the well-drained upland soils and conversion to pasture was extensive. By 1947, pasture occupied more farmland than all other crops combined in Thurston County (Poulson et al. 1947). Therefore, loss of prairie habitat which formerly surrounded wetlands has likely played a role in the decline of Oregon Spotted Frog populations in Washington State (Slipp 1940, Hallock 2013).

The identified threats to the Oregon Spotted Frogs in the Black River sub-basin include, but are not limited to habitat loss and/or modification due to land conversions, hydrologic changes (*e.g.*, drainage ditches and loss of beaver), development (both urban and agricultural), shrub and tree encroachment and riparian restoration plantings, invasive reed canarygrass, reduced water quality, introduced predators (bullfrogs and warm and cold water fish), and isolated breeding locations. Breeding habitat maintenance, utilizing a variety of methods, is ongoing at multiple locations, but are not consistent or extensive. Currently, the need for habitat management has not kept pace abating or reducing threats in this sub-basin. Cattle grazing is maintaining vegetation height that is necessary for suitable breeding habitat but may result in less than optimal water quality conditions if not properly managed.

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Appendix C: Best Management Practices

Overview

The purpose of this Appendix is to identify:

- 1) Prohibited activities to prevent unauthorized “take”;
- 2) Exempted forms of “take” (Special 4(d) Rule authorized activities);
- 3) Best Management Practices (BMPs) to avoid and minimize impacts for Covered Activities of the Habitat Conservation Plan (HCP); and
- 4) Enhanced BMPs for voluntary implementation to maintain and/or enhance existing habitat values and functions for Covered Species.

These BMPs are intended to reduce impacts to the HCP Covered Species from the Covered Activities. BMPs will be implemented to the maximum extent practicable to avoid and minimize impacts, which in turn will reduce incidental take and the need and cost of offsetting impacts to Covered Species through mitigation. Each BMP is linked to applicable Covered Species via habitat type. Dry prairie/grassland habitats (hereafter prairie habitats) host Olympia, Yelm, and Tenino Pocket Gophers, Taylor’s Checkerspot Butterfly, and Oregon Vesper Sparrow. Wetland/riparian habitat for Oregon Spotted Frog (OSF) is included in the Oregon Spotted Frog Habitat Screen (OSF Habitat Screen).

Mitigation actions associated with development proposals shall adhere to mitigation sequencing as stated in Thurston County Code (TCC) Section 24.01.037. Avoiding habitat (prairie and the OSF Habitat Screen) impacts through up front project planning that reduces an activity’s footprint or relocates the activity, so it does not intersect with habitat, is the preferred mechanism to reduce impacts to the Covered Species. However, where avoiding habitat is not possible and activities will occur, application of the BMPs will result in minimization of impacts by limiting the degree or magnitude of the action to the greatest extent practicable. Any impacts remaining after avoiding and minimizing impacts shall be offset by mitigation.

Due to the variability in when specific BMPs will be applicable and practicable across the County and the breadth of Covered Activities, the impact areas included in Section 4: Impacts Analysis have not been adjusted for projected reductions from avoidance or minimization of impacts through the BMPs. County permit findings will document avoidance and minimization measures achieved by application as part the permitting process, and these will be summarized in the County’s HCP Annual Report.

Thurston County already implements multiple sets of BMPs (e.g., as part of its Regional Road Maintenance Guidelines; RRMG). The HCP BMP minimization measures in this Appendix are intended to work in concert with pre-existing BMPs to which the County is already committed. Should a RRMG BMP implementation have the potential to cause “take” of a Covered Species, alternative methods will be sought, or the action will be mitigated.

Prohibited Activities

- Thurston County, its Departments, and Applicants shall not “...*harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect* Covered Species or attempt to engage in any such conduct” (ESA Section 9; 16 U.S. Code § 1538; 50 CFR § 17.3).
- Thurston County, its Departments, and Applicants shall not import, possess, transport, propagate, release, or introduce any prohibited Level 1, 2, or 3 aquatic invasive species (inclusive of American Bullfrog; *Lithobates catesbeianus*), except for scientific research or display, or pursuant to a State-approved monitoring and control program designed to capture, possess, and destroy prohibited species specimens (W.A.C. 220-640-050, W.A.C. 220-640-100, W.A.C. 220-640-110).

Special Management Areas for Oregon Spotted Frog

The HCP identifies the Oregon Spotted Frog (OSF) Habitat Screen as potential areas where OSF habitat may occur, a portion of which is actually occupied by OSF. A significant area of County-maintained roadside right-of-way is included in the OSF Habitat Screen. Survey of the entire area before County transportation maintenance activities is not practicable (though survey will occur before transportation construction projects). To increase the efficiency of applying the BMPs for Oregon Spotted Frog habitat, the HCP identifies Special Management Areas (SMAs) for Oregon Spotted Frog along specific roads managed by the County in the OSF Habitat Screen. These are stretches of roadside right-of-way that are known to support OSF or are near to and hydrologically connected to currently or recently occupied OSF habitat. Currently identified SMAs are identified in Figure 1. Thurston County will update the map of SMAs over time, adding new locations if necessary.

The Oregon Spotted Frog SMAs are the highest priority areas for implementation of the BMPs during regular transportation maintenance, roadside right-of-way management, Beaver dam management (HCP Appendix E: Beaver Dam Management Plan), and water/wastewater management activities.

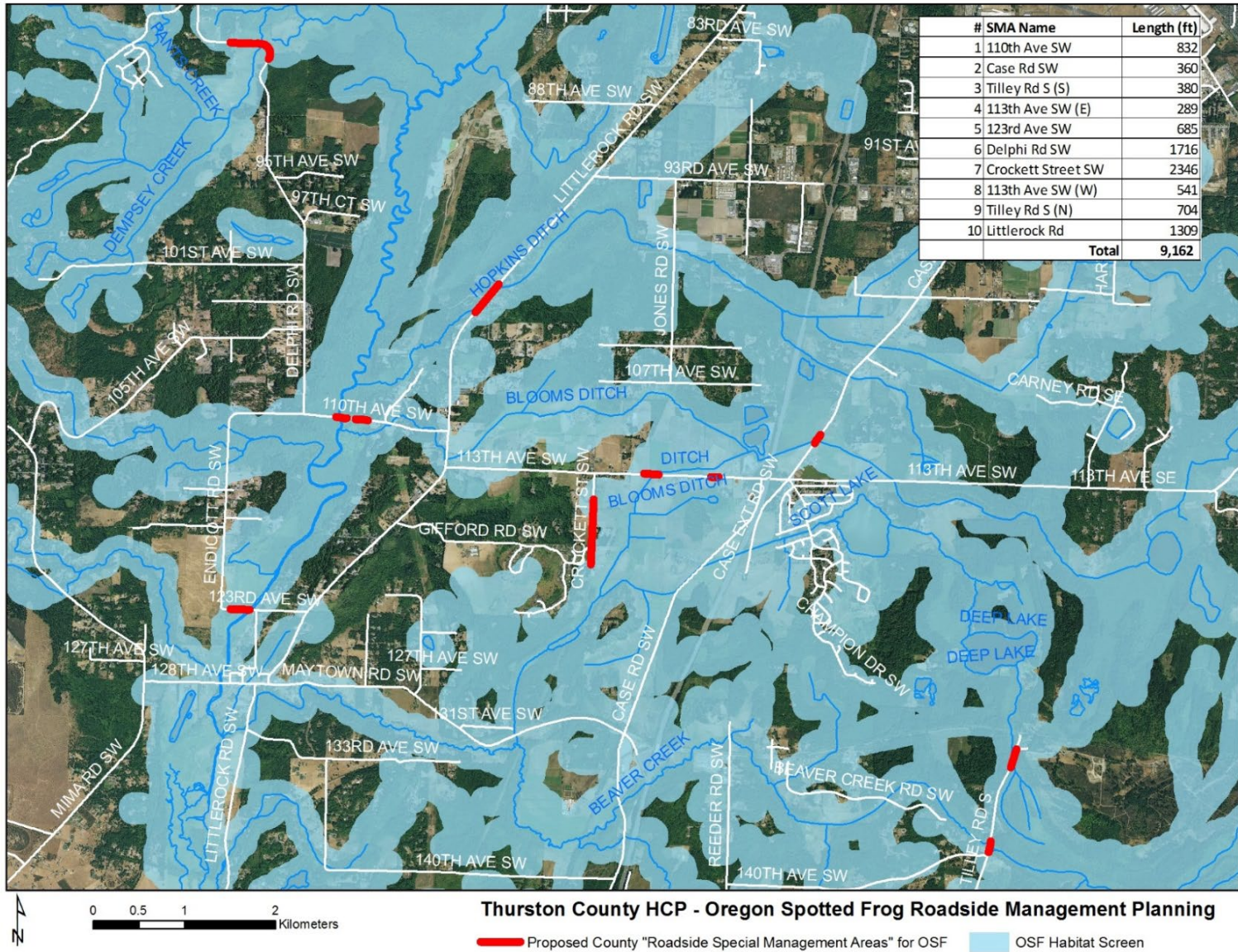


Figure 1. Special Management Areas for Oregon Spotted Frog in the greater Black River watershed of Thurston County where BMP implementation will be prioritized

Exempt Activities for Mazama Pocket Gopher

Special rules under Section 4(d) of the Endangered Species Act apply to the Mazama Pocket Gopher subspecies and their habitat only. Should a site contain other Covered Species and/or their habitat, these exemptions do not apply. All exemptions must also comply with all regulations of Thurston County Code.

Single Family Residential Property Activities

- Harvest, control, or other management of noxious weeds and invasive plants through mowing, herbicide and fungicide application, fumigation, or burning. Use of herbicides, fungicides, fumigation, and burning must occur in such a way that nontarget plants are avoided to the maximum extent practicable;
- Single-family, residential landowners/managers may site, install, place, and/or build a storage sheds, carports, or dog kennel, provided these are less than 120 square feet (sq ft) (11.15 square meters (sq m) in size; and
- Single-family, residential landowners/managers may site and install fencing, garden plots, or play equipment.

Agriculture Activities

For the purposes of this exemption, farm means any facility, including land, buildings, watercourses, and appurtenances, used in the commercial production of crops, nursery or orchard stock, the propagation and raising of nursery or orchard stock, livestock or poultry, or livestock or poultry products.

- Agricultural Activities which do not disturb the soil surface are allowed, such as haying, baling, and some orchard and berry plant management activities. Disturbances to soils should generally not exceed a 12 inch (in) (30.5 centimeter (cm)) depth. Allowed activities include:
 - Grazing; routine installation, management, and maintenance of stock water facilities (such as stock ponds, berms, troughs, and tanks; pipelines and watering systems to maintain water supplies);
 - Routine maintenance or construction of fencing;
 - Maintenance of livestock management facilities (such as corrals, sheds, and other ranch outbuildings);
 - Repair and maintenance of unimproved agricultural roads (this exemption does not include improvement, upgrade, or construction of new roads);
 - Planting, harvest, fertilization, harrowing, tilling, or rotation of crops; placement of mineral supplements, plant nutrients, or soil amendments;
 - Harvest, control, or other management of noxious weeds and invasive plants through mowing, discing, herbicide and fungicide application, fumigation, or burning; and
 - Occasional deep tillage (Deep tillage for reduction of compaction, usually at depths of 18 to 36 in (45.7 to 91.4 cm), may be conducted between September 1 and February 28, but only once in 10 years.).

Standard BMPS - Avoidance and Minimization

The following BMPs are the recommended best available practicable means to avoid and minimize impacts to Covered Species and their habitats. All BMPs must be implemented to the maximum extent practicable during the Covered Activities.

Prairie Species Habitat

The following BMPs address planning, permitting, construction, and maintenance where Covered Activities could or may have unavoidable impacts to Olympia, Tenino and Yelm pocket gopher sub-species, Taylors checkerspot butterfly, Oregon vesper sparrow habitat.

Siting and Locating Activities

- 1 Avoid impacts by locating development in areas with no mapped habitat or within existing impacted areas (impacts must have been completed prior to 2014)
- 2 Avoid impacting more-preferred Mazama Pocket Gopher soils if there are both preferred types mapped on the parcel
- 3 Avoid grading by incorporating topography into site design
- 4 Align proposed development close to access point for the lot/parcel
- 5 Request setback variance where it will assist with habitat avoidance and minimization
- 6 Use existing points of entry, roads, and/or travel paths where they provide the necessary site access
- 7 Reduce the width of access roads or driveways. Use pullouts and T-dead ends instead of cul-de-sac where allowed by code.
- 8 Where possible, align driveways with utility lines
- 9 Cluster structures (e.g., residence, accessory structures, and other appurtenances) and development activities (e.g., staging areas and access points) within a development envelope.
- 10 All subdivision of land shall cluster developments to minimize fragmentation of the habitat.
- 11 Configure development in Covered Species habitat to maximize patches of undisturbed habitat and avoid configurations that leave narrow bands of habitat (i.e., maximize the width-to-length ratio of the open space or conservation area).
- 12 Development shall design and maintain adequate habitat connectivity to adjacent undeveloped areas or preserved lands, as determined by the review authority.
- 13 Conservation lots or tracts created shall meet the requirements of Thurston County Code Chapter 24.60 and 24.65
- 14 All subdivision of land shall provide for the location and construction of public utilities and facilities, such as sewer, gas, electrical and water systems in a manner that to the extent practicable co-locates with right-of-way or other road or driveways.

Construction Minimization

- 15 Establish, demarcate, and observe “no work zones” on the project site that will not be affected by proposed construction project. The “no work zone” shall be delineated on site with a temporary fencing barrier prior to commencement of construction activities . The development envelope, shall contain all clearing and grading limits, encompass related activities, including site access/points of entry, staging of equipment, stockpiling of materials, and utility installations. The “no work zone(s)” and clearing and grading limits must be clearly identified on the approved site plans and verified on site.
- 16 Implement approved temporary erosion and sediment control plan using all known available and reasonable methods of treatment, prevention, and control of sediment. Implement measures to control and prevent sediments from leaving the development envelope or entering aquatic systems and ensure no foreign material is side-cast into Covered Species habitat (such as soil, rock, gravel, uncured cement concrete or washout, and asphalt grindings or slurry)
- 17 Develop a Stormwater Pollution Prevention Plan (SWPPP) where required pursuant to Thurston County Code Title 15 and as described in Thurston County Drainage Design and Erosion Control Manual (DDECM). Where more than 7,000 sq ft (650 sq m) of soil will be disturbed, prepare a spill prevention, control, and countermeasures plan
- 18 Use the lightest equipment feasible and minimize passes and tracking of equipment over Covered Species habitat to lessen soil damage, compaction, and/or rutting
- 19 Mow and/or selectively apply herbicide¹ to remove and control noxious weeds and invasive/non-native/nuisance vegetation in late February/early March (if/when weather and soil moisture conditions allow), and in the late August/early September after native plants have senesced. Also, after Taylor’s Checkerspot butterflies and other pollinators have entered diapause (generally by August 1). Techniques that minimize soil disturbance are preferred. Herbicides may only be used according to their label constraints.
- 20 Side-cast native soil material alongside trenches and other excavations, and stockpile and later use these materials to backfill trenches and excavations. Backfill native soil material, with only a minimal amount of light grading, to re-establish original ground contours
- 21 In habitat for Taylor’s Checkerspot Butterfly, delay vegetation mowing until after nectar species have finished flowering and seed production. This date should be determined by when butterflies are in diapause (generally by August 1)

Oregon Spotted Frog Habitat Screen

The following BMPs address planning, permitting, construction, and maintenance where Covered Activities would or may have unavoidable impacts to perennial or intermittent waters, wetlands, and/or wetland buffers, that support and provide habitat for the Oregon Spotted Frog.

¹ Herbicides will only be used according to their label constraints and Federal Insecticide, Fungicide, and Rodenticide Act label approved uses, guidelines and in accordance with Washington regulations. The commercial use of chemical control of noxious vegetation requires registration with WSDA (RCW 15.58 and RCW 17.21) and for all aquatic areas requires a NPDES Aquatic Invasive Species permit (RCW 90.48).

Siting and Locating Activities

- 1 Avoid impacts by locating development in areas with no Oregon Spotted Frog habitat or within previously disturbed areas
- 2 Avoid staging within 200 ft (61 m) of occupied (or potentially occupied) Covered Species habitat as identified during survey (perennial or intermittent waters, wetlands, wetland buffers, and/or seasonally-flooded areas), unless site-specific review indicates that no impacts are likely to occur due to topography or other factors
- 3 Locate development close to access point for the lot/parcel
- 4 Align new road or utility corridors to avoid wetland and their buffers
- 5 Cluster structures (e.g., residence, accessory structures, and other appurtenances) and development activities (e.g., staging areas and access points) to minimize the area of the parcel(s), and the amount of Covered Species habitat, that would be affected by the activities
- 6 Subdivision of land shall cluster developments to minimize fragmentation of the habitat
- 7 Demonstrate adequate habitat connectivity to adjacent undeveloped or preserved lands
- 8 Configure development in Covered Species habitat to maximize patches of undisturbed habitat and avoid configurations that do not leave narrow bands of habitat (maximize the width-to-length ratio)
- 9 Avoid crossing wetted streams or wetlands with vehicles and heavy equipment unless as part of an emergency action. Demonstrate that there is no practicable alternative to the new crossing.

Note: Additional crossing co-located with existing crossings shall be presumed to be the least harmful alternative. The expansion of existing crossings shall be presumed to be the less harmful of to the resource than the construction of new crossings
- 10 When traversing a wetland or its buffer is determined to be necessary the demonstrate the following:
 - a. Wetland/buffer crossed at their narrowest point;
 - b. Access has used existing points of entry, roads, and/or travel paths;
 - c. Crossing widths are the minimum necessary.
 - d. Road shoulders and/or sidewalks have been reduced or eliminated at wetland crossings, if safety is not compromised;
 - e. Hydrologic connectivity between wetlands is maintained by using permeable fill; and
 - f. Culverts sized correctly for best hydrologic connectivity
- 11 Minimize temporary roads and travel paths within 300 ft (91 m) of streams or wetlands
- 12 Demonstrate how the project will avoid or minimize draining of wetlands or seasonally flooded areas, and avoids diverting or interrupting surface hydrology, unless as part of habitat restoration.
- 13 Demonstrate the placement of stormwater ponds does not create a barrier between Oregon Spotted Frog breeding habitats and Oregon Spotted Frog rearing, overwintering, and non-breeding habitats
- 14 Complete culvert, conveyance, and ditch maintenance activities when they are dry (i.e., under low-flow or no-flow conditions). Avoid draining wetlands or seasonally-flooded areas, and diverting or interrupting surface hydrology, during the Oregon Spotted Frog breeding season

(February thru June, approximate), when adult frogs, egg masses, and/or tadpoles may be present (e.g., avoid draining or dewatering wetlands, seasonally-flooded areas, and perennial or intermittent waters; and, avoid impacts to aquatic movement corridors, including shallow-water areas with a gradual gradient or slope)

- 15 Maintain gradual gradients or slopes between Oregon Spotted Frog breeding habitats and Oregon Spotted Frog rearing, overwintering, and non-breeding habitats so that tadpoles and juvenile frogs can follow receding water to areas that hold or maintain water inundation year-round
- 16 Consider and plan for landscape-scale habitat connectivity when programming and designing road and infrastructure improvements within the Oregon Spotted Frog Special Management Areas (SMAs) (inclusive of wetlands, seasonally flooded areas, watercourses, and ditches)
- 17 Evaluate opportunities for extending wetland hydroperiods and holding/retaining water in seasonally flooded areas

Construction Minimization

- 18 Establish, demarcate, and observe “no work zones” on the project site that will not be affected by proposed construction project. The “no work zone” shall be delineated on site with a temporary fencing barrier prior to commencement of construction activities . The development envelope, shall contain all clearing and grading limits, encompass related activities, including site access/points of entry, staging of equipment, stockpiling of materials, and utility installations. The “no work zone(s)” and clearing and grading limits must be clearly identified on the approved site plans
- 19 Implement approved temporary erosion and sediment control plan using all known available and reasonable methods of treatment, prevention, and control of sediment. Implement measures to control and prevent sediments from leaving the development envelope or entering aquatic systems and ensure no foreign material is side-cast into Covered Species habitat (such as soil, rock, gravel, uncured cement concrete or washout, and asphalt grindings or slurry)
- 20 Implement a Stormwater Pollution Prevention Plan (SWPPP) where required pursuant to Thurston County Code Title 15 and as described in the Thurston County Drainage Design and Erosion Control Manual (DDECM). Where more than 7,000 sq ft (650 sq m) of soil will be disturbed, prepare a spill prevention, control, and countermeasures plan
- 21 Use biodegradable hydraulic fluids and lubricants in vehicles and heavy equipment (unless operating in the dry or during emergency actions) to reduce potential impacts resulting from a spill(s) or leak(s)
- 22 Describe “weed free” (disinfection) protocols to be used to avoid spreading invasive species and/or disease
- 23 Demonstrate green infrastructure and Low Impact Development Stormwater BMPs to have been implemented , where feasible. Avoid redirection of water to or from an existing wetland unless as part of habitat restoration
- 24 Minimize the duration of in-water work (i.e., work within the wetted perimeter of a wetland or waterbody). Clean culverts and conveyances with hand tools, or from the top of the bank, under low-flow or no-flow conditions, or with flow bypass installed. Upon completion of all in-water work, remove all flow bypass or stream diversion devices and materials (e.g., temporary pipe, conduit, culvert, diversion dam or berm, pumps, sandbags, etc.), and stabilize and restore any disturbed soil, the channel bed and banks
- 25 Restoration or replanting plans for riparian area in or adjacent to suitable Oregon Spotted Frog habitats (inclusive of all wetlands, seasonally-flooded areas, perennial or intermittent waters,

watercourses, and ditches located within the Oregon Spotted Frog Habitat Screen), will avoid planting trees or taller shrubs where they may shade breeding sites. Breeding sites will be maintained/restored with short-statured vegetation (e.g., a 6 in (15 cm) vegetation height) by selecting/planting low growing species, such as inflated sedge (*Carex exsiccata*), slough sedge (*Carex obnupta*), awlfruit sedge (*Carex stipata*), spikerush (*Eleocharis palustris obtusa*), tall mannagrass (*Glyceria elata*), hairy-leaf rush (*Juncus supiniformis*), softstem bulrush (*Schoenoplectus tabernaemontani*), small flowered bulrush (*Scirpus microcarpus*), and/or bur-reed (*Sparganium emersum*).

- 26 Avoid applying herbicides within 200 ft (61 m) of suitable Oregon Spotted Frog habitats (inclusive of all wetlands, seasonally-flooded areas, perennial or intermittent waters, watercourses, and ditches located within the OSF Habitat Screen), unless site-specific review indicates that no impacts are likely to occur due to topography or other factors. Herbicides applied to seasonally flooded areas during the dry season must break down and be absent from the environment before the next inundation
- 27 Avoid planting trees or taller shrubs, in or along seasonal or permanent bodies of water, within the Oregon Spotted Frog habitat including SMAs (inclusive of wetlands, seasonally flooded areas, watercourses, and ditches)
- 28 Avoid unnecessary management alterations and/or impacts to American Beaver (*Castor canadensis*) activities, dams, and/or ponds within the Oregon Spotted Frog habitat including SMAs (inclusive of wetlands, seasonally flooded areas, watercourses, and ditches)

Enhanced BMPs

These BMPs are recommended as best available and practicable means for property owners/managers who may want to voluntarily maintain and or enhance habitat values and functions for Covered Species outside of the development envelope. None of the activities listed below should be interpreted as mitigation efforts to offset impacts to Covered Species.

Prairie Habitat

The following BMPs address activities that maintain and/or enhance prairie and associated Covered Species habitats (e.g., Mazama Pocket Gopher subspecies, Oregon Vesper Sparrow, Taylor's Checkerspot Butterfly). The following activities are encouraged for all properties with dry prairie habitat and for restoration activities in mitigation areas to the greatest extent practicable.

- 1) Remove encroaching trees, shrubs, and noxious weeds. Aggressively control and remove non-native species such as: Scotch broom (*Cytisus scoparius*); tall oatgrass (*Arrhenatherum elatius*); spurge laurel (*Daphne laureola*); and leafy spurge (*Euphorbia esula*). Maintain low densities of tansy ragwort (*Senecio jacobaea*) in accordance with Thurston County Noxious Weed Rules and Regulations to be no more than 25 plants in an area of 20 acres (8 hectares);
- 2) Mow and/or mechanically remove noxious weeds and invasive/non-native/nuisance vegetation using the lightest equipment feasible and limit the number of passes. Avoid wet soils and soils that are likely to become rutted, compacted, or otherwise damaged. Set mower decks sufficiently high to avoid soil gouging;

- 3) Use herbicides² to control noxious weeds and invasive/non-native/nuisance vegetation in a manner that avoids non-target plants, such as spot spraying/selective application of herbicide instead of broadcast spraying. Coordinate with Thurston County Noxious Weeds to identify the best options or more information tcweeds@co.thurston.wa.us;
- 4) Limit the access, or unattended/unsupervised access, that domesticated pets (cats and dogs) have to occupied (or potentially occupied) Covered Species habitat. Mazama Pocket Gophers are vulnerable to predation, including predation by domesticated pets. This may be best accomplished by fencing and excluding domesticated pets from areas being maintained for prairie habitat;
- 5) Plant butterfly and other pollinator host and nectar/food plants (e.g., Table 1). Coordinate with Thurston County, the Washington State Department of Fish and Wildlife, and/or the Service to identify the best options, and to plan for compatible long-term management;
- 6) Consider taking additional actions that promote conservation. Maintain movement corridors and larger, contiguous areas of undeveloped Covered Species habitat by working collaboratively with adjacent landowners, neighborhood associations, the Thurston County Conservation District, the Thurston County Washington State University (WSU) Extension Office, and/or conservation organizations; and
- 7) Consider taking additional actions that promote conservation. Actively manage for native vegetation (including native bunchgrasses), by avoiding or limiting the extent of lawn. Avoid excessive irrigation and/or fertilization, which tend to favor invasive/non-native/nuisance vegetation. The dry prairie habitat that support Covered Species are vulnerable to encroachment by trees and woody plants, and invasive/non-native/nuisance vegetation, which degrades the quality and function of available habitat.

² Herbicides will only be used according to their label constraints and Federal Insecticide, Fungicide, and Rodenticide Act label approved uses, guidelines and in accordance with Washington regulations. The commercial use of chemicals to control noxious vegetation requires registration with WSDA (RCW 15.58 and RCW 17.21) and for all aquatic areas requires a NPDES Aquatic Invasive Species permit (RCW 90.48).

Oregon Spotted Frog Habitat Screen

The following BMPs address activities that maintain and enhance OSF breeding habitats and OSF rearing, overwintering, and non-breeding habitats. Maintenance and enhancement of habitat is encouraged for areas that contain suitable hydrology and other conditions outside of the development envelope. These activities are encouraged for all properties with Oregon Spotted Frog habitat and for restoration and mitigation areas to the greatest extent practicable.

Note: Activity within a wetland and or its buffer may require prior authorization through Thurston County.

- 1) Remove encroaching trees and shrubs. Aggressively control reed canarygrass (*Phalaris arundinacea*) via hand or mechanical means;
- 2) Mow and/or mechanically remove noxious weeds and invasive/non-native/nuisance vegetation using the lightest equipment feasible and limit the number of passes to avoid ground compaction. Set mower decks sufficiently high to avoid soil gouging;
- 3) Submit a plan for removal (and/or control) non-native, predatory, and competing species from suitable Oregon Spotted Frog habitats (inclusive of all wetlands, seasonally-flooded areas, perennial or intermittent waters, watercourses, and ditches located within the Oregon Spotted Frog Habitat Screen) (e.g., bullfrogs³, introduced warm water fishes). Remove or control reed canarygrass to maintain short-statured vegetation (e.g., a 6-inch vegetation height). Use current methods endorsed by the Service and Washington State Department of Fish and Wildlife;
- 4) Avoid removing large wood from suitable Oregon Spotted Frog habitats (inclusive of all wetlands, seasonally flooded areas, perennial or intermittent waters, watercourses, and ditches located within the OSF Habitat Screen);
- 5) Prioritize removal of existing, treated wood (creosote) structures;
- 6) Consider and plan for landscape-scale habitat connectivity. Evaluate opportunities for extending wetland hydroperiods and holding/retaining water in seasonally flooded areas;
- 7) Maintain movement corridors and larger, contiguous areas of Covered Species habitat may be facilitated by working collaboratively with adjacent landowners, neighborhood associations, the Thurston Conservation District, the Thurston County WSU Extension Office, or conservation organizations; and
- 8) Consider taking additional actions that promote and conserve water and reduce withdrawals from sources of surface and ground water.

³ It is unlawful to take bullfrogs except by angling, hand dip netting, spearing (gigging), or with bow and arrow; there is no daily limit on the number of bullfrogs that may be taken, no possession limit, and no size restrictions in Washington (W.A.C. 220-416-120).

Table 1. Partial list of native host and nectar/food plants for butterflies and pollinators in Thurston County.

Scientific Name	Common Name	Origin
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	Native
<i>Armeria maritima</i>	Sea pink	Native
<i>Balsamorhiza deltoidea</i>	Balsamroot	Native
<i>Camassia quamash</i>	Camas	Native
<i>Castilleja hispida</i>	Harsh paintbrush	Native
<i>Castilleja levisecta</i>	Golden paintbrush	Native
<i>Collinsia spp</i>	Blue eyed mary	Native
<i>Festuca roemerii</i>	Roemer's fescue	Native
<i>Fragaria virginiana</i>	Strawberry	Native
<i>Lomatium triternatum</i>	Nineleaf biscuitroot	Native
<i>Lomatium utriculatum</i>	Spring gold	Native
<i>Plectritis congesta</i>	Seablush	Native
<i>Ranunculus occidentalis</i>	Western buttercup	Native
<i>Saxifraga integrifolia</i>	Wholeleaf saxifrage	Native
<i>Viola adunca</i>	Hookedspur violet	Native

Appendix D: Bridge Maintenance Hydraulic Project Approval (HPA)



HYDRAULIC PROJECT APPROVAL

Washington Department of
Fish & Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

Issued Date: September 11, 2020
Project End Date: September 10, 2025

Permit Number: 2020-6-358+01
FPA/Public Notice Number: N/A
Application ID: 22169

PERMITTEE	AUTHORIZED AGENT OR CONTRACTOR
Thurston County ATTENTION: Trevin Taylor 9605 Tilley Road S Ste C Olympia, WA 98512-9140	

Project Name: Thurston County - Countywide Bridge Maintenance
Project Description: Countywide Bridge Maintenance GHPA, replaces Thurston County HPA #2015-6-580+01 to perform routine bridge maintenance throughout Thurston County.

PROVISIONS

1. THURSTON COUNTY PUBLIC WORKS – COUNTYWIDE BRIDGE MAINTAINANCE

Description: 5-year permit for maintenance activities consisting of cleaning and repair work to bridges owned and maintained by Thurston County.

1. AUTHORIZATION LIMITATION: This countywide general Hydraulic Project Approval (HPA) authorizes the following Thurston County bridge maintenance activities: drain cleaning; sweeping or vacuuming the deck, sidewalks, and gutters; cleaning and washing; painting (including abrasive blasting and preparatory washing); general maintenance and repair; and deck road surface overlay replacement, gutter, and sidewalk replacement; miscellaneous maintenance.

2. This HPA does not permit stream maintenance work, or excavation of the bed or banks of any watercourse. Riprap maintenance and replacement is not covered under this HPA. The repositioning of large woody material accumulated on bridge supports and approaches will be covered in a different HPA. If the applicant cannot comply with the provisions of this HPA due to site-specific or other concerns, a separate written HPA may be sought from the local Habitat Biologist (HB) for the project. See <https://wdfw.wa.gov/licenses/environmental/hpa/about> for a current listing of HBs and their coverage area(s).

GENERAL PROVISIONS APPLICABLE TO ALL WORK ACTIVITIES UNLESS SPECIFIED OTHERWISE IN ACTIVITY SPECIFIC SECTIONS A THROUGH F

NOTIFICATION REQUIREMENTS

- 3. NOTIFICATION PRIOR TO WORK START: Unless specified otherwise in Sections A through F, the permittee shall contact the Area Habitat Biologist and HPAapplications@dfw.wa.gov at least ten days before starting maintenance work.
- 4. UNSCHEDULED OR EMERGENCY WORK: The permittee does not have to notify WDFW prior to starting unscheduled or emergency maintenance work but shall contact the Area Habitat Biologist within three business days after starting work.
- 5. Notification is not required for routine deck cleaning with a vacuum sweeper.
- 6. The permittee will send the notification by email, and it must include the starting date, description of work, waterbody name, location including road number and milepost if applicable, and the HPA number.



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ANNUAL REPORTING

7. Thurston County shall compile an annual report of work performed each calendar year. The annual report shall be titled "Thurston County Bridge Maintenance General HPA Annual Report (year), HPA Number" and be submitted to HPAapplications@dfw.wa.gov or uploaded to the Aquatic Protection Permitting System (APPS) by February 28th of the following year. In the final year of the HPA, the report must be submitted prior to the expiration date. An annual report is required even if no work was performed. The annual report will include:

- a. HPA number, permittee, contact person, address, phone number, date of report, time period.
- b. Total number of projects completed.
- c. Problem(s) encountered: Such as inability to comply with provisions, lack of notification to WDFW, corrective action taken to rectify problems, and impacts to fish life and water quality from activity.
- d. Recommendations for improvement to best management practices and permit provisions.
- e. List of individual projects completed including water body name, road number or milepost if applicable, latitude and longitude in WGS 84 decimal degree format, date and duration of work, description of work, whether or not large woody material (LWD) was repositioned, diameter at breast height of LWD, number of wood pieced relocated, and if the LWM was reduced in size (note that LWD repositioning is not authorized under this HPA).
- f. Except as noted in individual sections below, only projects that were conducted under one or more sections of this HPA need to be in the report. Other non-structural maintenance projects (e.g. light repairs, stripping, and safety cables) do not need to be reported.

8. TIMING LIMITATIONS: Work under this HPA may begin immediately and shall be completed by September 10, 2025 provided work within the wetted perimeter shall only occur during the attached work windows (Attachement 1) .

9. APPROVED PLANS AND SPECIFICATIONS: You must accomplish the work per plans and specifications submitted with the application and approved by the Washington Department of Fish and Wildlife, except as modified by this Hydraulic Project Approval. You must have a copy of these plans and this HPA available on site during all phases of the project construction.

10. INVASIVE SPECIES CONTROL: Follow Level 1 Decontamination protocol for low risk locations. Thoroughly remove visible dirt and organic debris from all equipment and gear (including drive mechanisms, wheels, tires, tracks, buckets and undercarriage) before arriving and leaving the job site to prevent the transport and introduction of invasive species. Properly dispose of any water and chemicals used to clean gear and equipment. For contaminated or high risk sites please refer to the Level 2 Decontamination protocol. You can find this and additional information in the Washington Department of Fish and Wildlife's "Invasive Species Management Protocols", available online at <https://wdfw.wa.gov/species-habitats/invasive/prevention>

11. FISH KILL/ WATER QUALITY PROBLEM NOTIFICATION: If a fish kill occurs or fish are observed in distress at the job site, immediately stop all activities causing harm. Immediately notify the Washington Department of Fish and Wildlife of the problem. If the likely cause of the fish kill or fish distress is related to water quality, also notify the Washington Military Department Emergency Management Division at 1-800-258-5990. Activities related to the fish kill or fish distress must not resume until the Washington Department of Fish and Wildlife gives approval. The Washington Department of Fish and Wildlife may require additional measures to mitigate impacts.

STAGING, JOB SITE ACCESS, AND EQUIPMENT

12. To the extent practicable riparian vegetation (streamside or shoreline woody vegetation) within 200 feet perpendicular to the Ordinary High Water Line (OHWL) and adjacent to the structure must not be damaged. Within the riparian area existing parking lots, open managed fields, and lots may be used for staging work.

- a. Should riparian vegetation be damaged to such an extent that it is unlikely to survive; the vegetation will be replanted with native species of similar type (e.g. shrubs for shrubs, trees for trees).
- b. Damaged plant species identified as invasive or noxious in WAC (WAC 16-750), will be removed and replaced with native species of similar type (e.g. shrubs for shrubs, trees for trees).
- c. For short-term erosion control purposes, planting herbaceous species may be necessary.

13. Cleaned debris and other polluting substances from this project must be collected and then contained and deposited above the limits of the 100 year-flood or extreme high tide in a disposal site that has the appropriate



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regulatory approval. No debris or substances may be placed in the channel, in road drainages, wetlands, riparian (streamside or shoreline) areas, or on adjacent land where they may erode or leach into state waters. No petroleum products, hydraulic fluids, fresh concrete, sediments and sediment-laden water, chemicals, or any other polluting substances may be allowed to enter state waters.

14. To prevent leaching, construct forms to contain any wet concrete. Forms must remain in place until the concrete is cured.

15. Washing must be done with clean water. No detergents or other cleaning agents may be used except:

a. A 5.25% sodium hypochlorite solution may be directly applied onto areas of bird guano or fungus growth remaining after dry cleaning and any pressure washing of bulk deposit or growth. The sodium hypochlorite solution may not be used as an additive to the water used for pressure washing. Wash water associated with the use of sodium hypochlorite must be fully contained and may not be allowed to enter state waters.

b. A degreaser on an absorbent material may be used to remove residual grease after hand cleaning the surface, provided none of this material may enter state water.

16. This Hydraulic Project Approval does not authorize equipment crossings of the stream.

17. Limit the use of equipment waterward of the ordinary high water line to that necessary to gain position for the work unless specified in Activity Specific Sections in HPA below.

18. Check equipment daily for leaks and complete any required repairs in an upland location before using the equipment in or near the water.

19. Do not use wood treated with oil-type preservative (creosote, pentachlorophenol) in any hydraulic project. Wood treated with waterborne preservative chemicals (ACZA, ACQ) may be used if the Western Wood Preservers Institute has approved the waterborne chemical for use in the aquatic environment. The manufacturer must follow the Western Wood Preservers Institute guidelines and the best management practices to minimize the preservative migrating from treated wood into aquatic environments. To minimize leaching, wood treated with a preservative by someone other than a manufacturer must follow the field treating guidelines. These guidelines and best management practices are available at www.wwpinstitute.org

20. Any deployed containment, boom or filter structure must be routinely inspected and repaired as necessary to ensure its function. Debris and substances collected in the containment, boom or filter structure must be removed from the structure at least daily, whenever accumulation place the structure at risk, and before relocation or the removal of the structure.

21. WORK SITE RESTORATION: Upon project completion all temporary work structures, devices, equipment, materials, man-made debris and wastes from the project must be completely removed from within the OHWL, adjacent shoreline, and riparian areas. Any damaged riparian vegetation must be replaced using native species of similar type (e.g. shrubs for shrubs, trees for trees).

ACTIVITY SPECIFIC SECTIONS FOR BRIDGE MAINTENANCE AND PRESERVATION:

- A. DECK AND DRAIN CLEANING
- B. CLEANING and WASHING
- C. PAINTING, INCLUDING PREPARATORY CLEANING, WASHING, and ABRASIVE BLASTING
- D. GENERAL MAINTENANCE and REPAIR
- E. DECK OVERLAY REPLACEMENT
- F. MISCELLANEOUS MAINTENANCE

SECTION A

ACTIVITY DESCRIPTION: DECK AND DRAIN CLEANING: This work occurs frequently for bridge safety and appearance and includes sweeping and/or vacuuming the deck, sidewalks, gutters, and drains. The only wash water that is authorized to enter state waters is direct drain flushing water after dry cleaning methods have been used in the drains.

22. TIMING LIMITATIONS: Work may occur year-round.

23. NOTIFICATION and ANNUAL REPORTING are not required for this work.

24. No work or equipment use may occur below the OHWL or affect the bed of state waters.



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25. The deck must first be cleaned using dry methods and equipment (scraping, sweeping, vacuuming) that will prevent debris and substances from entering state waters.
26. During washing operations proper BMPs must be used at the deck drains to ensure dirty wash water and other debris will not be discharged to the water body. Upon completion of cleaning operations the BMPs will be removed and clean water can be used to flush out the deck drains.

SECTION B

ACTIVITY DESCRIPTION: CLEANING and WASHING: This work is cleaning and washing of all or part of a bridge structure for general maintenance or inspection purposes. In most cases, dry cleaning using scraping, sweeping, and vacuuming methods and equipment is completed first. Then the superstructure is washed. The wash water may enter state waters. See section C for provisions for cleaning and washing in preparation for structure painting.

27. **TIMING LIMITATIONS:** Work shall only occur during the following times:

- a. The Permittee may discharge wastewater to surface waters with flows less than 351 cubic feet per second (cfs) in Western Washington only during seasonally high flow periods. The seasonally high flow period West of the Cascade Mountain Crest: November 1 to May 31.
- b. For work located over marine water, the Permittee must avoid washing structures during high or low slack tide, except when washing during slack tide is necessary for the health or safety of workers or the general public, or to avoid conflict with other legal requirements
- c. Thurston County has six bridges located in the shoreline that may require year-round cleaning based on the bridge inspection requirements. (S-7 Steamboat Island, W-7 Woodard Bay, 0-2 Old Hwy 410, 0-3 Madrona Beach Road, 0-4 Mudbay Road and H-1 Hawks Prairie).

28. **NOTIFICATION** is not required for this work.

29. No heavy equipment use may occur below the OHWL or affect the bed of state waters. The installation of BMPs may occur in the dry below the OHWL landward of the wetted perimeter.

30. The bridge must first be cleaned using dry methods and equipment (scraping, sweeping, vacuuming) that will prevent debris and substances from entering state waters. Bridges that have been dry cleaned within the past 12 months may be pressure washed without first dry cleaning.

31. On portions of bridges where paint may be dislodged by low water pressure washing techniques, only dry cleaning techniques are authorized. Washing must stop if loose paint is observed.

32. Washing must occur with the minimum water pressure necessary to accomplish the work but prevent existing paint from being removed and entering state waters.

33. During washing operations proper BMPs must be used at the deck drains to ensure dirty wash water and other debris will not be discharged to the water body. Upon completion of cleaning operations the BMPs will be removed and clean water can be used to flush out the deck drains.

SECTION C

ACTIVITY DESCRIPTION: PAINTING, INCLUDING PREPARATORY CLEANING, WASHING, and ABRASIVE BLASTING: This painting work includes preparatory dry cleaning the superstructure to be painted using scraping, sweeping, and vacuuming methods and equipment. A debris and paint collection containment and water filter structure is required. After dry cleaning, washing of the superstructure to be painted is done with high pressure equipment followed by selective areas abrasive blasting. Only filtered wash water may enter state waters.

TIMING LIMITATIONS:

34. a. Saltwater: If the bridge is less than fifty (50) feet in elevation above the mean higher high water and the project includes a containment or filter structure or a temporary floating or pier mounted work platform that would result in temporary new area shading of eelgrass, kelp, and/or other intertidal wetland vascular plants longer than 72 hours, the shading part of the work shall only occur from October 1 to April 30 to prevent shading impacts to such saltwater vegetation habitat.

b. Freshwater: Work may occur year-around.

35. **NOTIFICATION** is required for this work. The permittee or contractor must notify the WDFW Area Habitat Biologist



HYDRAULIC PROJECT APPROVAL

Washington Department of
Fish & Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

Issued Date: September 11, 2020
Project End Date: September 10, 2025

Permit Number: 2020-6-358+01
FPA/Public Notice Number: N/A
Application ID: 22169

prior to starting work. Notification may be by email, facsimile (FAX), telephone, or in person. Notification must include:

- a. Contact person and telephone number.
- b. Water body name.
- c. Work location including latitude/longitude, road number and milepost if applicable, or comparable site location information.
- d. Starting date and estimated ending date for work.
- e. Application ID and Permit Number of the HPA.

36. No heavy equipment use may occur below the OHWL or affect the bed of state waters, except the use of a temporary floating or a pier mounted work platform. The manual installation of BMPs may occur in the dry below the OHWL landward of the wetted perimeter.

37. Minimal, non-destructive, disturbance (e.g. walking, sliding materials) to the stream banks or shoreline may occur when placing, using, or removing a temporary floating or pier mounted work platform.

38. Any temporary floating platform must not ground on the bed of state waters.

39. No temporary floating platform anchoring or pier mounted work platform may occur in freshwater that would disturb fish spawning areas or in saltwater that would disturb eelgrass, kelp, and/or other intertidal wetland vascular plants.

40. The bridge must first be cleaned using dry methods and equipment (scraping, sweeping, vacuuming) that will prevent debris and substances from entering state waters.

41. Wash water and debris resulting from pressure washing, including but not restricted to dirt and old paint chips, must be filtered with a #100 or finer sieve before that water is allowed to enter state water.

42. Proper BMPs must be used at the deck drains during wet cleaning operations to ensure dirty wash water and other debris will not be discharged to the water body through the drains. Upon completion of cleaning operations the BMPs may be removed and clean water can be used to flush out the deck drains.

43. Dry method work that could result in debris and substances entering state waters, such as dirt, abrasive blasting medium, old paint chips, and new paint, must include a containment structure capable of collecting all such debris and substances.

SECTION D

ACTIVITY DESCRIPTION: BRIDGE GENERAL MAINTENANCE and REPAIR: This work is to maintain the bridge structure and is restricted to maintenance, repair, or replacement of structural components above state waters. This work does not include new construction, replacement or expansion of the existing structure. The work may include use of temporary floating platforms and temporary work or jacking platforms in the dry, as provided below. Installation of non-structural components (e.g. lights, signs, lane striping) does not require an HPA and is therefore not subject to this HPA.

44. TIMING LIMITATIONS:

a. Saltwater: If the structure is less than fifty feet in elevation above the water and the project includes a containment or filter structure or a temporary floating platform that would result in temporary new area shading of eelgrass, kelp, and/or other intertidal wetland vascular plants longer than 72 hours, the shading part of the work may only occur from October 1 to April 30, to prevent shading impacts to saltwater vegetation habitat. Temporary work or jacking platforms located on the bed below the OHWL may only be constructed July 15 - February 15. Pier-mounted or floating temporary work or jacking platforms may be constructed and used year around.

b. Freshwater: Work may occur year-around except: Temporary work or jacking platforms located on the streambed below the OHWL may only be constructed during the applicable fish life work windows (see Attachment 1 in the application record). Pier-mounted or floating temporary work or jacking platforms may be constructed and used year around.

45. NOTIFICATION is not required for this work.

46. Equipment should be stationed on and operate from the Right of Way (ROW) which may include only the dry portions of the streambed. Equipment is not authorized to enter the water. If equipment must be stationed outside the ROW it may do so provided no construction, land clearing, or other improvements occur outside the ROW.

47. Minor grading of the bank to allow temporary access for equipment is discouraged, but allowed provided no materials are brought in from off-site and the soils are stabilized and the access site is re-vegetated as required below



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upon project completion. Trees measuring 4.5 feet or greater in height above grade or with a diameter of four inches or greater must not be damaged.

48. Except as noted in provision 47, minimal, non-destructive, disturbance (e.g. walking, sliding materials) to the stream banks or shoreline may occur when placing or removing temporary platforms.

49. Temporary floating platforms must not ground on the bed of state waters.

50. No temporary floating platform anchoring or temporary work or jacking platform construction may occur in freshwater that would disturb fish spawning areas or in saltwater that would disturb eelgrass, kelp, and/or other intertidal wetland vascular plants.

51. Work that would result in debris and substances entering state waters must include a containment structure capable of collecting all such debris and substances.

SECTION E

ACTIVITY DESCRIPTION: DECK OVERLAY REPLACEMENT: This work includes removal and replacement of existing concrete or asphalt overlay of the deck road surface, gutters, and sidewalks only where a structurally sound subsurface exists that will prevent existing or new overlay material from entering state waters. This work does not allow debris, materials, or substances entering state waters; new construction activities, or replacement of stringers and/or other structural supports.

52. **TIMING LIMITATIONS:** Work may occur year-around.

53. **NOTIFICATION** is not required for this work.

54. No work or equipment use may occur below the OHWL or affect the bed of state waters.

55. An existing structurally sound impervious subsurface is required to prevent existing deck material and new surfacing material from entering state waters.

56. Bridge drains must be blocked during existing surface removal and new surface installation to prevent water, debris, and other substances from entering state waters.

57. During physical or hydraulic removal of the existing surface, all debris and water must be fully contained and disposed of in an approved location to prevent them from entering state waters.

58. New overlay material must not be allowed to enter state waters.

SECTION F

ACTIVITY DESCRIPTION: MISCELANIOUS NON-STRUCTURAL BRIDGE MAINTAINANCE: This work includes removal, retrofit and replacement of existing damaged or obsolete (concrete, aluminum, steel, composite and wood) gutters, rub-rails, traffic barriers, pedestrian rails, guardrails and sidewalks that are not part of the superstructure. This work does not allow: debris, materials, or substances entering state waters; new construction activities, or replacement of stringers and/or other structural supports.

59. **TIMING LIMITATIONS:** Work may occur year-around.

60. **NOTIFICATION PRIOR TO STARTING WORK** is not required for this work.

61. No work or equipment use shall occur below the OHWL or affect the bed of state waters.

LOCATION #1: , , WA						
WORK START: September 11, 2020			WORK END: September 10, 2025			
<u>WRIA</u>		<u>Waterbody:</u>			<u>Tributary to:</u>	
<u>1/4 SEC:</u>	<u>Section:</u>	<u>Township:</u>	<u>Range:</u>	<u>Latitude:</u>	<u>Longitude:</u>	<u>County:</u>
						Thurston



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<u>Location #1 Driving Directions</u>		

APPLY TO ALL HYDRAULIC PROJECT APPROVALS

This Hydraulic Project Approval pertains only to those requirements of the Washington State Hydraulic Code, specifically Chapter 77.55 RCW. Additional authorization from other public agencies may be necessary for this project. The person(s) to whom this Hydraulic Project Approval is issued is responsible for applying for and obtaining any additional authorization from other public agencies (local, state and/or federal) that may be necessary for this project.

This Hydraulic Project Approval shall be available on the job site at all times and all its provisions followed by the person (s) to whom this Hydraulic Project Approval is issued and operator(s) performing the work.

This Hydraulic Project Approval does not authorize trespass.

The person(s) to whom this Hydraulic Project Approval is issued and operator(s) performing the work may be held liable for any loss or damage to fish life or fish habitat that results from failure to comply with the provisions of this Hydraulic Project Approval.

Failure to comply with the provisions of this Hydraulic Project Approval could result in civil action against you, including, but not limited to, a stop work order or notice to comply, and/or a gross misdemeanor criminal charge, possibly punishable by fine and/or imprisonment.

All Hydraulic Project Approvals issued under RCW 77.55.021 are subject to additional restrictions, conditions, or revocation if the Department of Fish and Wildlife determines that changed conditions require such action. The person(s) to whom this Hydraulic Project Approval is issued has the right to appeal those decisions. Procedures for filing appeals are listed below.



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MINOR MODIFICATIONS TO THIS HPA: You may request approval of minor modifications to the required work timing or to the plans and specifications approved in this HPA unless this is a General HPA. If this is a General HPA you must use the Major Modification process described below. Any approved minor modification will require issuance of a letter documenting the approval. A minor modification to the required work timing means any change to the work start or end dates of the current work season to enable project or work phase completion. Minor modifications will be approved only if spawning or incubating fish are not present within the vicinity of the project. You may request subsequent minor modifications to the required work timing. A minor modification of the plans and specifications means any changes in the materials, characteristics or construction of your project that does not alter the project's impact to fish life or habitat and does not require a change in the provisions of the HPA to mitigate the impacts of the modification. If you originally applied for your HPA through the online Aquatic Protection Permitting System (APPS), you may request a minor modification through APPS. A link to APPS is at <http://wdfw.wa.gov/licensing/hpa/>. If you did not use APPS you must submit a written request that clearly indicates you are seeking a minor modification to an existing HPA. Written requests must include the name of the applicant, the name of the authorized agent if one is acting for the applicant, the APP ID number of the HPA, the date issued, the permitting biologist, the requested changes to the HPA, the reason for the requested change, the date of the request, and the requestor's signature. Send by mail to: Washington Department of Fish and Wildlife, PO Box 43234, Olympia, Washington 98504-3234, or by email to HPAapplications@dfw.wa.gov. You should allow up to 45 days for the department to process your request.

MAJOR MODIFICATIONS TO THIS HPA: You may request approval of major modifications to any aspect of your HPA. Any approved change other than a minor modification to your HPA will require issuance of a new HPA. If you originally applied for your HPA through the online Aquatic Protection Permitting System (APPS), you may request a major modification through APPS. A link to APPS is at <http://wdfw.wa.gov/licensing/hpa/>. If you did not use APPS you must submit a written request that clearly indicates you are requesting a major modification to an existing HPA. Written requests must include the name of the applicant, the name of the authorized agent if one is acting for the applicant, the APP ID number of the HPA, the date issued, the permitting biologist, the requested changes to the HPA, the reason for the requested change, the date of the request, and the requestor's signature. Send your written request by mail to: Washington Department of Fish and Wildlife, PO Box 43234, Olympia, Washington 98504-3234. You may email your request for a major modification to HPAapplications@dfw.wa.gov. You should allow up to 45 days for the department to process your request.

APPEALS INFORMATION

If you wish to appeal the issuance, denial, conditioning, or modification of a Hydraulic Project Approval (HPA), Washington Department of Fish and Wildlife (WDFW) recommends that you first contact the department employee who issued or denied the HPA to discuss your concerns. Such a discussion may resolve your concerns without the need for further appeal action. If you proceed with an appeal, you may request an informal or formal appeal. WDFW encourages you to take advantage of the informal appeal process before initiating a formal appeal. The informal appeal process includes a review by department management of the HPA or denial and often resolves issues faster and with less legal complexity than the formal appeal process. If the informal appeal process does not resolve your concerns, you may advance your appeal to the formal process. You may contact the HPA Appeals Coordinator at (360) 902-2534 for more information.

A. INFORMAL APPEALS: WAC 220-660-460 is the rule describing how to request an informal appeal of WDFW actions taken under Chapter 77.55 RCW. Please refer to that rule for complete informal appeal procedures. The following information summarizes that rule.



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A person who is aggrieved by the issuance, denial, conditioning, or modification of an HPA may request an informal appeal of that action. You must send your request to WDFW by mail to the HPA Appeals Coordinator, Department of Fish and Wildlife, Habitat Program, PO Box 43234, Olympia, Washington 98504-3234; e-mail to HPAapplications@dfw.wa.gov; fax to (360) 902-2946; or hand-delivery to the Natural Resources Building, 1111 Washington St SE, Habitat Program, Fifth floor. WDFW must receive your request within 30 days from the date you receive notice of the decision. If you agree, and you applied for the HPA, resolution of the appeal may be facilitated through an informal conference with the WDFW employee responsible for the decision and a supervisor. If a resolution is not reached through the informal conference, or you are not the person who applied for the HPA, the HPA Appeals Coordinator or designee may conduct an informal hearing or review and recommend a decision to the Director or designee. If you are not satisfied with the results of the informal appeal, you may file a request for a formal appeal.

B. FORMAL APPEALS: WAC 220-660-470 is the rule describing how to request a formal appeal of WDFW actions taken under Chapter 77.55 RCW. Please refer to that rule for complete formal appeal procedures. The following information summarizes that rule.

A person who is aggrieved by the issuance, denial, conditioning, or modification of an HPA may request a formal appeal of that action. You must send your request for a formal appeal to the clerk of the Pollution Control Hearings Boards and serve a copy on WDFW within 30 days from the date you receive notice of the decision. You may serve WDFW by mail to the HPA Appeals Coordinator, Department of Fish and Wildlife, Habitat Program, PO Box 43234, Olympia, Washington 98504-3234; e-mail to HPAapplications@dfw.wa.gov; fax to (360) 902-2946; or hand-delivery to the Natural Resources Building, 1111 Washington St SE, Habitat Program, Fifth floor. The time period for requesting a formal appeal is suspended during consideration of a timely informal appeal. If there has been an informal appeal, you may request a formal appeal within 30 days from the date you receive the Director's or designee's written decision in response to the informal appeal.

C. FAILURE TO APPEAL WITHIN THE REQUIRED TIME PERIODS: If there is no timely request for an appeal, the WDFW action shall be final and unappealable.

Habitat Biologist Noll.Steinweg@dfw.wa.gov
Noll Steinweg 360-628-2173

for Director
WDFW

Appendix E:

Beaver Dam Management Plan

for
Thurston County Public Works & Storm and Surface Water Utility

Developed by
Mike Clark, Thurston County Public Works

In coordination with
Teal Waterstrat, US Fish and Wildlife Service

Revised April 2016

FOR COUNTY STAFF:

Prior to removing a dam, installing levelers, deceivers and/or trapping, an ESA checklist should be filled out and reviewed by the Tech Support Division to ensure that activities taken follow the County's General Hydraulic Permit. The completed checklist will have the following information attached

- Dam location
- History of the site
- Impacts (upland or down)
- Preliminary Site Assessment (photos, measurements, data loggers)
- Spawning windows
- Risk – Flooding, infrastructure (Private and Public), safety, health and critical areas
- BMP's outside OSF Habitat – Follow provisions in GHPA
- BMP's Inside OSF Habitat – See below
- Copy of HPA
- 3- day notification to WDFW and USFWS if dam is within OSF Screen

Beaver Dam Removal in Oregon Spotted Frog (OSF) Habitat

The Black River Watershed, including tributaries of the Black Lake and Black River are known to be occupied by Oregon Spotted Frog (OSF). In the Thurston County Habitat Conservation Plan (HCP), this area is identified as the OSF Habitat Screen (Figure 1). Therefore, beaver dam removal within the Black River watershed shall include special consideration of this species' habitat and life history requirements. These may include additional timing restrictions, frog-specific handling techniques, and restricting personnel and equipment work in shallow flooded areas. **These limitations do not supersede the need for emergency¹ beaver dam removal when human property, health, or lives are at risk.**

When working in the Black River - Black Lake Watershed and in the OSF Habitat Screen, or if OSF at any life stage (eggs, tadpoles, and frogs) are encountered, please see additional beaver dam removal procedures that follow in this document. When unsure if the beaver dam removal project is in a location that might contain OSF, its habitat, or you encounter any life stage of the OSF please first contact Thurston County Public Works, who will then contact the Washington U.S. Fish and Wildlife (USFWS) Office at 360-753-9440.

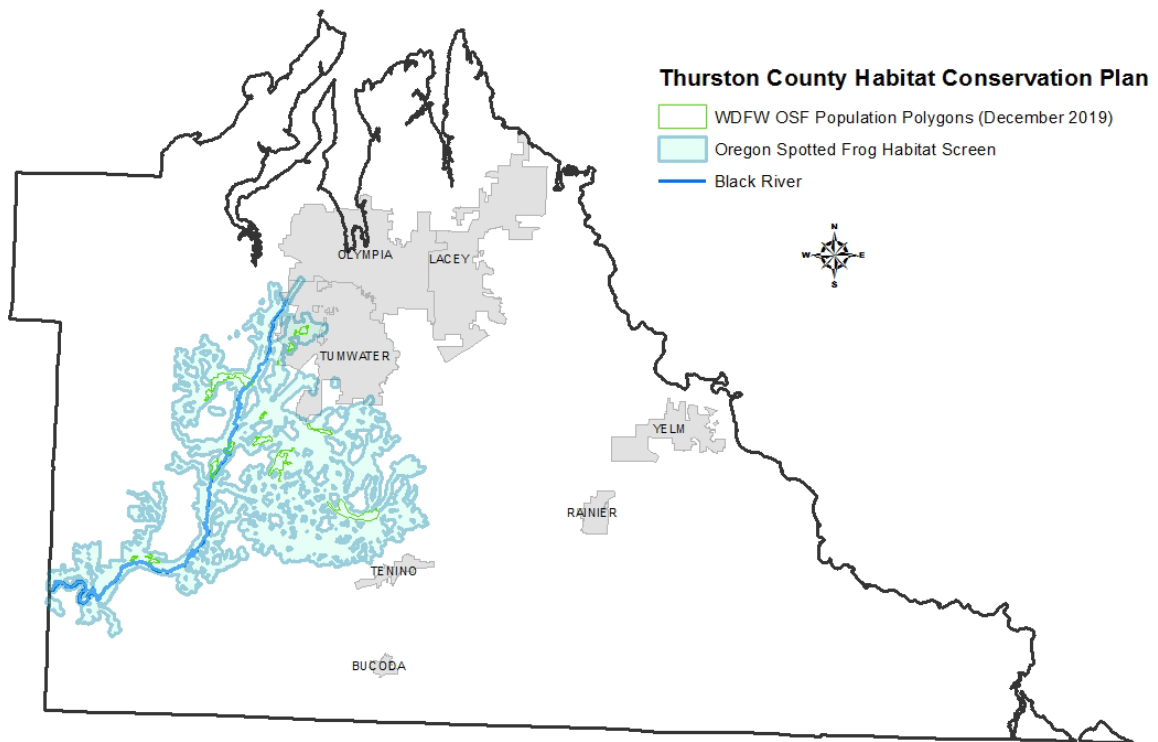


Figure 1. Thurston County HCP OSF Habitat Screen.

¹ "Emergency" means an immediate threat to life, the public, property, or of environmental degradation.

Beaver Dam Management (Modified from 2015 Hydraulic Code)

(1) Description:

- a) A person may need to remove, breach, or modify a beaver dam to prevent damage to private and public land, structures, or other improvements of value from flooding. Beaver dams are normally removed using hand tools or equipment such as backhoes or mini excavators.
- b) An alternative to frequent dam removal is installing a beaver exclusion (deceiver) device. These devices prevent beavers from building a dam that blocks water flow at the mouth or inside of culverts or bridges. See Photos section for examples of beaver exclusion devices.
- c) Installing a water level (flow) control device may be a preferred alternative to removing or breaching an established dam that maintains a beaver wetland; however, fish passage must be maintained. A person can install a water level control device to maintain a desirable beaver wetland. These devices are installed at the intended depth, extending upstream and downstream of the dam. This preserves the pond's habitat benefits.

(2) Fish life concerns:

- a) Beavers play an important ecological role in creating and maintaining ponds and wetlands for fish and wildlife habitat. Ponds also provide surface water storage that improves summer flows, as well as improving water quality through retaining sediment.
- b) Breaching, notching, or removing a dam can negatively affect fish life and the habitat that supports fish life by dewatering the upstream pond, stranding fish life, and releasing large volumes of water (that can be devoid of oxygen) and sediment downstream. Releasing sediment can affect downstream spawning areas. Breaching or removing a beaver dam may not prevent future beaver activity in the area. Persistent breaching or removing a beaver dam can increase the risk of negative impacts to habitat. In these instances, the department may recommend that a person consider other beaver management techniques.
- c) Beaver exclusion devices and water level control devices can create a design challenge for fish passage and the devices can decrease the likelihood for long-term fish passage.

(3) Removal or breaching a beaver dam:

- a) Beaver dams may be removed or modified without compensatory mitigation only when:
 - (i) The continued existence of the beaver dam poses an imminent threat to the integrity of water crossing structures, other structures or improvements of value, private and public land, or in some rare cases, the environment; and

- (ii) The beaver dam has been in existence for less than one year. Removal of older dams will be considered on a site-specific basis.
- b) Beaver dam management activities must take place when the work will cause the least impact to fish life. Except for an emergency or imminent danger, all work must occur when spawning or incubating fish are less likely to be present.
- c) Beaver dam management activities must take place when the work will cause the least impact to OSF habitat. Except for an emergency or imminent danger, all work must occur when breeding and oviposition are less likely to be present
- d) Whenever feasible, remove or notch beaver dams by hand or with hand-held tools and hand-operated or motorized winches.

(4) Removal or breaching a beaver dam construction:

- a) Before starting work, install effective sediment and erosion control measures to prevent sediment from entering waters of the state. Inspect the sediment and erosion control measures regularly during construction and make all needed repairs if any damage occurs.
- b) **Remove the dam gradually** to allow the water to release slowly and prevent the downstream release of accumulated sediment at the bottom of the pond, or cause damage or erosion to the stream bed and banks. The Washington Department of Fish and Wildlife (WDFW) may specify in the Hydraulic Permit Approval (HPA) the rate water can be released.
- c) When notching, the notch must not extend below the height of the accumulated sediment.
- d) To prevent bank erosion and flooding of adjacent properties, the breach in the beaver dam must not be wider than the original stream channel as measured WDFW. WDFW may approve larger breaches on a case-by-case basis.
- e) WDFW will specify the sequence in which to breach or remove a series of dams to avoid severe flooding and damage to habitat.
- f) Leave large woody material embedded in the stream bed or banks undisturbed.
- g) During and immediately after removal, monitor upstream and downstream for stranded fish in isolated pools. Capture and safely move all stranded or isolated fish to the nearest free-flowing water.

(5) Water level control device installation design and construction:

- a) Design and install water level control devices so that during low flows (when beavers are more actively increasing dam height), the flow passes through the device and maintains fish passage.
- b) Design and install water level control devices so that during low flows, the device will convey enough flow over and around the dam to pass fish; or design and install a water control device that also functions as a fish ladder.
- c) Install water level control devices in beaver ponds with pool depth of four feet or more. If the water level control device is installed in water shallower than four feet, the design must have an enclosure to protect the water intake from beaver activity.
- d) Maintain the water level control device to ensure it functions as designed.

(6) **Beaver exclusion devices design and construction:** Design, install, and maintain guards, grates, grills, fences, and other beaver exclusion devices to provide unimpeded fish passage and to prevent beavers from plugging a culvert or other water crossing structures such as low bridge crossings.

Additional Procedures for Removal or Maintenance of Dams in the Black River Watershed in OSF habitat

Ensure that these additional minimization measures are applied as are relevant when modifying or removing beaver dams in the Black River - Black Lake Watersheds if you are working in OSF habitat (Figure 2).

OSF habitat can be broadly defined in two categories: breeding and oviposition habitat, and non-breeding habitat.

Breeding habitat is characterized as shallow water emergent (sedge, rush, and grass vegetation) wetlands which are relatively unshaded and that ideally have an aquatic connection to perennial waters. The extent of this habitat can vary inter and intra-annually with fluctuating water levels.

Non-breeding habitat can include characteristics of breeding habitat but also includes slow moving deeper and shaded waters with floating and submerged vegetation. This can include springs, ponds, lakes, sluggish streams or rivers, irrigation canals, shrub wells, or roadside ditches.

If the entire impact area for the project is in a shaded conifer dominated riparian area, has primarily coarse inorganic substrates (gravel, cobble, etc.), and has swiftly flowing waters, then these further measures do not need to be applied as these are not habitat types used by the OSF. If you are unsure if the project will impact OSF habitat please call the Washington USFWS Office at (360) 753-9440 for guidance.



Figure 2. OSF habitat on in the Black River.

Additional OSF Minimization Measures

- If any OSF of any life stage, dead or alive, are encountered at any stage of the beaver dam removal or modification process notify the Washington USFWS Office at (360) 753-9440. Notification should include the date, time, precise location of the animal or carcass, and any other pertinent information.
- If dam removal is taking place in February through May and in habitat that is or may be suitable for OSF breeding, a qualified biologist or qualified County or USFWS staff member screen the areas to be impacted for OSF egg masses upstream and downstream of the dam removal site prior to removal or modification actions. If egg masses are encountered do not proceed with beaver management activities and contact USFWS at (360)753-9440 except in emergency situations. In emergency situations please contact USFWS as soon as is practical.
- When possible remove (or reduce the height of) dams when the area is dry to reduce the possibility of harming any life stage of the OSF through habitat modification or desiccation. Additionally void work during heavy rains.
- If there is site disturbance and exposed soils result, re-seeding exposed area as soon as suitable growing conditions exist. If the disturbed area is in OSF critical habitat or OSF

breeding habitat, trees, especially conifers, will not be planted along the shoreline to avoid shading of potential breeding sites.

- Natural woody material that is smaller than large woody material may be, in order of preference, repositioned within the stream or allowed to float downstream. Refrain from placing debris on land as OSFs may be occupying or hiding in woody debris and could be stranded out of water.
- Except in emergency situations, vehicle equipment may not operate in any standing water.
- OSFs may be stranded by dam notching or removal. The permittee shall have amphibian capture and transportation equipment ready and on the job site to capture and safely move stranded fish and frogs² from the work area when the water level drops. When required, the permittee shall have a qualified biologist or staff person trained by WDFW, US Fish and Wildlife Service, National Marine Fisheries Service, or an equivalent entity supervise the capture and safe removal of aquatic vertebrates from the job site. Fish removal and exclusion shall follow protocol identified in the Regional Road Management Program (<http://www.wsdot.wa.gov/maintenance/roadside/esa.htm>). Amphibian removal and exclusion shall follow protocol for amphibian handling (Under development as of August 2015). OSFs will ideally be moved to an aquatically connected lentic habitat in the immediate project area.

Photos of Beaver Dam Management Needs and Tools

² OSF can be difficult to distinguish from red-legged frog; unless there is a trained individual to differentiate the two species, all frogs should be moved. Egg and larval OSF transportation guidelines are currently in development by the USFWS, but are not finalized.



Roadside beaver dam – creates significant flooding and saturates road which leads to premature failure



Beaver dam removal by hand – fortunately not much backwater



Submerged 4' diameter culverts with beaver dam built inside



This backwater can create hardship for septic systems upstream



Deceivers help keep the dam from being built inside and is sized accordingly to fish species



"T" posts at outfall prevents beavers from building inside



Deceiver with flashing lights



Beaver Dam beneath RR Trestle



Looking upstream inside of a 6' diameter w/beaver dam

APPENDIX F: OREGON SPOTTED FROG HABITAT SURVEY PROTOCOL

Introduction

Potentially suitable habitat for Oregon Spotted Frog (OSF) was mapped in an overlay called the Oregon Spotted Frog Habitat Screen Layer ('OSF Habitat Screen'; HCP Figure 2.6). The OSF Habitat Screen includes 39,493 ac (15,982 ha) and intersects 5,718 tax parcels. Thurston County developed the OSF Habitat Screen with technical assistance from the United States Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW), and other knowledgeable parties. The development of the OSF Habitat Screen is described in HCP Section 2.2.5.

The OSF Habitat Screen identifies a mix of known and potential habitat for OSF. On-the-ground surveys for OSF in Thurston County to date have focused on areas immediately around known locations, therefore survey of potential, but unconfirmed OSF habitat has been limited. The County, USFWS, and WDFW acknowledge that the entire OSF Habitat Screen is not suitable OSF habitat. Therefore, prior to any Covered Activity occurring within the OSF Habitat Screen, except routine right-of-way maintenance, an OSF habitat verification process will be completed. OSF habitat verification process will utilize the protocols identified in this document. Additional follow up species survey and technical assistance comments from USFWS on survey results will be completed as determined by the reviewing entity. Impacts will only be assessed where suitable OSF habitat is verified with this protocol. A survey completed for OSF habitat will be valid for one year.

Oregon Spotted Frog Suitable Habitat Definition

OSF habitat is characterized by ephemeral or permanent bodies of fresh water, including, but not limited to natural or manmade ponds, springs, lakes, slow-moving streams, or pools within or oxbows adjacent to streams, canals, and ditches.

The OSF needs two broad categories of habitat: breeding and nonbreeding. Suitable habitat for OSF may include any one of these habitats, or a combination.

- Breeding habitat consists of ovipositioning and rearing habitat and is characterized as shallow water (< 12 in deep) emergent (short-stature (< 2 foot) sedge, rush, and grass vegetation) wetlands, which are unshaded (0-75% canopy cover¹) and that ideally have hydrologic connection during highwater season, even for short periods (30 or less days) to perennial waters. The extent of this habitat can vary inter- and intra-annually with fluctuating water levels.
- Non-breeding, summer and winter habitat types can include characteristics of breeding habitat but also include slow moving deeper and shaded waters with floating and submerged

¹ Areas with deciduous canopy species will typically not be leafed out during OSF breeding season.

vegetation. This can include springs, ponds, lakes, sluggish streams or rivers, irrigation canals, shrub wells, roadside ditches, swales, or depressional areas.

If the parcel and/or project contain habitat which meets the OSF suitable habitat definition, then the area is considered to contain suitable OSF habitat.

OSF Habitat Suitability Verification Protocol

Step 1: Office GIS Evaluation

County staff will review proposed project information, aerial photos, maps, and GIS resources. If the following condition can be verified, the project area is NOT considered OSF habitat, and may be removed from OSF review:

- A. The entire parcel is forested with >75% canopy cover of deciduous or evergreen tree species²;

If the above condition is NOT present, continue with a field evaluation (described below).

Step 2: Field Evaluation

Conduct visits to evaluate parcels and included project areas for suitable OSF habitat from January 1 – April 15. If USFWS notifies the County, this period may be modified. This temporal period is typically when fall and winter precipitation events in Thurston County cause inundation of seasonal wetlands that Oregon spotted frog use for breeding. Therefore, identification of all habitat types is most likely to be possible during this time. This evaluation period may be adjusted through adaptive management over the permit term of the HCP.

Assess conditions on the parcel and specifically within the project area to determine if OSF habitat (breeding, rearing summer, or winter) is present. All habitat types do not need to be present within the parcel for the area to be considered suitable habitat for OSF.

General Evaluation Questions

If the answer to either of the following questions (B and C) is YES, there is NOT suitable habitat onsite, and the project may be removed from further review. If the answers to questions are all NO, OSF habitat may be present - continue to the next section to determine what type if any is present.

- B. Is all aquatic habitat on the parcel a flowing stream with inorganic substrates (i.e., gravel cobble) in a forest with >75% canopy cover of deciduous or evergreen tree species and/or > 75% forest associated or woody wetland vegetation? **YES/NO DESCRIBE**
- C. Is all aquatic habitat on the parcel lasting < 30 days and not hydrologically connected (above surface) to other persistent water (present > 30 days)? **YES/NO DESCRIBE**

² A site visit may be conducted to confirm the office review. Should the parcel condition be substantially different a field evaluation may be required.

Evaluation questions for Breeding and Rearing Habitat

If the answer to one or more of the questions below (D-I) is YES, it is suitable OSF habitat, with potential conditions for Breeding and Rearing:

- D. Does the parcel contain *shallows* with extensive (> 1,000 sq. ft.) areas < 12 inches deep? **YES/NO**
- E. Are these shallows (Question D) inundated for at least 5 weeks during late winter/early spring, starting as early as February? **YES/NO**
- F. Is the vegetation covering the parcel or in these shallows dominated by (constituting > 50% of existing vegetative cover) emergent wetland vegetation³? **YES/NO DESCRIBE**
- G. Do these shallows (Question D) have > 10% vegetative coverage of substrate, primarily (> 50%) in submergent and emergent growth forms? **YES/NO DESCRIBE**
- H. Do these shallows (Question D) have low (< 75%) surface and above-water canopy closure in the form of woody stemmed shrubs and trees, excepting the margins (within 50 ft of open expanses) of deciduous forest stands where leaf-out occurs after egg-laying⁴? **YES/NO DESCRIBE**
- I. Do any or all these shallows (Question D) remain hydrologically connected to summer-season habitat by still- or slow-moving surface waters until post hatching (June 30th) in an average year? **YES/NO DESCRIBE**

Evaluation questions for suitable summer habitat

If the habitat element below (M) is present, it is suitable OSF habitat, with potential for summer occupancy:

- M. Does the parcel contains perennial lentic pools, ditches, canals, or slow-moving rivers, or other wetted areas that have emergent, floating, or submergent wetland vegetation (potentially including freshwater woody wetland vegetation such as: hardhack, willow, or alder (*Spiraea* spp., *Salix* spp., or *Alnus* spp.) in shrub-tree form)? **YES/NO DESCRIBE**

³ Vegetation cover would include species such as *Carex*, *Eleocharis*, *Juncus*, *Sparganium*, *Spiraea*, *Potamogeton*, *Scirpus*, *Utricularia*, *Ranunculus*, filamentous algae, and native grasses, but may also contain subdominant vegetation of other plant species having an upright submergent or emergent growth form. As most OSF occupied areas are currently dominated by reed canarygrass (*Phalaris*), non-native vegetation may function as breeding habitat.

⁴ Note that in some watersheds, occupied breeding habitat has been planted with trees and shrubs as wetland mitigation/enhancement. These habitats may continue to be occupied but may not meet all the criteria in this screen.

Evaluation questions for suitable winter habitat

If one or more of the habitat elements below (N-P) is present, it is suitable OSF habitat, with potential for winter occupancy:

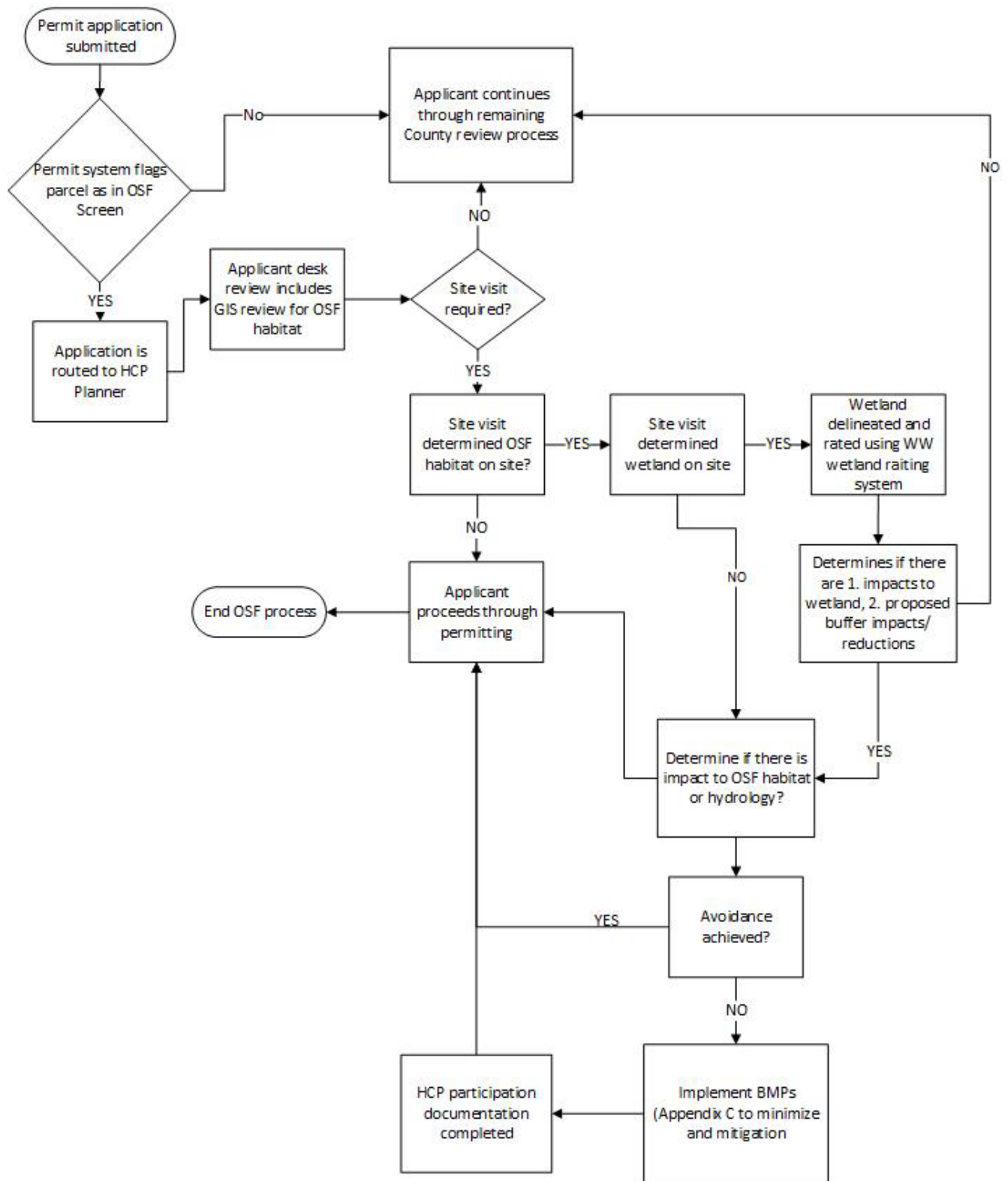
- N. Does the parcel contain any ponded, pooled, or channeled areas of either lotic (flowing) or lentic (standing) water that exceeds 6" in depth? **YES/NO DESCRIBE**

- O. Does the parcel contain any ponded, pooled, or channeled areas of either lotic or lentic water that have some combination of aquatic bed, emergent, and scrub shrub vegetation present and are intermixed with unconsolidated bottom habitat? **YES/NO DESCRIBE**

- P. Does the parcel contain any ponded, pooled, or channeled areas of either lotic or lentic water that are not scoured⁵ by winter storm-related flows during an average year, but are inundated from at least October through March? **YES/NO DESCRIBE**

⁵ Scoured: having flows capable of removing rooted vegetation or re-arranging distribution of large- grained sand and gravel substrates.

Oregon Spotted Frog Survey System



Appendix G: Critical Habitat Primary Constituent Elements (PCEs)

Mazama Pocket Gopher

(1) Soils that support the burrowing habits of the Mazama Pocket Gopher, and where the four Thurston/Pierce subspecies of the Mazama Pocket Gopher may be found. These are usually friable, loamy, and deep soils, some with relatively greater content of sand, gravel, or silt, all generally on slopes less than 15 percent. Most are moderately to well-drained, but some are poorly drained. The range of each subspecies of the Mazama Pocket Gopher overlaps with a subset of potentially suitable soil series or soil series complexes.

- a. Olympia pocket gopher soils include the following soil series or soil series complex: Alderwood; Cagey; Everett; Godfrey; Indianola; Kapowsin; McKenna; Nisqually; Norma; Spana; Spanaway; Spanaway-Nisqually complex; and Yelm.
- b. Tenino pocket gopher soils include the following soil series or soil series complex: Alderwood; Cagey; Everett; Indianola; Kapowsin; Nisqually; Norma; Spanaway; Spanaway-Nisqually complex; and Yelm.
- c. Yelm pocket gopher soils include the following soil series or soil series complex: Alderwood; Cagey; Everett; Godfrey; Indianola; Kapowsin; McKenna; Nisqually; Norma; Spanaway; Spanaway-Nisqually complex; and Yelm.

(2) Areas equal to or larger than 50 ac (20 ha) in size that provide for breeding, foraging, and dispersal activities, found in the soil series or soil series complexes listed in (1), above, that have:

- a. Less than 10 percent woody vegetation cover;
- b. Vegetative cover suitable for foraging by gophers. Pocket gophers' diet includes a wide variety of plant material, including leafy vegetation, succulent roots, shoots, tubers, and grasses. Forbs and grasses that Mazama Pocket Gophers are known to eat include, but are not limited to: *Achillea millefolium* (common yarrow), *Agoseris* spp. (agoseris), *Cirsium* spp. (thistle), *Bromus* spp. (brome), *Camassia* spp. (camas), *Collomia linearis* (tiny trumpet), *Epilobium* spp. (several willowherb spp.), *Eriophyllum lanatum* (woolly sunflower), *Gayophytum diffusum* (groundsmoke), *Hypochaeris radicata* (hairy cat's ear), *Lathyrus* spp. (peavine), *Lupinus* spp. (lupine), *Microsteris gracilis* (slender phlox), *Penstemon* spp. (penstemon), *Perideridia gairdneri* (Gairdner's yampah), *Phacelia heterophylla* (varileaf phacelia), *Polygonum douglasii* (knotweed), *Potentilla* spp. (cinquefoil), *Pteridium aquilinum* (bracken fern), *Taraxacum officinale* (common dandelion), *Trifolium* spp. (clover), and *Viola* spp. (violet); and
- c. Few, if any, barriers to dispersal within the unit or subunit. Barriers to dispersal may include, but are not limited to, forest edges, roads (paved and unpaved), abrupt elevation changes, Scotch broom thickets, highly cultivated lawns, inhospitable soil types or substrates, development and buildings, slopes greater than 35%, and open water.

Taylor's Checkerspot Butterfly

(1) Patches of early seral, short-statured, perennial bunchgrass plant communities composed of native grass and forb species in a diverse topographic landscape ranging in size from less than 1 ac up to 100 ac (0.4 to 40 ha) with little or no overstory forest vegetation that have areas of bare soil for basking that contain:

(a) In Washington and Oregon, common bunchgrass species found on northwest grasslands include *Festuca roemerii* (Roemer's fescue), *Danthonia californica* (California oat grass), *Koeleria cristata* (prairie Junegrass), *Elymus glaucus* (blue wild rye), *Agrostis scabra* (rough bentgrass), and on cooler, high-elevation sites typical of coastal bluffs and balds, *Festuca rubra* (red fescue).

(b) On moist grasslands found near the coast and in the Willamette Valley, there may be *Bromus sitchensis* (Sitka brome) and *Deschampsia cespitosa* (tufted hairgrass) in the mix of prairie grasses. Less abundant forbs found on the grasslands include, but are not limited to, *Trifolium* spp. (true clovers), narrow-leaved plantain (*Plantago lanceolata*), harsh paintbrush (*Castilleja hispida*), Puget balsamroot (*Balsamorhiza deltoidea*), woolly sunflower, nineleaved desert parsley (*Lomatium triternatum*), fine-leaved desert parsley (*Lomatium utriculatum*), common camas (*Camassia quamash*), showy fleabane (*Erigeron speciosus*), Canada thistle (*Cirsium arvense*), common yarrow, prairie lupine (*Lupinus lepidus*), and sicklekeeled lupine (*L. albicaulis*).

(2) Primary larval host plants (narrow-leaved plantain and harsh paintbrush) and at least one of the secondary annual larval host plants (blue-eyed Mary (*Collinsia parviflora*), sea blush (*Plectritis congesta*), or dwarf owl-clover (*Triphysaria pusilla*) or one of several species of speedwell (marsh speedwell (*Veronica scutella*), American speedwell (*V. beccabunga* var. *americana*), or thymeleaf speedwell (*V. serpyllifolia*)).

(3) Adult nectar sources for feeding that include several species found as part of the native (and one nonnative) species mix on northwest grasslands, including, but not limited to: narrowleaved plantain; harsh paintbrush; Puget balsam root; woolly sunshine; nineleaved desert parsley; fine-leaved desert parsley or spring gold; common camas; showy fleabane; Canada thistle; common yarrow; prairie lupine; sicklekeeled lupine, and wild strawberry (*Fragaria virginiana*).

(4) Aquatic features such as wetlands, springs, seeps, streams, ponds, lakes, and puddles that provide moisture during periods of drought, particularly late in the spring and early summer. These features can be permanent, seasonal, or ephemeral.

Oregon Spotted Frog

(1) Nonbreeding (N), Breeding (B), Rearing (R), and Overwintering Habitat (O). Ephemeral or permanent bodies of freshwater, including, but not limited to natural or manmade ponds, springs, lakes, slow-moving streams, or pools within or oxbows adjacent to streams, canals, and ditches, that have one or more of the following characteristics:

- Inundated for a minimum of 4 months per year (B, R) (timing varies by elevation but may begin as early as February and last as long as September);
- Inundated from October through March (O);

- If ephemeral, areas are hydrologically connected by surface water flow to a permanent water body (e.g., pools, springs, ponds, lakes, streams, canals, or ditches) (B, R);
- Shallow water areas (less than or equal to 30 centimeters (12 inches), or water of this depth over vegetation in deeper water (B, R);
- Total surface area with less than 50 percent vegetative cover (N);
- Gradual topographic gradient (less than 3 percent slope) from shallow water toward deeper, permanent water (B, R);
- Herbaceous wetland vegetation (i.e., emergent, submergent, and floating leaved aquatic plants), or vegetation that can structurally mimic emergent wetland vegetation through manipulation (B, R);
- Shallow water areas with high solar exposure or low (short) canopy cover (B, R);
- An absence or low density of nonnative predators (B, R, N)

(2) Aquatic movement corridors. Ephemeral or permanent bodies of fresh water that have one or more of the following characteristics:

- Less than or equal to 5 km (3.1 miles) linear distance from breeding areas;
- Impediment free (including, but not limited to, hard barriers such as dams, biological barriers such as abundant predators, or lack of refugia from predators).

(3) Refugia habitat. Nonbreeding, breeding, rearing, or overwintering habitat or aquatic movement corridors with habitat characteristics (e.g., dense vegetation and/or an abundance of woody debris) that provide refugia from predators (e.g., nonnative fish or bullfrogs).

Appendix H: Credit-Debit Methodology

Overview

This Appendix describes the credit-debit methodology for the Thurston County Habitat Conservation Plan (HCP). This is the method that the County will use to quantify impacts (debits) from Covered Activities and mitigation offsets (credits) from the Conservation Program for the Covered Species that reside in prairies: Olympia Pocket Gopher, Tenino Pocket Gopher, Yelm Pocket Gopher, Taylor's Checkerspot Butterfly, and Oregon Vesper Sparrow. The credit-debit methodology for Oregon Spotted Frog is included in HCP Chapter 7.

Before the development of the HCP, and in advance of some of the listing of the Covered Species, the Prairie Habitat Assessment Methodology (PHAM; Thurston County Resource Stewardship Department 2014), based on the Species and Habitat Asset and Risk Prioritization model framework, was developed by Thurston County, Willamette Partnership and ENVIRON. PHAM was intended to help standardize an approach for assessing impacts to and coordinating mitigation for prairie ecosystems in Thurston County. PHAM focused on the Mazama Pocket Gopher subspecies, Taylor's Checkerspot Butterfly and Streaked Horned Lark.

During the period of HCP development from 2014 to 2020, the list of species to be covered by the HCP changed, and the information describing species needs evolved. The United States Fish and Wildlife Service (USFWS) has produced updated habitat suitability criteria for the Mazama Pocket Gopher subspecies (MPG) and Taylor's Checkerspot Butterfly and has provided feedback that has significantly altered how credits and debits will be calculated under the HCP. This current guidance is the basis of the credit-debit methodology for the HCP and is described in this Appendix. PHAM is no longer used. All credit and debit calculations are consistent with the Performance Standards identified for each Covered Species in HCP Chapter 7: Implementation. Any revisions to the Performance Standards resulting from adaptive management will be carried through to this credit-debit methodology and associated Effectiveness Monitoring procedures.

All personnel implementing the activities described in the credit-debit methodology must possess the training and qualifications identified in HCP Chapter 6: Monitoring and Adaptive Management and be in possession of any required USFWS or Washington Department of Fish and Wildlife (WDFW) permits.

Key HCP Parameters Overview

Key parameters for the credit-debit methodology calculations are included in the tables of the HCP. These tables, with original numbering for cross reference, are also provided in this Appendix for ease of reference. The following HCP tables are provided at the end of this Appendix:

- HCP Table 2.3 Prairie soils with documented use by MPG subspecies in Thurston County (USFWS 2016).
- HCP Table 2.4 Key species for Taylor’s Checkerspot habitat in Thurston County.
- HCP Table 4.1 Assigned occupancy values for MPG habitat, based on occupancy and soil preference categories. A value of 1 = 100% value.
- HCP Table 7.1 All upland species vegetation Performance Standards comparison table.
- HCP Table 7.3 All prairie species credit value comparison table.
- HCP Table 7.4 Assigned occupancy values for Oregon Vesper Sparrow habitat. A value of 1 = 100% value.

Procedures for Quantifying Debits

The Debit Method guides the assessment of the habitat quality and quantity for Covered Species in a localized area, specifically the project Development Envelope. The Development Envelope area is associated with a project’s impacts and it defines the boundaries for the calculation of debits. For most activities, this is the area directly affected by a Covered Activity.

The Debit Method is to be implemented as a mapping exercise in the office, without field surveys, and can occur at any time of year. A field survey to determine Mazama pocket gopher soils is only required if a permit application requests an Expanded Permit Review (see HCP Chapter 7: Implementation). If using the Expanded Permit Review, the County will follow the field survey procedures in Appendix K: Site Evaluation Protocol. If during the field survey positive findings of the Mazama pocket gopher are observed, the information shall be noted as part of the survey notes and the property shall be considered occupied by the Covered Species.

Debit Method Steps:

- 1) Obtain a map of the project design for the proposed activity location. Map should include project site coordinates, scale bar, Development Envelope boundary, and parcel/project boundaries, overlaid on recent, high-resolution aerial imagery.
- 2) Integrate the Development Envelope boundary into a GIS map that includes the following layers:
 - a) Mapped extent for each Covered Species
 - b) MPG Basemap of Occupancy Levels (this will include mapped Covered Species extents from Thurston County GeoData)
 - c) Oregon Vesper Sparrow Basemap of Occupancy Levels (this will include mapped Covered Species extents from Thurston County GeoData)
 - d) NRCS Soil Survey Data with soils classified by MPG preference
 - e) Recent high-resolution aerial imagery (ESRI/AGOL or other source)

- f) Service Areas for MPG
- 3) Clip the Development Envelope to remove non habitat areas as (e.g., fully forested areas, hard/impervious surface¹, existing permitted/authorized structure). This creates the Debit Assessment Area.
- 4) Identify overlap of the Debit Assessment Area with the mapped extent for the Covered Species using the GIS layers integrated in step 2. This is the extent of overlap (e.g., area of impact) in acres. *Note: Use HCP Table 2.3 and the NRCS Soil GIS data layers to identify the MPG extent in the Debit Assessment Area – this is the area of MPG soils within the Debit Assessment Area.*
- a) If the Debit Assessment Area overlaps the mapped extent for an MPG subspecies, for each Service Area, complete the following steps:
- i. Use best available species occupancy data (e.g., Thurston County Geodata, WDFW, Appendix K - Site Evaluation Protocol) to identify the preference of MPG soils (more preferred or less preferred) and occupancy category present in the Debit Assessment Area. Use Table 4.1 to identify the correct MPG Occupancy-Soil Preference Habitat Value of the Debit Assessment Area.
 - ii. Multiply the MPG extent of overlap (in acres) for each Occupancy-Soil Preference Habitat Value to calculate the functional acre (debit) for MPG occupancy.
 - iii. Multiply the MPG extent of overlap (in acres) by the habitat quality value default for MPG debits², a standard value of 0.6 functional acre(debits/acre) to calculate the functional acre debit for MPG habitat quality.
 - iv. Sum the debit for MPG occupancy and the debit for MPG habitat quality to calculate the total debit for MPG in the Debit Assessment Area
 - v. For Yelm Pocket Gopher, if the debit will be mitigated outside the Service Area where the impact occurred, an out-of-Service Area multiplier will of 1.25 shall be applied. This multiplier is applied to the debit-side formula only.

¹ Hard/impervious surface shall be excluded if installed prior to 2014 or permitted/authorized by the County.

² The default MPG debits assumes a vegetation condition intermediate between Shrub Dominated and Degraded Grassland; HCP Table 7.1; Performance Standards.

- b) If the Debit Assessment Area overlaps the mapped extent for Taylor’s Checkerspot Butterfly:
- i) Multiply the extent of the overlap (in acres) by the default habitat quality for Taylor’s Checkerspot Butterfly debits, a habitat value of 0.3 functional acre debits/acre (HCP Table 7.1; Performance Standards), to calculate the total debit for Taylor’s Checkerspot Butterfly in the Debit Assessment Area.
- c) If the Debit Assessment Area overlaps the mapped extent for Oregon Vesper Sparrow:
- i) Use best available species occupancy data (e.g., Thurston County Geodata, WDFW) to determine which occupancy category best describes the Debit Assessment Area.
 - ii) Multiply the extent of overlap (in acres) by the assigned value for its occupancy category (HCP Table 7.4). To calculate the occupancy debit for Oregon Vesper Sparrow in the Debit Assessment Area.
 - iii) Multiply the extent of overlap (in acres), by the default habitat quality for Oregon Vesper Sparrow debits, a habitat value of 0.4 functional acre debits/acre (HCP Table 7.1; Performance Standards). To calculate the habitat quality debit for Oregon Vesper Sparrow in the Debit Assessment Area.
 - iv) Sum the debit for OVS occupancy and the debit for OVS habitat quality to calculate the total debit for OVS in the Debit Assessment Area.
- 5) Summarize total debits by Covered Species for the Debit Assessment Area. A sample summary table is included in Table 1.

Table 1. Sample Debit Assessment Area debit summary.

Site/Project:			
Covered Species	Occupancy Debits	Habitat Quality Debits	Total Debits
Olympia Pocket Gopher			
Tenino Pocket Gopher			
Yelm Pocket Gopher – YPG E			
Yelm Pocket Gopher – YPG N			
Yelm Pocket Gopher – YPG S			
Taylor’s Checkerspot Butterfly	n/a		
Oregon Vesper Sparrow			
Total			

Procedures for Quantifying Credits

The Credit Method is intended primarily for use in Thurston County from:

- 1st of April through the 15th of June (Taylor's Checkerspot Butterfly and MPG);
- 1st of May through the 31st of May (Oregon Vesper Sparrow) and MPG; and
- 1st of June through the 31st of October (MPG Only).

Dates are based on the typical flowering period of prairie plants. As such, dates are weather dependent, with some annual variation expected in start and end date. County staff should consult WDFW or USFWS to determine whether April 1st is an appropriate survey start date in any given year.

Office Preparation

- 1) Obtain a map of the project design for the proposed mitigation site. Map should include project site coordinates, scale bar, Credit Assessment Area boundary, and parcel boundaries (if relevant), overlaid on recent, high-resolution aerial imagery. The Credit Assessment Area is the area being evaluated for credits.
- 2) Integrate the Credit Assessment Area boundary into a GIS map that includes the following layers:
 - a) Mapped extent for each Covered Species
 - b) Mazama Pocket Gopher Basemap of Occupancy Levels (MPG Basemap; this will include mapped Covered Species extents from Thurston County GeoData)
 - c) Oregon Vesper Sparrow Basemap of Occupancy Levels (Oregon Vesper Sparrow Basemap; this will include mapped Covered Species extents from Thurston County GeoData)
 - d) NRCS Soil Survey Data
 - e) Recent high-resolution aerial imagery (ESRI/AGOL or other source)
 - f) Service Areas for MPG
 - g) Any site-specific management zones
 - h) Other site-specific data (including Taylor's Checkerspot occupancy)
- 3) Identify overlap of the Credit Assessment Area with the mapped extent for the Covered Species.
 - a) MPG Soils:
 - i) Using the soil data (and list of soils in HCP Table 2.3), identify the area for each MPG soil type within the Credit Assessment Area. Identify existing known areas of MPG occupancy using the best available information (e.g., Thurston County Geodata NRCS Mapped Soils).

- b) Taylor’s Checkerspot Butterfly: Identify overlap of Credit Assessment Area with mapped extent for Taylor’s Checkerspot Butterfly.
 - c) Oregon Vesper Sparrow: Identify overlap of Credit Assessment area with mapped extent for Oregon Vesper Sparrow.
- 4) If potential habitat for Covered Species exist, visit the project site and schedule a field visit between approximately: 1st of April and 15th of June. These dates will ensure you are able to detect key prairie plant species. There will be variation between years. For Oregon Vesper Sparrow, a visit in the month of May is required. If potential habitat exists for MPG, a second field visit may be required between: 1st of June and 31st of October (September 1 through October 31, supports the highest probability of gopher mound detection (Olson, 2011). See Table 2 for approximate time needed to complete a survey.
 - 5) Using a GIS grid, within the Credit Assessment Area, map where you will establish on-the-ground transects that traverse the entire area, approximately 25 meters apart. Identify the points on the transects for data collection.
 - 6) Develop and review a data collection form, either electronic or paper.

Table 2. Approximate field survey times estimates.

Survey Extent	Time Estimate
1 acre	1.5-3 hour
5 acres	3-6 hours
10 acres	6-9 hours
30 acres	9-12 hours
100 acres	24-40 hours

Field Procedures

Suggested Field Equipment List: Hardware with GIS Platform, polygon of Credit Assessment Area, polygon of any management zones or other stratification by Covered Species, data collection form (digital or otherwise, e.g., Survey 123 or ArcCollector), meter tapes, digital camera, compass, flagging, laser range finder.

1. Identify the Credit Assessment Area on the ground and familiarize yourself with the topography and layout of the site.

2. Within the Credit Assessment Area, using your GIS established grid, establish on-the-ground transects that traverse the entire area, approximately 25 meters apart. Establish temporary or permanent markers if prescribed by the site manager. Establish the centroid of each cell – this will be the data collection point. Each cell represents 0.1544 acre (625 m²) in area.

3. Walking each transect, collect data every 25 meters by evaluating habitat characteristics 12.5 m to the front, back, left, and right directions (representing a 25 m x 25 m area, or ‘cell’).
 - a. Record the following data at each point based on ocular estimates for all measurements (except for vegetation height), according to the categorical bins provided in the relevant data forms:
 - i. Herbaceous (non-woody) plant species richness in the 25 m x 25 m area, separating native and nonnative.
 - ii. Percent cover (aerial) of trees, native and non-native, separating deciduous and evergreen, and specifically noting Oregon white oak (*Quercus garryana*).
 - iii. Percent cover (aerial) of shrubs, distinguishing native and non-native, and specifically noting Oregon white oak and kinnikinnick (*Arctostaphylos uva-ursi*).
 - iv. Total percent cover (aerial) native herbaceous species (excluding bracken fern, and separating forbs and graminoids).
 - v. Total percent cover (aerial) non-native herbaceous species (separating forbs and graminoids).
 - vi. Total percent cover of invasive species (inclusive of species identified as noxious weeds or species of concern by the Thurston County Noxious Weeds and Lakes Management Department).
 - vii. Percent cover (aerial) unvegetated ground cover (moss/lichen/litter less than 2 cm (0.8 in) high is also considered unvegetated).
 - viii. Average vegetation height, using a meter stick to measure representative plants.
 - ix. Presence and abundance of gopher mounds.
 - x. Species richness of oviposition and larval host plant(s) species (HCP Table 2.4) for Taylor’s Checkerspot Butterfly (note each species present).
 - xi. Presence of Taylor’s Checkerspot Butterfly nectar species (note species present and abundance- either as square meters of foliar cover or counts of flowering

units). A current list of Taylor's Checkerspot Butterfly Nectar species is included in HCP Table 2.4. This list will be adaptively managed over time.

Data Management and Calculations

1. Implement data quality control and quality assurance measures.
2. Analyze the field data for each 25 m cell in the Credit Assessment Area relative to the Performance Standards for each Covered Species. Attribute data to the cell centroid point.
 - a. For Olympia, Tenino and Yelm Pocket Gopher (each Service Area):
 - i. Evaluate data and buffer the centroid of cells with gopher mounds by 200 meters, to identify the boundaries of Category 2 MPG occupancy: Adjacent or Proximal to Occupancy (see HCP Table 4.1).
 - ii. Categorize each cell for MPG occupancy and MPG soil preference (HCP Table 4.1). Using the values for occupancy and soil preference (HCP Table 4.1), calculate a MPG occupancy credit value for each cell. Convert the 625 m² cells to acres first – one cell equals 0.1544 acres.
 - iii. Evaluate data and categorize each cell for MPG habitat quality (HCP Table 4.7). Using the relative values for MPG prairie quality (HCP Table 7.3), calculate a MPG habitat quality credit value for each cell. Convert the 625 m² cells to acres first – one cell equals 0.1544 acres.
 - iv. Sum the MPG occupancy and MPG habitat quality credit values for each cell to generate a total MPG credit attribute for each cell.
 - v. Sum the total MPG credits for the Credit Assessment Area.
 - b. For Taylor's Checkerspot Butterfly:
 - i. Using the field data, categorize each cell for Taylor's Checkerspot Butterfly habitat quality (HCP Table 7.1).
 - ii. Using the relative values for Taylor's Checkerspot Butterfly habitat quality (HCP Table 7.3), calculate the Taylor's Checkerspot Butterfly credit value for each cell. Convert the 625 m² cells to acres first – one cell equals 0.1544 acres.
 1. Use existing Taylor's Checkerspot Butterfly transect survey data to determine occupancy. If the data from the step above indicate any cells supports high quality native prairie, and those cells also meet the occupancy

definition for Taylor's Checkerspot Butterfly, use the full 1 credit per acre credit value instead of 0.8.

- iii. Sum the total Taylor's Checkerspot Butterfly habitat quality credits for the Credit Assessment Area.

c. For Oregon Vesper Sparrow:

- i. Using best available data, identify the Oregon Vesper Sparrow occupancy category, and associated relative occupancy credit value (HCP Table 7.1 and HCP Table 7.3). Convert the 625 m² cells to acres first – one cell equals 0.1544 acres.
- ii. Using the field data, categorize each cell for Oregon Vesper Sparrow habitat quality (HCP Table 7.1).
- iii. Using the relative values for Oregon Vesper Sparrow habitat quality (HCP Table 7.3), calculate the Oregon Vesper Sparrow habitat quality credit value for each cell. Convert the 625 m² cells to acres first – one cell equals 0.1544 acres.
- iv. Sum the occupancy credits and habitat quality credits to calculate total Oregon Vesper Sparrow credits for the Credit Assessment Area.

3. Summarize all credits for the Credit Assessment Area, by management zone or other stratification, if appropriate. See a sample credit summary table in Table 4.

Table 3. Sample Credit Assessment Area credit summary.

SITE:			
Management Zone A			
Covered Species	Occupancy Credits	Habitat Quality Credits	Total Credits
Olympia Pocket Gopher			
Tenino Pocket Gopher			
Yelm Pocket Gopher – YPG E			
Yelm Pocket Gopher – YPG N			
Yelm Pocket Gopher – YPG S			
Taylor’s Checkerspot Butterfly			
Oregon Vesper Sparrow			
Management Zone B			
Covered Species	Occupancy Credits	Habitat Quality Credits	Total Credits
Olympia Pocket Gopher			
Tenino Pocket Gopher			
Yelm Pocket Gopher – YPG E			
Yelm Pocket Gopher – YPG N			
Yelm Pocket Gopher – YPG S			
Taylor’s Checkerspot Butterfly			
Oregon Vesper Sparrow			
TOTAL:			
Covered Species	Occupancy Credits	Habitat Quality Credits	Total Credits
Olympia Pocket Gopher			
Tenino Pocket Gopher			
Yelm Pocket Gopher – YPG E			
Yelm Pocket Gopher – YPG N			
Yelm Pocket Gopher – YPG S			
Taylor’s Checkerspot Butterfly			
Oregon Vesper Sparrow			

Key HCP Parameters- HCP Tables

HCP Table 2.3 Prairie soils with documented use by Mazama Pocket Gopher subspecies in Thurston County (USFWS 2016).

Preference by MPG	Description
More Preferred	<p>Nisqually loamy fine sand, 0 to 3 percent slopes Nisqually loamy fine sand, 3 to 15 percent slopes Spanaway-Nisqually complex, 2 to 10 percent slopes Cagey loamy sand Indianola loamy sand, 0 to 3 percent slopes Spanaway gravelly sandy loam, 0 to 3 percent slopes Spanaway gravelly sandy loam, 3 to 15 percent slopes</p>
Less Preferred	<p>Alderwood gravelly sandy loam, 0 to 3 percent slopes Alderwood gravelly sandy loam, 3 to 15 percent slopes Everett very gravelly sandy loam, 0 to 3 percent slopes Everett very gravelly sandy loam, 3 to 15 percent slopes Indianola loamy sand, 3 to 15 percent slopes Kapowsin silt loam, 3 to 15 percent slopes McKenna gravelly silt loam, 0 to 5 percent slopes Norma fine sandy loam Norma silt loam Spana gravelly loam Spanaway stony sandy loam, 0 to 3 percent slopes Spanaway stony sandy loam, 3 to 15 percent slopes Yelm fine sandy loam, 0 to 3 percent slopes Yelm fine sandy loam, 3 to 15 percent slopes</p>

HCP Table 2.4 Key species for Taylor’s Checkerspot habitat in Thurston County.

Species Type	Scientific Name	Common Name	Origin
Larval host species – Oviposition host			
	<i>Castilleja levisecta</i>	Golden paintbrush	Native
	<i>Plantago lanceolata</i>	English plantain	Non-native
	<i>Castilleja hispida</i>	Harsh paintbrush	Native
Larval host species			
	<i>Collinsia spp</i>	Blue eyed mary	Native
Nectar resources			
	<i>Armeria maritima</i>	Sea pink	Native
	<i>Balsamorhiza deltoidea</i>	Balsamroot	Native
	<i>Camassia quamash</i>	Camas	Native
	<i>Fragaria virginiana</i>	Strawberry	Native
	<i>Lomatium triternatum</i>	Nineleaf biscuitroot	Native
	<i>Lomatium utriculatum</i>	Spring gold	Native
	<i>Saxifraga integrifolia</i>	Wholeleaf saxifrage	Native
	<i>Plectritis congesta</i>	Seablush	Native
	<i>Ranunculus occidentalis</i>	Western buttercup	Native

Table 4.4 Assigned occupancy-soil preference habitat values for Mazama Pocket Gopher subspecies habitat, based on occupancy and soil preference categories. A value of 1 = 100% value.

Occupancy Category	Definition of Category	Occupancy-Soil Preference Habitat Value	
		More Preferred Soils	Less Preferred Soils
Category 1: Occupied	Site is known to be occupied by Mazama Pocket Gophers.	1	1
Category 2: Adjacent or Proximal to Occupancy	Site occupancy is unknown, but site is within 656 ft (200 m) of an occupied area (Mazama Pocket Gopher subspecies soils are present on project site, and there are no barriers to Mazama Pocket Gopher subspecies movement between project site and occupied area).	0.95	0.75
Category 3: Suitable, Connected, but Less Close to Occupancy	Site occupancy is unknown, and site is more than 656 ft (200 m) of an occupied area (Mazama Pocket Gopher subspecies soils are present on project site, and there are no barriers to Mazama Pocket Gopher subspecies movement between project site and occupied area).	0.60	0.15

HCP Table 7.1 All upland species habitat quality Performance Standards comparison table.

	Taylor's Checkerspot Butterfly				Oregon Vesper Sparrow			Mazama Pocket Gopher	
	Shrub/Tree Cover ^{2,3,4}	Native Herbaceous Cover ²	Larval Host Species	Nectar Species	Shrub/Tree Cover ²	Native Herbaceous Cover ²	Cover of Veg. Between ~ 6 – 20 in (15- 51 cm) in Height During May	Shrub/Tree Cover ^{2,3,4}	Native Herbaceous Cover ²
Shrub-Dominated	Shrub cover ≥30%; Tree cover <5%	-	-	-	Shrub cover ≥50%; Tree cover <5%	-	< 50%	Shrub cover ≥25%; Tree cover <5%	-
Degraded Grassland	Shrub cover <30%; Tree cover <5%	<10%	1 Larval Host species	< 4 Nectar species	Shrub cover >30%; Tree cover <5% or 15-25%	<10%	< 50	Shrub cover ≤25%; Tree cover <5%	<10%
Native Prairie	Shrub cover <15%; Tree cover <5%	10-30%	2-5 Larval Host species, At least 1 oviposition host	> 4 Nectar species	Shrub cover <30%; Tree cover <5% or 15-25%	10-30%	50-75%	Shrub cover ≤10%; Tree cover <5%	10-30%
High-Quality Native Prairie	Shrub cover <5%; Tree cover <5%	>30%	2-5 Larval Host species, At least 1 oviposition host	> 8 Nectar species, at least one with late flowering phenology	Shrub cover <15%; Tree cover <5%	>30%	> 75 %	Shrub cover ≤10%; Tree cover <5%	>30%

¹ The Performance Standards define five categories of overall prairie habitat quality; mitigation sites and proposals should realize benefits in the form of long-term restoration and enhancement of dry prairie habitat functions (functional lift).

² Percent cover metrics are assessed using a grid of 25m x 25m sample cells; or, a conditionally approved alternative sample cell/unit configuration.

³ Trees may not exceed 5 percent cover, unless native oak savanna (less than 25 percent cover of oaks, *Quercus garryana*).

⁴ Woody shrubs; excludes native oak and kinnikinnick (*Arctostaphylos uva-ursi*).

HCP Table 7.3 All prairie species habitat quality value comparison table. A value of 1 = 100% value.

Habitat Category	Credit Value (companion to vegetation Performance Standards table)		
	TCB	OVS	MPG
Shrub-Dominated	0.1	0.1	0.5
Degraded Grassland	0.3	0.4	0.7
Native Prairie	0.6	0.6	0.9
High-Quality Prairie	0.8*	0.8	1.0

*If high quality prairie becomes occupied by TCB, the habitat value becomes 1. Occupancy is the true test of the suitability of habitat.

HCP Table 7.4 Assigned occupancy values for Oregon Vesper Sparrow habitat. A value of 1 = 100% value.

Occupancy Category	Definition of Category	Occupancy Values
Category 1: Occupied	Site is known to be occupied by Oregon Vesper Sparrow	1
Category 2: Adjacent or Proximal to Occupancy	Site occupancy is unknown, but site is located on a parcel adjacent to a site known to be occupied by Oregon Vesper Sparrow	0.8
Category 3: Suitable, not adjacent to occupancy	Site occupancy is unknown, and site is not located on a parcel adjacent to a site known to be occupied by Oregon Vesper Sparrow	0

Literature Cited

Thurston County Resource Stewardship Department. 2014. Thurston County Prairie Habitat Assessment Methodology: Protocol Document. Version 1.00. Olympia, WA.

Appendix I: Site Management Plan Template

Note: The following Site Management Plan template must be used for all Conservation Lands under the Thurston County Habitat Conservation Plan (HCP). All Site Management Plans must be reviewed by the HCP Implementation Team and approved by the County. It is recognized that each site will have its own needs and characteristics, but all Site Management Plans must be consistent with the requirements of the “Thurston County HCP Instruments,” which include the HCP and the Incidental Take Permit (ITP). They must also be consistent with the terms of an executed Conservation Easement (See Appendix L to the HCP).

General Notes to Reviewers

As part of the Thurston County HCP implementation, the County, or its designee, for each Easement Area, will develop Site Management Plans that are consistent with the Conservation Easement, the Thurston County HCP, and associated Incidental Take Permit (ITP). The Site Management Plan template is anticipated to be prepared and incorporated by reference in the site-specific Conservation Easement.

The Conservation Easement is to identify permitted activities within the conservation easement area ("Easement Area"), prohibitions on activities within the Easement Area, and requirements for Easement Area management. A Site Management Plan describes the management and monitoring activities to achieve the identified Performance Standards (HCP Chapter 7) for the Covered Species for the Easement Area.

Thurston County recognizes that changes in (e.g., agricultural practices and technologies, weather cycles, natural resource management technologies, conservation practices, and actions necessary to ensure compliance with the Thurston County HCP and Associated ITP) may dictate changes in the management of the Easement Area. The revisions shall be consistent with the applicable Thurston County HCP Performance Standards. The Site Management Plan may be revised from time to time when adaptive management thresholds in the Thurston County HCP are triggered and only with the written approval of Thurston County.

A complete Site Management Plan, including any subsequent amendment, will be kept on file with Thurston County Community Planning and Economic Development Department. In addition, the Site Management Plans will be provided to U.S. Fish and Wildlife as part of each annual report.

Thurston County, or its assigned designee, will work with each landowner to develop and, where necessary, revise a site-specific management plan that is suitable to the site's specific conditions and is mutually agreed upon by the landowner and manager (where needed), and Thurston County.

Site Management Plan Template

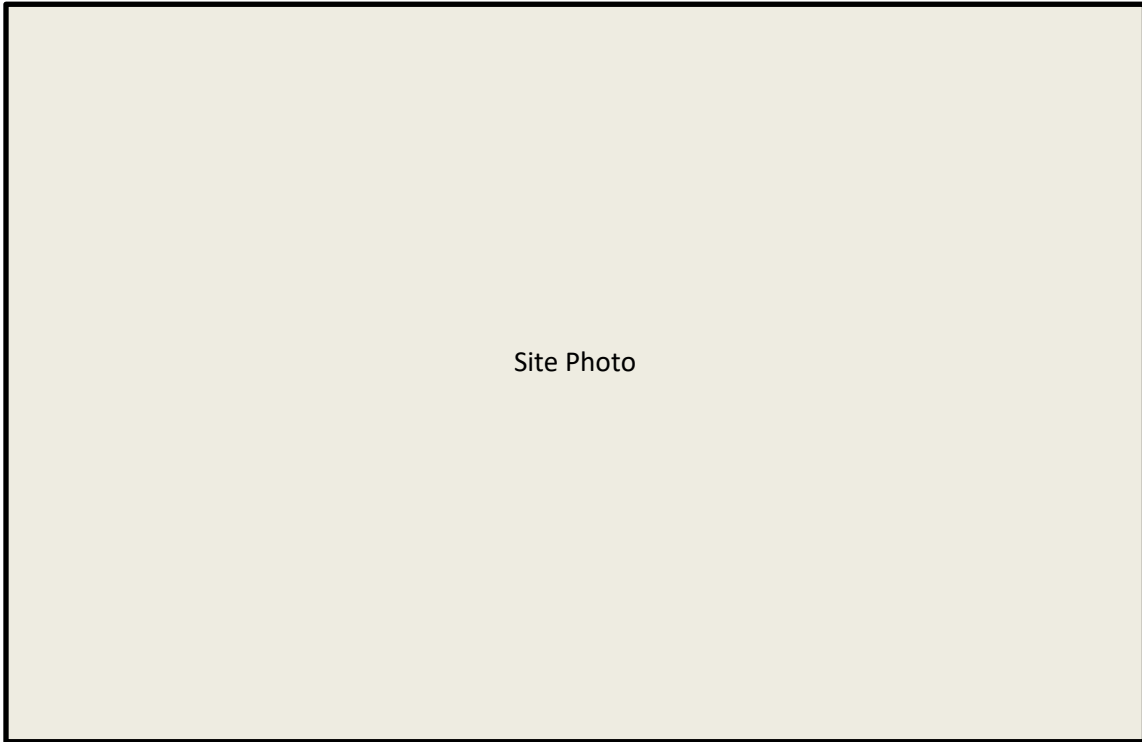
This Site Management Plan template is a companion document to the Thurston County HCP Conservation Easement template and is intended to assist in the development of site-specific management plan for properties included in the Thurston County HCP Conservation Lands System.

Text Color Code Key:

- **Blue Text** includes general notes to the user intended to provide additional explanation.
- **[Green Bracketed Text]** notes where site-specific information needs to be included. The description of the type of information is written within the brackets.
- Acceptable variations to the primary text will be provided in brown text surrounded by brackets, like this: *(replace "Thurston County" with the "Easement Holder" if the County is not the Easement Holder)*
- **{Purple Bracketed Text}** provides references to associated sections of the Thurston HCP that may contain additional explanation or detail.

Thurston County Habitat Conservation Plan

[Site Name] Site Management Plan



Site Photo

Date [insert completion date]

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1 INTRODUCTION

1.1 Purpose and Establishment

Thurston County is currently implementing a Habitat Conservation Plan (HCP) pursuant to USFWS-issued Incidental Take Permit [insert number]. The HCP provides for the conservation of the Covered Species¹ and protects regional biodiversity by protecting, restoring, enhancing, and managing Covered Species habitat and important natural communities across Thurston County, including natural and agricultural landscapes that support the Covered Species. As part of the HCP Conservation Program, Thurston County acquires Conservation Easements from willing landowners on lands within the County that include conservation and management conditions consistent with the Biological Goal and Conservation Objectives of the Thurston County HCP.

A Conservation Easement has been established on a [insert acreage of conservation easement] -acre portion of the [insert name of site or sites] property (Easement Area). The [insert site name] Conservation Easement was filed with the Thurston County Auditor's Office on [insert date] and is identified as [insert County Document code shown in top right corner of recorded easement document DOC-YEAR-restofcode-xx]. This Site Management Plan was developed concurrently with the Conservation Easement, and the Baseline Documentation Report for the property. Both the Conservation Easement and this Site Management Plan are intended to be consistent with the ITP, and the HCP including, without limitation, the Biological Goal and Conservation Objectives of the HCP, and to contribute to the HCP Conservation Program.

The Conservation Values of the Easement Area are:

- [Insert description of the Conservation Values as they are described in the Conservation Easement]

The Easement Area contributes to the HCP Conservation Program by:

{See Chapter 5 of the Thurston County HCP for the full description of the Conservation Program.} [Insert a separate bullet here for each Thurston County HCP Conservation Objective that is addressed] {See section 5.2.1 – 5.2.4 of the Thurston County HCP}. [An example format for describing an HCP Conservation Objective is provided below.]

In support of HCP Conservation Objective 2: Protect, Enhance, and Maintain New Reserves, protecting, enhancing, and maintaining in perpetuity [insert acreage] acres of [insert habitat type (e.g., nesting, foraging, upland, aquatic)] for [insert Covered Species] and [insert land cover type providing the abovementioned habitat] *{this includes the land cover type(s) present on the site that provide habitat for the identified Covered Species (e.g., upland, pasture, riparian) along with the habitat function that the identified land cover type provides (e.g., foraging, nesting, aquatic, upland habitat)}.*

¹ Covered Species are identified in HCP Chapter 1 and described briefly in HCP Chapter 2. For a complete description of status, range, life history, and threats for each Covered Species associated with the Thurston County HCP, See Appendix B: Covered Species Descriptions of the Thurston County HCP. Available: <https://www.thurstoncountywa.gov/planning/Pages/hcp-docs-maps.aspx>

1.2 Purpose of Site Management Plan

The purpose of this Site Management Plan is to ensure the Easement Area is managed, monitored, and maintained in perpetuity for the Covered Species. This document includes a description of biological resources identified for protection and establishes specific guidelines, roles, and responsibilities for the management and monitoring of the Conservation Easement. It was developed concurrently with the Conservation Easement and is intended to be consistent with its terms. This Site Management Plan, as it may be amended from time-to-time, is incorporated by reference into the Conservation Easement, and is a binding and enforceable agreement that is to be implemented in accordance with the requirements of the Conservation Easement covering the property. In the event of a conflict between the text of the Conservation Easement and the text of this Site Management Plan, the text of the Conservation Easement will control.

1.3 Performance Standards and Credit Determination Methodology

Performance standards describe the habitat conditions necessary to earn and release mitigation credits from New Reserves, Working Lands Easements, and Enhanced Existing Preserves (inclusive of any lands dedicated in lieu of mitigation that feed into one of these Conservation Objectives) in the Conservation Lands System during the phases of their habitat enhancement and management. Performance standards define targeted categories of habitat quality and function for each Covered Species (HCP Section 7.4). For this site, the applicable performance standards are:

- [list which performance standards are expected to be achieved at this site]

The Credit-Debit Methodology is the process by which the County will use to quantify impacts (debits) from Covered Activities and mitigation offsets (credits) from the Conservation Program for the Covered Species. This method is described in HCP Appendix H.

1.4 Land Ownership, Management and Monitoring Entities

The parties responsible for ensuring that the lands associated with the Conservation Easement are maintained in a manner consistent with the Conservation Easement are listed below. The Landowner is responsible for overseeing implementation of all management activities and site requirements that are prescribed in this Site Management Plan. *(If the landowner wishes to formally designate all or a portion of this responsibility to another entity such as a Land Manager, lessee or an entity that the Landowner has willingly delegated the responsibility of all or portion of site management (grazing management, habitat enhancement activities, etc.) then indicate as such here and provide contact information below the Landowner contact information).*

Landowner

The landowner that owns fee title to the Easement Area. Contact information for the landowner is as follows:

Name: [insert contact person and organization/entity where applicable]

Contact Name: Delete if landowner is an individual

Address:

Phone number:

Email:

Conservation Easement Holder

The Conservation Easement holder is responsible for conducting, at minimum, annual compliance monitoring to ensure the Easement Area is managed and maintained in accordance with the Thurston County HCP and ITP, the Conservation Easement, and this Site Management Plan.

Name: [Insert contact person and organization/entity]

Contact Name:

Address:

Phone number:

Email:

(In cases where the Thurston County is not the Conservation Easement holder, a separate contact entry will be added for the Thurston County Community Planning and Development Services Department:

Thurston County

Thurston County Community Planning and Development Services Department oversees the implementation of the Thurston County HCP and is responsible for ensuring the activities within the Easement Area are consistent with the Thurston County HCP Conservation Program.

Contact name:

Address:

Phone number:

Email:

2 PROPERTY DESCRIPTION

2.1 Location and Setting

The property is located at [insert address or other location description], in Thurston County, Washington. The Easement Area is shown on the general vicinity map (Figure 1), location map (Figure 2), and the site map (Figure 3). The general vicinity map shows the Easement Area in relation to cities, towns, or major roads, and other distinguishable landmarks. The location map shows the Easement Area and adjacent lands, and the site map shows the Easement Area and specific land management areas defined within the Conservation Easement.

Assessor's Parcel Number(s): [insert Parcel #]

U.S. Geological Survey 7.5-minute quadrangle: [insert name of quad map]

Township, Range, & Section: [insert Township, Range, & Section]

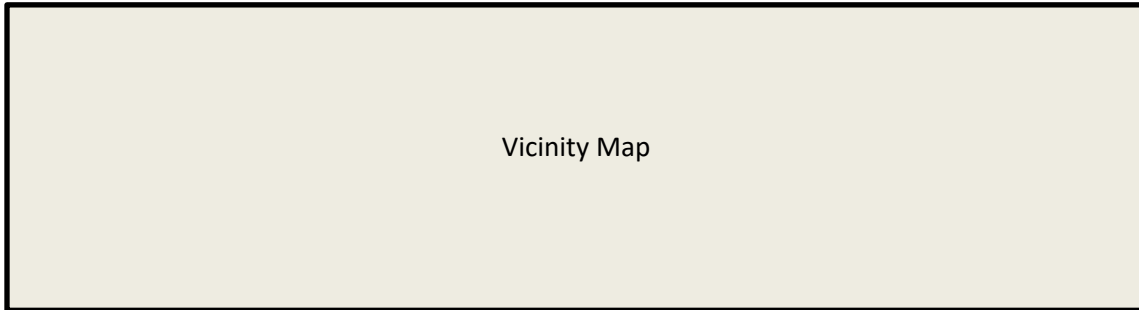


Figure 1: [insert name of site] vicinity map

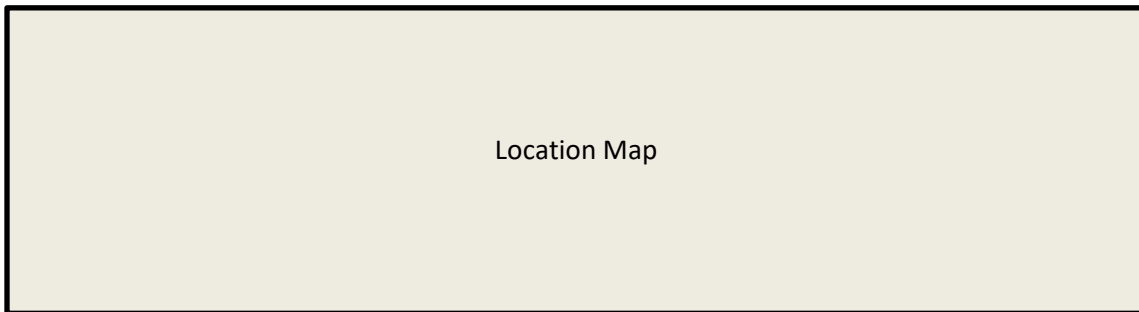


Figure 2: [insert name of site] location map showing adjacent land uses as captured in aerial photo taken [insert date of aerial photo]

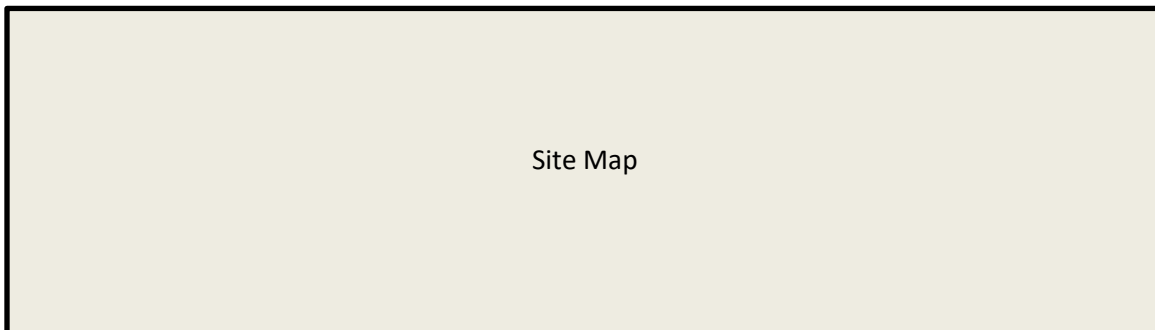


Figure 3: [insert name of site] site map showing specific land management areas or zones.

2.2 Site Soils, Topography, and Hydrology

[Note any significant topographic features (i.e. Mima Mounds), soil types, hydrologic conditions associated with the site. Identify any significant HGM or land cover types (e.g., freshwater emergent wetland, riverine, etc.) Show the location of any hydrologic land cover types in Figure 3 if applicable.]

2.3 Historical and Current Land Use

[Describe and distinguish between past and present land use including, any development, crop types, grazing practices, and/or other land use activities as applicable. Also, describe all existing structures and improvements including, but not limited to, roads, levees, fencing, and buildings, and whether they are in the Easement Area or within a development envelope (if any) defined in the Conservation Easement. This information should be like the Baseline Assessment Report. Also, Include a summary of the findings of any completed in the Phase 1 Environmental Site Assessment.]

2.4 Existing Easements

[If there are existing encumbrances, include descriptions/locations of existing easements located on the property, their nature (buried pipeline, overhead power, ingress/egress, etc.), authorized users, encroachments, access procedures, etc. Depict easements, rights of way, ingress, and egress routes, and any encroachments in a map. This section should reflect and include the site's Baseline Documentation Report by reference. If there are no existing known encumbrances on the site, state so here – DO NOT DELETE THIS SECTION.]

2.5 Threats to Conservation Values

[Insert a description of threats to conservation values at the site, which may include invasive species, small Covered Species population size (e.g., genetic bottleneck), erosion, trespass, surrounding land use or development, or other threats. This section should be modified as needed based on applicable threats for each specific site.]

2.6 Adjacent Land Uses

[Provide a description of the adjacent land uses at the time in which the Conservation Easement was established. These land uses may change over time; however, the description of the baseline conditions will give the manager some idea of the conditions present when the Site Management Plan was first developed and can bring to light areas that may be of management concern or items outside of the Easement Area that may support or compromise the integrity of the functional acres over time. Note any known lands in conservation existing within a two mile radius of the property at the time in which the Conservation Easement was established, identify if any are part of the Thurston County HCP Conservation Land System, and show them on the map in Figure 2.]

2.7 Constraints

[Identify constraints here generally and fully described in section 5.1 below. This section should not restate what was provided in section 2.4 above. Examples of constraints are site where: (The major sources of water in a stream in which a hydroperiod is controlled upstream stormwater discharge; the mitigation site is next to a pasture from which cattle sometimes escape and cause damage to new plantings; the forested buffer is owned by someone else, and may be logged.)]

3 HABITAT AND SPECIES DESCRIPTIONS

3.1 Inventory and Analysis

[Cross-reference the Baseline Documentation Report and/or collect and provide appropriate biological resource information. The inventory level of detail should be appropriate for identifying and calculating the lift between baseline conditions and the desired future conditions for the site. Describe land cover type(s), their extent, and their condition (forest, prairie, emergent wetland, stream/riparian, range, etc.); infrastructure (roads, buildings, power lines, drainage ditches, culverts, etc.); invasive species; cultural, educational, and aesthetic resources. Include appropriate maps and/or imagery and reference them in the Plan text. Include any applicable information about how the protection of this site fits in with protection of other adjacent sites or of specific natural community types that have been designated as important. This is a general explanation and should reference the baseline report completed prior to purchase of the site as well as any condition changes since the initial Baseline Documentation report.]

3.2 Covered Species

[Describe all Covered Species that occur or may occur on the site.] *{a complete list of Covered Species is found in Chapter 2 of the Thurston County HCP}.*

3.3 Vegetation Type and Habitat Condition

[Describe and discuss Covered Species habitat present in the Easement Area] *{this includes the land cover type(s) present on the site that provide for the identified Covered Species in Section 2.2 of the Thurston County HCP (e.g., grassland and prairie habitats on certain soil types) along with the habitat functions that the identified land cover type provides (e.g., foraging, nesting, breeding, overwintering)}.*

4 DESIRED FUTURE CONDITIONS

[Describe the desired future conditions at the site, how they meet specific HCP Performance Standards (cite to HCP) and Performance Targets (cite to HCP), and protect and enhance Conservation Values. Stratify desired future conditions by management zones or areas, as appropriate. Describe how the desired future conditions are influenced by projected changes in vegetation and ecosystem processes resulting from climate change. Desired future conditions will include Site Goals and Site Objectives]

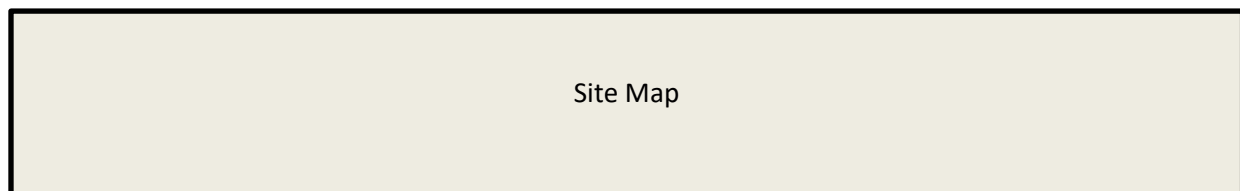


Figure 4: [insert name of site] site map showing specific zones/areas and acreages for desired future conditions.

4.1 Site Goals

[Insert site goals. The goals for the site management plan will reflect the conditions specified in the Conservation Easement, and the site purpose, above. Goals will be consistent with the Biological Goal and Conservation Objectives of the Thurston County HCP and describe which Conservation Values the

site is intended to protect. Goals must be forward-thinking and consider if the habitat and ecosystem processes at the site are expected to change as the climate changes.]

4.2 Site Objectives

Adaptive management requires stated management objectives to guide decisions about what to try, and explicit assumptions about expected outcomes to compare against actual outcomes. Objectives also play a crucial role in evaluating performance, reducing uncertainty, and improving management through time. Objectives are the standard against which progress is measured. This section is to develop objectives that are specific to the site.

[In describing desired conditions, specify objectives for each covered species and associated habitat in the Easement Area. Site Objectives must be SMART: Specific, Measurable, Achievable, Realistic, and conducted within a specified Time period. Objectives may include:

- Performance Standards for Covered Species
- Extent of the easement area reaching Performance Standards for each species by a specific date
- Other site-specific measures of habitat quality and quantity desired by a specific date
- Establishment or maintenance of natural disturbance regimes and processes
- Occupancy or abundance of covered species
- Threat reduction or prevention of threats.]

4.3 Climate Change

For all types of HCP Conservation Lands, the Site Management Plan must consider the anticipated effects of climate change when developing goals and objectives for the site. Only sites reasonably expected to support habitat for Covered Species according to best available climate scenarios will be capable of meeting Performance Targets.

[Insert site specific information describing the anticipated effects of climate change and how climate change has been considered in the development of the desired future conditions for the site, management prescriptions, and Performance Targets. (Consider the development of conceptual models - simple diagrams that link goals and objectives, threats, conservation actions, and monitoring. Conceptual models will show the relationships of threats to covered species and their habitat, and root causes contributing to those threats. The models are useful to identify the best intervention points to implement strategies to reduce or prevent threats, address root causes of the threats, identify sources of uncertainty in our predictions of how well management actions are expected to work, and are useful for developing monitoring plans).]

5 HABITAT MANAGEMENT PRESCRIPTIONS

Management of the site includes those actions needed to achieve and maintain the desired future conditions for each Conservation Value identified in an Easement Area, as informed by the HCP Performance Standards and measured through Performance Targets.

[Management actions are the framework for achieving and maintaining the desired future conditions. The actions should account for baseline conditions and site history {this is especially important for Oregon Spotted Frog/wetland sites}. Before including actions, evaluate their known effectiveness for achieving the objectives and the Performance Targets. Identify and select preferred actions that will

best address the needs of the sites to reach the desired future conditions. If maintaining current status is the desired future condition, develop strategies to minimize those threats identified. Choose from one of the conservation land types listed below and provide the needed information.]

5.1 New Reserves

[Develop a table that lists each action, responsible parties, schedule, and cost. For each phase of management², describe the management actions, best practices, and techniques which will be used and within what zones³ of the site, and at what schedule. Identify who is responsible for implementing the management actions and who is responsible for management and maintenance over time.

For applicable sites, this section would summarize land management prescriptions, schedules, locations and details regarding timing, duration, and/or quantity of management actions, by phase and zone. Management actions may include, but are not limited to, methods and timing of invasive species management, specific allowable grazing practices undertaken to achieve specified conservation goals, prescribed fire, native species seeding, etc.]

5.2 Enhanced Existing Preserves

[Develop a table that lists each action, responsible parties, schedule, and cost. For each phase of management, describe the management actions, best practices, and techniques which will be used and within what zones of the site, and at what schedule. Identify who is responsible for implementing the management actions and who is responsible for management and maintenance over time.

This section describes any management actions occurring in the Easement Area that are conducted to enhance the functional acres of the site that improve existing protected land, by phase and zone. Management actions described here are generally species-specific and will vary depending on the nature of the site. Examples of management practices that may be included: managing vegetation height for birds, planning of specific oviposition vegetation, restoration of upland buffers, seeding, burning, invasive plant management, etc.]

5.3 Working Lands Easements

[Develop a table that lists each action, responsible parties, schedule, and cost. For each phase of management, describe the management actions, best practices, and techniques which will be used and within what zones of the site, and at what schedule. Identify who is responsible for implementing the management actions and who is responsible for management and maintenance over time.

For applicable sites, this section will identify the specific locations in which agricultural activities occur and/or are allowed to occur, because they aid in achieving Performance Targets and ultimately desired future conditions. Provide a description of the agricultural practices within the defined areas, and any details regarding timing, duration, and/or quantity of practices. Information must be provided by phase and zone, as applicable. These items may include, but are not limited to, methods and/or timing of

² The restoration/enhancement management activities of a site may need to be broken up into distinct periods. Each of these periods would be a phase of management.

³ Conservation site may contain different areas or zones whereby management activities may differ. Zones may be created on a site to distinguish conservation activities for different species to ensure no double dipping of mitigation credits.

grazing where species are present, management of irrigation, and others. Section 6.3.1 below contains information to assist in the development of the Site Management Plan for Working Land Easements.]

5.3.1 Conservation Planning Considerations for Working Land Easements:

[The following nine step Conservation Planning Process (provided by NRCS) is intended to assist in developing this section of the management plan to attain the described desired future conditions and for the benefit of covered species and their habitat on Working Land Easements.]

5.3.1.1 Identify Problems and Opportunities.

- Landowner interested in rotational grazing, expanding/deepening forage management
- Potential for expanded native habitat, landowner is aware of other landowners who have implemented conservation easements on grazed prairie ground
- Is amenable to native interseeding, planned grazing, enhancing grazing infrastructure on property

5.3.1.2 Determine Objectives.

- Implement a pilot rotational grazing system
- Learn about temporary electric fencing systems
- Develop a draft grazing map more broadly for the property on the basis of the pilot
- Seed natives and evaluate establishment
- Implement pilot rotational grazing system and evaluation forage response

5.3.1.3 Inventory Resources.

- Walk-about forage inventory with NRCS
- ID site selection for rotational grazing pilot
- Inventory forage species, opportunities for management impacts on forage improvement

5.3.1.4 Analyze Resource Data.

- Family resources, family objectives
- Pasture condition
- Site soils
- Site forage condition: current condition, potential for improvement
- Evaluate current practices: stocking rate, grazing resources
- Current infrastructure options and limitations
- Native habitat opportunities: species resource potential and limitations

5.3.1.5 Formulate Alternatives.

- Install cross fencing
- Install additional grazing infrastructure: watering system, grazing plan/protocol
- Implement planned grazing with rest periods and stubble height goals
- Establish deferment period
- Seed native forbs to augment/establish native species
- Establish record-keeping logs
- Establish data collection and Management Plan with proper technical research protocol

5.3.1.6 Evaluate Alternatives.

- Sufficient family resources and commitment?
- Sufficient technical resources and commitment?
- Costs and budget review

- Timing compatible with partners, farm operation, etc.?
- Farm map, fencing plan, etc. ok?
- Native seed availability, site preparation, equipment and personnel review

5.3.1.7 *Make Decisions.*

- Confirm plan as noted
- Develop adaptive management strategies
 - o Potential problems: pest management, logistics, finances
 - o Try to anticipate likely problems

5.3.1.8 *Implement the Plan.*

- Purchase supplies
- Plan installation
- Keep formal actions/notes logs
- Record-keeping: finances, grazing log
- Data collection with technical team

5.3.1.9 *Evaluate the Plan.* [This information should then be incorporated into the monitoring and adaptive management section]

- Pasture condition (opportunity for formal forage scoring)
- Site soils data: fertility baseline and soil pits
- Site forage inventory (with NRCS)
- Stocking rate calculations, projections
- Forage: Stubble height, forage biomass
- Native plant establishment
- Review grazing plan periodically
- Adaptive management as needed
- Annual meetings to review actions and modify upcoming season

6 OVERALL SITE MANAGEMENT AND COORDINATION

6.1 Overall Site Management

Elevated Performance Targets require elevated levels of management actions needed to attain Desired Future Conditions and maintain the site at that state in perpetuity.

[Describe the actions to be taken to monitor for trespass, dumping, and other unauthorized activities. Include schedule/timeline and/or frequency for each action. In addition, describe maintenance of site infrastructure (roads, gates, fencing) and provide a schedule and/or frequency for each action. Include maps of current and future conditions. Describe if any public access will be allowed and how the public will be monitor and for what reasons the public would be allowed on site (e.g., volunteers, guided education groups, etc.).]

6.2 Coordination with Third Parties

[Some properties are subject to pre-existing encumbrances (e.g., utility and access easements) that give third parties rights to use the property. In such instances, the Site Management Plan must include actions for coordinating with the third parties to ensure their activities are within their rights and obligations, and to minimize impacts to the mitigation site and Covered Species and habitat.]

6.3 Water Rights

[If an applicant is proposing to acquire fee property with appurtenant water rights, or a Conservation Easement with the authority to use appurtenant water rights, a discussion of the use of those rights should go here. The use shall be consistent with the management goals and strategies identified in the Management Plan, including use of water for restoration or in-stream purposes. *(Typically for OSF restoration plan) and consistent with the terms of the Conservation Easement.*]

7 COSTS AND ENDOWMENT CALCULATIONS

7.1 Management and Maintenance Costs

It is expected that implementation of an approved Site Management Plan will result in the achievement and maintenance in perpetuity of Performance Targets and Performance Standards, the release of mitigation credits, and the receipt of revenues via mitigation fees. The Site Management Plan must describe the amount of funding needed for all phases of implementation, including habitat restoration, management, maintenance, monitoring, and any needed contingency funding. This cost information informs the calculation of the funds required for the stewardship endowment and the monitoring and defense endowment (where applicable) amount required by the Thurston County HCP and Incidental Take Permit. The cost per phase informs the endowment funding schedule. The stewardship endowment is to be fully funded prior to the release of the final 15% of credits from the site.

[Provide a summary of costs by phase]

[Insert a PAR⁴ or similar long-term management and maintenance calculation, associated information, and description here.]

8 PERFORMANCE TARGETS, CREDIT RELEASE SCHEDULE, AND ENDOWMENT FUNDING

[The Site Management Plan must be implemented using methods and practices that are sound and scientifically based. *{They must be consistent with the HCP, including the HCP Biological Goal, HCP Conservation Objectives, and Performance Standard. They must also be consistent with the ITP}*. This section shall discuss the Performance Targets to be met for each phase and include a schedule of endowment deposits/funding.]

8.1 Site Phases – Performance Targets and Schedule

The restoration of the site will be implemented in [insert number of phases here] phases. [Insert responsibly party name] will conduct management and monitoring actions associated with each phase.

Credit release for each phase will be contingent, in part, on schedule of the stewardship endowment, and verification by the County the restoration actions have resulted in achievement of Performance Standards that warrant release of additional credits.

⁴ Property Record Analysis is a tool developed by Center for Natural Lands Management that has been widely used to estimate various costs for phased enhancement and restoration and determine an endowment amount.

The Performance Targets for each phase are based on the expected condition of habitat (vegetation) relative to the HCP Performance Standards, and level of [specific Covered Species or sub-species here] occupancy at a site. The Performance Targets for [insert site name] are described in [insert HCP Table number here, using prairie species or Oregon Spotted Frog template as appropriate]. The Performance Targets for each phase can be further quantified through estimates of credits that will be available for release at each phase, as calculated by the HCP Credit-Debit Methodology, and qualified by the generalized HCP credit release schedule in HCP Chapter 7. In general, the total credit value is described by the area of the site at each habitat condition, and the acres of the site that support or are considered occupied by [specific Covered Species or sub-species here]. *Note that for Enhanced Existing Preserves, all credit calculations must take into account pre-existing obligations, funding restrictions, and commitments of the site.*

Restoration actions are needed to lift the functional acres of the site between Phases. The site requires active restoration to lift it from the [insert phases here (for example: Initial to Intermediate Condition and from Intermediate to Final Condition)].

[Insert a schedule for the implementation of the phases. Include the management and monitoring of activities and credit releases]

At any and all Phases, for credits to be verified and released at Enhanced Existing Preserves, clear documentation must identify and distinguish that credits are earned via funding provided by Thurston County HCP Program, and not from state or federal funds designated to the Existing Preserve.

[Insert table No.]: [use for upland species] Minimum Performance Targets to be maintained during each of the phases on [insert site name here]. Performance targets for each phase are measured by the acreage the site that are categorized at each Performance Standard level – e.g., as High-Quality Native Prairie, Native Prairie, Degraded Grassland, Shrub Dominated. Also included is the acres to be occupied by [insert species here] as measured by presence or other measure of occupancy (for MPG sub-species gopher mounds = presence). (Note: While 25 m x 25 m cells are the units monitored, this table is intended to summarize that information into acres, which can be used to calculate credits. Also, this table may be stratified by management zone where appropriate, but subtotals and overall row and column totals must be provided.)

	Acres on Site						Estimated Credit Release (in alignment with HCP Credit-Debit Methodology (Appendix H) and Credit Release Schedule (HCP Chapter 7))
	High-quality Native Prairie	Native Prairie	Degraded Grassland	Shrub-dominated	Non-prairie	[Species Name] Occupancy	
Baseline							
Phase _							

Phase _							
Phase _							
Final Phase							

[Insert Table No.]: (use for wetland/OSF habitat) Minimum targets to be maintained during each of the phases on the [insert site name here] to determine performance measure are met.							
	Phase I Baseline (Year 1)	Phase II Post Restoration (Year 2)	Phase III (Years 3)	Phase IV (Years 5)	Phase V (Years 7)	Phase VI (Years 10)	
Native Emergent and Submergent Vegetation Cover							
Native shrub cover to provide wintering habitat							
Emergent vegetation no greater than 12 in above water surface to provide breeding habitat							
Open Water							
Credit release schedule⁵	15% (#)	15% (#)	20% (#)	20% (#)	15% (#)	15% (#)	

8.1.1 Phase 1

[Insert narrative description here of the prairie baseline values that occur on the site, how these values were identified. Describe the phase objectives and restoration actions, metrics, frequency, and schedule to be taken to provide the ecological lift that improves conditions to meet the Performance Target (from 5 Habitat Management Prescriptions). Describe the number of functional acres, and the endowment amount needed to support maintenance, monitoring, management, of the phase in perpetuity; __

⁵ Credit release schedule should reflect Performance Standards for OSF in HCP Chapter 7 and not the minimum requirements as stated in WAC 173-700 331-334

[Continue to insert needed phases with narratives.]

8.1.2 Final Phase and Beyond

[Insert the targets for the final phase the year at which this is expected, the composition of the site, the increase in number of credits from the described work, the percentage of each habitat category that is expected as well as the endowment needed to support the management, maintenance, monitoring, and defense of the site in its final condition – the Performance Target and habitat conditions - in perpetuity.]

Describe the phase objectives and restoration actions, metrics, frequency, and schedule to be taken to provide the ecological lift that improves conditions to meet the Performance Target per year of the phase.]

9 MONITORING AND ADAPTIVE MANAGEMENT

Monitoring consists of two types: compliance monitoring to show the planned work was completed, and effectiveness monitoring to test the assumptions about the responses of species, their habitat, and threats to management actions. The Conservation Easement describes site access for monitoring purposes.

9.1 Compliance Monitoring

The purpose of Compliance Monitoring at the site scale is to affirm that actions identified in the Site Management Plan have been implemented and the Easement Holder has complied with the requirements of the Conservation Easement. Compliance monitoring will be conducted annually, at a minimum.

9.2 Effectiveness Monitoring

The purpose of HCP Effectiveness Monitoring is to evaluate the success of the implementation of the HCP's Conservation Program. As required by the Thurston County HCP, sites that are part of the HCP Conservation Lands System will be monitored [insert responsible party here] on a regular basis, and at a minimum of [insert frequency, no less than every five years]. Effectiveness Monitoring at the site will also include site-specific monitoring to be used for evaluating the success of site management activities. Monitoring activities will:

[Effectiveness monitoring will be planned for intervals frequent enough to detect if site management actions are benefiting the conservation values at the site; appropriate intervals will depend upon the species, habitat, or threat monitored.] Assess the status of Covered Species and their associated habitat on the site.

- Assess the status of threats on the site.
- Evaluate the effectiveness of management activities in achieving the HCP Conservation Objectives and Site Objectives.
- Test the assumptions in the conceptual model.
- Evaluate progress towards achieving Prairie Species Performance Standards (HCP 7.4.1) and Targets to inform credit release, including, but not limited to:
 - Percent cover woody vegetation
 - Percent cover native herbaceous vegetation

- Native plant species richness
 - Host and nectar plants for Taylor’s checkerspot butterfly
 - Vegetation structure for Oregon vesper sparrow
- Evaluate progress towards achieving Oregon spotted frog Performance Standards (HCP 7.4.2) to inform credit release, including, but not limited to:
 - Stable patterns of hydrology that coincide with the stages of OSF life history
 - Minimal cover of woody vegetation, except wintering habitat
 - appropriate vegetative structure of emergent and submergent plants
 - Include monitoring the effects of climate change on the progress towards achieving Site Objectives and Performance Standards and Targets.

(For prairie species, insert the following, tailored to the Covered Species present at the site:)

Site level Effectiveness Monitoring protocols are included as the Procedures for Quantifying Credits in the Credit-Debit Methodology (HCP Appendix H). In summary, the procedure describes the office preparation, GIS mapping, and field survey to collect monitoring data. The field data collection consists of a census of habitat quality and function within a grid of 0.1544 acre (625 m²) cells distributed contiguously across the prairie at a site. Percent cover of tree, shrub, native herbaceous vegetation, non-native vegetation, invasive or noxious weeds, and bare ground is visually estimated by category. The diversity (species richness) of native species, and the presence of species or specific habitat or indicators (e.g., Pocket Gopher mounds, nectar/host plants for Taylor’s Checkerspot Butterfly, habitat structure for Oregon Vesper Sparrow) is recorded within each cell. These data are then used to categorize each cell as to its habitat type and presence or potential for Covered Species.

(For Oregon Spotted Frog, insert the following:)

Monitoring protocols for Oregon Spotted Frog also follow the Credit-Debit Methodology for the species (described further in Section 7.5.4 of the HCP), and will follow the procedures identified in the [“Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington”](#) manual. Overlain on the wetlands crediting procedure layout to evaluate overall habitat will be evaluation of habitat quality and function attributes specific to Oregon Spotted Frog, including abundance of native emergent and submergent vegetation, area of native shrub cover to provide wintering habitat, area if emergent vegetation to provide breeding habitat, and open water depth.

[Insert any language regarding specific schedule of monitoring based on species or habitat factors (e.g., timing of species presence or a particular life stage).]

9.3 Adapt Site Management Actions

Results of Effectiveness Monitoring will be used to evaluate uncertainty related to Covered Species and associated habitat responses to habitat restoration and management and to make recommendations with regard to:

- The success of habitat enhancement;
- The status of Covered Species habitat quality and function, and any needed actions to remedy declines;

- Exceedance of HCP triggers for covered species occurrence and habitat quality (HCP Table 6.2);
- The status of threats;
- Problems that need near-term or long-term attention (e.g., invasive species removal, fence repair);
- Effectiveness of the monitoring program and improvements needed; and
- Adjustments needed in the conceptual model.

Site level adaptive management on HCP Conservation Lands will address uncertainty related to the response of Covered Species and associated habitat to restoration, enhancement, management, and maintenance activities. Through adaptive management, land managers will detect declines in Covered Species habitat quality and function (e.g., increasing invasive shrub species populations) and adjust management practices within the Site Management Plan to restore habitat quality and function. In response to analysis of Effectiveness Monitoring data, the County will work with the HCP Implementation Team to recommend and approve minor adaptive adjustments to Site Management Plans, acquisition criteria, monitoring frequency, or other factors.

Exceedance of the site level adaptive management triggers identified in Table 6.2 of the HCP will initiate responses as indicated in the table. All changes to management actions will be included in the HCP Annual Report. If major changes are necessary, such changes will conform to the procedure outlined in 11.2, Amendments to the Site Management Plan.

Examples of key uncertainties and adaptive management actions that may be triggered at the site scale are outlined in HCP Table 6.2. Information will be reviewed for these site level adaptive management triggers during each Effectiveness Monitoring cycle.

Noncompliance with the Conservation Easement and/or Site Management Plan provisions will be addressed in accordance with the provisions of the Conservation Easement.

10 TERM, AMENDMENTS, TRANSFERS, AND NOTICES

10.1 Site Management Plan Term

[Insert the schedule for routine review]. The Site Management Plan is still binding after and beyond transfer of all credits and will continue to guide management and long-term maintenance of the property in perpetuity.

10.2 Amendments to the Site Management Plan

It is recognized that adaptive management and changed or unforeseen circumstances identified in the HCP may arise during the perpetual term of the conservation easement. In this event, the Site Management Plan will be amended to address these contingencies.

It is possible to make changes to the Site Management Plan that are unrelated to implementation of adaptive management measures and changed and unforeseen circumstance measures. Any of the participating parties (as identified in Section 1.4) may request a modification to this Site Management Plan if the requested change (1) is consistent with the terms the Conservation Easement, and (2) meets or exceeds the existing ability of Site Management Plan activities to meet the HCP Conservation Program

goals and Conservation Objectives, Performance Targets identified for the site, and facilitates increased credits (functional acres) that may be released from the property.

Conservation Easement Holders and third-party beneficiaries of the Conservation Easement shall be provided an opportunity to review and provide comments on any proposed amendments to the Site Management Plan.

All proposed amendments to the Site Management Plan shall be formalized in writing. All modifications must be consistent with the requirements for the Thurston County HCP, ITP, and the terms of the Conservation Easement. Since adaptive management and compliance with changed and unforeseen circumstances provisions are requirements of the HCP and Conservation Easement, approval of measures proposed to meet these requirements shall not be unreasonably withheld.

10.3 Transfer of Responsibilities

Any subsequent landowner of the Conservation Easement Area assumes the responsibilities described in this Site Management Plan and as required in the Conservation Easement. The Conservation Easement holder [and Thurston County – if the County is not the easement holder] shall be notified in writing of any transfer of land ownership or land management responsibilities under this Site Management Plan. Any transfer of responsibilities shall be incorporated into an updated version of this Site Management Plan and kept on file by all parties.

10.4 Notices

[This section is a place to insert contact information for Conservation Easement third-party beneficiaries or other entities that should receive notifications beyond those listed in Section 1.4. If this is not needed, this Section can be removed]

In addition to the parties named in Section 1.4, the following entities shall be provided with written notice of any proposed modifications to this Site Management Plan: [insert entities]

Appendix J: Certificate of Inclusion

NOTE: The following document will be used in the process for Thurston County to issue a Certificate of Inclusion for the HCP. The Certificate of Inclusion is issued by the County at the time of permit issuance. The Certificate of Inclusion is part of the Thurston County's official permit records.

Text Color Code Key:

- **Blue Text** includes general notes to the user intended to provide additional explanation.
- **[Green Bracketed Text]** notes where site-specific information needs to be included. The description of the type of information is written within the brackets.
- Acceptable variations to the primary text will be provided in brown text surrounded by brackets, like this: *(replace "Thurston County" with the "Easement Holder" if the County is not the Easement Holder)*
- **{Purple Bracketed Text}** provides references to associated sections of the Thurston HCP that may contain additional explanation or detail.

THURSTON COUNTY HABITAT CONSERVATION PLAN

CERTIFICATE OF INCLUSION

The United States Fish and Wildlife Service has issued to Thurston County an Incidental Take Permit ("ITP") pursuant to the federal Endangered Species Act authorizing "Take" of certain species in accordance with the terms and conditions of the ITP, and the Thurston County Habitat Conservation Plan ("HCP"). Pursuant to Thurston County Code (TCC) Title [XX.XX] HCP Implementation, staff has evaluated the proposed application for development within Covered Species habitat and reviewed the proposed mitigation plan.

The County has determined that the applicant, [applicant name], has implemented all appropriate Best Management Practices to the extent practicable, has (choose one: "paid the appropriate mitigation fee in the amount of \$ _____", or "obtained the required number of credits [insert #] from a USFWS approved Conservation Bank [bank name] Exhibit A" or "has provided a mitigation plan Exhibit A that meets the requirements of HCP Section 7.6.2 Mitigation via Land Dedication") and is approved for [insert#] acres/[insert credit#] of impact as depicted on the approved site plan attached to permit [permit number] and as described in Exhibit B. The project is located at [insert APN# or describe location no APN].

Under the Permit, certain activities by are authorized to "Take" certain species, provided all applicable terms and conditions of the ITP, the HCP and associated documents are met. Additionally, ITP coverage is contingent on compliance with the County permits/authorization for the proposed activities as set forth in Exhibit B with respect to any Take of [insert appropriate covered species] as identified in the HCP. Coverage under the ITP will become effective upon receipt of the Certificate of Inclusion by the Thurston County.

EXHIBIT A

EXHIBIT B

Covered Species and Participant’s Proposed Activities Relative to Certificate of Inclusion

DESCRIPTION OF PROJECT

[Provide a summary describing the scope and nature of the proposed activities and uses of the Property. This summary should provide details regarding the proposed development plan, including acreage of the development envelope and Debit Assessment Area. Attach site plan that identifies the foregoing items.]

Identify which of the following activities are covered.

<u>Covered Activity</u>	<u>Yes</u>	<u>No</u>
Residential Development		
Added Accessory Structures		
Commercial and Industrial Development		
Environmental Health (extended septic systems, home heating oil tank removal, etc)		
Public Service Facilities (Schools/Fire Stations)		
Landfill/Solid Waste Management		
Public Works Transportation Projects		
Public Works Transportation Maintenance		
Water Resources Management		
Parks and Trail Maintenance		

Identify which of the following species are covered.

<u>Covered Species</u>	<u>Yes</u>	<u>No</u>
Mazama Pocket Gopher (Yelm)		
Mazama Pocket Gopher (Olympia)		
Mazama Pocket Gopher (Tenino)		

Taylor's Checkerspot Butterfly		
Oregon Vesper Sparrow		
Oregon Spotted Frog		

Identify which BMPs were implemented:

[List BMPs described in the application to be implemented]

**Exhibit B
To Certificate of Inclusion**

Participant's Proposed Land Dedication Plan

[include approved land dedication plan including, but not limited to requirements of HCP Section 7.6.2]

Appendix K: Site Evaluation Protocol

Introduction:

Thurston County has developed a Habitat Conservation Plan for multiple species, known as the Thurston County Habitat Conservation Plan (HCP). Under the HCP, mitigation will be required for unavoidable impacts to the habitats of species covered by the plan. This guide is specific to the three subspecies of Mazama Pocket Gopher (*Thomomys mazama*, MPG) that are included in the HCP, as a means to verify whether the glacial outwash soils known to support the MPG are present on a parcel proposed for development (**Table 1**). The soils referenced are described fully in the USDA Natural Resources Conservation Service (NRCS) Soil Survey of Thurston County, Washington (Pringle et al., 1990). A detailed description of the soil survey process is described in the Field Book for Describing and Sampling Soils (Schoeneberger et al., 2012).

Thurston County has developed a map of parcels with glacial outwash soils known to support the MPG and other prairie-associated species, provided by NRCS and US Fish and Wildlife Service (USFWS). This map will be incorporated into the HCP as screen layers, available in Thurston County GeoData (GeoData), that establish the presence of potential habitat for the covered species based on soil types. The presence of these soils triggers potential mitigation fees under the HCP. Hence the term “gopher soils” or “MPG soils” refers to the soil types MPG have been known to use.

A soil testing protocol has been developed for landowners who wish to provide evidence as to whether MPG soils are present on their property. The protocol is based on the “Long-Term Agricultural Lands of Commercial Significance” (LTA) soil survey process created by NRCS and the MPG soils verification process implemented by USFWS during the 2015-2016 Thurston County MPG project screenings. The only way to remove a project from the MPG soil classification would be through onsite documentation that the soil in the project area does not match the soil mapping in the Thurston County soils map as depicted in the Thurston County Geodata GIS system. The Site Survey Protocol, if results reveal an absence of MPG soils on all or certain portions of a property, may exempt a development from mitigation requirements for the MPG only.

Thurston County Soil Survey-based MPG Map Units

<i>NRCS Map Unit #</i>	<i>Soil Series Name and Description</i>
1	Alderwood gravelly sandy loam, 0-3 percent slope
2	Alderwood gravelly sandy loam, 3-15 percent slope
20	Cagey loamy sand
32	Everett very gravelly sandy loam, 0-3 percent slope
33	Everett very gravelly sandy loam, 3-15 percent slope
46	Indianola loamy sand, 0-3 percent slope
47	Indianola loamy sand, 3-15 percent slope
50	Kapowsin silt loam, 3-15 percent slope
65	McKenna gravelly silt loam, 0-5 percent slope
73	Nisqually loamy fine sand 0-3 percent slope
74	Nisqually loamy fine sand 3-15 percent slope
75	Norma fine sandy loam
76	Norma silt loam
109	Spana gravelly loam
110	Spanaway gravelly sandy loam, 0-3 percent slope
111	Spanaway gravelly sandy loam, 3-15 percent slope
112	Spanaway stony sandy loam, 0-3 percent slope
113	Spanaway stony sandy loam, 3-15 percent slope
114	Spanaway-Nisqually complex, 2-10 percent slope
126	Yelm fine sandy loam, 0 to 3 percent slope
127	Yelm fine sandy loam, 3-15 percent slope

Table 1. Soils known to support the MPG, including NRCS Map unit and slopes

It is noteworthy that in some cases, there could be inclusions of other, non-MPG soils series in a GeoData map unit that cannot be extracted without detailed and complex soil mapping, which is outside of the scope of this protocol. Since this scenario may occur at some point, a clear decision should be made as to whether that alternate approach (detailed soil mapping at the series level) may be accepted by the County. If so, a Certified Soils professional, as identified below, would be required to carry out that work.

The protocol that we offer below can be successfully carried out by the following properly trained professionals:

- A certified professional soil scientist (Soil Science Society of America (SSSA) Certified Professional Soil Scientist (CPSS), National Society of Consulting Soil Scientists (NSCSS), Registered Professional Soil Scientist (RPSS) or soil classifier (SSSA; Certified Professional Soil Classifier (CPSC)). Please see the requirements below (Soil Science Society of America (2010):

Standard Field Protocol

Tools and materials needed:

- Thurston County GeoData aerial map showing NRCS soils
- Tile spade
- Hand-auger
- Munsell Color Book
- Meter stick or tape measure
- Data form for recording soil descriptions (or notebook for detailed documentation)
- Spray bottle filled with water, for wetting soils
- Grain size sieve set (standard sizes)
- Camera

On most sites, the following process should yield enough information to verify or refute the MPG soil classification:

Step 1: Using mapped soil information field locate the boundary of the portion of the parcel mapped with MPG soils, unless such soils are mapped throughout the parcel.

Examine landscape features of the property in question, particularly within the proposed development envelope, in relation to surrounding portions of the parcel. Observe slope features surrounding each sampling point. Features such as a nearly level bench or depression, for example, may signify a soil inclusion. Other features to assess include:

- Landform
- Slope
- Hydrology – Wetland or seasonally high groundwater
- Vegetation type
- Obvious indications that soils have been previously graded, filled, or otherwise substantially disturbed; in such cases, an attempt should be made to identify and verify soils at one of the least disturbed portions of the site, particularly when in or surrounding a proposed building area.
- Soil materials, including cemented layers, layers of silt or substantial clay content, or strongly contrasting soil textures

Selecting Soil Pit Locations

For soil pit analysis, identify locations which best represent the mapped soil series in the portion of the parcel in which you are working. If available, already-exposed soil profiles, such as septic test pits, may be used to examine soil type. Soil pit analysis should be avoided in the following areas:

- Compacted or disturbed areas (unless representative of the entire parcel)
- Areas which lie within a drainage channel or pond

- Sections of the parcel which lie in or near a path or road.
- Areas with vegetation which greatly differs from surrounding plant cover, in the same mapped soil type
- Locations which lie on the borders of two different mapped soil types

Step 2: Hand-auger or tile spade soils to **30** inches depth across the mapped MPG soils areas at 200-300 foot intervals. For a 20-acre site entirely within MPG soils, that would result in around 10-20 sample points. There should be no fewer than 8 sample points on a 20-acre site regardless.

- If soil is too rocky or compacted to dig a pit with a spade and an auger must be used, place soil on a tarp in order to identify by horizon.
- If no bedrock or glacial till (or other material that is impossible to hand auger or dig through) is encountered within 24 inches, then proceed with evaluation of soil color for indication of presence of shallow groundwater tables.
- Examine soils for texture, color, and other characteristics typical of mapped soil series (i.e. amount of rock fragments, cemented layers, layers of silt or substantial clay content, or strongly contrasting soil textures).

Step 3: With a tile spade, cut an intact slab of soil profile from the side of the auger hole, and lay the slab flat on the ground beside the hole. Most tile spades are about 14 inches long, which will require a second deeper slab to see the entire profile to at least 20 inches depth. With flat palms, push sideways in opposite directions on the slab face to break the slab vertically to reveal undisturbed soil structure and colors within the slab.

- For the mineral¹ soil series in the list above:
 - If the soil to at least 20 inches depth matches the description, texture, color, hue, chroma, and other features typical of the appropriate MPG soils series mapped on the parcel, based on the NRCS Soils Guide (Pringle et al. 1990) and the Munsell Color Book (Munsell Color 1975), then the soil meets criteria to be classified as MPG. **Appendix A.** summarizes the typical hues, values, and chromas of all MPG soil series, by horizon and depth. Measure and record horizon depths. Use a spray bottle to wet soils as needed during pedon analysis.
 - Photograph the soil profile exposed in your soil pit
 - Record soil features using a USDA-NRCS Pedon Description Form (**Appendix B.**) or similar form, or take detailed notes which contain the information required in the form.
 - Collect soil samples for laboratory sieve or other characterization analysis, if needed. Samples should be 3 to 4 kg, or a minimum of 1 kg for soils with fragments up to 20 mm in size (Schoeneberger et al., 2012).

¹ Mineral soil versus Organic soil: A mineral soil is dominated by sand silt and clay; an organic soil has an unusually high content of organic materials from a slower than usual breakdown of plant materials. This second condition only occurs in wetland soils that are saturated for extended periods of time. The organic soil series map units are called “mucks” in the list above; the rest are mineral soils.

Please note that on sites which are close to the 50% cut-off in terms of soil depth – similar to the slope class problem described above -- survey-level information may be required to refute the soil classification based on soil depth alone. In that case, the surveyor, working together with the field professional, will provide a surveyed line showing exactly where the edge of the soil depth break occurs on the landscape.

Step 4: If any of the soil layers within 24 inches depth below the soil surface are dominantly grey with a Munsell Color Book chroma of 2 or less interspersed with rusty (reddish or orange) spots of color, then the seasonal water table **may** be too shallow for the soil to support MPG habitat.

The color-based evidence of a shallow seasonal water table described above will persist for many years after a mineral soil has been effectively drained. Some of the organic soils listed in **Table 1**, such as the Norma and McKenna series, are known to be poorly drained and are sometimes found in wetlands. Potentially, such soils on a site may have been wetland soils which were effectively drained. This final step is intended to document whether or not the hydrologic regime (long-duration water table) that created those soil colors or that soil organic matter content still persists above 24 inches depth. If it does, then the area **may** not be regulated as MPG habitat since there are possible restrictions to tunneling and food caching. However, MPG have been known to temporarily utilize or disperse over seasonally flooded areas during dry periods (G. Olson, pers. comm.).

- First, locate, sketch map and describe as precisely as possible any artificial (human-made) or natural (nature-made) drainage features that may have lowered the water table indicated by the soil colors or organic content, as described above
 - Artificial drainage: surface ditches or evidence of drain tiles (include depth and width of ditch or drain tile as well as water surface depth, if present), how the ditches or drains connect, the direction of flow, and where they enter and exit the target parcel... etc.
 - Natural drainage: such as a deeply incised natural stream channel that may have drained what was once a wetland on a stream-side terrace.

This documentation provides evidence that a previous hydrologic condition may not persist under current site conditions. If ditches are at least one foot deeper than 20 inches, and they are well-maintained, that alone may be enough to indicate that the soil is properly classified as those supporting potential MPG habitat. If the ditches are shallower than 20 inches, then it is likely that there is a seasonal water table within 20 inches, which may restrict use by the MPG. If there are rusty (reddish or orange) spots of color at less than 20 inches depth below the soil surface, interspersed between a background Munsell Color Book chroma of **greater than 2**, then the soil is expected to be well drained enough during the growing season to meet criteria to be classified as MPG, although it may have a periodic short duration winter water table event in response to winter storms.

- If this work is carried out during the wet season, direct observation and measurement of the water table may be sufficient during mid-to-late winter months. **However, this may require a return visit during a drier period (i.e., late spring or summer) in order to verify that flooding is persistent enough to exclude seasonal use by the MPG.**
 - For work carried out during late winter months, direct observation and documentation that the water table is at greater than 20 inches depth over a period of at least 4 weeks

prior to April 1 is an excellent indication that the site hydrology has been lowered to below 20 inches by the artificial or natural drainage features. In that case, the parcel DOES meet criteria to be classified as MPG.

- If the water table is at less than 20 inches for more than 4 weeks at a time during any period between April 1 and October 1, then the area should **NOT** be classified as MPG.
- To be classified as MPG, the water table may persist for long periods of time between October 1st and April 1st, as long as it drains to below 20 inches by April 1 in most years.
- On some sites, this documentation may require water table monitoring, either by regular manual measurements or through installation of programmable dataloggers or a studpipe with a datalogger that can record periodic water table levels (details provided below). If this monitoring indicates clearly that water tables persist for 4 weeks at a time after April 1 in most years, **then that parcel should not be regulated as MPG.**

Step 5: Reports

Following the soil field assessment, a report should be submitted to Thurston County. The report should include detailed information describing findings, and state clearly whether or not the MPG soils mapped on the property were verified. The following information should be included:

- Purpose and scope of the study
- Table depicting soil series mapped on parcel, with USDA NRCS Soil Survey map unit symbols
- GeoData or NRCS Soil Map for parcel in question
- Map depicting locations of soil test pits
- Description of site topography and dominant vegetation type(s)
- Description of soil taxonomy, soil horizon names, and horizon depths, including hue, value, chroma, texture, structure, and presence of features such as coarse fragments and roots
- Photographs of exposed soil profiles; include markers and labels defining borders and names of soil horizons
- Determination of soil series identified from field and laboratory sieve or other analysis; sieve report table
- Determination of water table and location

References

Munsell Color (1975). *Munsell Soil Color Charts*. 1975th ed., Munsell Color.

Pringle, R. F. et al. (1990). Soil Survey of Thurston County, Washington. U.S. Department of Agriculture, Soil Conservation Service.

Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and Soil Survey Staff (2012). Field book for describing and sampling soils, Version 3.0. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.

Soil Science Society of America (2010). Certified Professional Soil Scientist, Soil Classifier. A Program of the Soil Science Society of America. Madison, WI May 2010. www.soils.org/certifications

Appendix A: Hue, Value, and Chromas of Table 1. Gopher Soils, by Horizon

NRCS Map Unit #	Soil Series/depth	Hue by Horizon*		Value/ Chroma
1/2	Alderwood series			
	0 to 6 inches	A: Very dark brown	10YR	2/2
		Gravelly sandy loam, dark brown (dry)	7.5 YR	3/4
	6 to 15 inches	Bw1: Dark brown	7.5 YR	3/4
		Gravelly sandy loam, yellowish brown (dry)	10 YR	5/6
	15 to 30 inches	Bw2: Dark brown	7.5 YR	3/4
		Very gravelly sandy loam light yellowish brown (dry)	10 YR	6/4
	30 inches	Bqm: Dark grayish brown	2.5 Y	4/2
		Very gravelly sandy loam light brownish gray (dry)	10 YR	6/2
20	Cagey series			
	0 to 6 inches	Ap: Dark brown	10 YR	3/3
		Loamy sand, brown (dry)	10 YR	5/3
	6 to 28 inches	Bw: Dark yellowish brown	10 YR	4/4
		Loamy sand, pale brown (dry)	10 YR	6/3
	28 to 34 inches	C1: Light olive brown	2.5 Y	5/4
		Fine sand, light brownish gray (dry)	2.5 Y	6/2
	34 to 60 inches	C2: Light olive brown	2.5 Y	5/4
		Fine sand, pale olive (dry)	5 Y	6/3
		Many fine distinct strong brown, mottles	7.5 YR	5/8
32/33	Everett series			
	0 to 3 inches	A: Dark reddish brown	5 YR	2/2
		Very gravelly sandy loam, dark brown (dry)	10 YR	4/3
	3 to 12 inches	Bw: Dark brown	7.5 YR	3/4
		Extremely gravelly sandy loam, brown (dry)	10 YR	5/3
	12 to 20 inches	BC: Dark yellowish brown	10 YR	4/4
		Extremely gravelly loamy sand, pale brown (dry)	10 YR	6/3
	20 to 28 inches	C1: Olive brown	2.5 Y	4/4
		Extremely gravelly loamy sand, grayish brown (dry)	2.5 Y	5/2
	28 to 60 inches	C2: Dark grayish brown	2.5 Y	4/2
		Extremely gravelly sand, gray	5 Y	6/1
46/47	Indianola series			
	0 to 6 inches	A: Dark reddish brown	5 YR	3/3
		Loamy sand, brown (dry)	10 YR	5/3
	6 to 13 inches	Bw: Dark reddish brown	5YR	3/4
		Loamy sand, pale brown (dry)	10 YR	6/3
	13 to 25 inches	BC: Dark brown	10 YR	4/3
		Loamy sand, pale brown (dry)	10 YR	6/3
	25 to 35 inches	C1: Dark yellowish brown	10 YR	4/4

		Sand, Light brownish gray (dry)	2.5 Y	6/2
	35 to 60 inches	C2: Olive brown	2.5 Y	4/4
		Sand, light brownish gray (dry)	2.5 Y	6/2
50	Kapowsin series			
	0 to 4 inches	A: Dark brown	10 YR	3/3
		Silt loam, brown (dry)	10 YR	5/3
	4 to 11 inches	BA: Dark yellowish brown	10 YR	3/4
		Silt loam, light yellowish brown (dry)	10 YR	6/4
	11 to 18 inches	BW1: Dark yellowish brown	10 YR	4/4
		Silt loam, pale brown (dry)	10 YR	6/3
	18 to 22 inches	BW2: Dark yellowish brown	10 YR	3/6
		Loam, light yellowish brown (dry)	10 YR	6/4
		Few fine faint yellowish brown, mottles	10 YR	5/4
	22 to 30 inches	2Bw3: Dark yellowish brown	10 YR	4/6
		Gravelly loam, pale brown (dry)	10 YR	6/3
		Yellowish brown	10 YR	5/4
		Few fine faint yellowish brown, mottles	10 YR	5/4
	30 to 60 inches	2Bqm: Grayish brown	2.5 Y	5/2
		Gravelly loam, Light gray (dry)	2.5 Y	7/2
65	McKenna series			
	0 to 9 inches	A: Black	10 YR	2/1
		Gravelly silt loam, dark gray (dry)	10 YR	4/1
	9 to 13 inches	BA: Very dark grayish brown	10 YR	3/2
		Gravelly silt loam, light brownish gray (dry)	10 YR	6/2
		Few fine faint yellowish brown, mottles	10 YR	5/6
	13 to 21 inches	Bw1: Very dark grayish brown	10 YR	3/2
		Very gravelly silt loam, pale brown (dry)	10 YR	6/3
	21 to 28 inches	Bw2: Dark brown	10 YR	3/3
		Very gravelly loam, pale brown (dry)	10 YR	6/3
		Common medium distinct dark brown, mottles	7.5 YR	4/4
	28 to 36 inches	Bw3: Dark yellowish brown	10 YR	3/4
		Very gravelly loam, pale brown (dry)	10 YR	6/3
		Few fine faint yellowish brown, mottles	10 YR	5/8
		Olive gray, mottles	5 Y	5/2
	36 to 60 inches	Cr: Dark greenish gray	5 BG	4/1
		Dense glacial till that crushes to very Gravelly loam, gray (dry)	N	6/0
73/74	Nisqually series			
	0 to 5 inches	Ap: Black	5 YR	2/1
		Loamy fine sand, dark gray (dry)	10 YR	4/1
	5 to 18 inches	A1: Very dark gray	10 YR	3/1
		Loamy fine sand, dark gray (dry)	10 YR	4/1
	18 to 31 inches	A2: Very dark grayish brown	10 YR	3/2
		Loamy fine sand, grayish brown (dry)	10 YR	5/2
	31 to 48 inches	C1: Light olive brown	2.5 Y	5/4
		Loamy sand, grayish brown (dry)	2.5 Y	5/2

	48 to 60 inches	C2: Light olive brown	2.5 Y	5/4
		Light brownish gray (dry)	2.5 Y	6/2
75/76	Norma Series			
	0 to 8 inches	Ap: Very dark gray	10 YR	3/1
		Silt loam, dark brown (dry)	10 YR	4/3
	8 to 30 inches	Bw: Grayish brown	2.5 Y	5/2
		Sandy loam, light brownish gray (dry)	2.5 Y	6/2
		Common medium prominent reddish yellow, mottles	7.5 YR	6/6
	30 to 60 inches	Cg: Olive gray	5Y	5/2
		Sandy loam, light gray (dry)	5Y	7/2
		Common medium prominent red, mottles	2.5 YR	5/8
109	Spana series			
	0 to 22 inches	A: Black	10 YR	2/1
		Gravelly loam, very dark grayish brown (dry)	10YR	3/2
	22 to 26 inches	Bw1: Very dark grayish brown	10 YR	3/2
		Gravelly loam, grayish brown (dry)	10 YR	5/2
	26 to 38 inches	Bw2: Brown	10 YR	5/3
		Very gravelly loam, pale brown (dry)	10 YR	6/3
	38 to 39 inches	2C1: Dark yellowish brown	10 YR	4/4
		Extremely gravelly sandy loam, very pale brown (dry)	10 YR	7/4
	39 to 60 inches	2C2: Dark brown	10 YR	4/3
		Extremely gravelly sandy loam, pale brown (dry)	10 YR	6/3
110/111/ 112/113/ 114	Spanaway series			
	0 to 15 inches	A: Black	10 YR	2/1
		Gravelly sandy loam, very dark grayish brown (dry)	10 YR	3/2
	15 to 20 inches	Bw: Dark yellowish brown	10 YR	3/4
		Very gravelly sandy loam, light olive brown (dry)	2.5 Y	5/4
	20 to 60 inches	C: Dark yellowish brown	10 YR	4/4
		Extremely gravelly sand, yellowish brown (dry)	10 YR	5/4
126/127	Yelm series			
	0 to 8 inches	Apc: Dark brown	7.5 YR	3/2
		Fine sandy loam, grayish brown (dry)	10 YR	5/2
	8 to 17 inches	Bw1: Dark yellowish brown	10 YR	4/4
		Fine sandy loam, pale brown (dry)	10 YR	6/3
		Few faint greenish gray, mottles	5 GY	6/1
	17 to 36 inches	Bw2: Dark grayish brown	2.5 Y	4/2
		Fine sandy loam, light brownish gray (dry)	2.5 Y	6/2
		Few fine faint very dark grayish brown, organic masses 1 to 2 inches in diameter	2.5 Y	3/2
		Few fine faint greenish gray, mottles	5 GY	6/1

	36 to 46 inches	Bw3: Olive brown	2.5 Y	4/4
		Fine sandy loam, grayish brown (dry)	2.5 Y	5/2
	46 to 60 inches	C: Light olive brown	2.5 Y	5/4
		Loamy sand, light gray (dry)	2.5 Y	7/2

*Colors describe moist soil, unless otherwise stated

Appendix B: USDA-NRCS Soils Form

USDA-NRCS		PEDON DESCRIPTION				Pedon ID # :	Basic Soils Course		May-04																																																																																																																																							
Series or Component Name:		Map Unit Symbol:	Photo #:	Classification:			Soil Moist. Regime (Tax.):																																																																																																																																									
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Landscape:	Landform:	Microfeature:	Anthro:	Elevation:	Aspect:	Slope (%):	Slope Complexity:	Slope Shape: (Up & Dn / Across)																																																																																																																																								
Hillslope Profile Position:	Geom. Component:	Microrelief:	Physio. Division:	Physio. Province:	Physio. Section:	State Physio. Area:	Local Physio. Area:																																																																																																																																									
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Parent Material:	Bedrock: Kind:	Fract.:	Hard.:	Depth:	Lithostrat. Units:	Group:	Formation:	Member:																																																																																																																																								
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Component Name:														Map Unit Symbol:		Date:												
Obsr. Method	Depth (cm)		Horizon	Bnd	Matrix Color		Texture	Rock Frag			Structure			Sand %	Silt %	Clay %	LEP	Mottles										
	(TOP)	(BOT)			Dry	Moist		Knd %	Rnd	Sz	Grade	Sz	Type					% Sz	Cont.	Col	Mst	Shp	Loc					
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Appendix L: Model Conservation Easement

General Notes to Reviewers

The following is intended to aid interested parties in their review of the Thurston County HCP Model Conservation Easement.

1. Conservation Values. The intent of the Conservation Easement is to protect and preserve Thurston County HCP Covered Species as well as habitat for these species within the Easement Area, including the agricultural uses that are support these Conservation Values. Section 5.4 of the HCP defines criteria for selection of conservation lands. The Conservation Easement will describe the Conservation Values of the property in terms of Covered Species and their habitat. It will describe Conservation Values, at a minimum, using the land cover types and Covered Species habitat described in Section 2.2 of the HCP, Covered Species, and Appendix B: Covered Species Descriptions. A legal description and map must be included in the easement.

2. Easement language. This model easement is intended for use on lands Thurston County will enroll in the Thurston County HCP Conservation Land System. Easement language in **orange text** in this model is specific to Conservation Easements that include working lands. The establishment of Conservation Easements on private lands under the Thurston County HCP will provide benefit of conservation for Covered Species and continued compatible use of agricultural lands in the Plan Area that provide habitat value for Covered Species. For properties that will not be used for working lands production, omit text provided in **orange**.

To ensure that the terms of the Thurston County HCP and Incidental Take Permit are met, the model Conservation Easement requirements including, without limitation, approved and prohibited uses, is non-negotiable. Site specific considerations, such as measures needed to accommodate ongoing agricultural and ranching uses that are compatible with Conservation Values may be addressed through the Site Management Plan that accompanies the Conservation Easement. The model Site Management Plan is included as Attachment [insert] to the Thurston County HCP.

In cases where variations in easement language are anticipated to occur in the form of replacement language or additional language due to somewhat common conditions, acceptable variations to the primary text will be provided in **brown text** surrounded by brackets, like this *[replace “Thurston County, an incorporated County under the State of Washington” with the full legal name of the Easement Holder of Thurston County is not the Easement Holder]*

Some sections of the easement will require the insertion of easement-specific text. This includes items such as dates, property information, or specific easement conditions. Text that identifies information that is needed is provided in **green text** with brackets, like this: *[insert date]*

Some portions of the easement refer to items described in greater detail in the Thurston County HCP. In cases where this occurs, references to where additional information can be found within the Thurston County HCP are provided for reference in **purple text** within

brackets, like this: *{a complete list of Covered Species is found in Section 2.2 of the Thurston County HCP}*. Similarly, blue text within brackets [Landowner Information:] is included in some portions of the model easement that uses to provide additional information for those developing or reviewing a draft Conservation Easement that uses this model. Bracketed text should be deleted prior to the finalization of any Conservation Easement.

3. Easement Use. This template is prepared for use on privately-owned lands. However, it may also be modified for use on publicly-owned lands, including but not limited to lands that the Thurston County (or another public entity) acquires in fee title. For example, in an easement covering publicly-owned lands, the easement may include references to provisions of an accompanying Site Management Plan that described recreational uses and public access that are deemed compatible with the protection of Conservation Values within the Easement Area.

4. Site Management Plan; Relationship to Conservation Easement. This model Conservation Easement anticipates the concurrent preparation of a site-specific Site Management Plan for each Easement Area. The Site Management Plan is designed to ensure the Easement Area is managed, monitored, and maintained in perpetuity for the benefit of Covered Species and their habitat (the “Conservation Values”). The Site Management Plan describes (among other things) the allowed, restricted, and required activities within the Easement Area.

The Conservation Easement **permanently applies** to uses and activities. the Easement Area. The Site Management Plan will contain terms relating to agriculture uses permitted by the Conservation Easement. Additionally, the Site Management Plan may contain terms relating to recreational uses, public access, and other uses and activities that are permitted by the Conservation Easement, and are of interest to an individual landowner or Thurston County., The terms of the Site Management Plan must be compatible with the Conservation Values of the property.

The Site Management Plan, on a case-by-case basis depending on site-specific conditions and species and habitat needs, permit activities that are consistent with Conservation Values. An example of this is the repair, removal, and placement of fencing, particularly for properties with grazing or other agricultural uses that require occasional changes in fencing. These activities are generally allowed in the Site Management Plan for purposes of reasonable and customary agricultural management, and for security in connection with the protection of Conservation Values.

Changes in, without limitation, agricultural practices and technologies, weather cycles, natural resource management technologies, conservation practices, and actions necessary to ensure compliance with the Thurston County HCP and Associated ITP (The “Thurston County HCP Instruments”), may dictate changes in the management of the Easement Area, consistent with the purposes of this Conservation Easement and the Thurston County HCP. The Site Management Plan may be revised from time to time in writing by the County so long as the

revision are consistent with the terms of the Conservation Easement, Conservation Values, and the Thurston County HCP Instruments.

5. Easement Holder. This model assumes Thurston County or a qualified conservation organization *{see Section 7.9.2 for description of necessary qualifications}* will hold the Conservation Easement. The primary easement holder language assumes Thurston County is the easement holder and alternative language is included in bracketed brown text for insertion in Conservation Easements that will be held by another qualified conservation organization. An organization other than Thurston County must be the easement holder in situations in which the County holds the land in fee title.

6. Due Diligence to Accept Conservation Easement. To approve and accept a Conservation Easement, the County must have documentation to ensure ownership, title, and pre-existing easements do not conflict with the conservation goals established for each property enrolled in the Conservation Land System. In order to accomplish this the following documentation shall be completed:

- A Baseline Documentation Report, which is a pre-acquisition assessment of the property that summarizes the baseline biological conditions, including, without limitation, the presence and condition of habitat and Covered Species; any agricultural activities in the Easement Area; a map of the parcel which identifies the easement area and any proposed Development Envelopes, a description of the property's physical condition (e.g., roads, buildings, fences, wells, other structures), and ground and aerial photographs documenting the condition of the property and the Conservation Values found there; and
- A description of the property's relation to other components of the Conservation Land System and other properties that are subject to other permanent protections for conservation purposes; and
- A title report and legal description of the property, including review of all other easements, covenants, restrictions, reserved rights (including mineral, oil, and gas rights), mortgages and trusts, and property other property interests (including water rights); and

Professionally prepared evidence demonstrating that any pre-existing third-party-held property interests will not conflict with the protection of the property's Conservation Values; and *[Note: If mineral, oil or gas right are separately owned (i.e., have previously been severed from the surface estate) and the Landowner is unable to acquire those rights despite reasonable, documented efforts, the County will consider factors such as (i) the likelihood such rights will be exercised in the future, (ii) whether a right of surface entry exists, and (iii) whether potential impacts from the activity, should it occur, can be contained within a Development Envelope and not impact the remainder of the Easement*

Area. Thurston County will reject a proposed Conservation Easement if protection of Conservation Values from severed mineral, oil, or gas rights is not reasonably assured.]

- A Phase I Environmental Site Assessment to identify potential environmental contamination if there are indications that a property may have previously included uses that have the potential for contamination.

GRANT DEED OF CONSERVATION EASEMENT AND PERMANENT RESTRICTIONS ON USE

This GRANT DEED OF CONSERVATION EASEMENT AND PERMANENT RESTRICTIONS ON USE ("Conservation Easement") is made as of _____, 20__ (the "Effective Date") by [*insert full legal name of landowner(s) and address*] ("Landowner"), in favor of Thurston County, an incorporated County under the State of Washington, having an address of 2000 Lakeside Drive SW, Olympia, Washington, 98502 ("Easement Holder") (collectively "Parties") [*replace "Thurston County, an incorporated County under the State of Washington" and address with the full legal name of the Easement Holder AND delete "Thurston County" IF Thurston County is not the Easement Holder*].

1. RECITALS

- 1.1 Landowner is the sole owner in fee simple of the certain parcels of real property containing [*insert acres*] acres (hereinafter, "Easement Area"), located in Thurston County, Washington, designated Assessor's Parcel Number(s) [*insert APNs*]. Said real property is more particularly described in Exhibit "A" ("Legal Description") and shown on Exhibit "B" ("Site Map"), which are attached to this instrument and incorporated herein by this reference.
- 1.2 The Easement Area possesses significant wildlife and habitat values of great importance to the Easement Holder, the United States Fish and Wildlife Service (hereafter the "Beneficiary"), and the people of the United States. These wildlife and habitat values are hereafter collectively referred to as the "Conservation Values". The Easement Area will provide Conservation Values for wildlife and the ecosystems upon which they depend including, without limitation, [*insert: appropriate Covered Species {a complete list of Covered Species is found in Section 2.2 of the Thurston County HCP}*] and contains [*list functional habitat land cover types present in the Easement Area {this includes the land cover type(s) present on the site that provide for the identified Covered Species in Section 2.2 of the Thurston County HCP (e.g., grassland and prairie habitats on certain soil*

types) along with the habitat functions that the identified land cover type provides (e.g., foraging, nesting, breeding, overwintering}].

- 1.3 The status of the Conservation Values and any **agricultural** uses that support these Conservation Values, as well as other uses and improvements within the Easement Area at the time of the execution of the Conservation Easement are described in the “Baseline Documentation Report.” A Baseline Documentation Report is a pre-acquisition assessment of the property that summarizes the baseline biological conditions including, without limitation, the presence and condition of habitat and Covered Species; any agricultural activities in the Easement Area; a map of the parcel which identifies the Easement Area and any designated Development Envelopes, a description of the property’s physical condition (e.g., roads, buildings, fences, wells, other structures); and ground and aerial photographs documenting the condition of the entire Easement Area including the Conservation Values found. Both Parties acknowledge, as described in Exhibit C attached hereto and incorporated herein by reference, that each has received a copy of the Baseline Documentation Report, and that it accurately represents the Easement Area as of the date of the Conservation Easement.
- 1.4 The Parties intend that the Conservation Values be preserved and maintained in perpetuity by permitting only those land uses within the Easement Area that serve and do not impair or interfere with the Conservation Values.
- 1.5 Landowner, as owner of the Easement Area, has the right to protect and preserve the Conservation Values, and desires and intends to transfer such rights to Easement Holder in perpetuity to ensure the Landowner is protecting and preserving this Conservation Easement as set forth in this document.
- 1.6 This Conservation Easement is being executed and delivered to satisfy habitat conservation requirements set forth in the following documents (collectively the “**Thurston County HCP Instruments**”):
 - 1.6.1 The Thurston County HCP (“**Thurston HCP**”), dated _____, prepared by County of Thurston, and approved by the United States Fish and Wildlife Service (“**USFWS or Beneficiary**”) (16 U.S.C. Section 1531 *et seq.*, as it may be amended from time to time) (“**ESA**”); and
 - 1.6.2 The federal incidental take permit issued by USFWS to the Permittee for the Thurston County HCP pursuant to Section 10 of

ESA dated [insert] as it may be amended from time-to-time (“Permit”).

- 1.7 Execution is also intended to satisfy Thurston County’s Critical Areas Ordinance under chapter 24.25 Thurston County Code.
- 1.8 The State of Washington recognizes the public importance and validity of Conservation Easements by enactment of Washington Civil Code 64.04.130. Easement Holder is authorized to hold a Conservation Easement pursuant to this law, and such right or interest has been legally conveyed to the Easement Holder pursuant to Chapter 64.04 RCW.
- 1.9 The Beneficiary, 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 ESA, the Fish and Wildlife Coordination Act, 16 U.S.C. sections 661-666c, the Fish and Wildlife Act of 1956, 16 U.S.C. section 742(f) et seq., and other provisions of federal law.
- 1.10 Thurston County serves as the implementing entity of the Thurston HCP, and as such, is responsible for overseeing implementation of the Thurston County HCP Instruments, including carrying out planning and design, habitat restoration, monitoring, adaptive management programs, and periodic coordination with the Beneficiary. The Thurston County HCP Instruments confer separate rights and obligations on Thurston County that will survive any future transfer of the Conservation Easement. Following recordation of this Conservation Easement, the Easement Area will be incorporated into the Conservation Land System (as such term is defined in the Thurston HCP *{see Chapter 5 of the HCP}*) (“**Conservation Land System**”) and will count toward the land acquisition requirements set forth in the Thurston HCP.
- 1.11 The Site Management Plan, known as “*[insert title for Site Management Plan – typically this includes the site name]*,” that applies to the Easement Area is incorporated in this Agreement and provided as Exhibit __ herein.

2. CONVEYANCE AND CONSIDERATION

- 2.1 The Parties agree that the terms and recitals set forth in Section 1 are material to this Conservation Easement, and that each Party has relied on the material nature of such terms and recitals in entering into this Conservation Easement. The Recitals set forth in Section 1 above are

incorporated into the terms of this Conservation Easement for all intents and purposes and are binding on the Parties.

- 2.2 For the reasons stated above, and in consideration of the mutual covenants, terms, conditions and restrictions contained herein, and pursuant to the laws of Washington and in particular RCW 64.04.130, Landowner, on behalf of itself, its successors, assigns, heirs and executors hereby voluntarily grants, conveys and warrants, for good and valuable consideration, the receipt of which is acknowledged hereby, to Easement Holder, its successors and assigns a Conservation Easement in perpetuity the Easement Areas.
- 2.3 This conveyance is a conveyance of an interest in real property under the provisions of RCW 64.04.130.
- 2.4 Landowner expressly intends that this Conservation Easement runs with the land and that this Conservation Easement, including all duties, obligations, and rights conferred herein, shall be binding upon Landowner's and Easement Holder's successors, assigns, and heirs and executors in perpetuity.
- 2.5 **Third-Party Beneficiary.**

Landowner and Easement Holder acknowledge that the Beneficiary, including its successors and assigns, has an interest in ensuring the protection of Conservation Values. The Landowner and Easement Holder agree to make the Beneficiary a third-party beneficiary to this Conservation Easement. Beneficiary has the right to enforce the terms and conditions of this Conservation Easement and is entitled to the same remedies as the Parties. The Parties do not intend to transfer any property interest in the Easement Area to the Beneficiary. Rather, the Parties each intend to grant the Beneficiary the contractual right to enforce the terms and conditions of this Conservation Easement as a third-party beneficiary under the principles of Washington contract law. Additionally, the Parties recognize that the Beneficiary has or will rely on the mutual promise of the Parties to grant it third-party beneficiary status to support its Permit issuance decision. The Parties acknowledge and agree that Beneficiary is expressly granted certain additional rights under this Conservation Easement including, but not limited to, (1) prior written notice of certain specified actions and a right of approval of certain specified actions; and (2) the same right of access to the Easement Area granted to the Easement Holder pursuant to Section 5.2 of this Conservation Easement (including, without limitation, access for purposes of monitoring the condition of the Easement Area and ensuring compliance with the terms and conditions of this Conservation Easement).

The Beneficiary rights are in addition to, and do not limit, any other rights held by the Beneficiary.

3. PURPOSE

3.1 **Purpose.** The purpose of this Conservation Easement (“Purpose”) is to protect the Conservation Values of the Easement Area in perpetuity in a condition that is consistent with the requirements of (1) Thurston County HCP Instruments; (2) the Site Management Plan, which is designed to ensure that Conservation Values are, at a minimum, maintained in perpetuity at a level commensurate with the mitigation credit claimed by Thurston County under the mitigation crediting system set out in the Thurston County HCP Instruments, and (3) other Conservation Value protections of this Conservation Easement. Additionally, the Purpose of this Conservation Easement is to prevent any use of the Easement Area that will impair or interfere with the Conservation Values. [Include the following if there are other purposes, that are fully compatible with Conservation Values, such as open space or conservation futures: “this Conservation Easement is also entered for purposes of ensuring the land preserves the goals and meet the requirements of RCW xxxxx.”]

3.2 Interpretation of the Conservation Easement

3.2.1 The Parties intend that this Conservation Easement be interpreted in a manner consistent with its Purpose.

3.2.2 If any language of this Conservation Easement is deemed unclear or causes inconsistency within its own terms, it shall be interpreted to achieve and protect Conservation Values, achieve consistency with the HCP and Site Management Plan, and to advance the stated intent and purpose stated herein and in the HCP Instruments. The Parties intend that, except for activities occurring within Development Envelopes, this Conservation Easement be interpreted to confine the Landowner’s use of the Easement Area to such activities that are consistent with the Purpose and terms of this Conservation Easement. At the same time, the Parties intend, and this Conservation Easement is structured, to give Landowner flexibility and discretion to undertake activities that are consistent with the Purpose and terms of this Conservation Easement.

3.2.3 Interpretation of this perpetual Conservation Easement and the accompanying Site Management Plan, which is incorporated herein by reference, may in some instances be informed by the text of the Thurston County HCP Instruments, as provided in subsection 3.2.2, above. Although the HCP Instruments may terminate in the future, the Conservation

Easement will survive in perpetuity and as a matter of interpretation may require review of terms within the HCP Instruments. For purposes of interpretation of this Conservation Easement, the Thurston County HCP Instruments, as they may be amended from time-to-time, shall be deemed to survive future termination, expiration, or suspension. The Thurston County HCP Instruments are kept on file by Thurston County and the USFWS.

- 3.3 **Public Access.** Nothing contained in this Conservation Easement gives or grants to the public an independent right to enter upon or use the Easement Area or any portion thereof. Any existing public right to enter upon or use the Easement Area must be disclosed by the Landowner and documented in the Baseline Documentation Report.

4. SITE MAGAGEMENT PLAN

- 4.1 The Site Management Plan (the “MP”) is designed to ensure the Easement Area is managed, monitored, and maintained in perpetuity for the benefit the Conservation Values. The MP was developed in accordance with the terms of this Conservation Easement and the applicable requirements of the Thurston County HCP Instruments. The MP contains provision addressing how activities permitted by the Conservation Easement can be undertaken in the Easement Area in a manner that ensure the preservation of Conservation Values. Where agricultural use is approved in the Conservation Easement, the MP includes provisions that may assist in preserving and maintaining the agricultural use of the Easement Area to the extent such use is compatible with the preservation of its Conservation Values and the other terms of this Conservation Easement. Additionally, the MP may contain terms relating to recreational uses, public access, and other uses and activities that are permitted by the Conservation Easement and are of interest to an individual landowner or Thurston County. The original MP is incorporated in this agreement as Exhibit [insert]. Subject to the requirements of paragraph 4.1 above, the MP may be amended from time-to-time, in writing, by the County. The MP and all amendments thereto must be consistent with the protection of Conservation Values, the Purposes and terms of this Conservation Easement, and the Thurston County HCP Instruments. Without limitation, revisions may address: (1) changes in agricultural practices and technologies, weather cycles, natural resource management technologies; (2) changes in conservation practices (3) Adaptive Management; (4) implementation of measures to address Changed Circumstances or Unforeseen Circumstances consistent with the Thurston County HCP Instruments and the terms of this Conservation Easement; and (5) facilitation of approved uses under Conservation

Easement that are not addressed in the current version of the MP. Such amendments are at the sole discretion of County.

- 4.2 Notwithstanding the County's sole discretion to amend the MP in Section 4.2 o protect Conservation Values, no such amendment shall unreasonably expand upon landowner's responsibilities as originally contemplated in the initial MP, Exhibit __. An unreasonable expansion under this subsection would include a significant and noticeable increase in the scope and magnitude of a landowner responsibility under the original plan. However, a landowner responsibility is not deemed unreasonably modified merely by virtue of being substituted or replaced by the County's MP amendment.
- 4.3 All amendments to the MP are hereby incorporated by reference to this Agreement. The final, approved copy of the MP, and any amendments thereto, shall be kept on file at Thurston County in an identifiable location. The County shall ensure MP documents are maintained in perpetuity and not subject to destruction under the Records Retention Act, Chapter 40.14 RCW. The County shall promptly furnish the MP Amendments kept on file whenever requested by either the Beneficiary or Landowner. Amendments to the MP need not be recorded with the land record, but may be recorded at the election of any of the parties to this agreement.
- 4.4 [If Easement holder is not County, add the following: "Prior to any amendment of the MP, the County shall consult in good faith with the Easement Holder regarding the proposed amendment, and shall respond in writing to any easement holder concerns prior to amending the MP."]

5. DEVELOPMENT ENVELOPES

- 5.1 **Development Envelope.** [Include this section in situations where the Landowner intends to conduct activities, or has or is interested in retaining the right to have, a residence, buildings, road, or other improvements, that are incompatible with the preservation of Conservation Values within the Easement Area]
- 5.1.1 Development Envelopes are designated locations within an Easement Area that contain or are expected to contain development (including, without limitation, a residence or other area where buildings, other improvements, ingress/egress routes) or activities which are considered incompatible with the preservation of Conservation. Exhibit [insert] contains (1) a legal description of the Development Envelope(s) within the Easement Area, (2) a detailed description of all current and future anticipated development and activities within the Development Enveloped(s).

- 5.1.2 Activities or land uses within the Development Envelope(s) cannot interfere with the protection, enhancement, or restoration of the Conservation Values on the portions of the Easement Area that are not included in the Development Envelope. Any breach of this requirement shall constitute a breach of the terms of this Conservation Easement.
- 5.1.3 The parties understand and acknowledge that the Development Envelope(s) are not compatible with Conservation Values and do not count towards satisfying the conservation goals and objectives, and mitigation requirements of the Thurston HCP Instruments.

6. RIGHTS AND RESPONSIBILITIES OF THE EASEMENT HOLDER

To accomplish the Purpose of this Conservation Easement, the following rights are conveyed to Easement Holder by this Conservation Easement:

- 6.1 **Protection.** Easement Holder shall have the right and responsibility to:
 - 6.1.1 Preserve and protect the Habitat Conservation Values of the Easement Area in perpetuity;
 - 6.1.2 *[In situations where the Parties agree to conduct restoration or enhancement habitat conditions to a level that exceeds, in quality, quantity, or both, the level that exists at the time of the Conservation Easement execution, the following language will be inserted: "To restore and or enhance the Conservation Values in accordance with the requirements of the MP, the Thurston County HCP Instruments, and applicable terms and conditions of this Conservation Easement."]*
 - 6.1.3 Ensure compliance with the terms of this Conservation Easement, prevent any activity on or use of the Easement Area that is inconsistent with the terms and Purposes of this Conservation Easement, and 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 or activity that is inconsistent with the terms and Purpose of this Conservation Easement; and
 - 6.1.4 Conduct, at minimum, annual compliance monitoring to ensure the Easement Area is maintained in accordance with the Thurston County HCP Instruments and this Conservation Easement. This provision 6.1.4 does not govern the interval for monitoring the effectiveness of site management actions for achievement of conservation objectives identified in the MP.

- 6.1.5 Easement Holder is authorized to perform all activities as specified in the MP, Exhibit [insert], and as specified in any future amendment of the MP as it may be modified from time to time.
- 6.1.6 The Easement Holder may also undertake actions to address Changed Circumstance and Unforeseen Circumstance for purposes of preserving Conservation Values in accordance with the requirements of the Thurston County HCP Instruments.
- 6.2 **Access.** As provided for and limited herein, Landowner hereby grants to Easement Holder non-exclusive access at reasonable times on the Easement Area solely for the purposes of fulfilling Easement Holder's obligations under this Conservation Easement and exercising its affirmative rights and obligations under this Conservation Easement, including but not limited to implementing the MP as it may be modified from time to time. Easement Holder will use reasonable efforts to provide a minimum of 48 hours advance notice of entry, but may enter without notice upon a reasonable belief that a violation of the Conservation Easement is occurring.
- 6.3 **Injunction and Restoration.** Easement Holder shall have the right to prevent, or cause Landowner to prevent, any use of, or activity on, the Easement Area that is inconsistent with the Purpose and terms of this Conservation Easement, including trespasses by members of the public, and shall have the right to undertake or cause to be undertaken the restoration of such areas or features of the Easement Area as may be materially damaged by activities contrary to the provisions hereof, all in accordance with Section 10.
- 6.4 **Enforcement.** Easement Holder shall have the right to enforce the terms of this Conservation Easement, inclusive of all exhibits and future amendments to the MP as incorporated by reference herein. Enforcement of this Conservation Easement may be accomplished either through the terms of this Conservation Easement and/or remedies available through local ordinance, including but not limited to the issuance of civil penalties and liens against the landowner's property. *[use when County is not the Easement Holder: "The parties to this Conservation Easement acknowledge and accept Thurston County as a third party beneficiary, having all rights of enforcement available to the Easement holder and as available through local ordinance, including but not limited to its ability to issue civil penalties"]*
- 6.5 **Assignment.** Easement Holder shall have the right to assign or otherwise contract for the performance of obligations and responsibilities under this

Conservation Easement. However, in no such case shall any assignment be interpreted to abrogate Thurston County's responsibilities under the HCP instruments, including ensuring protection of Conservation Values of the Easement Area in perpetuity.

7. LANDOWNER PERMITTED AND REQUIRED ACTIVITIES AND USES

- 7.1 **Agricultural Activities.** [Include the following provision to authorize continued agricultural and ranching use that is compatible with Conservation Values.] Land owner reserves to itself, and to its personal representatives, heir and successor and assigns the right to engage in or permit or invite others to engage in existing lawful and routine **agricultural and ranching** and are documented and addressed in MP, Exhibit [insert] herein, so long as such activities are consistent with preservation of Conservation Values, and the terms and Purpose of this Conservation Easement (including, without limitation, sections 4.1 and 7.5), and applicable law.
- 7.2 **[insert if landowner is conducting stewardship activities: Restoration Activities.** Landowner acknowledges and agrees to engage in habitat restoration activities ("Habitat Activities") as provided and detailed in the MP and in any subsequent amendments of the MP made in the future, pursuant to Section 4 of this Agreement.
- 7.3 **Recreational or Educational Activities.** Landowner may engage in, and allow others to engage in, recreational or educational activities on the Easement Area. Recreational and educational uses are limited to uses that do not require site modification including, without limitation, modifications to accommodate motorized, mechanical or electronic accessories. All forms of recreation that adversely impacts the Conservation Values are prohibited. All recreational and educational activities on the Easement Area shall be carried out in compliance with the Purpose and terms of this Conservation Easement, and in a manner that maintains the primacy of, and remains subordinate to the Conservation Values, and the terms of this Conservation Easement, the MP, and the Thurston County HCP Instruments. The SM may include site-specific limitations or approvals of recreational activities, provided that they are consistent with the text and intent of this paragraph 7.3.
- 7.4 **Forestry Use.** Landowner may remove trees from the Easement Area when required for safety, fire protection, pest control, disease control, restoration, domestic use, or as necessary to benefit Habitat Activities (the "Forestry Activities"). All Forestry Activities on the Easement Area shall be

carried out in compliance with the Purpose and terms of this Conservation Easement.

- 7.5 Landowner shall not interfere with activities and practices that are identified in the MP, as it is amended from time to time, and Landowner will participate in all activities and practices when such participation is identified.
- 7.6 In the event that the Landowner knows or reasonably suspects that an activity under the Landowners direct or indirect control has taken negatively impacted Conservation Values in a manner or to an extent not authorized in this Conservation Easement, the MP, or the Thurston County HCP Instruments, the Landowner must immediately cease the activity and provide a detailed description of the impacts to the Easement Holder and Beneficiary within 24 hours of discovery of the impacts.
- 7.7 In the event that the Landowner knows or reasonably suspects that an activity or event, such as fire, that is not under the Landowners direct or indirect control, has negatively impacted Conservation Values in a manner or to an extent not contemplated in this Conservation Easement the Landowner must provide a detailed description of the impacts to the Easement Holder and Beneficiary within 24 hours of discovery of the impacts.

8. PROHIBITED USES AND RESTRICTIONS ON PERMITTED USES

Any use of, or activity on, the Easement Area inconsistent with the Purpose or other terms of the Conservation Easement is prohibited, and Landowner acknowledges and agrees that it will not conduct, engage in, or permit any such use or activity. Without limiting the generality of the foregoing, the following uses of, or activities on, the Easement Area are either (a) inconsistent with the Purpose of this Conservation Easement and prohibited or (b) limited as provided herein to make such uses or activities consistent with the Purpose of this Conservation Easement.

- 8.1 **Prohibitions.** Notwithstanding any general permission provided in section 6 of this Conservation Easement, the following activities are prohibited as described below:
 - 8.1.1 **In General following is prohibited:** Any watering activity that is inconsistent with the protection of Conservation Values; recreational activities that are incompatible with Conservation Values such as, but not limited to, horseback riding, biking, or hunting, or that require Easement Area modification; use of off-road vehicles and use of any other motorized vehicles except on existing roadways or as necessary for approved uses; planting, introduction, or dispersion of non-native invasive or exotic plant

or animal species; and any and all other activities and uses which may adversely affect the Conservation Values of the Easement Area or otherwise interfere with the purposes of this Conservation Easement.

- 8.1.2 Removing, destroying, or cutting of trees, shrubs, or other vegetation except as allowed in the MP is prohibited.
- 8.1.3 Planting, introduction, or dispersal of invasive plant or animal species is prohibited.
- 8.1.4 Undertaking any activity or use that may violate or fail to comply with relevant federal, state, or local laws, regulations, or policies applicable to Landowner, the Easement Area, or the activity or use in question is prohibited.
- 8.1.5 **No Conversion to Incompatible Uses.** Except for actions expressly permitted within the boundaries of a Development Envelope(s) as described and depicted herein, the Landowner shall not convert the Easement Area to any use that is incompatible with maintaining the conservation values and Purposes on the Easement Area or the Thurston County HCP Instruments.
- 8.1.6 **Treatments.** Use of fertilizers, pesticides, biocides, herbicides or other chemicals, except as allowable under applicable law, the Thurston County HCP Instruments, and as provided in the MP in connection with the **agricultural** use of the Easement Area, are prohibited.
- 8.1.7 **Limitations on Agricultural Use.** Vineyards, orchards, nurseries, intensive livestock use (e.g., dairy, commercial feedlot), and other agricultural uses, except as allowed in the MP, as provided in Exhibit [insert] to this Easement Agreement, are prohibited. For purposes of this Conservation Easement, a commercial feedlot is defined as a permanently constructed confined area or facility within which the land is not grazed or cropped annually, and that is used to receive livestock that are confined solely for the purpose of growing or finishing. Nothing in this Section shall prevent Landowner from leasing pasture for the grazing of livestock owned by others consistent with Section 6.1 and other provisions of this Conservation Easement. Landowner shall not engage in, or permit others to engage in, the commercial production of cultivated marine or freshwater aquatic products on the Easement Area. *[Note to landowners: The specific agricultural practices identified above are prohibited for all Conservation Easements. This does not preclude a landowner from having fruit trees or vines within a designated development envelope area, as are common around a home site. For easements that include active agricultural lands at the time the*

easement is established, the existing agricultural uses that support the Conservation Values of the site will be allowed in the Site Management Plan. For example, if the site includes pasture fields that provide habitat for a Covered Species, agricultural use of the site as needed to maintain the pasture fields that provide habitat to the species will be allowed uses in the Site Management Plan.]

- 8.1.8 **Limitations on Improvements.** Except as set forth in the MP with respect to actions undertaken solely for conservation Purposes, or occurring within the Development Envelope(s) described and depicted in Appendix [insert] hereto, any construction, reconstruction, relocation or placement of any road, building, billboard, or sign, or any other structure or improvement of any kind, or altering the surface or general topography of the Easement Area is prohibited. *[Note to landowners: The repair, removal, and placement of fencing, particularly for properties with irrigated pasture or other agricultural uses that require occasional changes in fencing are generally allowed in the Site Management Plan for purposes of reasonable, lawful, and routine agricultural practices, and for the security in connection with the protection of Conservation Values and reserved uses of the Easement Area. The relocation of formal and informal access roads may also need to be addressed in the Site Management Plan on some properties];*
- 8.1.9 **Limitations on Mining.** Landowner shall not, or allow others to, conduct, engage in, or permit the commercial mining or commercial extraction of soil, sand, gravel, oil, natural gas, fuel, or any other mineral substance
- 8.1.10 **Limitations on Alteration of Land.** Landowner shall not, nor authorize other to, alter the surface or subsurface of the land, including, without limitation, grading, trenching, excavating or removing loam, soil, sand, gravel, rock, stone, aggregate, peat, or sod. This provision is not intended to prohibit lawful and routine agricultural practices (e.g., tilling, soil amendments, laser leveling) and other uses that are associated with site management activities that do not impair the Conservation Values of the Easement Area, and are allowed in the MP.
- 8.1.11 **No Significant Erosion or Pollution.** Landowner shall not engage in any use or activity that causes or is likely to cause soil degradation or erosion or contamination or pollution of any soils or surface or subsurface waters on the Easement Area.
- 8.1.12 **Construction of commercial, industrial, institutional, agricultural or residential structures or uses.** Reconstruction, expansion, location, relocation, installation, or placement of any building, road, trail, billboard

or sign, or any other structure or improvement of any kind, is prohibited except within any Development Envelope.

- 8.1.13 **Subdivision.** 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, is prohibited.
- 8.1.14 **Vegetation.** Removing, disturbing, altering, destroying, or cutting of trees, shrubs or other vegetation, except as required by law and in conformance with the MP for (1) fire breaks, (2) maintenance of existing foot trails or roads that are otherwise permitted under this Conservation Easement, or (3) prevention or treatment of disease, is prohibited.
- 8.1.15 **Water Bodies or Courses.** Manipulating, impounding or altering any natural water course, body of water or water circulation on the Easement Area, and activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters, is prohibited. *[Note to landowners: The management and maintenance of canals, ponds, and other artificial water features as needed to maintain cultivated lands and other site conditions that support the Conservation Values of the site are allowed as described in the Site Management Plan.]*
- 8.1.16 **Mineral Rights, Air Rights.** The following is prohibited: Transferring, encumbering, selling, leasing or otherwise separating the mineral, oil, gas, air for the Easement Area.
- 8.1.17 **Water.** The Baseline Report will document existing water conditions, whether naturally or artificially provided. The Landowner may not take actions that are inconsistent with Baseline Report or enhanced water quantity and distribution in the Easement Area that may impact Conservation Values as described in the MP including, without limitation, curtailing water use, 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: (i) riparian water rights; (ii) appropriative water rights; (iii) 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 (iv) any water from wells that are in existence or may be constructed in the future on the Easement Area. This provision applies to the entire property including the Easement Area and any Development Envelopes.

- 8.1.18 **Additional Easements.** Granting 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) is prohibited. This section 8.1.18 shall not prohibit the transfer of a fee or leasehold interest in the property that complies with the transfer requirements of section 9.
- 8.1.19 **Limitations on Waste Disposal.** Landowner may not accumulate and store ashes, garbage, bio-solids, or other waste ("Trash") on the Easement Area. Landowner shall not store, otherwise dispose, or Release (or permit the disposal or release of) any Hazardous Materials (as defined in Section 13) on the Easement Area. The term "Release" shall mean any release, generation, treatment, disposal, dumping, burying, or abandonment.
- 8.1.20 **Development Rights.** Exercising development rights within the easement area, except for those specifically reserved for use within Development Envelopes, is prohibited. Landowner hereby relinquishes all other development rights, and the Parties agree that such rights may not be used on or transferred off the Easement Area as it now or hereafter may be bounded or described.
- 8.1.21 **[Insert additional prohibitions as appropriate for the Easement Area and its Conservation Value, as needed.]**

9. LIMITATION ON TRANSFERS

- 9.1 **Transfer.** For purposes of this Section, "Transfer" includes but is not limited to any sale, grant, lease, hypothecation, assignment, conveyance, or any transaction the purpose of which is to effect a sale, grant, lease, hypothecation, assignment, or conveyance.
- 9.2 **Landowner Notice and Consent Requirements.** Landowner shall not undertake or permit any Transfer of any rights in the Easement Area without prior notice to and consent of Easement Holder and notice to Beneficiary as provided for in Section 11. Such consent may not be unreasonably withheld, but must be consistent the Purpose and terms of this Conservation Easement, the MP, and the Thurston HCP Instruments. Such notice to Easement Holder and the Beneficiary shall include the name, address, and telephone number of the prospective transferee or such transferee's representative.

- 9.3 **Landowner Transfer Requirements.** With respect to any Easement Holder-permitted Transfer made after conclusion of the notice period, Landowner agrees to describe and incorporate by reference the terms of this Conservation Easement and associated documents by reference in any deed or other legal instrument by which it divests itself of any interest in all or a portion of the Easement Area including, without limitation, any lease. In addition to any other rights they may have under this Conservation Easement, Easement Holder and the Beneficiaries shall have the right to prevent subsequent transfers in which prospective subsequent claimants or transferees are not given actual notice of the covenants, terms, conditions and restrictions of this Conservation Easement. The failure of the Landowner to perform any act required by this Section shall not impair the validity of this Conservation Easement or limit its enforceability in any way. Any successor in interest or lessor of Landowner, by acceptance of a deed, lease, or other document purporting to convey an interest in the Easement Area, shall be deemed to have consented to, reaffirmed and agreed to be bound by all of the terms, covenants, restrictions, and conditions of this Conservation Easement.

10. TRANSFER OF EASEMENT HOLDER'S PROPERTY INTEREST

- 10.1 **Transfer of the Conservation Easement.** This Conservation Easement is transferrable, but Easement Holder may transfer its rights and obligations under this Conservation Easement only to an organization that is a qualified holder at the time of transfer under Washington Law including under RCW 64.04.130, as amended. Easement Holder shall not transfer this Conservation Easement without first providing ninety (90) days' notice to, and written consent of Beneficiary. The transfer shall not be valid without such notice; provided, however, that the failure of Easement Holder to give such notice or otherwise comply with the requirements of this paragraph shall not impair the validity of this Conservation Easement or limit its enforceability in any way. As a condition of such transfer, Easement Holder shall require that transferee to comply with and continue to carry out the Purpose of this Conservation Easement. Approved transfers shall be filed in the land record of Thurston County.
- 10.2 **Rights and Obligations Upon Transfer.** A party's rights and obligations under this Conservation Easement terminate upon transfer of the party's interest in the Easement Area or this Conservation Easement, as the case may be, except that liability for acts or omissions occurring prior to transfer shall survive transfer.

11. NOTICE AND CONSENT - IN GENERAL

11.1 Notice.

11.1.1 **Easement Holder and Third Party Beneficiaries.** Certain provisions of this Conservation Easement require notice to Landowner prior to undertaking certain activities. Whenever such notice is required, and no other timeline for notice is set forth elsewhere in this Conservation Easement, such notice shall be in writing not less than thirty (30) days prior to the date any use or activity is intended to be taken. The notice shall describe the nature, scope, design, location, timetable, and any other material aspect of the proposed use or activity in sufficient detail to permit Landowner and the Beneficiary to make an informed judgment as to its consistency with the terms of this Conservation Easement and the Purpose thereof.

11.1.2 **Landowner.** Certain provisions of this Conservation Easement require Landowner to give notice to Easement Holder and the Beneficiary prior to undertaking certain activities. The purpose of requiring Landowner to notify Easement Holder and the Beneficiary prior to undertaking these permitted uses and activities is to afford Easement Holder and the Beneficiary an adequate opportunity to ensure that the use or activity in question is designed and carried out in a manner consistent with the Purpose of this Conservation Easement. Whenever such notice is required, and no other timeline for notice is set forth elsewhere in this Conservation Easement, Landowner shall provide such notice in writing not less than ninety (90) days prior to the date Landowner intends to undertake the use or activity in question. The notice shall describe the nature, scope, design, location, timetable, and any other material aspect of the proposed use or activity in sufficient detail to permit Easement Holder and the Beneficiary to make an informed judgment as to its consistency with the terms of this Conservation Easement and the Purpose thereof.

11.1.3 **Coordination.** Whenever notice is issued under this Conservation Easement, such notice will be provided to all parties and third beneficiaries identified herein.

11.2 Consent

11.2.1 **Consent by Beneficiary Required.** Notwithstanding any other provision of this agreement, wherever in this Conservation Easement the Easement Holder's consent is required with respect to any material term of this Conservation Easement, such consent shall be provided in writing. If the Beneficiary provides consent in association with any matter arising under

this this Conservation Easement such consent must be evidenced in writing for the consent to be valid.

11.2.2 Consent Not Unreasonably Withheld. Wherever in this Conservation Easement a Party's or Beneficiary consent is required, such consent may be withheld only upon a reasonable determination by the consenting party that the action as proposed would be inconsistent with the Purpose or terms of this Conservation Easement, the MP, or the Thurston County HCP Instruments.

11.2.3 Timeline for Consent. Whenever in this Conservation Easement Landowner's, Easement Holder's or Beneficiaries consent is required, and no other timeline for consent is set forth elsewhere in this Conservation Easement, the Landowner shall grant or withhold consent in writing within thirty (30) days and the Easement Holder and Beneficiary shall, to the extent practicable in view of applicable government administrative process, grant or withhold their respective consent in writing within ninety (90) days.:

11.3 Addresses for Notices. Any notice, demand, request, consent, concurrence, approval, or communication that any party desires or is required to give to the other shall be in writing either served personally or sent by registered mail or overnight courier with proof of delivery, addressed as follows (or to such other address as any party from time to time shall designate by written notices to the each other party):

To Landowner:	Name Attention (if business) Address
To Easement Holder:	
To BENEFICIARY:	USFWS Washington Fish and Wildlife Office 510 Desmond Drive SE, Olympia, Washington 98503 360-753-9440 phone 360-753-9565 fax

11. EASEMENT HOLDER'S REMEDIES

- 11.1 **Notice of Non-Compliance.** If Easement Holder determines that the Landowner is in violation of the terms of this Conservation Easement or that a violation is threatened or reasonably foreseeable, Easement Holder as soon as possible but no later than ten (10) working days shall give written notice to Landowner with a copy to the Beneficiary(ies) of such matter and demand corrective action sufficient to cure or avoid the violation, as appropriate. Where the violation involves injury to the Easement Area resulting from any use or activity inconsistent with the Purpose or terms of this Conservation Easement, the Notice shall identify and demand to restore the portion of the Easement Area so injured to its prior or potential condition in accordance with a plan to which Easement Holder and Beneficiary has given written consent.
- 11.2 **Landowner's Failure to Respond.** Easement Holder may bring an action as provided in Section 11.3 if Landowner fails to cure the violation within thirty (30) days after receipt of notice thereof from Easement Holder. Notwithstanding, if Easement Holder, in its sole and absolute discretion, determines that circumstances require immediate action to prevent or mitigate significant damage to the Conservation Values, Easement Holder may pursue its remedies under this Section 11 without prior notice to Landowner, without participation in preventative discussions as provided for in Section 10, or without waiting for the period provided for cure to expire.
- 11.3 **Easement Holder's Action.** Easement Holder or Beneficiary(ies) may bring an action at law or in equity, or both, in a court of competent jurisdiction to enforce the terms of this Conservation Easement, to enjoin the violation, ex parte as necessary and as allowed under the applicable civil rules, by temporary or permanent injunction, to recover any damages to which it may be entitled for violation of the terms of this Conservation Easement or injury to any of the Conservation Values protected by this Conservation Easement, including damages for the loss of the Conservation Values; and to require the restoration of the Easement Area to the condition that existed prior to any such injury. Without limiting the Landowner's liability, the Easement Holder has the right to undertake corrective action on the Easement Area. All such actions for injunctive relief may be taken without Easement Holder being required to post bond or provide other security.

- 11.4 **Nature of Remedy.** Easement Holder's rights under this Section 10 apply in the event of violations of the terms of this Conservation Easement. Landowner agrees that Easement Holder's remedies at law for any violation of the terms of this Conservation Easement are inadequate and that Easement Holder shall be entitled to the injunctive relief described in this Section 10 both prohibitive and mandatory, in addition to such other relief to which Easement Holder 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. Easement Holder's remedies described in this Section 10 shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity. The provisions of Section 11.7 shall not be interpreted to preclude Easement Holder from obtaining injunctive relief.
- 11.5 **Damages.** Inasmuch as the actual damages to the Conservation Values that could result from a breach of this Conservation Easement by Landowner would be impractical or extremely difficult to measure, the Parties agree that the money damages Easement Holder is entitled to recover from Landowner shall be the cost of restoring any Conservation Values that have been damaged by such violation, and instituting such monitoring measures and additional financial mechanisms, e.g., bonds, letters of credit, etc., to reasonably ensure that the restoration will be successful and durable in perpetuity. Easement Holder shall also be entitled to an award of attorney's fees in the event it substantially prevails in a court of competent jurisdiction.
- 11.6 **Enforcement Discretion.** Enforcement of the terms of this Conservation Easement shall be at the sole discretion of the Easement Holder and the Beneficiary(ies), and any forbearance by Easement Holder or Beneficiary(ies) to exercise their respective rights under this Conservation Easement in the event of any breach of any terms of this Conservation Easement by Landowner shall not be deemed or construed to be a waiver of such term or of any rights they hold under this Conservation Easement. No delay or omission by Easement Holder or Beneficiary(ies) in the exercise of any right or remedy upon any breach by Landowners shall impair such right or remedy or be construed as a waiver.
- 11.7 **Waiver of Certain Defenses.** Landowner acknowledges that it has carefully reviewed this Conservation Easement and has been advised by Easement Holder to seek legal counsel to regarding the effect of its terms and conditions. In full knowledge of the provisions of this Conservation Easement, Landowner hereby waives any claim or defense it may have against Easement Holder or its successors or assigns in interest under or

pertaining to this Conservation Easement based upon abandonment, adverse possession or prescription relating to the Easement Area or this Conservation Easement.

- 11.8 **Acts Beyond Landowner's Control.** Nothing contained in this Conservation Easement shall be construed to entitle Easement Holder to bring any action against Landowner to abate, correct, or restore any condition on the Easement Area or to recover damages for any injury to or change in the Easement Area resulting from beyond the Landowner's control, including, without limitation, natural disaster, fire, flood, storm, pest infestation, earth movement, and climate change, and from any prudent action taken by Landowner under emergency conditions to prevent, abate, or mitigate significant injury to the Easement Area resulting from such causes.
- 11.9 **Trespassers.** Landowner shall undertake all reasonable actions to prevent the 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. In the event the terms of this Conservation Easement are violated by acts of trespassers, and Landowner has not undertaken suit itself, Landowner agrees, at Easement Holder's option, to assign its right of action to Easement Holder or to appoint Easement Holder its attorney in fact, for purposes of pursuing enforcement action against the responsible parties. In the event of repeated violations by acts of trespassers, Landowner shall take reasonable steps to abate further trespass, including use of fencing or installation of surveillance. *[for public agency-owned lands include the following language: or (iii) acts by persons that entered the Easement Area lawfully or unlawfully whose activities degrade or harm the Conservation Values of the Easement Area or whose activities are otherwise inconsistent with this Conservation Easement where Landowner has undertaken all reasonable actions to discourage or prevent such activities].*

12. LIABILITIES AND TAXES

- 12.1 **Liabilities (and Insurance).** Landowner retains all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep, maintenance, the monitoring of hazardous conditions thereon, or the protection of Landowner, the public or any third parties from risks relating to conditions within the Easement Area. Landowner remains solely responsible for obtaining any applicable governmental permits and approval for any activity or use permitted by this Conservation Easement, and all activity on or use of the Easement Area shall be undertaken in

accordance with all applicable federal, state, and local laws, regulations, and requirements.

- 12.2 **No Liens or Security Interest.** Landowner shall keep the Easement Area free of any liens including those arising out of any work performed for, material furnished to, or obligations incurred by Landowner and any security interest that may interfere with this Conservation Easement. The Easement Area shall be deemed to be free of such liens or security interests if they are expressly subordinated to this Conservation Easement in writing and do not require any action or inaction inconsistent with the Purpose and terms of this Conservation Easement or the Thurston County HCP Instruments.
- 12.3 **Taxes.** Landowner shall pay before delinquency all taxes, assessments (general and special), fees, charges of whatever description levied on or assessed against the Easement Area by competent authority (collectively “taxes”), including any taxes imposed upon, or incurred as a result of, this Conservation Easement, and shall furnish Easement Holder with satisfactory evidence of payment upon request. Nothing in this agreement prohibits the Landowner from seeking tax relief as a result of the Conservation Easement.

13. REPRESENTATIONS AND WARRANTIES. Landowner represents and warrants that, after reasonable investigation and to the best of Landowner’s knowledge:

- 13.1 Landowner 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 Landowner has full right and authority to enter into this Conservation Easement and convey the Conservation Easement to Easement Holder.
- 13.2 Landowner and the Easement Area are in compliance with all federal, state, and local laws, regulations, and requirements applicable to the Easement Area and its use *[except as disclosed in the Baseline Report]. [Insert site specific conditions, if applicable];*
- 13.3 To the knowledge of Landowner, there has been no release, dumping, burying, abandonment or migration from off-site on the Easement Area of any substances, materials, or wastes that are or are designated as, hazardous, toxic, dangerous, or harmful or contain components that are, or are designated as, hazardous, toxic, dangerous, or harmful and/or that are subject to regulation as hazardous, toxic, dangerous, or harmful by any federal, state or local law, regulation, statute, or ordinance;
- 13.4 Neither Landowner nor Landowner’s predecessors in interest have disposed of any hazardous substances off-site, nor have they disposed of

substances at sites designated or proposed to be designated as federal Superfund (42 U.S.C. § 9601 et seq.) or state Model Toxics Control Act (RCW 70.105D.010 et seq.) ("MTCA") sites; and

- 13.5 There is no pending or threatened litigation affecting the Easement Area or any portion of the Easement Area that will materially impair the Conservation Values of any portion of the Easement Area. No civil or criminal proceedings have been instigated or are pending against Landowner or its predecessors by government agencies or third parties arising out of alleged violations of Environmental Laws, and neither Landowner nor its predecessors in interest have received any notices of violation, penalties, claims, demand letters, or other notifications relating to a breach of Environmental Laws.
- 13.6 **Remediation.** If, at any time, there occurs, or has occurred, a Release in, on, or about the Easement Area of a Hazardous Substance, Landowner agrees to take or compel responsible third parties to take all steps required under applicable law and necessary to assure its containment and remediation, including any cleanup that may be required (except that the use of institutional controls shall not be allowed without Easement Holder's consent), unless the Release was caused by Easement Holder, in which case Easement Holder shall be responsible for such remediation to the extent the Release was caused by Easement Holder. At its discretion, Easement Holder may assist Landowner in compelling third parties to contain and remediate any such Release.
- 13.7 **Control.** Nothing in this Conservation Easement shall be construed as giving rise, in the absence of a judicial decree, to any right or ability in Easement Holder or any Beneficiary to this Conservation Easement to exercise physical or managerial control over the day-to-day operations of the Easement Area, or any of Landowner's activities on the Easement Area, or otherwise to become an operator with respect to the Easement Area within the meaning of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA").

14. No Hazardous Materials Liability.

- 14.1 Except as disclosed in any Phase 1 report provided to Easement Holder prior to the recordation of this Conservation Easement, Landowner represents and warrants to Easement Holder and Beneficiary 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.

- 14.2 Without limiting any other obligations of Landowner under this Conservation Easement, Landowner hereby releases and agrees to indemnify, protect and hold harmless Easement Holder's Indemnified Parties and Beneficiary's Indemnified Parties (each as defined in Section 18 from and against any and all Claims (as defined in Section 18 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 Easement Holder's Indemnified Parties or Beneficiary's Indemnified Parties with respect to any Hazardous Materials placed, disposed, or released by Easement Holder's Indemnified Parties or Beneficiary's 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 Indemnified Parties by reason of any such Claim, Landowner shall, at the election of and upon written notice from the Beneficiary or Easement Holder Indemnified Party, defend such action or proceeding by counsel reasonably acceptable to the respective Indemnified Party or reimburse the respective Indemnified Party for all charges incurred for services of the U.S. Department of Justice or Thurston County Prosecutors Office 5in defending the action or proceeding.
- 14.3 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 Easement Holder or Beneficiary any of the following:
- 14.3.1 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
- 14.3.2 The obligations or liabilities of a person described in 42 U.S.C. section 9607(a)(3) or (4); or
- 14.3.3 The obligations of a responsible person under any applicable Environmental Laws; or
- 14.3.4 The right or duty to investigate and remediate any Hazardous Materials associated with the Property; or

- 14.3.5 Any control over Landowner's ability to investigate, remove, remediate or otherwise clean up any Hazardous Materials associated with the Property.
- 14.4 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 "HMTA"); the Hazardous Waste Management Act (HWMA) of 1976, as amended (RCW 70.105), 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.
- 14.5 The term "Environmental Laws" includes, without limitation, CERCLA, RCRA, HMTA, , HWMA 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.
- 14.6 Landowner represents, warrants and covenants to Easement Holder and Beneficiary that activities upon and use of the Property by Landowner, its agents, employees, invitees and contractors will comply with all Environmental Laws. Easement Holder represents, warrants and covenants to Landowner and Beneficiary that activities upon and use of the Property by Easement Holder, its agents, employees, invitees and contractors will comply with all Environmental Laws.

15. EXTINGUISHMENT

- 15.1.1 This Conservation Easement constitutes a property right. It is the Parties' intention that the terms and conditions of this Conservation Easement shall be carried out in perpetuity. Liberal construction is expressly required for attaining and maintaining in perpetuity Conservation Values and the Purposes of this Conservation Easement. If circumstances arise in the future that render all of the purposes of this Conservation Easement impossible to accomplish, this Conservation Easement can only be terminated or extinguished, in whole or in part, only by judicial proceedings in a court of competent jurisdiction. In addition, no such extinguishment shall affect the value of Easement Holder's interest in the Easement Area. If the Easement

Area, or any interest therein, is sold, exchanged or taken by power of eminent domain after such extinguishment, the Easement Holder shall be entitled to receive the fair market value of the Conservation Easement at the time of such extinguishment. If such extinguishment occurs with respect to fewer than all acres of the Easement Area, the amounts described below shall be calculated based on the actual number of acres subject to extinguishment.

15.1.2 The amount of the proceeds to which Easement Holder shall be entitled, after the satisfaction of prior claims, from any sale, exchange, or involuntary conversion of all or any portion of the Easement Area subsequent to such termination or extinguishment, shall be determined, unless otherwise provided by Washington law at the time.

15.1.3 In granting this Conservation Easement, Landowner has considered the fact that any use of the Easement Area that is prohibited by this Conservation Easement, or any other use as determined to be inconsistent with the Purpose of this Conservation Easement, may become economically more valuable than permitted uses. It is the intent of both Landowner and Easement Holder that such circumstances shall not justify the modification, termination, or extinguishment of this Conservation Easement. Landowner's inability to carry on any or all of the permitted uses, or the unprofitability of doing so, shall not impair the validity of this Conservation Easement or be considered grounds for its termination or extinguishment. Additionally, Changes in the value or use of the property on lands adjacent to or in the vicinity the easement Area shall not justify the modification, termination, or extinguishment of this Conservation Easement. The Parties Agree that it is their intent to preserve the condition of the Easement Area and each of the Conservation Values protected herein, notwithstanding economic, or other hardship or changes in circumstances or conditions. The Parties recognize that protection of Conservation Values in accordance with the requirements of this Conservation Easement is the intended best and most productive use of the Easement Area.

16. AMENDMENT

16.1 If circumstances arise under which an amendment to or modification of this Conservation Easement would be appropriate, the Parties may jointly amend this Conservation Easement provided that: (1) the Parties first obtain the written consent of the Beneficiary(ies) to the specific proposed language of the amendment; (2) the proposed amendment must be consistent with the perpetual protection and maintenance of all Conservation Values within the Easement Area; (3) the proposed

amendment must be consistent with the text and intent Thurston County HCP Instruments. whether or not the Thurston County HCP Instruments are in effect at the time of the proposed amendment; (4) the Conservation Easement and associated Easement Area must continue to be fully protected in perpetuity under Washington Law, including under RCW 64.04.130, (5) the proposed amendment shall not shorten the perpetual duration of this Conservation Easement, and (6) the amendment, if approved, shall be recorded in the official records of Thurston County, Washington, and any other jurisdiction in which such recording is required.

17. INDEMNIFICATION AND HOLD HARMLESS

17.1 Landowner shall hold harmless, protect, and indemnify Easement Holder and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each a "Easement Holder Indemnified Party" and, collectively, "Easement Holder'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 Easement Area, regardless of cause; (2) the existence, compliance with, or administration of this Conservation Easement and Restrictions; and (3) any financial obligation of any kind for which Landowner has responsibility. Provided, however, that this indemnification, defense and hold harmless covenant shall be inapplicable to the Easement Holder Indemnified Party with respect to any Claim to the extent due solely to the negligence or willful misconduct of that Easement Holder Indemnified Party.

17.2 *[If Easement Holder is not the County, add the following: "Landowner shall hold harmless, protect, and indemnify the County Beneficiary and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each a "County Indemnified Party") 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 Easement Area, regardless of cause; (2) the existence, compliance with, or administration of this Conservation Easement and Restrictions and (3) any financial obligation of any kind for which Landowner has responsibility. Provided, however, that this indemnification, defense and hold harmless covenant shall be inapplicable to the County Indemnified Party with respect to any Claim to the extent due solely to the negligence or willful misconduct of the County Indemnified Party.]

- 17.3 Landowner shall hold harmless, protect, and indemnify Beneficiary and its directors, officers, employees, agents, contractors and representatives, and the heirs, personal representatives, successors and assigns of each of them (each a "Beneficiary Indemnified Party" and, collectively, "Beneficiary 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; (2) the existence, compliance with, or administration of this Conservation Easement and Restrictions; and (3) any financial obligation of any kind for which Landowner has responsibility. Provided, however, that this indemnification, defense and hold harmless covenant shall be inapplicable to a Beneficiary Indemnified Party with respect to any Claim to the extent due solely to the negligence or willful misconduct of that Beneficiary's Indemnified Party. If any action or proceeding is brought against any of USFWS's Indemnified Parties by reason of any Claim to which the indemnification in this Section 17 applies, then Landowner 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.
- 17.4 If any action or proceeding is brought against any Indemnified Parties by reason of any Claim to which the indemnification in this Section applies, then Landowner shall, at the election of and upon written notice from the Indemnified Party, defend such action or proceeding by counsel reasonably acceptable to the Indemnified Party or reimburse the Indemnified Party for all charges incurred for services of the U.S. Department of Justice, Thurston County Prosecutor's Office, or other contracted legal services in defending the action or proceeding.
- 17.5 If and to the extent that this Conservation Easement is subject to RCW 4.24.115, it is agreed that where liability for damages arising out of bodily injury to persons or damage to property is caused by or results from the

concurrent negligence of the Easement Holder or Beneficiary Indemnified Party and Landowner, then Landowner's obligations of indemnity and defense under this Section shall be effective only to the extent of the Landowner's negligence.

18. GENERAL PROVISIONS

- 18.1 **Effective Date.** The Effective Date of this Conservation Easement shall be the date on which the Landowner executed this Conservation Easement.
- 18.2 **Governing Law and Venue.** The laws of the State of Washington and applicable federal law shall govern the interpretation and performance of this Conservation Easement. By executing this Conservation Easement, Landowner acknowledges the jurisdiction of the courts of the State of Washington in this matter. In the event of a lawsuit involving between Landowner and Easement Holder regarding this Conservation Easement the proper venue shall be in Thurston County. Notwithstanding, where the Beneficiary is a party in any judicial proceeding involving this Conservation Easement, venue shall be a federal court with appropriate jurisdiction.
- 18.3 **Liberal Construction.** Any general rule of construction to the contrary notwithstanding, this Conservation Easement shall be liberally construed to facilitate protection and maintenance of of all Conservation Values within the Easement Area in perpetuity. If any provision in this instrument is found to be ambiguous, an interpretation that is inconsistent with the foregoing shall be invalid. Liberal construction is expressly required for purposes of effectuating this Conservation Easement in perpetuity, notwithstanding changed conditions of any kind.
- 18.4 **Severability.**
- 18.4.1 Except as provided in Section 18.4.2 below, if any provision of this Conservation Easement, or the application thereof to any person or circumstance, is found to be invalid or unenforceable by any court of competent jurisdiction or is superseded by state or federal legislation, rules, regulations or decision, the remainder of the provisions of this Conservation Easement, or the application of such provision to persons or circumstances other than those as to which it is found to be invalid or unenforceable, as the case may be, shall not be affected thereby.
- 18.4.2 If any material provision of this Conservation Easement, or the application thereof to any person or circumstance, is found to be invalid or unenforceable by any court of competent jurisdiction or is superseded by

state or federal legislation, rules, regulations or decision, so that the intent of these provisions is frustrated, the parties agree to immediately negotiate a replacement provision to fulfill the intent of the superseded provisions consistent with the Purpose of this Conservation Easement and applicable law.

- 18.5 **Entire Agreement.** This instrument, including all attachments hereto, 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, all of which are merged herein. No alteration or variation of this instrument shall be valid or binding unless contained in an amendment that complies with Section 16.
- 18.6 **No Forfeiture.** Nothing contained herein will result in a forfeiture or reversion of Landowner's title in any respect.
- 18.7 **"Landowner" - "Easement Holder".** The terms "Landowner" and "Easement Holder," wherever used in this instrument, and any pronouns used in the place thereof, shall be held to mean and include, respectively the above-named Landowner and its successors and assigns, and the above-named Easement Holder and its successors and assigns. The term "Landowner" shall also include any party taking ownership of the Easement Area, or any portion thereof, subsequent to the foreclosure of any mortgage or deed of trust.
- 18.8 **Successors.** The covenants, terms, conditions, and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of, the Parties and their respective successors and assigns, and to any party taking ownership of the Easement Area, or any portion thereof, subsequent to the foreclosure of any mortgage or deed of trust, and shall continue as a servitude running in perpetuity.
- 18.9 **Captions.** The captions in this instrument have been inserted solely for convenience and ease of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.
- 18.10 **Counterparts.** The Parties may execute this instrument in two or more counterparts, which shall, in the aggregate, be signed by both 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.

- 18.11 **Authority.** The individuals signing below, if signing on behalf of any entity, represent and warrant that they have the requisite authority to bind the entity on whose behalf they are signing.
- 18.12 The parties to this Agreement agree and acknowledge that they have had their counsel review this agreement, that it was mutually drafted, and in the event of any ambiguity, the ambiguity shall not be construed against either party based on which party drafted the provision in question, nor shall the ambiguous provision be construed against the Beneficiary due to its role in providing technical assistance to Thurston County on the development of the Thurston County HCP.
- 18.13 **No Merger.** The doctrine of merger is not intended to apply 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 Landowner, Easement Holder, and Beneficiary 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 Landowner or its successor in interest, in favor of a third party approved in writing by Beneficiary to ensure that the mitigation obligations required under the Thurston County HCP Instruments, which include conservation of the Property in perpetuity through execution and recordation of a conservation easement or equivalent legal mechanism, and the purposes of RCW 64.04.130, 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 Washington law and otherwise exist in perpetuity.
- 18.14 **Recordation of Conservation Easement.** Easement Holder shall record this instrument, any amendments hereto in a timely fashion in the official records of Thurston County, Washington, and in any other appropriate jurisdictions, and may re-record it at any time as may be required to preserve its rights in this Conservation Easement. Landowner shall pay all recording costs and taxes necessary to record this Conservation Easement in the public record. Landowner will hold Easement Holder harmless from any recording costs or taxes necessary to record this Conservation Easement in the public records. Easement Holder will provide Beneficiary

with a copy of the recorded Conservation Easement within five (5) business days of recordation.

18.15 **ESA Section 4(d) Rule.** The ESA Section 4(d) Rules for Mazama pocket gophers (79 FR 19759; Exhibit E) is being attached to this Conservation Easement for reference purposes. The rule may be utilized in formulating an MP that benefits Mazama pocket gophers located within the Easement Area. The rule should not be read to prevent adoption of conservation measures necessary to protect and promote other Conservation. In the event of repeal of the rule, the MP may be amended, as needed, to ensure that Conservation Values on the site are protected and maintained in the absence of the rule.

19. SCHEDULE OF EXHIBITS

- Exhibit A – Legal Description
- Exhibit B – Site Map
- Exhibit C - Baseline Documentation Report
- Exhibit D - Encumbrances
- Exhibit E - Permitted Exceptions
- Exhibit F - Site Management Plan

IN WITNESS WHEREOF, the undersigned Grantor has executed this instrument this _____ day of _____, 20__.

LANDOWNER

By: _____

Name: _____

Title: _____

Date: _____

ACKNOWLEDGEMENT

STATE of _____

COUNTY of _____

On this _____ day of _____, 20____, personally appeared before me _____ to me known to be the individual(s) described in and who executed the written instrument, and acknowledged that _____ signed and sealed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Notary Signature

Printed Notary Name

NOTARY PUBLIC in and for the State of

My Appointment Expires _____

REMAINDER OF PAGE IS INTENTIONALLY BLANK; ADDITIONAL SIGNATURE PAGES FOLLOW

Thurston County Board of County Commissioners does hereby accept the above Grant Deed of Conservation Easement.

Dated: _____

ATTEST:

BOARD OF COUNTY COMMISSIONERS

Thurston County, Washington

Clerk of the Board

Chair

APPROVED AS TO FORM:

JON TUNHEIM
PROSECUTING ATTORNEY

Vice-Chair

By: _____
Deputy Prosecuting Attorney

Commissioner

REMAINDER OF PAGE IS INTENTIONALLY BLANK; ADDITIONAL SIGNATURE PAGES FOLLOW

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STATE of _____

COUNTY of _____

On this _____ day of _____, 20____, personally appeared before me _____
_____ to me known to be the individual(s) described in and who executed the written instrument, and acknowledged
that _____ signed and sealed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Notary Signature

Printed Notary Name

NOTARY PUBLIC in and for the State of _____,

residing at _____.

My Appointment Expires _____

STATE of _____

COUNTY of _____

On this _____ day of _____, 20____, personally appeared before me _____
_____ to me known to be the individual(s) described in and who executed the written instrument, and acknowledged
that _____ signed and sealed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Notary Signature

Printed Notary Name

NOTARY PUBLIC in and for the State of _____,

residing at _____.

My Appointment Expires _____

STATE of _____

COUNTY of _____

On this _____ day of _____, 20____, personally appeared before me _____
_____ to me known to be the individual(s) described in and who executed the written instrument, and acknowledged
that _____ signed and sealed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.
IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Notary Signature

Printed Notary Name

NOTARY PUBLIC in and for the State of _____,

residing at _____.

My Appointment Expires _____

EXHIBIT A
LEGAL DESCRIPTION AND SKETCH

EXHIBIT B
Site Map

EXHIBIT C
Baseline Report

EXHIBIT D
Site Management Plan

EXHIBIT E
Permitted Exceptions

Relevant text excerpted from *Federal Register Volume 79, No. 68*:

§ 17.40 Special rules—mammals.

(a) Mazama pocket gophers (Olympia, Roy Prairie, Tenino, and Yelm) (*Thomomys mazama pugetensis, glacialis, tumuli, and yelmensis*)

(1) Which populations of the Mazama pocket gopher are covered by this special rule?

This special rule covers the four Thurston/Pierce subspecies of the Mazama pocket gopher (Olympia, Roy Prairie, Tenino, and Yelm) (*Thomomys mazama pugetensis, glacialis, tumuli, and yelmensis*) wherever they occur.

(2) What activities are prohibited?

Except as noted in paragraphs (a)(3) through (7) of this section, all prohibitions of § 17.31 apply to the Olympia, Roy Prairie, Tenino, and Yelm pocket gophers.

(4) What agricultural activities are allowed on non-Federal lands?

Incidental take of the Olympia, Roy Prairie, Tenino, and Yelm pocket gophers will not be a violation of section 9 of the Act, if the incidental take results from agricultural or horticultural (farming) practices implemented on such lands consistent with State laws on non-Federal lands. For the purposes of this special rule, farm means any facility, including land, buildings, watercourses, and appurtenances, used in the commercial production of crops, nursery or orchard stock, the propagation and raising of nursery or orchard stock, livestock or poultry, or livestock or poultry products.

(i) For the purposes of this special rule, an agricultural (farming) practice means a mode of operation on a farm that:

(A) Is or may be used on a farm of a similar nature;

(B) Is a generally accepted, reasonable, and prudent method for the operation of the farm to obtain a profit in money;

(C) Is or may become a generally accepted, reasonable, and prudent method in conjunction with farm use;

(D) Complies with applicable State laws;

(E) Is done in a reasonable and prudent manner.

(ii) Accepted agricultural or horticultural (farming) practices include:

(A) Grazing;

(B) Routine installation, management, and maintenance of stock water facilities such as stock ponds, berms, troughs, and tanks, pipelines and watering systems to maintain water supplies;

(C) Routine maintenance or construction of fencing;

(D) Planting, harvest, fertilization, harrowing, tilling, or rotation of crops (Disturbance to the soils shall not exceed a 12-inch (30.5-cm) depth. All activities that do not disturb the soil surface are also allowed, such as haying, baling, some orchard and berry plant management activities, etc.);

(E) Maintenance of livestock management facilities such as corrals, sheds, and other ranch outbuildings;

(F) Repair and maintenance of unimproved agricultural roads (This exemption does not include improvement, upgrade, or construction of new roads.);

(G) Placement of mineral supplements, plant nutrients, or soil amendments;

(H) Harvest, control, or other management of noxious weeds and invasive plants through mowing, discing, herbicide and fungicide application, fumigation, or burning (Use of herbicides, fungicides, fumigation, and burning must occur in such a way that nontarget plants are avoided to the maximum extent practicable.); and

(I) Deep tillage (usually at depths of 18–36 inches (45.7–91.4 cm), for compaction reduction purposes) occurring between September 1 and February 28, no more often than once in 10 years.

Appendix M: Sample Conservation Land Restoration Schedule and Costs

Activities for Prairie Restoration on Scotch Broom Infested Land, 50 acres

Year	% of land	Activity	Hours, timing	Rate, materials, other
1	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
1	100%	Management Planning	80 hours	\$55 per hour
1	100%	Public outreach & communication	32 hours	\$35 per hour
1	100%	Mowing: 6' Bush Hog w/ JD 4000 tractor	5-8 days, \$28 per hour labor	JD 4000 series (100 to 155 hp) tractor, 6' bush hog, 6-10 acres per day
1	50%	Prescribed burning in fall		\$6000 per burn day; pre-burn fireline preparation included
1	50%	Weed control, burned land	8 hours @ \$28 per hour	Glyphosate treatment after green up
1	50%	Weed control, unburned land	Spot spray 40 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
1	50%	Seeding: Native fescue	Truax drop seeder, 6' width	Approximately \$100 per acre for native fescue seed, 4-8 lb per acre
Year	% of land	Activity	Hours, timing	Rate, materials, other
2	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
2	100%	Planning/Reporting	32 hours	\$55 per hour
2	100%	Public outreach & communication	32 hours	\$35 per hour
2	50%	Prescribed burning	Burn each parcel every 3 years	\$6000 per burn day; pre-burn fireline preparation included
2	50%	Weed control, burned land	7 hours @ \$28 per hour	Glyphosate treatment after green up
2	50%	Weed control, unburned land	Spot spray 7 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
2	50%	Seeding:	Truax drop seeder, 6' width	Approximately \$100 per acre for native fescue seed, 4-8 lb per acre
2	50%	Planting		Approx. 4000 plugs per 25-acre parcel @ \$1 per plug including labor
2	100%	Grass herbicide	13 hours @ \$28 per hour in spring	Envoy
2	100%	Invasive weed control	22 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
Year	% of land	Activity	Hours, timing	Rate, materials, other
3	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
3	100%	Planning/Reporting	32 hours	\$55 per hour
3	100%	Full Protocol Monitoring	80 hours	\$35 per hour
3	100%	Public outreach & communication	32 hours	\$35 per hour
3	100%	Weed control	Spot spray 22 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
3	100%	Grass herbicide	13 hours @ \$28 per hour in spring	Envoy
3	100%	Invasive weed control	22 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
Year	% of land	Activity	Hours, timing	Rate, materials, other
4	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
4	100%	Planning/Reporting & Adaptive Mgmt	48 hours	\$55 per hour
4	100%	Public outreach & communication	32 hours	\$35 per hour
4	50%	Prescribed burning	Burn each parcel every 3 years	\$6000 per burn day; pre-burn fireline preparation included
4	50%	Post burn activities	7 hours @ \$28 per hour	Glyphosate treatment after green up
4	50%	Weed control, unburned land	Spot spray 10 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
4	50%	Seeding:	Truax drop seeder, 6' width	Approximately \$100 per acre for native fescue seed, 4-8 lb per acre
4	50%	Planting		Approx. 4000 plugs per 25-acre parcel @ \$1 per plug including labor
4	100%	Grass herbicide	13 hours @ \$28 per hour in spring	Envoy
4	100%	Invasive weed control	22 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
Year	% of land	Activity	Hours, timing	Rate, materials, other
5	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
5	100%	Planning/Reporting	32 hours	\$55 per hour
5	100%	Public outreach & communication	32 hours	\$35 per hour
5	50%	Prescribed burning	Burn each parcel every 3 years	\$6000 per burn day; pre-burn fireline preparation included
5	50%	Post burn activities	7 hours @ \$28 per hour	Glyphosate treatment after green up
5	50%	Weed control, unburned land	Spot spray 11 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
5	50%	Seeding:	Truax drop seeder, 6' width	Approximately \$100 per acre for native fescue seed, 4-8 lb per acre
5	50%	Planting		Approx. 4000 plugs per 25-acre parcel @ \$1 per plug including labor
5	100%	Grass herbicide	13 hours @ \$28 per hour in spring	Envoy
5	100%	Invasive weed control	22 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
Year	% of land	Activity	Hours, timing	Rate, materials, other
6	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
6	100%	Planning/Reporting	32 hours	\$55 per hour
6	100%	Full Protocol Monitoring	80 hours	\$35 per hour

6	100%	Public outreach & communication	32 hours	\$35 per hour
6	50%	Seeding:	Truax drop seeder, 6' width	Approximately \$100 per acre for native fescue seed, 4-8 lb per acre
6	50%	Planting		Approx. 4000 plugs per 25-acre parcel @ \$1 per plug including labor
6	100%	Weed control	Spot spray 22 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
6	100%	Grass herbicide	13 hours @ \$28 per hour in spring	Envoy
6	100%	Invasive weed control	22 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
Year	% of land	Activity	Hours, timing	Rate, materials, other
7	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
7	100%	Planning/Reporting & Adaptive Mgmt	48 hours	\$55 per hour
7	100%	Public outreach & communication	32 hours	\$35 per hour
7	50%	Prescribed burning	Burn each parcel every 3 years	\$6000 per burn day; pre-burn fireline preparation included
7	50%	Post burn activities	7 hours @ \$28 per hour	Glyphosate treatment after green up
7	50%	Weed control, unburned land	Spot spray 7 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
7	50%	Seeding:	Truax drop seeder, 6' width	Native plant seed (forbs) @ \$750 per acre
7	50%	Planting		Approx. 4000 plugs per 25-acre parcel @ \$1 per plug including labor
7	100%	Invasive weed control	22 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
Year	% of land	Activity	Hours, timing	Rate, materials, other
8	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
8	100%	Planning/Reporting	32 hours	\$55 per hour
8	100%	Public outreach & communication	32 hours	\$35 per hour
8	50%	Prescribed burning	Burn each parcel every 3 years	\$6000 per burn day; pre-burn fireline preparation included
8	50%	Post burn activities	7 hours @ \$28 per hour	Glyphosate treatment after green up
8	50%	Weed control, unburned land	Spot spray 7 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
8	50%	Seeding:	Truax drop seeder, 6' width	Native plant seed (forbs) @ \$750 per acre
8	50%	Planting		Approx. 4000 plugs per 25-acre parcel @ \$1 per plug including labor
8	100%	Invasive weed control	16 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
Year	% of land	Activity	Hours, timing	Rate, materials, other
9	100%	Scouting Assessment	32 hours	\$35 per hour, including flagging, GIS work (one day, 4x per year)
9	100%	Planning/Reporting	32 hours	\$55 per hour
9	100%	Full Protocol Monitoring	80 hours	\$35 per hour
9	100%	Public outreach & communication	32 hours	\$35 per hour
9	100%	Weed control	Spot spray 11 hours @ \$28 per hour	Triclopyr 4 @ 2%, 2 person with backpack sprayers, 1 person on ATV
9	100%	Invasive weed control	11 hours @ \$28 per hour	Use boom sprayer (8' boom) if more than 25% needs spraying
9	50%	Seeding:	Truax drop seeder, 6' width	Approximately \$100 per acre for native fescue seed, 4-8 lb per acre
9	50%	Planting		Approx. 4000 plugs per 25-acre parcel @ \$1 per plug including labor