U.S. Fish and Wildlife Service

Finding of No Significant Impact

for the Issuance of a Short-Term Eagle Take Permit for California Flats Solar Project

California

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Introduction

The U.S. Fish and Wildlife Service (Service) received an application from California Flats Solar, LLC (Applicant), an affiliate of Capital Dynamics, Inc., requesting eagle take coverage under the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. §§ 668–668d and 50 Code of Federal Regulations [CFR] § 22.26) for incidental disturbance take of eagles at the California Flats Solar Project (Project). The Project is a 282.5-megawatt alternating current photovoltaic solar power facility on approximately 3,000 acres in unincorporated southeastern Monterey County, California that recently began full commercial operations in March 2019. The Applicant requested a single season incidental eagle take permit (permit) for the disturbance and loss of breeding productivity of two golden eagle (*Aquila chrysaetos*) pairs during the 2021 eagle breeding due to construction of a battery energy storage system modification to the existing Project (Project modification). Issuance of a permit by the Service for take that is incidental to otherwise lawful activities under the Eagle Act constitutes a discretionary Federal action that is subject to the National Environmental Policy Act (NEPA; 42 United States Code [U.S.C.] §§ 4321–4347).

In accordance with the NEPA, we prepared an Environmental Assessment (EA) analyzing the environmental consequences of issuing a permit for the disturbance take of golden eagles associated with the Project modification, as well as alternatives to this proposed action (Attachment 1). This EA assists the Service in ensuring compliance with the NEPA and in making a determination as to whether any "significant" impacts to the environment not previously analyzed under the Service's Programmatic Environmental Impact Statement for the Eagle Rule Revision, December 2016 (PEIS; USFWS 2016) could result from the analyzed actions, which would require preparation of an Environmental Impact Statement (EIS). "Significance" under NEPA is addressed by regulation 40 CFR § 1508.27, and requires short- and long-term consideration of both the context of a proposal and its intensity.

The Service's purpose in considering the proposed action of issuing an eagle incidental take permit is to fulfill our authority under the Eagle Act (16 U.S.C. §§ 668–668e) and its regulations (50 CFR § 22). Applicants whose otherwise lawful activities may result in take of eagles can apply for incidental take permits so that their projects may proceed without potential violations of the Eagle Act. The Service may issue permits for eagle take that is associated with, but not the purpose of, an activity. Such permits can be issued by the Service when the take that is authorized is compatible with the Eagle Act preservation standard; it is necessary to protect an interest in a particular locality; and it is associated with, but not the purpose of, the activity; and it cannot be practicably avoided (50 CFR § 22 and 81 Federal Register [FR] 91494).

The need for this federal action is a decision on an eagle incidental take permit application from California Flats Solar, LLC that is in compliance with all applicable regulatory requirements set forth under the Eagle Act in 50 CFR § 22.

Proposed Action and Alternatives Considered

In the EA, the Service fully analyzed three potential courses of action, summarized below, to respond to the Applicant's request for an incidental eagle take permit.

Proposed Action

The Service proposed to issue a single season incidental eagle take permit, with associated conditions, to California Flats Solar, LLC for disturbance to, and loss of breeding productivity of, two golden eagle breeding pairs in the vicinity of California Flats Solar Project during the 2021 eagle breeding season ("Proposed Action"). This loss of breeding productivity would equate to 1.18 young fledged estimated lost from the eagle population. The permit would require implementation of measures to avoid and minimize eagle take, monitoring of eagles, and compensatory mitigation to fully offset the estimated take (Attachment 1).

Alternative 1: No Action

Under the No-Action Alternative, the Service would take no further action on California Flats Solar, LLC's eagle take permit application.

Alternative 2: Issue permit for the disturbance take of a single golden eagle breeding pair

Under this alternative, the Service would issue an incidental eagle take permit for only a single golden eagle breeding pair. The permit would be as described in the Proposed Action, with all the same required conservation measures and mitigation, except under this alternative, we would only authorize, and the Applicant would only be required to mitigate for, disturbance take and loss of productivity of one golden eagle breeding pair (0.59 young fledged assumed lost from the golden eagle population). Under this alternative, if a new nest of a second golden eagle pair was to be built during the 2021 eagle breeding season, disturbance take and loss of productivity of this second golden eagle pair would not be authorized. Therefore, the Applicant would need to implement measures, such as halting construction activities, to avoid disturbance to the second pair of eagles utilizing this new nest. In all other ways, this alternative is the same as the Proposed Action.

Public Scoping and Tribal Coordination

Scoping regarding issuance of eagle take permits was performed for the PEIS (USFWS 2016a). In additional, we provided opportunity for public comment in September 2019 for a 30-year eagle take permit associated with the operation of this same Project. The Project and the previously issued eagle take permits associated with the Project have garnered minimal public interest and no controversy. The draft EA for the 30-year permit issued to the Applicant in early

2020 received no public comments. The proposed modifications to the Project that prompted the permit request currently under consideration are minor and effects to eagles from these modifications would be similar to those previously analyzed. Therefore, we decided it was not necessary to solicit further public comments on the similar analyses detailed in this EA.

To notify Tribes regarding potential issuance of an eagle take permit, the Service sent letters to 17 federally-recognized tribal governments located within 109 miles (the natal dispersal distance of golden eagles thought to adequately define the local area population of the eagles) of the Project informing them of the received permit application and preparation of this EA. The Santa Ynez Band of Chumash Indians called the Service to inform us they currently had no comment on this permit application and EA, but would like to remain informed of future actions. The Buena Vista Rancheria of Me-Wuk Indians of California responded with a letter dated September 8, 2020 requesting additional information on the permit application and take mitigation. The Service responded with further details explaining the estimated take, measures to minimize the take, and mitigation that would be required if the Permit was issued. The Service received no response from any of the other Tribes contacted.

Selected Alternative

Based on review of the analyses detailed in the EA, the Service selected the Proposed Action of issuing a single season incidental eagle take permit to California Flats Solar, LLC for disturbance and loss of productivity of two golden eagle pairs during the 2021 eagle breeding season equating to 1.18 young fledged estimated lost from the eagle population, with the requirement to implement avoidance and minimization measures, conduct eagle monitoring, and provide compensatory mitigation to fully offset the estimated take.

Take of golden eagles is predicted to occur under all alternatives, however the Proposed Action incorporates additional measures to avoid and minimize take of eagles, fully offsets the take with required compensatory mitigation, and includes eagle productivity monitoring, which would not occur under the No-Action Alternative.

The Service agrees with the Applicant that there is potential a second golden eagle pair, in addition to the pair currently occupying known nest GE20A, could construct a new nest within one mile of Project modification activities during the 2021 eagle breeding season (see Attachment 1, EA, "Environmental Consequences" section for further details). The Service agrees there is reasonable enough likelihood that this could occur to warrant disturbance take coverage of a second potential eagle pair, as described in the Proposed Action. If a new nest of a second golden eagle pair was to be built during the 2021 eagle breeding season, disturbance take and loss of productivity of this second golden eagle pair would be covered under the Proposed Action, but would not be covered under Alternative 2.

The Proposed Action is consistent with the purpose and need for this Federal action and is in compliance with all statutory (16 U.S.C. §§ 668) and regulatory requirements (50 CFR § 22.26 and 50 CFR § 13.21), including the criteria codified for permit issuance (50 CFR § 22.26(f)).

Significance Criteria

Regulations of the NEPA define significance criteria for consideration by federal agencies (40 CFR § 1508.27). Below we examine these criteria for the selected Proposed Action.

Context

NEPA requires consideration of the significance of an action in several contexts, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant in accordance with 40 CFR 1508.27(a). For purposes of analyzing the Selected Alternative, the appropriate context for potential impacts associated with the Proposed Action is local and regional, because the Proposed Action does not affect statewide or national resource values. The context of the Selected Alternative points to no significant environmental impact considering the following (as discussed in the EA):

- The Applicant will offset golden eagle take through compensatory mitigation. This will ensure that the impacts of issuing an eagle take permit on the local and regional golden eagle populations will be less than significant.
- Bald eagles and migratory birds may benefit from reduced electrocution risk due to the power pole retrofitting to be done for the eagle take permit.
- Authorizing incidental eagle take is not expected to have effects to species protected by the Endangered Species Act (ESA) at the Project facility. As described in the EA, the Service will evaluate the proposed mitigation site once the location is selected. The Service anticipates that adverse effects to species listed under the ESA would be avoidable, however if there is potential for impacts to species listed under the ESA, we would conduct an additional NEPA analysis.

Intensity

The term "intensity" refers to the severity of a proposed action's impact on the environment. In determining the intensity of an impact, the NEPA regulations direct federal agencies to consider ten specific factors, each of which is discussed below in relation to the Selected Alternative for the Project.

1)Impacts can be both beneficial and adverse and a significant effect may exist regardless of the perceived balance of effects.

While consideration of the intensity of Project impacts must include analysis of both beneficial and adverse effects, only a significant adverse effect triggers the need to prepare an EIS (40 CFR 1508.27). The potential beneficial effects and adverse impacts of the Proposed Action are discussed briefly below.

Beneficial Effects. As described in the EA, the Proposed Action includes power pole retrofitting as mitigation for take of eagles. Such retrofits are anticipated to protect eagles from electrocution. As the number of retrofits to be done for mitigation is calculated at a 1.2 to 1 ratio, these avoided eagle electrocutions will more than offset Project-related take of eagles, thereby benefiting the eagle population as a whole. Pole retrofits are also expected to benefit other raptors that may be susceptible to electrocution. Required monitoring of eagle territories and nest productivity will also be beneficial as it will support the Service's understanding of impacts from construction in the vicinity of nesting golden eagles. Furthermore, issuance of an incidental eagle take permit will allow the Applicant to operate in compliance with the Eagle Act.

Adverse Effects. As described in the EA, under the Proposed Action the Applicant would implement conservation measures to avoid or minimize the risk to eagles. However, loss of breeding productivity of two golden eagle pairs in the vicinity of the Project modification may occur due to disturbance from construction of the Project modification. Under the Proposed Action, these adverse impacts would be fully mitigated.

2) The degree to which the selected alternative will affect public health or safety.

The Proposed Action would include mitigating eagle take by retrofitting power poles to prevent eagle electrocutions. As eagle and other raptor electrocutions on power poles can start fires, decreasing eagle and other raptor electrocutions could benefit human safety by reducing fire risk.

3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wilderness, wild and scenic rivers, or ecologically critical areas.

The Service only evaluated whether or not to issue an incidental eagle take permit to the Applicant at a facility that was previously built and is currently operational, with the proposed Project modification located entirely within the original solar development project area. Therefore only potential impacts to eagles and effects of eagle take on cultural practices were considered in the EA analyses. Thus, the Service concluded the Proposed Action of issuing an eagle take permit to an existing operational facility where proposed modifications are only within previously evaluated areas would not impact unique characteristics of the geographic area.

4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

No effects of the Proposed Action were identified as highly controversial. As a factor for determining within the meaning of 40 CFR 1508.27(b)(4) whether to prepare a detailed EIS, controversy is not equated with the existence of opposition to a use. The NEPA implementation regulations (43 CFR 46.30) define controversial as "circumstances where a substantial dispute exists as to the environmental consequences of the proposed action

and does not refer to the existence of opposition to a proposed action, the effect of which is relatively undisputed."

5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The analyses in the Service's PEIS on issuing incidental eagle take permits provides information and greater certainty in understanding the risks and effects to eagles of issuing these incidental eagle take permits. Furthermore, as summarized in the EA, golden eagle use of, and nesting in, the Project area was assessed prior to construction of the Project, with continued nest surveying and monitoring (to various degrees) conducted annually from 2013 to 2020. This surveying and monitoring provides certainty in our assessment of the risk to eagles from the Project. Monitoring required under the Proposed Action would also increase certainty in the risks to eagles. There are no predicted effects of the Selected Alternative on the human environment that are considered to be highly uncertain or involve unique or unknown risks.

6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

Issuance of an eagle take permit for the Project does not set precedent for, or automatically apply, to other eagle take permit applications the Service is reviewing or could review in the future. Each permit request will be evaluated on a case-by-case basis. Therefore, the Proposed Action does not establish precedents for future actions or represent a decision in principle about a future action. Moreover, this Project will not limit the Service's discretion when processing future eagle take permit applications under the Eagle Act's permitting regulations.

7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts--which include connected actions regardless of land ownership.

The EA analyzes cumulative effects on golden eagles as required by NEPA (40 CFR 1508.8) and the Eagle Act's permitting regulations (50 CFR 22). Under 50 CFR 22.26, when reviewing a permit application, the Service is required to evaluate and consider effects of take permits on eagle populations at three scales: (1) the eagle management unit/bird conservation region, (2) local area, and (3) Project area. Our evaluation also considers cumulative effects. We incorporated data provided by the Applicant, our own data on permitted take and other documented eagle mortalities, and additional available information on population-limiting effects, in determining cumulative impacts to golden eagles. Although the Service did find evidence for the potential for minimal cumulative effects of eagle take at the Project and local scales, in the Proposed Action these potential cumulative effects are addressed by compensatory mitigation paid at a higher ratio than required to offset the estimated take. The Service will allow the Applicant to apply past unneeded mitigation from a previous permit that was paid at a 2:1 mitigation ratio to the take to be authorized under the currently requested permit. The mitigation ratio required by regulation (81 FR 91494) to offset authorized incidental eagle take is 1.2 to 1.

Mitigation paid at a 2:1 ratio provides additional benefits to eagles above and beyond that needed to fully offset the estimated take, so will also offset any potential effects from cumulative sources. Therefore, there are no significant adverse cumulative effects contributed under the Proposed Action.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

Eagles and their feathers are revered and considered sacred in many Native American traditions. Operation of the Project, including the take of eagles, is not expected to interfere with cultural practices and ceremonies related to eagles or to affect Native Americans' ability to obtain or use eagle feathers. Moreover, the Service requests any eagle feathers that are found be sent to our repository and, if in good condition, will be made available for these practices. Therefore, we do not anticipate any adverse effect on cultural practices.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973, or the degree to which the action may adversely affect a species proposed to be listed as endangered or threatened or proposed critical habitat.

Issuance of an eagle take permit will not adversely affect an endangered or threatened species or its habitat. While retrofitting power poles will likely benefit other raptor species, none of the raptor species are protected under the ESA. Because the Project has already been built and is operational, effects to species listed under ESA have been previously analyzed and conservation measures determined and implemented. Species listed under the ESA are identified and described, along with conservation strategies, in the Project's Low-Effect Habitat Conservation Plan (Althouse and Meade, Inc. 2016) and ESA Section 10(a)(1)(b) incidental take permit, and in the Biological Opinion provided by the Service to the U.S. Army Corps of Engineers on November 19, 2015 for the Army Corps of Engineers' proposal to issue a permit pursuant to section 404 of the Clean Water Act of 1962, as amended (33 U.S.C. 1344 et seq.) for the Project. As Project modifications will only occur in areas within the original solar development project area, the Service determined that Project modifications would have no effects to ESA-listed species beyond those previously analyzed for the Project. The Applicant will continue to implement all conservation measures previously outlined for the Project.

The Service's decision regarding the requested eagle take permit will not alter the physical footprint of the Project or Project modification, and therefore will not alter the Project impacts to federally threatened and endangered species in the Project area, under the Proposed Action. However required compensatory mitigation in the form of retrofitting electric power poles to offset authorized take of golden eagles under the requested eagle take permit has the potential to cause effects to ESA-listed species. As described in the EA, once the location of the mitigation is determined, the Service will evaluate the site for potential effects to species listed under the ESA. The Service anticipates that adverse effects to species listed under the ESA would be avoidable, however if there is

potential for impacts to ESA-listed species, the Service would prepare additional NEPA documentation to supplement the EA.

10. Whether the action threatens a violation of federal, state, or local law requirements imposed for the protection of the environment.

The Proposed Action, issuance of an incidental take permit under the Eagle Act, will not violate any federal, state, or local law.

Finding of No Significant Impact

The Service's Migratory Bird Program concludes from the analysis conducted in the EA and the information provided above that the Proposed Action would not trigger significant impacts on the environment based on criteria established by regulations, policy, and analysis. Analyses of impacts were conducted at the Project, local, and Regional scales, and direct, indirect, and cumulative effects were assessed. The selected Proposed Action, unlike the No Action Alternative and Alternative 2, is unlikely to have significant impacts on eagles because all reasonably foreseeable take of eagles is mitigated, cumulative effects are addressed, and the Proposed Action meets the Eagle Act's preservation standard (16 U.S.C. §§ 668a, 50 CFR § 22.3) and all regulatory requirements (50 CFR § 22.26).

Based on the findings discussed herein, we conclude that the Proposed Action is not a major Federal action and will result in no significant impacts to the environment, individually or cumulatively with other actions in the general area. This determination is based on the rationale that the significance criteria, as defined by the CEQ (40 CFR § 1508.27) have not been met. "Significantly" as used in NEPA requires considerations of both context and intensity. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR § 1508.27. Therefore, preparation of an EIS to further analyze possible effects is not required pursuant to Section 102(2)(c) of NEPA, and our environmental review under NEPA is concluded with this finding of no significant impact.

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Date: 2020.09.28 09:21:55 -07'00'

Chief, Migratory Birds Program
California-Great Basin Region
U.S. Fish and Wildlife Service

References

16 United States Code (U.S.C.) § 668. Title 16 - Conservation; Chapter 5a - Protection and Conservation of Wildlife; Subchapter II - Protection of Bald and Golden Eagles; Section (§) 668 - Bald and Golden Eagles. Available online: http://uscode.house.gov

33 United States Code (U.S.C.) § 1344. Title 33 – Navigation and Navigable Waters; Chapter 26 – Water Pollution Prevention and Control; Subchapter IV – Permits and Licenses; Section (§) 1344 – Permits for dredged or fill material. Available online: http://uscode.house.gov

40 Code of Federal Regulations (CFR) § 1508. Title 40 - Protection of Environment; Chapter V - Council on Environmental Quality; Part 1508 - Terminology and Index; Part 1508 - Definitions. Available online: https://www.ecfr.gov

42 United States Code (U.S.C.) §§ 4321-4347. Title 42 - the Public Health and Welfare; Chapter 55 - National Environmental Policy; Subchapters I (Policies and Goals) and II (Council on Environmental Quality); Sections (§§) 4321-4347. Available online: http://uscode.house.gov

43 Code of Federal Regulations (CFR) § 46. Title 43 - Public Lands: Interior; Part 46 - Implementation of the National Environmental Policy Act of 1969. 43 CFR 46. [73 Federal Register (FR) 61314, October 15, 2008, unless otherwise noted.]. Available online: http://www.gpo.gov/fdsys/pkg/ CFR-2011-title43-vol1/pdf/CFR-2011-title43-vol1-part46.pdf

50 Code of Federal Regulations (CFR) § 13.21. Title 50 - Wildlife and Fisheries; Chapter I - United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 13 - General Permit Procedures; Section (§) 13.21 – Issuance of permits. Available online: https://www.ecfr.gov

50 Code of Federal Regulations (CFR) § 22. Title 50 - Wildlife and Fisheries; Chapter I - United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 22 - Eagle Permits. Available online: https://www.ecfr.gov

81 Federal Register (FR) 91494. 2016. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests. Vol. 81, No. 242. December 16, 2016. pp 91494-91554. Available online: https://www.federalregister.gov/

Althouse and Meade, Inc. 2016. Low-Effect Habitat Conservation Plan for Issuance of an Incidental Take Permit Under Section 10(a)(1)(B) of the Endangered Species Act for California Flats Solar Project Operations and Maintenance Activities. Prepared by Althouse and Meade, Inc. Biological and Environmental Services. Prepared for California Flats Solar, LLC, San Francisco, CA. August 31, 2016.

US Fish and Wildlife Service (USFWS). 2016. Programmatic Environmental Impact Statement for the Eagle Rule Revision. December 2016. Available online: https://www.fws.gov/migratorybirds/pdf/management/FINAL-PEIS-Permits-to-Incidentally-Take-Eagles.pdf

Attachment 1. Final Environmental Assessment for the Issuance of a Short-Term Eagle Take Permit for California Flats Solar Project

U.S. Fish and Wildlife Service

Final Environmental Assessment

for the Issuance of a Short-Term Eagle Take Permit for California Flats Solar Project

California

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Cost Estimate of Completion: $4,600

September 2020

Contents

Abbreviations

Applicant	California Flats Solar, LLC
BBCS	Bird and Bat Conservation Strategy
CFR	Code of Federal Regulations
EA	Environmental Assessment
Eagle Act	Bald and Golden Eagle Protection Act
EMP	Eagle Management Plan
EMU	Eagle Management Unit
ESA	Endangered Species Act
FR	Federal Register
LAP	Local Area Population
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
PEIS	Programmatic Environmental Impact Statement for the Eagle Rule Revision
Permit	Applicant requested incidental eagle take permit
Project	California Flats Solar Project
Project modification	Battery Energy Storage System addition to the California Flats Solar Project
REA	Resource Equivalency Analysis
Service	United States Fish and Wildlife Service
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service

Introduction

This Environmental Assessment (EA) analyzes the environmental consequences, pursuant to the National Environmental Policy Act (NEPA; 42 United States Code [U.S.C.] §§ 4321–4347), of the U.S. Fish and Wildlife Service (Service) issuing an incidental eagle take permit (Permit) for the take of golden eagles (*Aquila chrysaetos*) associated with the California Flats Solar Project (Project). The applicant for the Permit, California Flats Solar, LLC (Applicant), an affiliate of Capital Dynamics, Inc., is requesting eagle take coverage under the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. §§ 668–668d and 50 Code of Federal Regulations [CFR] § 22.26) for take by disturbance of breeding golden eagles during the 2021 eagle breeding season from construction of a battery energy storage system modification to the existing Project (Project modification). Issuance of an eagle incidental take permit by the Service for take that is incidental to otherwise lawful activities under the Eagle Act constitutes a discretionary Federal action that is subject to the NEPA. This EA assists the Service in ensuring compliance with the NEPA and in making a determination as to whether any "significant" impacts to the environment not previously analyzed under the Service's Programmatic Environmental Impact Statement for the Eagle Rule Revision, December 2016 (PEIS; USFWS 2016a) could result from the analyzed actions, which would require preparation of an Environmental Impact Statement. This EA evaluates the effects of the Service's proposed action to issue an eagle incidental take permit to the Applicant, as well as alternatives to this action.

The Eagle Act authorizes the Service to issue eagle take permits only when the take is compatible with the preservation of each eagle species (known as the Eagle Act's "preservation standard"), which is defined in regulations as "consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units and the persistence of local populations throughout the geographic range of each species" (50 CFR § 22.3).

The Applicant has applied for a single season incidental eagle take permit for take by disturbance and loss of breeding productivity of two golden eagle breeding pairs during the 2021 eagle breeding season resulting from Project modification activities.

This EA evaluates whether issuance of the Permit will have significant impacts on the existing human environment, beyond those previously analyzed in the PEIS. "Significance" under NEPA is addressed by regulation 40 CFR § 1508.27, and requires short- and long-term consideration of both the context of a proposal and its intensity.

This proposal conforms with, and carries out, the management approach analyzed in, and adopted subsequent to, the Service's PEIS. Accordingly, this EA tiers from the PEIS. Project-specific information not considered in the PEIS will be considered in this EA as described below.

Purpose and Need

The Service's purpose in considering the proposed action is to fulfill our authority under the Eagle Act (16 U.S.C. §§ 668–668e) and its regulations (50 CFR § 22). Applicants whose otherwise lawful activities may result in take of eagles can apply for eagle incidental take permits so that their projects may proceed without potential violations of the Eagle Act. The Service may issue eagle take permits for eagle take that is associated with, but not the purpose of, an activity. Such permits can be issued by the Service when the take that is authorized is compatible with the Eagle Act preservation standard; it is necessary to protect an interest in a particular locality; and it is associated with, but not the purpose of, the activity; and it cannot be practicably avoided (50 CFR § 22 and 81 Federal Register [FR] 91494).

The need for this federal action is a decision on an eagle incidental take permit application from California Flats Solar, LLC that is in compliance with all applicable regulatory requirements set forth under the Eagle Act in 50 CFR § 22.

Authorities

Service authorities are codified under multiple statutes that address management and conservation of natural resources from many perspectives, including, but not limited to the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. This analysis is based on the Eagle Act (16 U.S.C. §§ 668–668e) and its regulations (50 CFR § 22). The PEIS has a full list of authorities that apply to this action (USFWS 2016a: Section 1.6, pages 7-12), which are incorporated by reference here.

Background

The Project is an existing 282.5-megawatt alternating current photovoltaic solar power facility on approximately 3,000 acres in unincorporated southeastern Monterey County, California, with road access to the Project through the northeastern corner of San Luis Obispo County north of State Route 41 (Figure 1). The Project lies within the southern terminus of the Diablo mountain range with Cholame Valley to the west. The town of Parkfield and the city of Paso Robles lie approximately seven miles to the northwest and 25 miles to the southwest, respectively, from the project area. The region is sparsely populated and dominated by agriculture and ranching activities. The Project is located within a large cattle ranch, known as the "Jack Ranch", at elevations around 1,700 feet, with land use in the project footprint historically consisting of cattle grazing. The Project experiences substantial year-round sunlight, is located along an existing transmission line, and is part of a Competitive Renewable Energy Zone under California's Renewable Energy Transmission Initiative (County of Monterey 2014).

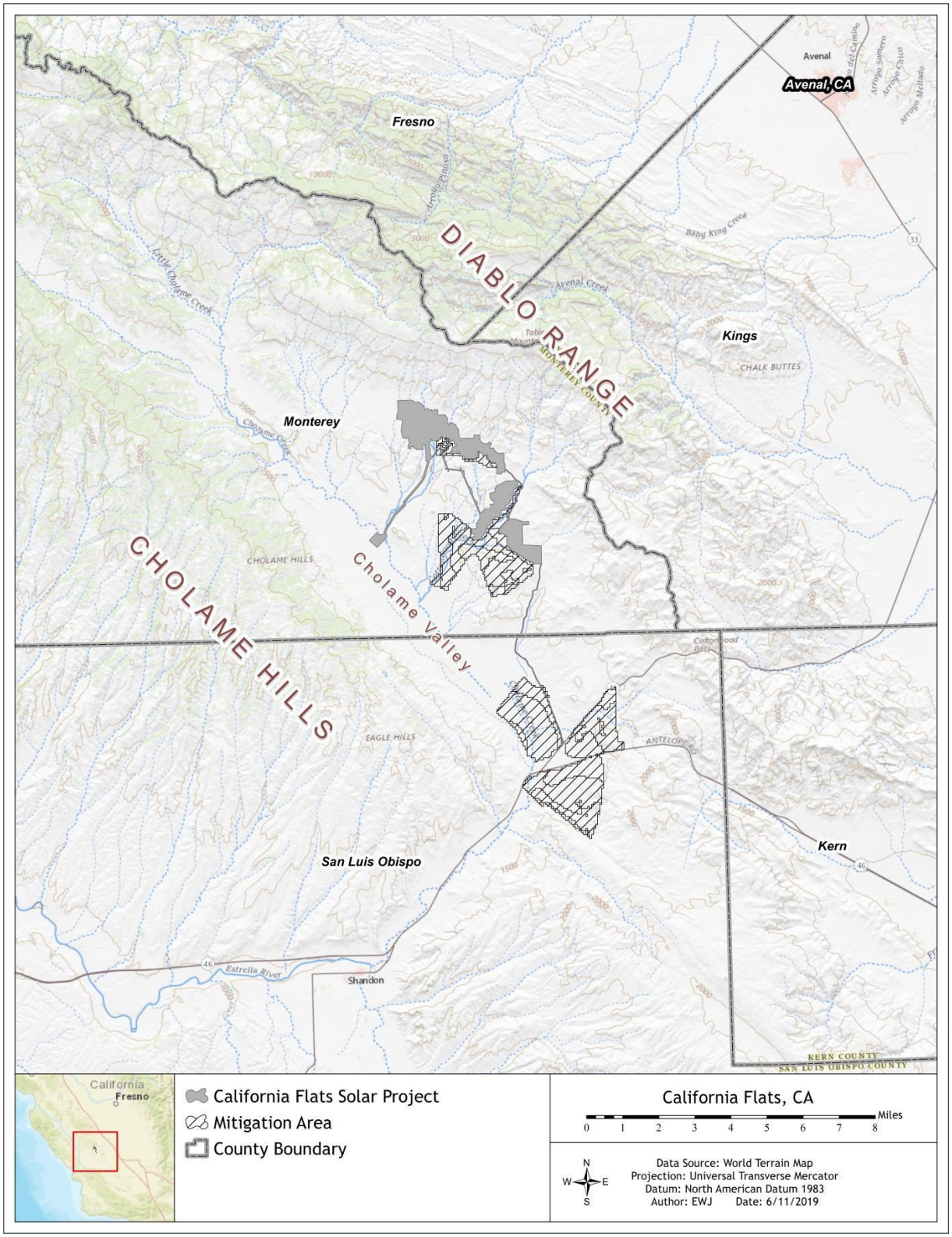

Figure 1. Vicinity map of the California Flats Solar Project.

The first phase of the Project was completed and began commercial operations in August 2017, and the second, and final, phase of the project began commercial operations in March 2019. The Applicant will be adding a Battery Energy Storage System to the Project (Project modification), with construction of the modification scheduled to commence in November 2020 and be completed in May 2021. The Project modification will fall entirely within the original solar development project area of the Project (Figure 2).

The Project modification will include installation of up to 85 Tesla MegaPack battery units installed on 75-foot-long by 12-foot-wide concrete pads. Minor surface excavation of approximately 2.3 acres with an approximate depth of up to six feet would be required for the establishment of the concrete pads that would house the battery units. Additional substation infrastructure will also need to be added adjacent to the existing northern substation, encompassing an area of approximately 104 x 106 feet with structures ranging from approximately 20-90 feet in height. Approximately 1, 650 feet of overhead line comprised of seven steel poles will be installed between the battery units and the new substation. Modifications will also include additional fencing and security improvements and minor improvements to an existing internal access road.

The landscape in the Project vicinity is dominated by gently rolling terrain and grasslands, surrounded by woodlands and shrublands where various trees, primarily oak trees, provide nest substrate suited to eagles and other raptors. Eagle use of the Project area was assessed prior to Project construction. Eagles were found to occupy the area year round, with confirmed nesting in multiple territories around the Project. Eagle nest surveys and monitoring has been conducted annually from 2013 to the present, however, monitoring effort and methods have varied. Information on eagles in the Project vicinity is elaborated on in the Affected Environment section below.

The Applicant has applied for multiple incidental eagle take permits previously for different phases of the Project. During construction of the Project, the Applicant applied for, and the Service issued, a one-year permit for disturbance to nest GE19A in 2017 and one-year permit for disturbance to nest GE13A in 2018, as construction activities occurred less than 1/2 mile from the nests in those respective years. The Applicant also applied for a 30-year incidental eagle take permit for reoccurring loss of annual productivity from two golden eagle territories in the vicinity of the Project due to disturbance from operational and maintenance activities at the facility and loss of habitat from land development by the Project. The application for the 30-year eagle permit included an Eagle Management Plan (EMP) for the Project that detailed efforts to avoid or minimize impacts to golden eagles from the Project. The Service issued this 30-year permit in early 2020. The take authorized under these three permits was fully offset by compensatory mitigation. None of these previously issued permits addressed impacts associated with installation of a battery facility.

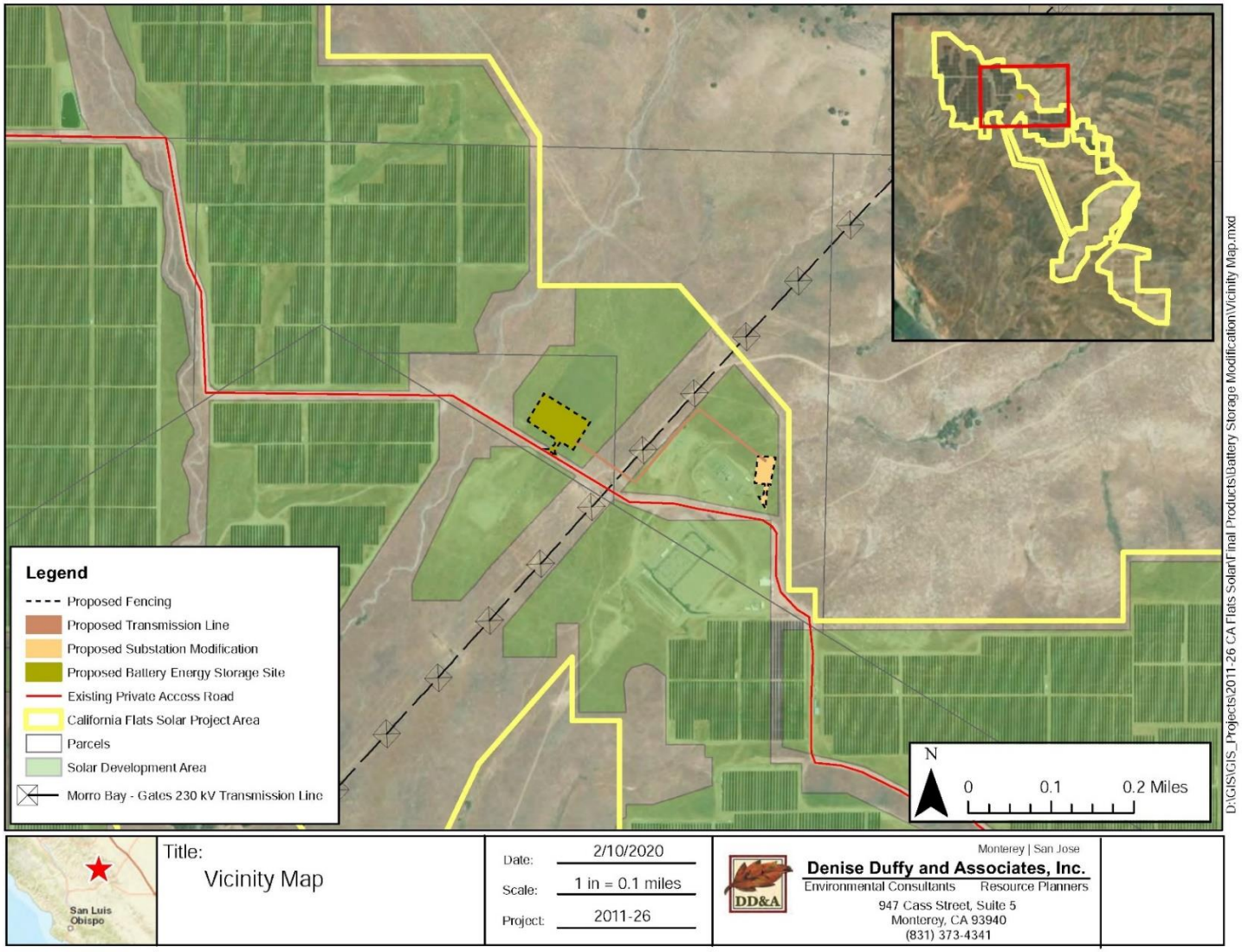

Figure 2. Location of the Battery Energy Storage System modification within the California Flats Solar Project

Scoping, Consultation and Coordination

The Project and the previously issued take permits for golden eagles associated with the Project have garnered minimal public interest and no controversy. The draft EA for the 30-year permit issued to the Applicant in early 2020 received no public comments. The proposed modifications to the Project that prompted the permit request currently under consideration are minor, and effects to eagles from these modifications would be similar to those previously analyzed. Therefore, we decided it was not necessary to solicit further public comments on the similar analyses detailed in this EA. This EA incorporates by reference the scoping performed for the PEIS (USFWS 2016a: Chapter 6, page 175), and public input on the 30-year eagle take permit already issued to the Applicant for operations associated with this same Project.

Coordination with Tribal Governments

Tribal participation is an integral part of the NEPA and the National Historic Preservation Act (NHPA) process, as well as a key component of the Service's decision whether to issue an eagle take permit. The United States Army Corps of Engineers consulted with American Indian Tribes regarding construction of the Project as part of an analysis for NHPA compliance for their issuance of a Clean Water Act Section 404 permit. Cultural and religious concerns regarding eagles were analyzed in the PEIS, and tribal consultation already conducted for the PEIS is incorporated by reference into this EA. The PEIS identified tribal coordination as an important issue for subsequent analysis, given the cultural importance of eagles to the tribes. In accordance with Executive Order 13175, Consultation and Coordination with Tribal Governments (65 FR 67249), the NHPA Section 106 (36 CFR § 800) and the Service's Native American Policy, the Service consults with Native American tribal governments whenever our actions taken under the authority of the Eagle Act may affect tribal lands, resources, or the ability to self-govern. This coordination process is also intended to ensure compliance the American Indian Religious Freedom Act.

To notify Tribes regarding potential issuance of the requested Permit, the Service sent letters to 17 federally-recognized tribal governments located within 109 miles (the natal dispersal distance of golden eagles thought to adequately define the local area population of the eagles) of the Project informing them of the received Permit application and preparation of this EA. The Santa Ynez Band of Chumash Indians called the Service to inform us they currently had no comment on this permit application and EA, but would like to remain informed of future actions. The Buena Vista Rancheria of Me-Wuk Indians of California responded with a letter dated September 8, 2020 requesting additional information on the permit application and take mitigation. The Service responded with further details explaining the estimated take, measures to minimize the take, and mitigation that would be required if the Permit was issued. The Service received no response from any of the other Tribes contacted.

Proposed Action and Alternatives

Proposed Action

We propose to issue a single season incidental eagle take permit, with associated conditions, to California Flats Solar, LLC for disturbance to, and loss of breeding productivity of, two golden eagle breeding pairs in the vicinity of the California Flats Solar Project during the 2021 eagle breeding season ("Proposed Action"). One known golden eagle nest is located within one mile of the scheduled Project modifications where the likelihood of disturbance from construction activities is increased. There is also potential for a second golden eagle pair to construct a new nest within one mile of Project modification activities.

Disturbance to breeding eagles is assumed to prevent eagles from successfully nesting and raising young. To estimate this loss of breeding productivity, the Service uses an estimate of 0.59 young fledged per each golden eagle breeding pair occupying a nesting territory each year (USFWS 2016b). Therefore, for disturbance to two golden eagle breeding pairs occupying two nesting territories over a single eagle breeding season, 1.18 young fledged would be assumed to be lost from the golden eagle population. This loss of productivity is debited from the Service's take thresholds for golden eagles.

The Proposed Action would require measures to avoid and minimize eagle take to the maximum extent practicable, monitoring of golden eagle breeding pairs authorized for take, and compensatory mitigation to offset estimated take of golden eagles.

***Avoidance and Minimization Measures*:** The Applicant would continue conservation measures outlined in the Project's EMP (Appendix B) and BBCS (Appendix C) such as vehicle restrictions and speed limits, garbage abatement, limited rodenticide use, livestock carcass management, and employee awareness/training programs. The Permit would also require additional avoidance and minimization measures such as, to the maximum extent practicable, conducting construction activities outside of the eagle breeding season (1 January through 31 August), initiating a noise abatement program for construction personnel within one mile of nesting eagles, avoiding conducting construction activities during heavy rain and inclement weather, only conducting construction activities within one-mile of nesting eagles during daylight hours, and training work crews about nesting eagles and eagle protection measures.

Compensatory Mitigation: The Applicant would fully offset the loss of productivity of two golden eagle pairs (1.18 young fledged) with compensatory mitigation at a 1.2 to 1 ratio, as required in the Eagle Act regulations (81 FR 91494).

Surveying and Monitoring: During the 2021 eagle breeding season, the Applicant would be required to survey for nests occurring within one mile of Project modification activities. Any nests found would be monitored to determine nesting status and success.

Criteria for issuance of an eagle take permit are codified in 50 CFR § 22.26(f). California Flats Solar, LLC's application for an incidental eagle take permit meets all the regulatory issuance

criteria and required determinations (50 CFR § 13.21 and 50 CFR § 22.26) for eagle take permits.

Alternative 1: No Action

Under the No-Action Alternative, the Service would take no further action on California Flats Solar, LLC's eagle take permit application. However, per regulations (50 CFR § 13.21), the Service must take action on the Permit application, determining whether to deny or issue the Permit. We consider this alternative because Service policy requires evaluation of a No-Action Alternative and it provides a clear comparison of any potential effects to the human environment from the Proposed Action.

The No-Action Alternative in this context analyzes predictable outcomes of the Service not issuing the requested Permit. Under the No-Action Alternative, Project modifications would likely be constructed without an eagle take permit being issued. Thus, for purposes of analyzing the No-Action Alternative, we assume that the Applicant will implement all measures required by other agencies and jurisdictions to conduct the activity at this site, as well as implementing measures contained in the Applicant's EMP (Appendix B) and BBCS (Appendix C), but the conservation measures proposed under this requested Permit would not be required. The Project proponent may choose to implement some, none, or all of those conservation measures. Under this alternative, we assume that the Applicant will take some reasonable steps to avoid taking eagles, but the Project proponent will not be protected from enforcement for violating the Eagle Act should take of an eagle occur.

Alternative 2: Issue permit for the disturbance take of a single golden eagle breeding pair

Under this alternative, the Service would issue an incidental eagle take permit for only a single golden eagle breeding pair. The permit would be as described in the Proposed Action, with all the same required conservation measures and mitigation, except under this alternative, we would only authorize, and the Applicant would only be required to mitigate for, disturbance take and loss of productivity of one golden eagle breeding pair (0.59 young fledged assumed lost from the golden eagle population). Under this alternative, if a new nest of a second golden eagle pair was to be built during the 2021 eagle breeding season, disturbance take and loss of productivity of this second golden eagle pair would not be authorized. Therefore, the Applicant would need to implement measures, such as halting construction activities, to avoid disturbance to the second pair of eagles utilizing this new nest. In all other ways, this alternative is the same as the Proposed Action.

Other Alternatives Considered but Not Evaluated in this Environmental Assessment

The Service considered other alternatives based on communication with the Applicant but concluded that these alternatives did not meet the purpose and need underlying the action because they were not consistent with the Eagle Act and its regulations or did not adequately address the risk of take at the Project. Therefore, the Service did not assess the potential environmental impacts of those alternatives. Below is a summary of the alternatives considered but eliminated from further review.

Alternative 3: Deny Permit

Under this alternative, the Service would deny the Permit application because the Applicant falls under one of the disqualifying factors and circumstances denoted in 50 CFR § 13.21, the application fails to meet all regulatory permit issuance criteria and required determinations listed in 50 CFR § 22.26.

Our permit issuance regulations at 50 CFR § 13.21(b) set forth a variety of circumstances that disqualify an applicant from obtaining a permit. None of the disqualifying factors or circumstances denoted in 50 CFR § 13.21 apply to California Flats Solar, LLC. We next considered whether the Applicant meets all issuance criteria for the type of permit being issued. For eagle incidental take permits, those issuance criteria are found in 50 CFR § 22.26(f). California Flats Solar, LLC's application meets all the regulatory issuance criteria and required determinations (50 CFR § 22.26) for eagle take permits.

When an applicant for an eagle incidental take permit is not disqualified under 50 CFR 13.21 and meets all the issuance criteria of 50 CFR § 22.26, denial of the permit is not a reasonable option. Therefore, this alternative—denial of the Permit—was eliminated from further consideration.

Affected Environment

This section describes the current status of the environmental resources and values that may be affected by the Proposed Action and alternatives.

Golden Eagle

Golden eagle habitat in central California consists mainly of open grasslands and oak savanna interspersed with oak and shrub woodlands. The eagles in this area predominately nest in trees, utilizing nearby open areas for foraging on ground squirrels and jackrabbits. Golden eagle use of, and nesting in, the Project area was assessed prior to construction of the Project, with continued nest surveying and monitoring (to various degrees) conducted annually from 2013 to 2020 (Appendix B). Golden eagle use in the Project area was recorded during all seasons, but generally at higher rates during spring. Golden eagle nesting surveys conducted in 2013

identified at least 21, but possibly up to 33, golden eagle breeding territories within ten miles of the Project and potentially six golden eagle nests within one mile of the Project boundary (H.T. Harvey & Associates 2013). Continued monitoring indicated eight golden eagle nests within two miles of the Project, five of which were located within one mile of the Project (WEST 2014, WEST 2015, WEST 2017, WEST 2018; Appendix B, nests GE12A, GE13A, GE18A, GE19A, and GE20A). A sixth potential eagle nest located within one mile of the Project (H.T. Harvey & Associates 2013; Appendix B, nest GE28A) was never confirmed to be an eagle nest, was seen to be in disrepair in early surveys (WEST 2014), was absent during surveys in 2015 (WEST 2015), and has not been replaced as of present. In 2017, a new nest adjacent to nest GE13A was constructed by, presumably, the same golden eagle pair that had used nest GE13A (WEST 2017). After nest GE12A fell and was destroyed in 2018, a new nest was constructed adjacent to the old nest location in 2020, presumably by the same golden eagle pair that had used nest GE12A (Appendix A).

During nest surveys and monitoring from 2013-2018, nest GE20A and its surrounding territory were only occupied in 2013 and 2015. The nest was in a state of disrepair throughout this period and no nesting attempts were observed (Appendix A). However, during monitoring conducted in 2020, the nest was found to have been rebuilt with observations of an incubating golden eagle on the nest (Appendix A). Nest GE20A is located within approximately 0.9 miles of the scheduled Project modifications and is approximately 0.3 miles from the closest point of the existing Project infrastructure (Figure 3).

The golden eagle pair associated with nest GE19A did not utilize that nest in 2020, but is believed to have constructed and used a new golden eagle nest found in 2020 located approximately 1.3 miles north of nest GE19A (Appendix A).

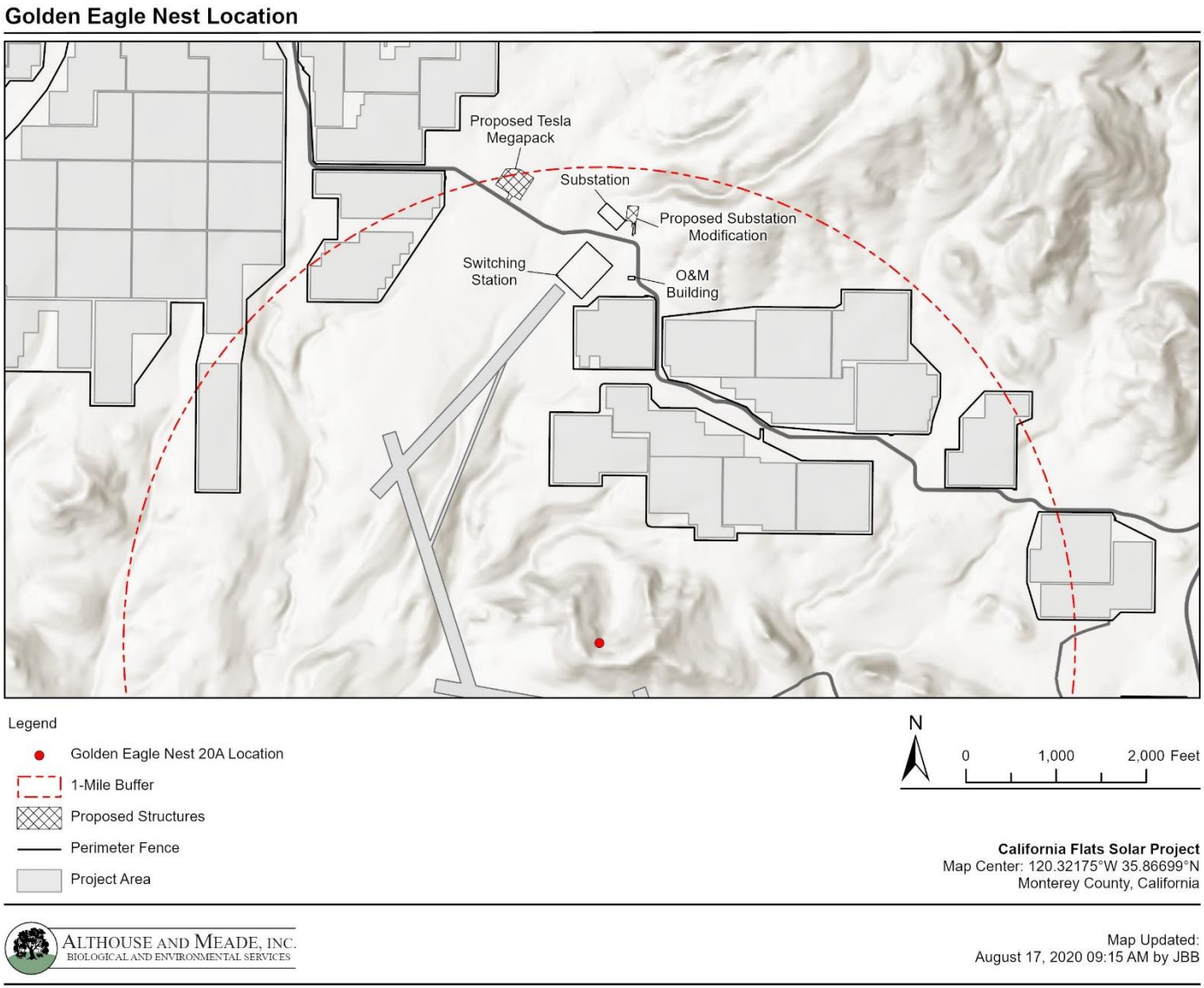

Figure 3. Location of golden eagle nest GE20A and the Proposed Battery Energy Storage System Modification at the California Flats Solar Project.

Bald Eagles

Bald eagles (*Haliaeetus leucocephalus*) are known to occur in the region, but are not expected to be affected by Project modifications. Although bald eagles were observed during surveys surrounding the project, these observations were outside of the Project area (Mattson et al. 2015). Four bald eagle nests, thought to constitute three nesting territories, are known within ten miles of the Project (WEST 2015), however no bald eagle nests have been identified within two miles of the Project, therefore bald eagle disturbance is not expected to result from Project modification activities.

Migratory Birds

Effects to migratory birds have been analyzed in the PEIS, and those analyses are incorporated by reference here. Avian species that may occur in the Project area are identified and described, along with conservation measures in the Project's BBCS (Appendix C).

Species Listed under the Endangered Species Act

Species listed under the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. §§ 1531-1544) are identified and described, along with conservation strategies, in the Project's Low-Effect Habitat Conservation Plan (Althouse and Meade, Inc. 2016) and in the Biological Opinion provided by the Service to the U.S. Army Corps of Engineers on November 19, 2015 for the Army Corps of Engineers' proposal to issue a permit pursuant to section 404 of the Clean Water Act of 1962, as amended (33 U.S.C. 1344 et seq.) for the Project.

Although the Service's decision regarding the requested Permit will not alter the physical footprint of the Project and therefore will not alter the Project impacts to federally threatened and endangered species in the Project area, under the Proposed Action, required compensatory mitigation in the form of retrofitting electric power poles to offset authorized take of golden eagles under an eagle take permit has the potential to cause effects to ESA-listed species in the area where retrofitting is completed.

Cultural and Socio-economic Interests

Bald and golden eagles are important symbols of U.S. history and sacred to many Native American cultures. Some Native American cultures utilize eagles, eagle feathers, and other eagle parts for religious practices and cultural ceremonies. Outside of rituals and practices, wild eagles as live beings are deeply important to many tribes (Lawrence 1990, as cited by USFWS 2016a). Numerous tribes confirmed the importance of wild eagles during scoping and tribal consultation for the PEIS. The Proposed Action or considered alternatives would not impact cultural or socioeconomic interests beyond the impacts already discussed in the PEIS. Therefore, cultural and socioeconomic interests will not be further analyzed in the EA.

Climate Change

Climate change was considered in the PEIS and is incorporated by reference here.

Environmental Consequences

This section summarizes the effects on the environment of implementing the Proposed Action or alternatives to the action. The discussion of overall effects to the environment of the eagle incidental take permit program is provided in the PEIS and is incorporated by reference here. This section of this EA analyzes only the effects that were not analyzed in the PEIS that may result from the issuance of an eagle incidental take permit for this specific project.

Proposed Action

In determining the significance of effects of the Project modification on eagles, we screened the Proposed Action of issuing a single season eagle take permit for disturbance take and loss of productivity of two golden eagle breeding pairs against the analysis provided in the PEIS and the Service's 2016 report, *Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update* (USFWS 2016b). We assessed Project effects to eagles at the project, local, and regional scales.

Golden Eagles

Direct and Indirect Effects

One golden eagle nest, nest GE20A, is located within one mile of the scheduled Project modifications (Figure 3) where the likelihood of disturbance from construction activities is increased. Human activity and noise near an eagle nest may decrease foraging opportunities and efficiency, decrease the potential for territory occupancy, result in nest abandonment, or affect the likelihood of the eagles to successfully incubate or fledge young (Rosenfield et al. 2007, Scott 1985). Project modification activities will be visible from nest GE20A. The Applicant is also concerned that recent shifting in golden eagle territories and eagle nesting locations in the vicinity of Project modifications, create the potential for another golden eagle pair (in addition to the pair utilizing nest GE20A) to construct a new nest within one mile of Project modification activities. Therefore, the Applicant has also requested take authorization for disturbance to a second potential eagle pair to prevent the need to halt Project modification activities midway through construction.

Eagles nest in relatively close proximity in the habitat surrounding the Project, and recent shifting of the GE19 nesting pair to the north (from nest GE19A to nest GE19B) has left potentially available nesting habitat for another pair of eagles to attempt to establish a nest in the area (Figure 4). If nest GE20A is occupied and used during the 2021 eagle breeding season and another eagle breeding pair constructs a nest within one mile of Project modification activities,

two golden eagle breeding pairs may be susceptible to disturbance take and loss of productivity for a single breeding season due to Project modification activities.

To estimate potential loss of breeding productivity, the Service uses an estimate of 0.59 young fledged per each golden eagle breeding pair occupying a nesting territory each year (USFWS 2016b). When a golden eagle breeding pair is disturbed, the Service assumes this 0.59 annual nesting-territory productivity is lost. Therefore, for disturbance to two golden eagle breeding pairs occupying two nesting territories over a single eagle breeding season, 1.18 young fledged would be assumed to be lost from the golden eagle population. This loss of productivity is debited from the Service's take thresholds for golden eagles.

The Proposed Action incorporates measures to minimize and avoid eagle take to the maximum degree practicable, as required by regulation. The Project is already implementing conservation measures outlined in the Project's EMP (Appendix B) and BBCS (Appendix C) such as vehicle restrictions and speed limits, garbage abatement, limited rodenticide use, livestock carcass management, employee awareness/training programs, designing power poles to be avian safe, and installing flight diverters on new power lines to prevent bird collisions. The Permit would also require additional avoidance and minimization measures such as, to the maximum extent practicable, conducting construction activities outside of the eagle breeding season (1 January through 31 August), initiating a noise abatement program for construction personnel within one mile of nesting eagles, avoiding conducting construction activities during heavy rain and inclement weather, only conducting construction activities within one-mile of nesting eagles during daylight hours, and training work crews about nesting eagles and eagle protection measures. The Applicant has asserted it is impracticable to conduct most construction activities outside the eagle breeding season due to permitting completion and battery delivery timelines, as well as contractual power delivery commitments.

Along with implementing these minimization and avoidance measures, the Applicant would provide compensatory mitigation to offset the estimated take at a 1.2 to 1 ratio, as required in the Eagle Act regulations (81 FR 91494), by paying for retrofitting of electric power poles that are an electrocution risk to eagles. The 1.2 to 1 ratio for compensatory mitigation achieves a net benefit to golden eagle populations, ensuring that regional eagle populations are maintained consistent with the preservation standard of the Eagle Act despite indications of declines in golden eagle populations (USFWS 2016a). As this would fully offset the estimated take, as well as provide an additional net benefit to eagle populations, there would be no significant negative direct and indirect effects to eagle populations from issuing an eagle take permit under the Proposed Action.

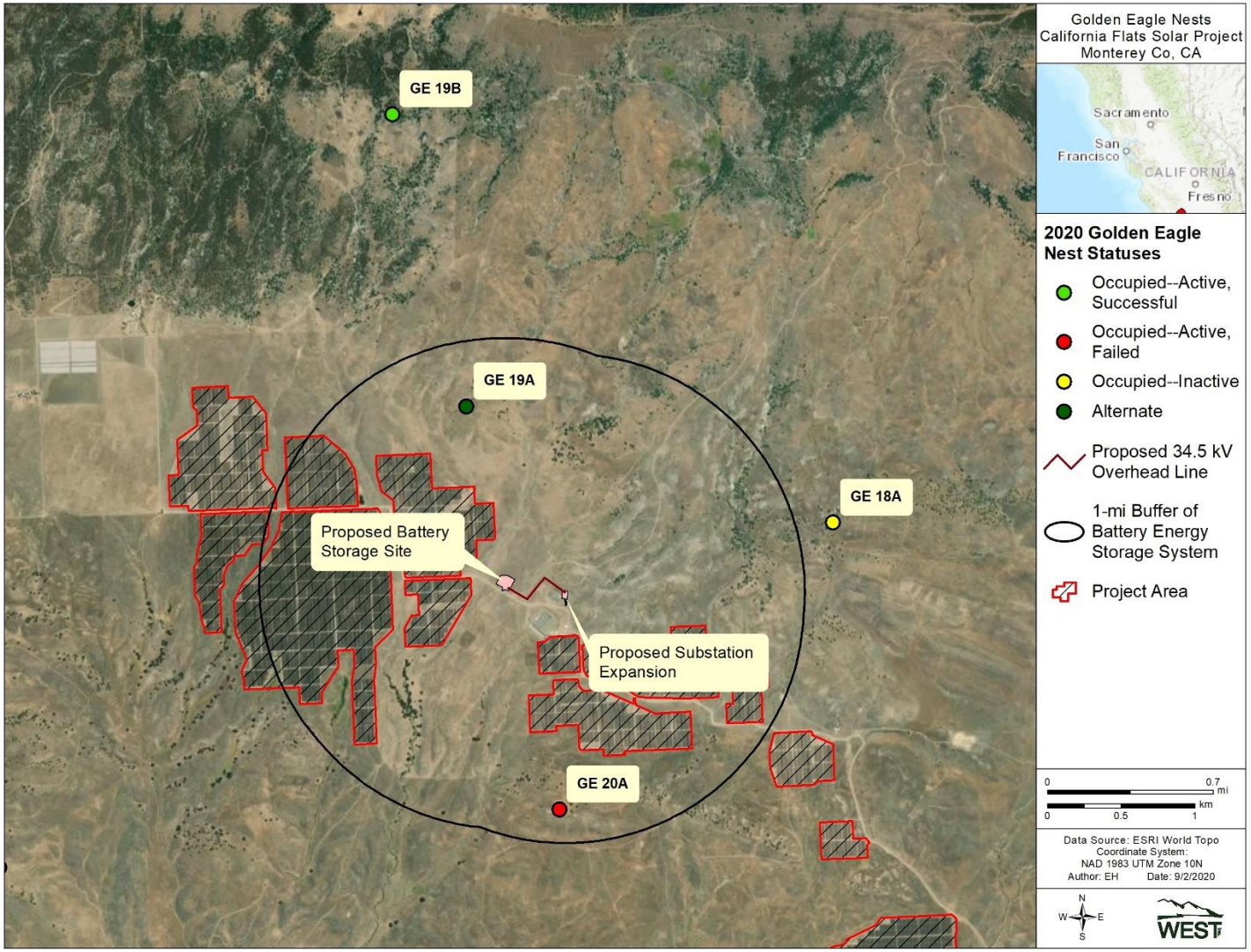

Figure 4. Location of eagle nests in the vicinity of the Proposed Battery Energy Storage System Modification at the California Flats Solar Project.

The retrofitting of electric utility power poles can be used to offset authorized take of golden eagles, as electrocution from power poles is known to be a major cause of eagle mortality. Power poles can be retrofitted by verified methods (such as insulating or covering electrical components or modifying pole elements to increase the distance between electrical components) to reduce the risk of electrocution to eagles, with the maintenance and efficacy of retrofits confirmed through post-installation inspections and monitoring. The effects of retrofitting power poles has been quantified "per eagle", allowing use of a Resource Equivalency Analysis (REA) to calculate the number of power pole retrofits needed to offset the authorized take of golden eagles (USFWS 2013).

The Applicant has previously paid for compensatory mitigation to offset loss of productivity of golden eagle breeding pairs from disturbance caused by the Project construction, as required by permits issued in 2017 and 2018 for the disturbance take. However, in one case, take did not occur as the eagles successfully fledged chicks that season. The eagle pair utilizing nest GE13A, authorized for disturbance take and loss of productivity in 2018, successfully fledged chicks during that breeding season. Therefore, the Service would allow the unneeded mitigation paid to offset that take that did not occur to be applied to the mitigation requirement under this current Permit. Therefore, the Applicant has already provided compensatory mitigation to offset loss of productivity of one of the two golden eagle breeding pairs that would be authorized for take under this current Permit. The Applicant would still need to provide compensatory mitigation to offset the loss of productivity of the second golden eagle breeding pair.

The Service ran the REA to determine the number of power poles that would need to be retrofit to offset the disturbance take and loss of productivity to the second golden eagle breeding pair. Incorporating the 1.2 to 1 compensatory mitigation ratio required under the Eagle Act regulations, the Applicant would need to retrofit 10-23 power poles to offset the take of 0.71 golden eagles (a 1.2 to 1 ratio of the estimated take of 0.59 golden eagles) at the Project. The final number of poles retrofitted will depend on the type and expected longevity of each retrofit, once the actual poles have been identified. To complete the required compensatory mitigation, the Applicant would either work directly with a utility company to complete the required power pole retrofits, with Service approval of the developed plan, or would work with an in-lieu fee program to purchase credits to fulfill the required retrofits to be completed.

Along with the benefit to eagles of reducing mortalities by electrocution, retrofitting of power poles to prevent bird electrocutions also increases public safety by reducing the risk of wildfires. Bird electrocution events may ignite fires in the vegetation surrounding and below the site of electrocution, so decreasing electrocution risk also reduces the risk of fire.

Eagle Act regulations require compensatory mitigation to be sited in the same eagle management unit (EMU) in which the take occurs (50 CFR § 22.26(c)(1)(iii)(B)). The Project is located in the Pacific Flyway EMU for golden eagles. The Applicant or the in-lieu fee program manager would coordinate with electric utility companies within the Pacific Flyway to determine locations of power poles that are appropriate for retrofitting to prevent eagle electrocutions. The retrofits conducted as compensatory mitigation for the California Flats Solar, LLC's Permit would not be duplicative of the utility company's other obligations to retrofit power poles,

including addressing their own responsibilities to rectify eagle take caused by electrocutions and line collisions from their infrastructure.

Under the Proposed Action, the Applicant would provide compensatory mitigation to fully offset the single season loss of breeding productivity of two golden eagle pairs (1.18 young fledged) at a 1.2 to 1 ratio. In addition, the 1.2 to 1 ratio also provides an additional net benefit to golden eagle populations. As the estimated take of golden eagles by Project modification activities would be fully offset by compensatory mitigation provided by the Applicant, direct and indirect effects of issuance of the requested incidental eagle take Permit on golden eagle populations would not be significant and are therefore compatible with the preservation of golden eagles.

Cumulative Effects

The purpose of this cumulative effects evaluation is to identify situations where the golden eagle take proposed under the Proposed Action combined with take from other present or foreseeable future actions and sources may be approaching levels that are biologically problematic. Effects of take may be cumulative at the project scale, at the local-area eagle population scale, and at the EMU scale.

At the project scale, disturbance from Project modification activities could cause golden eagle pairs to attempt to move away from these human activities, which could in turn cause eagle pair territory boundaries in the vicinity of the Project to shift, which could cause increased antagonistic interactions with surrounding eagle pairs, potentially creating a ripple-effect of impacts to eagles in areas surrounding the Project. The Project may also continue to have impacts to golden eagles in the foreseeable future due to proximity of the Project and Project modifications to eagle territories and development of the Project on eagle foraging habitat, which may cause continual loss of productivity and potential territory abandonment of golden eagle pairs breeding in the vicinity of the project. This potential take has been avoided and minimized to the maximum extent practicable and fully offset with compensatory mitigation required under the long-term incidental eagle take permit issued to the Project in early 2020 described in the Background section above. This permitted take is also included in the local-area population cumulative effects analysis described below.

To ensure that eagle populations at the local scale are not depleted by cumulative take in the local area, the Service analyzed the amount of annual eagle take that can be authorized while still maintaining local area populations of eagles (USFWS 2016a). The local-area population (LAP) scale is defined for eagles as the median natal dispersal distance for the given species, which for golden eagles is a 109-mile radius (USFWS 2016a). The Service's analysis found that to maintain local area eagle populations, annual cumulative authorized take must not exceed five percent of a LAP unless the Service can demonstrate why allowing take to exceed that limit is still compatible with the preservation of eagles. The Service must also assess any available data to determine if there is any indication that unauthorized take (take that has not been permitted by the Service) in the LAP may exceed ten percent, as this is roughly the average background level of unpermitted take in local area populations of golden eagles (USFWS 2016a). The eagle incidental take permit regulations require the Service to conduct an individual LAP analysis for each permit application as part of our application review (50 CFR § 22.26(e)). We, therefore,

considered cumulative effects to the eagle LAP surrounding the Project to evaluate whether the take to be authorized under this Permit, together with other sources of permitted take and unpermitted eagle mortality, may be incompatible with the persistence of this LAP. We incorporated data provided by the Applicant, our data on other eagle take authorized and permitted by the Service, and other reliably documented unauthorized eagle mortalities to estimate cumulative impacts to the LAP. We conducted our LAP cumulative effects analysis as described in the Service's *Eagle Conservation Plan Guidance* (USFWS 2013).

Results from our LAP cumulative effects analysis for the Proposed Action are summarized in Appendix D. The LAP is estimated to be 242.52 golden eagles. The five percent benchmark for sustainable authorized take of the LAP is 12.3 golden eagles per year. Current authorized take in the LAP, which includes permitted take at two other projects, long-term take at this Project authorized under a prior permit, and the take proposed for authorization under this Permit for the Project modification, is 2.9 golden eagles or 1.18% per year. This is well below the five percent sustainable take benchmark determined by the Service to maintain the local area population of golden eagles. The Service does, however, have evidence that unauthorized take may exceed ten percent of the LAP. A summary of available data of unauthorized take is provided in Appendix D and suggests that unauthorized take of eagles in the LAP may be around 10.95% per year.

Among other sources of unauthorized take, the Service is aware of several wind facilities in the vicinity of the LAP that are operational and likely to take eagles, but are not yet permitted for eagle take. Past take of eagles at these facilities is known to the Service and is included in the information analyzed as unauthorized eagle take. While additional future wind energy development and other activities may further increase eagle take in the LAP during the lifespan of this Permit, the Service cannot reasonably predict the resulting impacts to eagles of such projects when important aspects, such as their size, location, configuration, and lifespan, are currently unknown. There is no reasonable basis to consider such speculative impacts in this EA.

As we have evidence that the unauthorized take in the LAP may be above the 10% average of unpermitted mortality of golden eagles, adding further permitted take could potentially cause declines in the local area population of golden eagles. However, our estimate of the unauthorized take in the Project LAP is not far above the average. Also, the cumulative permitted take is well below the 5% threshold limit. Therefore, the potential for cumulative effects of take at the local scale exists, but is expected to be minimal.

The previously paid, but unneeded, compensatory mitigation the Applicant paid for a previous permit, which would be applied to offset the take authorized under this Permit as described above, was calculated at a 2:1 ratio of mitigation to take. The additional benefits to eagles of this higher ratio and larger compensatory mitigation payment should adequately address any potential cumulative effects of the take being authorized under this Permit.

Finally, take of eagles also has the potential to affect the larger eagle population. Therefore, the Service defined regional EMUs and analyzed the cumulative effects of permitting take of golden eagles in combination with ongoing unauthorized sources of human-caused eagle mortality and other present or foreseeable future actions affecting golden eagle populations (USFWS 2016a).

As part of the analysis, the Service determined sustainable limits to permitted take within each EMU. The take limit for all golden eagle EMUs was set to zero as golden eagle populations throughout the United States may be declining (USFWS 2016a). Therefore, any authorized take of golden eagles must be offset with compensatory mitigation at a mitigation ratio of 1.2 to 1 (81 FR 91494). The take that would be authorized under the Proposed Action would be offset by the compensatory mitigation that will be provided by the Applicant, as described above, so will not significantly impact the EMU eagle population. The avoidance and minimization measures that would be required under the Permit, along with monitoring, are designed to further ensure that the Permit is compatible with the preservation of the golden eagle at the regional EMU population scale.

As the estimated take of golden eagles by this Project, and the potential for the take to compound with other sources of eagle take to create cumulative effects, is either below Service-determined sustainable benchmarks or will be addressed by mitigation measures provided by the Applicant such as fully-offsetting compensatory mitigation, issuance of the requested incidental eagle take Permit would cause no significant adverse cumulative effects on golden eagle populations and is compatible with the preservation of golden eagles.

Monitoring

Under the Proposed Action to issue a single-season eagle take permit, the Applicant would be required to survey for nests occurring within one mile of Project modification activities during the 2021 eagle breeding season (1 January – 31 August). Any nests found would be monitored to determine nesting status and success.

Occupancy monitoring of eagle nests within one mile, and up to two miles as access allows, of the Project (as per the Project's BBCS and EMP), will also occur.

Bald Eagles

Although take of bald eagles is not expected to occur from Project modifications and take of bald eagles would not be authorized under the Proposed Action, bald eagles in the region may benefit from avoidance and minimization measures established to reduce the risk to golden eagles, as well as from compensatory mitigation actions provided to offset the take of golden eagles. No significant adverse effects are foreseen to bald eagles.

Migratory Birds

Project effects to migratory birds have been presented, along with conservation measures to address effects, in the Project's BBCS (Appendix C).

Issuance of the eagle take Permit to the Project may also provide benefits to migratory birds. Power pole retrofits done as compensatory mitigation for the eagle take Permit may minimize electrocution risk for raptors and other migratory birds, just as with eagles.

Issuance of an incidental eagle take permit would cause no significant adverse effects to migratory bird populations.

Species Listed under the Endangered Species Act

The Service reviewed the U.S. Army Corps of Engineers' proposed modification of the Project's Combined Development Permit authorizing the Project modification construction, operation, maintenance, and decommissioning for effects to species listed under ESA. The Service agreed with the U.S. Army Corps of Engineers' determination that Project modifications would have no effects to ESA-listed species beyond those previously analyzed in the Biological Opinion. The Applicant will continue to implement all conservation measures outlined in the Biological Opinion. The Applicant is working with the Service to determine if an amendment to the Low-Effect Habitat Conservation Plan and Incidental Take Permit is necessary.

Although the Service's decision regarding the eagle take Permit will not alter the physical footprint of the Project or Project modification and therefore will not alter the Project impacts to federally threatened and endangered species in the Project area, under the Proposed Action, required compensatory mitigation in the form of retrofitting electric power poles (described above in environmental consequences to golden eagles section) to offset authorized take of golden eagles under the eagle take Permit has the potential to cause effects to ESA-listed species. Section 7 of the ESA requires Federal agencies to consult to "insure that any action authorized, funded, or carried out" by them "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 U.S.C. § 1536(a)(2)). As discussed above in the environmental consequences to golden eagles section of this document, the compensatory mitigation sites for retrofitting of power poles to offset any authorized eagle take under the eagle take Permit have not yet been identified. Once the compensatory mitigation sites would be selected, the Service would conduct an internal Section 7 Consultation and further analyze and address potential effects to ESA-listed species at the location of the power poles that would be retrofitted. The Service anticipates that adverse effects to listed species would be avoidable by timing retrofits to avoid sensitive seasons, and/or through the use of other species-specific avoidance measures. However, if the determination of the Section 7 Consultation was that adverse effects were likely to occur to listed species, the Service would prepare additional NEPA documentation to supplement this EA.

Alternative 1: No Action

Golden Eagles

If, under the No-Action Alternative, the Service took no action on the Applicant's eagle take Permit application, should take of eagles occur, the Applicant would be in violation of the Eagle Act. Under this No-Action Alternative, although some eagle conservation measures and monitoring would occur at the Project as described in the Project's BBCS (Appendix C) and EMP (Appendix B), additional measures required under the Permit would not be implemented to

avoid or minimize risk to eagles of the Project modification activities. Therefore, the risk to eagles is expected to be higher under this alternative as compared to the Proposed Action. Furthermore, none of the impacts to golden eagles described above under the Proposed Action would be offset by compensatory mitigation if no action was taken on the application and an eagle take permit was not issued. Under this No-Action Alternative, direct impacts of the Project on the eagle population are anticipated to be unmitigated loss of productivity from one to two golden eagle pairs for the 2021 eagle breeding season equating to 0.59 to 1.18 young fledged assumed to be lost from the golden eagle population.

This alternative does not meet the purpose and need for the action because, by regulation (50 CFR § 13.21), when in receipt of a completed application, the Service must either issue or deny a permit to the applicant. The No-Action Alternative also does not meet the purpose of and need for the action because it would result in the adverse, unmitigated effects to golden eagles described above, effects that are not compatible with the preservation of golden eagles.

Bald Eagles

The Applicant did not apply for take authorization for bald eagles, nor is take of bald eagles expected to occur from Project modifications. However, the No-Action Alternative would mean benefits that bald eagles might also incur from avoidance and minimization measures established to reduce the risk to golden eagles and compensatory mitigation actions provided to offset the take of golden eagles, would not occur.

Migratory Birds

Any incidental benefits to migratory birds from avoidance, minimization, and mitigations required under the eagle take Permit would not be realized under the No-Action Alternative. The Applicant would implement conservation measures established in the Project's BBCS (Appendix C) regardless of whether or not the eagle take Permit was issued.

Species Listed under the Endangered Species Act

The Applicant has worked and will continue to work with the Service to determine take coverage under the ESA (16 U.S.C. §§ 1531-1544) to address Project effects on threatened and endangered species listed under ESA regardless of whether or not the eagle take Permit is issued. Therefore, environmental consequences of this alternative would be the same as the Proposed Action.

Alternative 2: Issue permit for the disturbance take of a single golden eagle breeding pair

As with the Proposed Action, we screened this alternative of issuing a single season eagle take permit for disturbance take and loss of productivity of one golden eagle breeding pair against the

analysis provided in the PEIS and the Service's 2016 report, *Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update* (USFWS 2016b). We assessed Project effects to eagles at the project, local, and regional scales.

Golden Eagles

Direct and Indirect Effects

Environmental consequences of Alternative 2 would be similar to those of the Proposed Action except that in this alternative only the golden eagle breeding pair with a known nest location, nest GE20A, within one mile of planned Project modifications would be authorized for disturbance take under an eagle take permit, and only 0.59 young fledged would be estimated to be lost from the golden eagle population and debited from the Service's take threshold for golden eagles. Under this alternative, if a new nest of a second golden eagle pair was to be built during the 2021 eagle breeding season, disturbance take and loss of productivity of this second golden eagle pair would not be authorized. Therefore, the Applicant would need to implement measures, such as halting construction activities, to avoid disturbance to the second pair of eagles utilizing this new nest.

The same measures required under the Proposed Action to avoid and minimize take of golden eagles would be required under this alternative. As with the Proposed Action, under this alternative, the Applicant would provide compensatory mitigation to offset the estimated take at a 1.2 to 1 ratio, as required in the Eagle Act regulations (81 FR 91494), by paying for retrofitting of electric power poles. As this would fully offset the estimated take under this Alternative, as well as provide an additional net benefit to eagle populations, there would be no significant negative direct and indirect effects to eagle populations from issuing an eagle take permit under this alternative.

As described above for the Proposed Action, the Applicant has previously paid for compensatory mitigation to offset loss of productivity of a golden eagle breeding pair that was unneeded as the eagle pair fledged chicks and loss of productivity did not occur during the season authorized for take. As noted under the Proposed Action, the Service would allow the unneeded mitigation paid to offset that take that did not occur to be applied to the mitigation requirement under the current Permit request. Therefore, the Applicant would have already provided compensatory mitigation to offset loss of productivity of the one golden eagle breeding pair that would be authorized for take under this alternative.

Under Alternative 2, the Applicant would have provided compensatory mitigation to fully offset the single season loss of breeding productivity of a golden eagle pair (0.59 young fledged) at a 1.2 to 1 ratio. In addition, the 1.2 to 1 ratio also provides an additional net benefit to golden eagle populations. As the take estimated under this alternative of golden eagles by Project modification activities would be fully offset by compensatory mitigation provided by the Applicant, direct and indirect effects of issuance of a single-season incidental eagle take permit on golden eagle populations would not be significant and are therefore compatible with the preservation of golden eagles.

Cumulative Effects

The purpose of this cumulative effects evaluation is to identify situations where the golden eagle take considered under Alternative 2, combined with take from other present or foreseeable future actions and sources, may be approaching levels that are biologically problematic. Effects of take may be cumulative at the project scale, at the local-area eagle population scale, and at the EMU scale.

Cumulative effects of Alternative 2 at the project scale and the EMU scale would be the same, and addressed in the same fashion, as stated under the Proposed Action.

Cumulative effects of Alternative 2 at the LAP scale would vary slightly from those under the Proposed Action. Results from the LAP cumulative effects analysis for Alternative 2 are summarized in Appendix E. As in the analysis for the Proposed Action, the LAP is estimated to be 242.52 golden eagles, and the five percent benchmark for sustainable authorized take of the LAP is 12.3 golden eagles per year. Current authorized take in the LAP under Alternative 2, which includes permitted take at two other projects, long-term take at this Project authorized under a prior permit, and the take proposed for authorization under Alternative 2 for the Project modification, is 2.31 golden eagles or 0.94% per year. This is well below the five percent sustainable take benchmark determined by the Service to maintain the local area population of golden eagles.

Estimated unauthorized take in the LAP would not differ between Alternative 2 and the Proposed Action. Therefore, the minimal potential for cumulative effects of take at the local scale exists, but is expected to be minimal, under Alternative 2 just as under the Proposed Action, and would be addressed as described under the Proposed Action.

As the estimated take of golden eagles considered under Alternative 2, and the potential for the take to compound with other sources of eagle take to create cumulative effects, is either below Service-determined sustainable benchmarks or will be addressed by mitigation measures provided by the Applicant such as fully-offsetting compensatory mitigation, issuance of an incidental eagle take permit for disturbance take and loss of productivity of one golden eagle breeding pair would cause no significant adverse cumulative effects on golden eagle populations and is compatible with the preservation of golden eagles.

Monitoring

Monitoring requirements under Alternative 2 would be the same as those for the Proposed Action.

Bald Eagles

Environmental consequences of this alternative would be the same as the Proposed Action.

Migratory Birds

Environmental consequences of this alternative would be the same as the Proposed Action.

Species Listed under the Endangered Species Act

Environmental consequences of this alternative would be the same as the Proposed Action.

Comparison of Alternatives

The following table compares the effects of the Proposed Action and alternatives (Table 1).

Table 1. Comparison of the Proposed Action and other alternatives

	Proposed Action: Issue Requested Permit for Disturbance Take of Two Golden Eagle Breeding Pairs	**Alternative 1: No Action**	**Alternative 2: Issue Permit for Disturbance Take of One Golden Eagle Breeding Pair**
Eagle Take Levels	Disturbance take and loss of productivity of two golden eagle breeding pairs	Disturbance take and loss of productivity of 1-2 golden eagle breeding pairs	Disturbance take and loss of productivity of one golden eagle breeding pair
Avoidance and Minimization	Follows measures described in the Applicant's Bird and Bat Conservation Strategy and Eagle Management Plan, as well as measures required under the Permit	Follows measures described in the Applicant's Bird and Bat Conservation Strategy and Eagle Management Plan	Follows measures described in the Applicant's Bird and Bat Conservation Strategy and Eagle Management Plan, as well as measures required under the permit
Compensatory Mitigation	Retrofit power poles to offset the loss of 1.18 golden eagles	None	Retrofit power poles to offset the loss of 0.59 golden eagles
Unmitigated Eagle Take	None	Loss of productivity from 1-2 golden eagle breeding pairs, equating to 0.59-1.18 young fledged estimated lost from the eagle population	None
Unmitigated Cumulative Effects	None	Potential for declines in the local population due to cumulative effects of take	None

	Proposed Action: Issue Requested Permit for Disturbance Take of Two Golden Eagle Breeding Pairs	Alternative 1: No Action	Alternative 2: Issue Permit for Disturbance Take of One Golden Eagle Breeding Pair
Data Collection /Monitoring	Nest surveying for and productivity monitoring of all nests located within one mile of Project modification activities during the 2021 eagle breeding season; Occupancy monitoring of eagle nests within one mile, and up to two miles as access allows, of the Project (as per the Project's BBCS and EMP)	Occupancy monitoring of eagle nests within one mile, and up to two miles as access allows, of the Project (as per the Project's BBCS and EMP)	Nest surveying for and productivity monitoring of all nests located within one mile of Project modification activities during the 2021 eagle breeding season; Occupancy monitoring of eagle nests within one mile, and up to two miles as access allows, of the Project (as per the Project's BBCS and EMP)
Company Liability for Eagle Take	No (if in compliance with Permit)	Yes	No, if in compliance with Permit and no additional eagle nests are found within one mile of Project modification activities
Meets Eagle Act Statutory and Regulatory Requirements	Yes	No	Yes, as long as no additional nests were found within one mile of Project modification activities

List of Preparers

Tracy Borneman, Migratory Bird Biologist

References

16 United States Code (U.S.C.) § 668. Title 16 - Conservation; Chapter 5a - Protection and Conservation of Wildlife; Subchapter II - Protection of Bald and Golden Eagles; Section (§) 668 - Bald and Golden Eagles. Available online: http://uscode.house.gov

16 United States Code (U.S.C.) §§ 1531-1544. Title 16 – Conservation; Chapter 35 – Endangered Species; Sections (§§) 1531-1544. Available online: http://uscode.house.gov

16 United States Code (U.S.C.) § 1536. Title 16 – Conservation; Chapter 35 – Endangered Species; Section (§) 1536 – Interagency Cooperation. Available online: http://uscode.house.gov

33 United States Code (U.S.C.) § 1344. Title 33 – Navigation and Navigable Waters; Chapter 26 – Water Pollution Prevention and Control; Subchapter IV – Permits and Licenses; Section (§) 1344 – Permits for dredged or fill material. Available online: http://uscode.house.gov

36 Code of Federal Regulations (CFR) § 800. Title 36 – Parks, Forests, and Public Property; Chapter VIII – Advisory Council on Historic Preservation; Part 800 – Protection of Historic Properties. Available online: https://www.ecfr.gov

40 Code of Federal Regulations (CFR) § 1508.27. Title 40 - Protection of Environment; Chapter V - Council on Environmental Quality; Part 1508 - Terminology and Index; Section (§) 1508.27 - Significantly. Available online: https://www.ecfr.gov

42 United States Code (U.S.C.) §§ 4321-4347. Title 42 - the Public Health and Welfare; Chapter 55 - National Environmental Policy; Subchapters I (Policies and Goals) and II (Council on Environmental Quality); Sections (§§) 4321-4347. Available online: http://uscode.house.gov

50 Code of Federal Regulations (CFR) § 13.21. Title 50 - Wildlife and Fisheries; Chapter I - United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 13 - General Permit Procedures; Section (§) 13.21 – Issuance of permits. Available online: https://www.ecfr.gov

50 Code of Federal Regulations (CFR) § 22. Title 50 - Wildlife and Fisheries; Chapter I - United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 22 - Eagle Permits. Available online: https://www.ecfr.gov

65 Federal Register (FR) 67249. 2000. Executive Order 13175, Consultation and Coordination with Indian Tribla Governments. Vol. 65, No. 218. November 9, 2000. pp 67249-67252. Available online: https://www.federalregister.gov/

81 Federal Register (FR) 91494. 2016. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests. Vol. 81, No. 242. December 16, 2016. pp 91494-91554. Available online: https://www.federalregister.gov/

Althouse and Meade, Inc. 2016. Low-Effect Habitat Conservation Plan for Issuance of an Incidental Take Permit Under Section 10(a)(1)(B) of the Endangered Species Act for California Flats Solar Project Operations and Maintenance Activities. Prepared by Althouse and Meade, Inc. Biological and Environmental Services. Prepared for California Flats Solar, LLC, San Francisco, CA. August 31, 2016.

County of Monterey. 2014. Draft Environmental Impact Report: California Flats Solar Project. Resource Management Agency Planning Department. Prepared by: Rincon Consultants, Inc. PLN120294. August 2014. Available online: http://www.co.monterey.ca.us/government/departments-i-z/resource-management-agency-rma-/planning/current-major-projects/california-flats-solar/deir-volume-i

H.T. Harvey & Associates. 2013. Baseline Raptor Nest Surveys for the Proposed California Flats Solar Project in Monterey County, California: 2013. Prepared by H.T. Harvey & Associates. Prepared for California Flats Solar, LLC, San Francisco, CA. September 2013.

Lawrence, E. A. 1990. Symbol of a Nation: The Bald Eagle in American Culture. Journal of American Culture 12(1): 63-69. https://doi.org/10.1111/j.1542-734X.1990.1301_63.x.

Mattson, T., J. Pickle, and A. Chatfield. 2015. 2014 Golden Eagle Studies at the California Flats Solar Project, Monterey County, California. Prepared for California Flats Solar, LLC, San Francisco, California. Western Ecosystems Technology, Inc., Cheyenne, Wyoming.

Rosenfield, R. N., J. W. Grier, and R. F. Fyfe. 2007. Reducing research and management disturbance. *In* Bird, D. M. and K. L. Bildstein, editors. Raptor research and management techniques (pp 351-364). Hancock House: Blaine, Washington.

Scott, T. A. 1985. Human Impacts on the Golden Eagle Population of San Diego County. Thesis. San Diego State University, San Diego, California.

US Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. US Department of the Interior, Fish and Wildlife Service, Division of Migratory Bird Management. April 2013. Executive Summary and frontmatter + 103 pp. Available online: https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance.pdf

US Fish and Wildlife Service (USFWS). 2016a. Programmatic Environmental Impact Statement for the Eagle Rule Revision. December 2016. Available online: https://www.fws.gov/migratorybirds/pdf/management/FINAL-PEIS-Permits-to-Incidentally-Take-Eagles.pdf

US Fish and Wildlife Service (USFWS). 2016b. Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update. Division of Migratory Bird Management, Washington D.C., USA. Available online: https://www.fws.gov/migratorybirds/pdf/management/EagleRuleRevisions-StatusReport.pdf

Western EcoSystems Technology, Inc. (WEST). 2014. California Flats Solar Project 2014 Eagle Nest Survey Report. Prepared by WEST. Prepared for California Flats Solar, LLC, San Francisco, California. December 2, 2014.

Western EcoSystems Technology, Inc. (WEST). 2015. California Flats Solar Project 2015 Eagle Nest Survey Report. Prepared by WEST. Prepared for California Flats Solar, LLC, San Francisco, California. June 29, 2015.

Western EcoSystems Technology, Inc. (WEST). 2017. 2017 Golden Eagle Nest Survey: California Flats Solar Project, Monterey County, California. Prepared by WEST. Prepared for California Flats Solar, LLC, San Francisco, California. November 6, 2017.

Western EcoSystems Technology, Inc. (WEST). 2018. 2018 Golden Eagle Nest Survey: California Flats Solar Project, Monterey County, California. Prepared by WEST. Prepared for California Flats Solar, LLC, San Francisco, California. September 4, 2018.

Appendix A. California Flats Solar LLC Eagle Incidental Take Permit Application, Section E

SECTION E. EAGLE TAKE – ASSOCIATED WITH BUT NOT THE PURPOSE OF AN ACTIVITY (INCIDENTAL TAKE)

(Bald and Golden Eagle Protection Act, 50 CFR 22.26)

Note: A Federal eagle incidental take permit authorizes the disturbance or other incidental take of eagles where the take results from but is not the purpose of an otherwise lawful activity. Permits are available to individuals, agencies, businesses, and other organizations. This permit does not authorize possession of any eagle, eagle parts, or eagle nests. Please read "Frequently Asked Questions About a Federal Permit For Eagle Take Necessary To Protect An Interest In A Particular Locality (Incidental Take)" and the pertinent regulations at 50 CFR 22.26 before you sign and submit your application.

Please provide the information requested below. If additional information needs to be provided that does not fit in the designated spaces, add additional sheets to your application submission. Please number pages accordingly using the page number box provided at the bottom of the sheet, and the corresponding question number. **We cannot accept pages that are over 8.5" x 11" or non-paper media, such as DVDs.**

You should be as thorough and specific as possible in your responses. Incomplete applications will be returned. Processing fees are not returned for abandoned applications. Processing time depends on the complexity of the request and completeness of the application, for short-term permit please allow 30-180 days and for long-term permit please allow 1-2 years.

1. Take Request. Include species, number, and type of take

Species	Type of Take (disturb, incidental kill/injure)	Number Requested (e.g. 3 eagles, 1 eagle pair, 2 eagle nests)
Bald Eagle		
Golden Eagle	Disturb	2 eagle nests (Nest 20A, Figure 1; additional nest that may be built within 1.0 mile of the Battery Energy Storage System in the future) See additional sheet for Figure 1.

2. Duration. When do you want your permit to be effective (month/year)? How many years do you want your permit to be valid? *Permits may be issued for up to 30 years. Durations of 5 years or less are considered short-term permits. Durations of more than 5 years are considered long-term permits and additional requirements apply - see Question 14*.

We request a disturbance permit from November 2020 through May 2021.
Construction of the Battery Energy Storage System modification (Proposed Modification) to the existing California Flats Solar Project (Project) is scheduled to commence November 2020 and would be complete (including testing and decommissioning) by May 2021.

3. Project Activity. Include any relevant information regarding your activity as it relates to eagles. You must include the following:

a. Activity Description. A detailed description of your project. Including information on construction, demolition, vegetation removal, infrastructure, etc. that may affect eagle(s).

See additional sheet.

b. Dates. The dates the activity will start and is projected to end. If the project has begun, describe the stage of progress and why you are requesting a permit now.

The activity will start in November 2020 and end in May 2021. Construction of the BESS would take approximately four months and construction of the substation modification would take approximately seven months. Some of this activity would occur during the 2021 breeding season.

c. Need. An explanation of why the take of eagles is necessary, including what interests will be protected by the project or activity.

This activity would ensure delivery of clean, renewable energy during peak demand periods. It will allow energy storage during periods of low-peak demand periods and subsequently distribute energy during periods of high-peak demand. This activity must occur during the spring of 2021 to meet contractual commitments.

d. Location. Describe activity location county/city information and, as appropriate, include: maps, digital photographs, and latitude/longitude geographic coordinates of the proposed activity.

See additional sheet.

4. Eagle Activity. Include any known information eagle activity. You must include the following:

a. Eagle Activity Description. Describe the type of eagle activity, for example nest(s), roost(s), important use area(s) (foraging, migration, overwintering), etc.

One golden eagle nest (Nest 20A) is located within one mile of the proposed activities. Nest monitoring efforts were conducted in 2020. The first nest monitoring session was conducted on March 3, 2020. Two adult golden eagles were observed associated with Nest 20A. One adult was in incubating position for the first half of the one-hour survey. The second adult returned to the nest from approximately 800 meters (m) west of the nest and was observed in an incubating position for the remainder of the survey. After the second adult returned, the first adult left the nest and flew west. The second nest monitoring session was conducted on April 11, 2020. During the four-hour survey, two adult golden eagles were observed perched and soaring within 1,600 m of the nest. Flights were recorded to the west, southwest, and south of the nest; however, the birds did not return to the nest during the survey.

b. Location. Describe the location of eagle nests, roosts, and/or use areas including latitude/longitude geographic coordinates and, as appropriate, maps, digital photographs, and other information. The Service cannot issue a permit to disturb a nest if the location of the nest is not provided.

See additional sheet.

c. History. If known, include the history of nest occupation, roost use, or important area use.

See additional sheet.

d. If known, provide the specific distance and locations of nests and other eagle-use areas from the project footprint.

Nest 20A is located approximately 0.9 mile from the Proposed Modification and approximately 0.3 mile from the existing Project.

5. Disturbance Take. If the projected take of eagles is in the form of disturbance, answer the following questions:

a. Will the activity be visible to eagles in the eagle-use areas or are there visual buffers such as screening vegetation or topography that blocks the view?

Yes, the activity will be visible from Nest 20A.

b. What is the extent of existing activities in the vicinity that are similar in nature, size, and use to your activity, and if so, what is the distance between those activities and the important eagle use areas.

See additional sheet.

6. Provide a detailed description of all avoidance, minimization, mitigation, and monitoring measures that you have incorporated into your planning for the activity that you will implement to reduce the likelihood for take of eagles. For long-term projects, this can be included in your Eagle Conservation Plan.

The USFWS has issued two permits for eagle take related to construction of the Project. Permits MB13707C-0 and MB64771C-0 authorized disturbance to a single golden eagle breeding pair by construction activities associated with Project within 1.0 mile of Nest 19A during the 2017 eagle breeding season and of Nest 13A during the 2018 eagle breeding season. A third permit, Permit MB23857D-0, issued in February 2020, authorized long-term incidental take of annual breeding productivity of these two golden eagle pairs by disturbance and habitat loss associated with the Project in Monterey, California for 30 years.

In 2018, Nest 13A fledged two young. In 2020, two new golden eagle nests were found during the eagle nest survey at the Project. Due to the healthy eagle population in the region and $1,750,000 already paid in mitigation, no additional mitigation is proposed for disturbance of two nests associated with the Proposed Modification.

7. Subpermittees. Anyone conducting permitted activities or acting as your agent must be identified by you, in writing, as a subpermittee under your permit. Your subpermittees must have either a copy of your permit that identifies them as a subpermittee, or a copy of your permit and a letter from the Permittee (Principal Officer) listing activities (including location and duration) they are authorized to conduct. The permittee is responsible for ensuring subpermittees are trained and adhere to the conditions of your permit. Subpermittees must be at least 18 years of age. A permittee or subpermittee must be present when conducting activities.

Not applicable.

8. Records. You must retain records legibly written or reproducible in English relating to the activities conducted under your permit for at least 5 years from the date of expiration of the permit.

Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept?

☑ Yes ☐ No If "no," provide the physical address _____

9. You are responsible for ensuring that the permitted activity is in compliance with all Federal, tribal, State, and local laws and regulations applicable to eagles. Have you obtained all required State or Tribal permits or approvals to conduct this activity? Indicate "Yes," Have applied," or None required." If "Yes," attach a copy of the approval(s). If "Have applied," submit a copy when issued. ☑ Yes ☐ Have applied ☐ None required

10. The name and contact information for any U.S. Fish and Wildlife Service employee(s) who has provided technical assistance or worked with you on this project. If you have received technical assistance for your project from your State wildlife agency, please provide the name and contact information for the individual(s).

Tracy Borneman, email: tracy_borneman@fws.gov, telephone: (916) 414-6571

11. Consultant: If you are a consultant submitting this permit application, please provide your name and contact information (phone/email).

Todd Mattson, WEST, Inc.: email: tmattson@west-inc.com, telephone: (612) 655-1726

Eric Hallingstad, WEST, Inc.: email: ehallingstad@west-inc.com, telephone: (509) 386-4616

12. Disqualification factor. A conviction, or entry of a plea of guilty or nolo contendere, for a felony violation of the Lacey Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act disqualifies any such person from receiving or exercising the privileges of a permit, unless such disqualification has been expressly waived by the Service Director in response to a written petition. (50 CFR 13.21(c)) Have you or any of the owners of the business, if applying as a business, been convicted, or entered a plea of guilty or nolo contendere, forfeited collateral, or are currently under charges for any violations of the laws mentioned above? Indicate "Yes" or "No."(you must provide an answer). If you answered "Yes" provide: a) the individual's name, b) date of charge, c) charge(s), d) location of incident, e) court, and f) action taken for each violation. (list all – use additional pages as necessary)

No.

13. Additional Requirement for LONG TERM PERMIT APPLICATIONS ONLY.

If you are requesting a permit longer than 5 years, complete the following. You are advised to coordinate with the Service as early as possible for advice on whether a permit is needed and for technical assistance in assembling your permit application package. The Service may provide guidance on developing complete and adequate application materials and will determine when the application form and materials are ready for submission. The information below must be included in your answers above, an Eagle Conservation Plan (ECP), or other documentation submitted with your application.

(a) Project-specific monitoring and survey protocols, take probability models, and any other applicable data quality standards and include all the data thereby obtained. If the Service has officially issued or endorsed, through rulemaking procedures, survey, modeling, or other data quality standards for the activity that will take eagles, you must follow them and include all the data thereby obtained.

(b) Wind Facilities. Pre-construction eagle survey information collected according to the following standards, unless exceptional circumstances apply.

(A) Surveys must consist of point-based recordings of bald eagle and golden eagle flight activity (minutes of flight) within a three-dimensional cylindrical plot (the sample plot). The radius of the sample plot is 2,625 feet (ft) (800 meters (m)), and the height above ground level must be either 656 ft (200 m) or 82 ft (25 m) above the maximum blade reach, whichever is greater.

(B) The duration of the survey for each visit to each sample plot must be at least 1 hour.

(C) Sampling must include at least 12 hours per sample plot per year for 2 or more years. Each sample plot must be sampled at least once per month, and the survey start time for a sampling period must be selected randomly from daylight hours (between sunrise and sunset)

(D) Sampling design must be spatially representative of the project footprint (minimum-convex polygon that encompasses the wind-project area inclusive of all hazardous areas, and spatial coverage of sample plots must include at least 30 percent of the project footprint. Sample plot locations must be determined randomly.

(E) Include all of the following information:

(1) Coordinates of each sample point in decimal degrees (specify projection/datum).

(2) The radius and height of each sample plot.

(3) The proportion of each three-dimensional sample plot that was observable from the sample point for each survey.

(4) Dates, times, and weather conditions for each survey, to include the time surveys at each sample point began and ended.

(5) Information for each survey on the number of eagles by species observed (both in flight and perched), and the amount of flight time (minutes) that each was in the sample plot area.

(6) The number of proposed turbines and their specifications, including brand/model, rotor diameter, hub height, and maximum blade reach (height), or the range of possible options.

(7) Coordinates of the proposed turbine locations in decimal degrees (specify projection/datum), including any alternate sites.

(F) Stratified-random sampling (a sample design that accounts for variation in eagle abundance by, for example, habitat, time of day, season) is recommended but can be waived after consultation and approval in advance from the Service.

14) I acknowledge that I have read the form Instructions and Frequently Asked Questions, and have accessed the page with the Return Addresses to obtain the address where I should return this form. I have also filled out all fields and questions in this application. Check this box to acknowledge: ☑

USFWS Incidental Permit Application – Form 3-200-71, California Flats Solar Project

Additional sheet with complete responses to permit questions

Section E

1. Take Request. Include species, number, and type of take

Species	**Type of Take (disturb, incidental kill/injure)**	**Number Requested (e.g., 3 eagles, 1 eagle pair, 2 eagle nests)**
Bald Eagle		
Golden Eagle	Disturb	2 nests (Nest 20A, Figure 1; additional nest that may be built within 1.0 mile of the Battery Energy Storage System in the future)

3. Project Activity. Include any relevant information regarding your activity as it relates to eagles. You must include the following:

a. Activity Description. A detailed description of your project. Including information on construction, demolition, vegetation removal, infrastructure, etc. that may affect eagle(s).

The Proposed Modification includes the construction and installation of on-site energy-related infrastructure improvements as part of the Battery Energy Storage System (BESS, e.g. MegaPack Units, substation modifications, transmission line, control and monitoring system) and improvements that would be needed to operate and maintain the energy-related facilities (e.g. safety features, drainage and fencing). The Proposed Modification is described in more detail below and is shown in Figure 2.

The Proposed Modification would include the installation of up to 85 Tesla MegaPack battery units. Each group of four MegaPack battery units would be installed on an approximately 75-foot-long by 12-foot-wide by two-foot-thick concrete pad. The concrete pad would be located within a previously disturbed area of the existing solar development area. Minor surface excavation of approximately 2.3 acres with an approximate depth of up to six feet would be required for the establishment of the concrete pads that would house the Megapack battery units.

The Proposed Modification also includes improvements to the existing northern substation to allow for additional energy to be converted from the BESS from 34.5kV to 230kV. The substation would be constructed on an approximately 104 x 160-foot area immediately adjacent to the existing northern substation and the existing PG&E Morro Bay-Gates 230kV line. The substation structures would range in height from

approximately 20 to 90 ft. Security fencing would be installed around the perimeter of the substation modification, consistent with the existing substation.

Approximately 1,650 feet of overhead line comprised of seven steel poles would be installed between the BESS and new CA Flats 60 Substation. A section of overhead line would run underground, crossing a transmission right of way for approximately 350 feet. The trench bottom depth would be approximately eight feet below grade with a top of conduit and cable at approximately three feet below grade, the trench bottom width would be approximately five feet and the trench top width would be approximately 12 feet wide with 1:1 side slopes.

Other modifications include: additional fencing and security improvements, similar fencing would also be installed to the existing northern substation, minor improvements to the existing internal access road (Figure 2).

d. Location. Describe activity location county/city information and, as appropriate, include: maps, digital photographs, and latitude/longitude geographic coordinates of the proposed activity.

The existing Project is located in unincorporated southeastern Monterey County, approximately seven miles southeast of the community of Parkfield and 25 miles northeast of the City of Paso Robles, near the borders of Monterey, San Luis Obispo, Kings and Fresno Counties (Figure 3). The proposed modification would take place within the footprint of the existing Project (Figure 4).

4. Eagle Activity. Include any known information about eagle activity. You must include the following:

b. Location. Describe the location of eagle nests, roosts, and/or use areas including latitude/longitude geographic coordinates, and, as appropriate, maps, digital photographs, and other information. The Service cannot issue a permit to disturb a nest if the location of the nest is not provided.

Figure 5 shows the locations of eagle nests in the immediate vicinity of the California Flats Solar Project. Nest 20A is located within 1.0 mile of the Proposed Modification in southern Monterey County, California at 35.8586°N, -120.3216°W (Figure 1). A photograph of Nest 20A is presented in Figure 6.

c. History. If known, include the history of nest occupation, roost use, or important area use.

See Table 1 for nest occupation history within 1.0 mile of the Project. We request a permit to disturb Nest 20A and one additional nest that may be built within 1.0 mile of the Proposed Modification during the 2021 breeding season.

5. Disturbance Take. If the projected take of eagles is in the form of disturbance, answer the following questions:

b. What is the extent of existing activities in the vicinity that are similar in nature, size, and use to your activity, and if so, what is the distance between those activities and the important eagle use areas.

The Proposed Modification would occur within the existing solar development area (Figure 4). The nest is located approximately 0.3 mile from the solar development area; during construction of the Project, the nest was unoccupied (2016-2018).

The applicant is not aware of other commercial solar energy facilities or other similar development activities in the vicinity of the California Flats Solar Project. The applicant understands that California Flats is the first solar energy facility to pursue an eagle take permit under the Bald and Golden Eagle Protection Act for take related to the potential permanent loss of nest productivity.

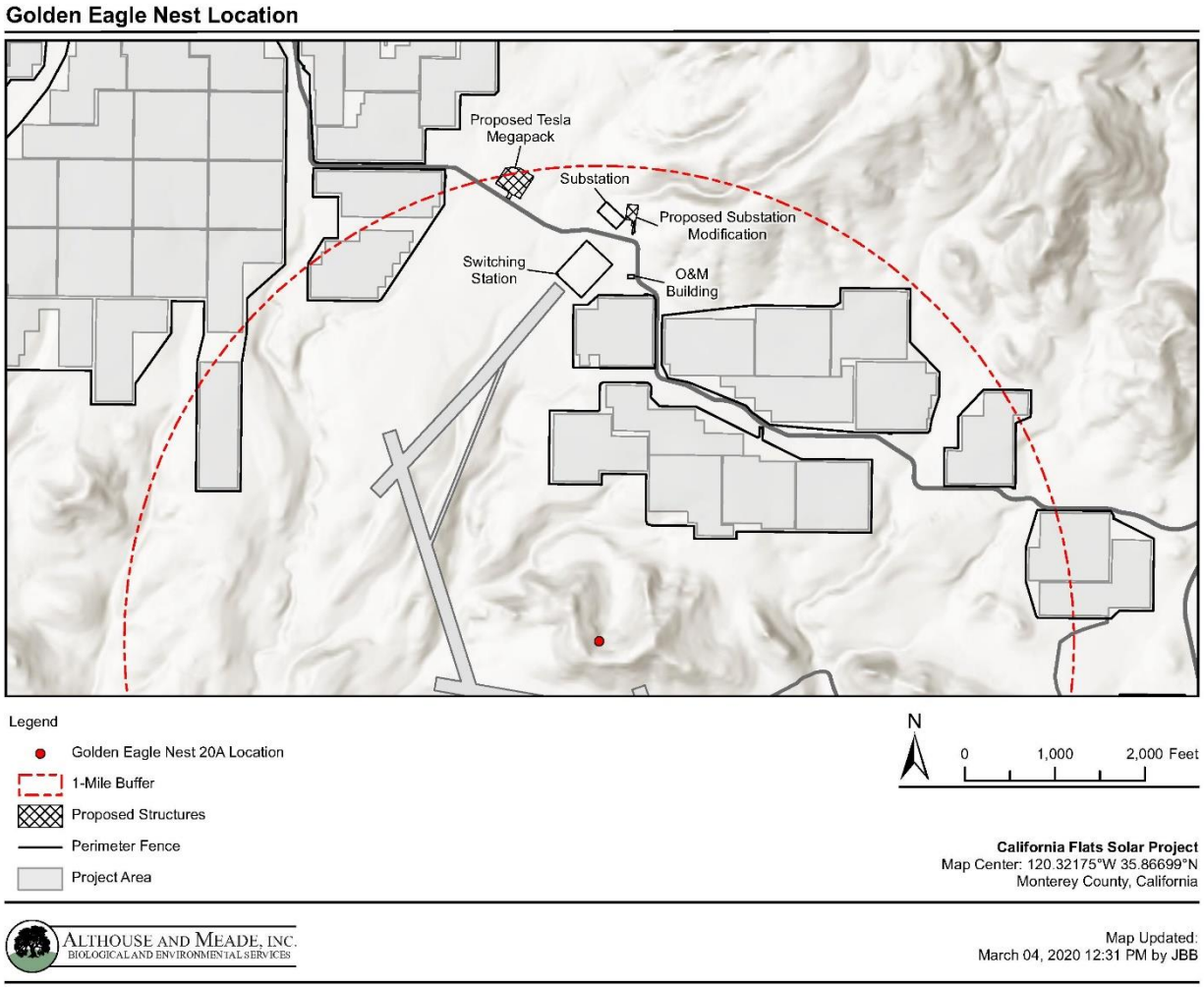

Figure 1. Location of golden eagle Nest 20A and the Proposed Battery Energy Storage System Modification at the California Flats Solar Project.

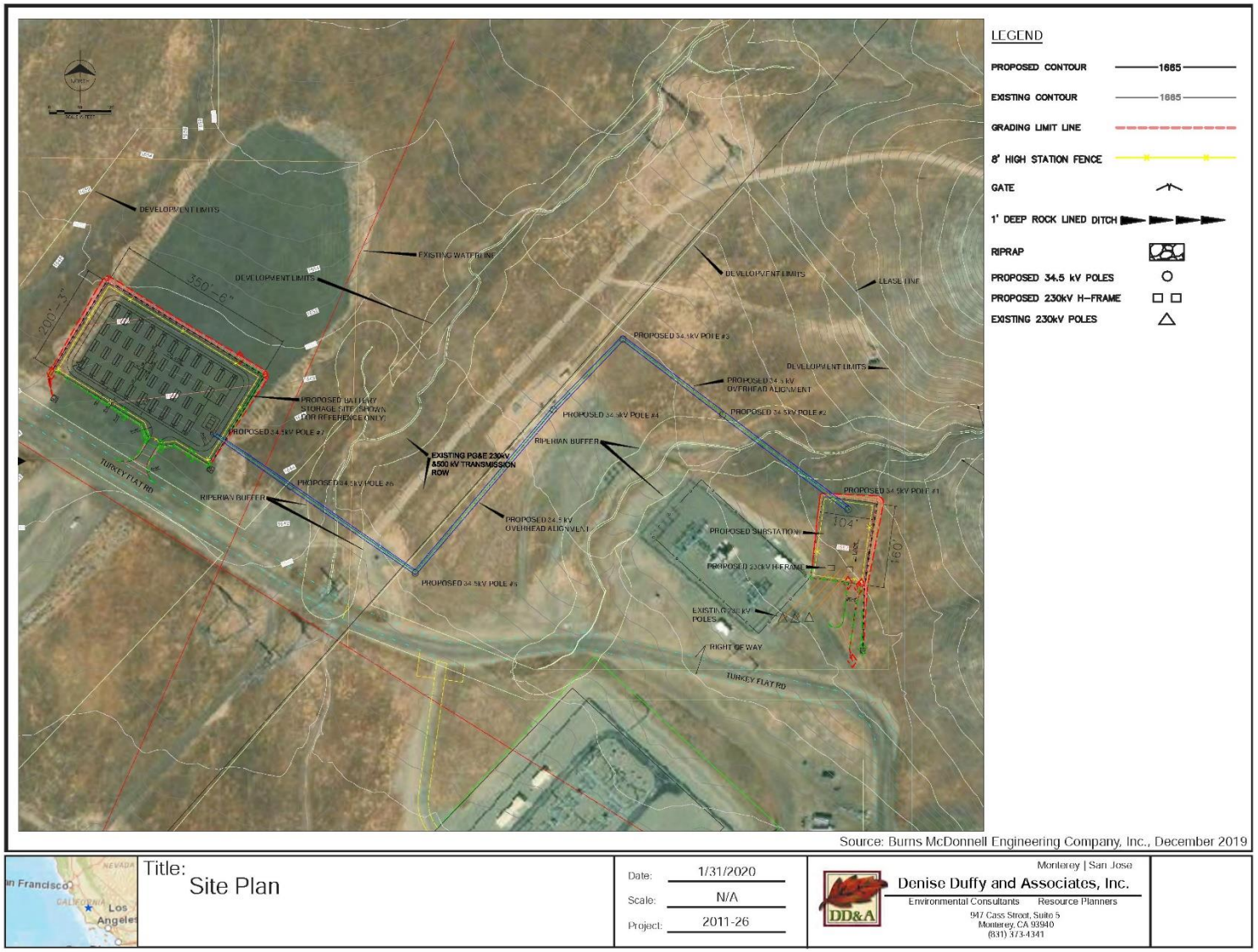

Figure 2. Site plan of the Proposed Battery Energy Storage System Modification at the California Flats Solar Project.

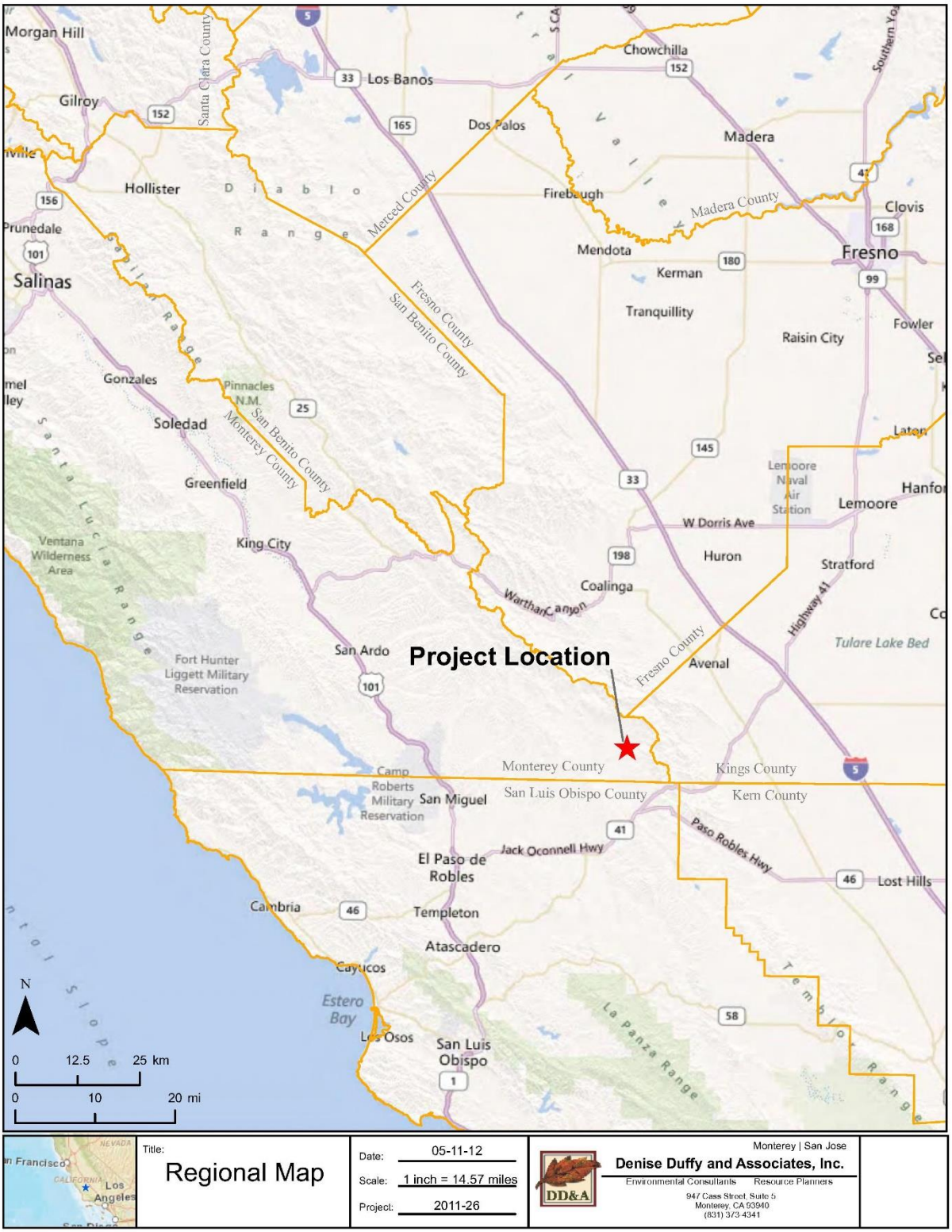

Figure 3. California Flats Solar Project in Monterey County, California.

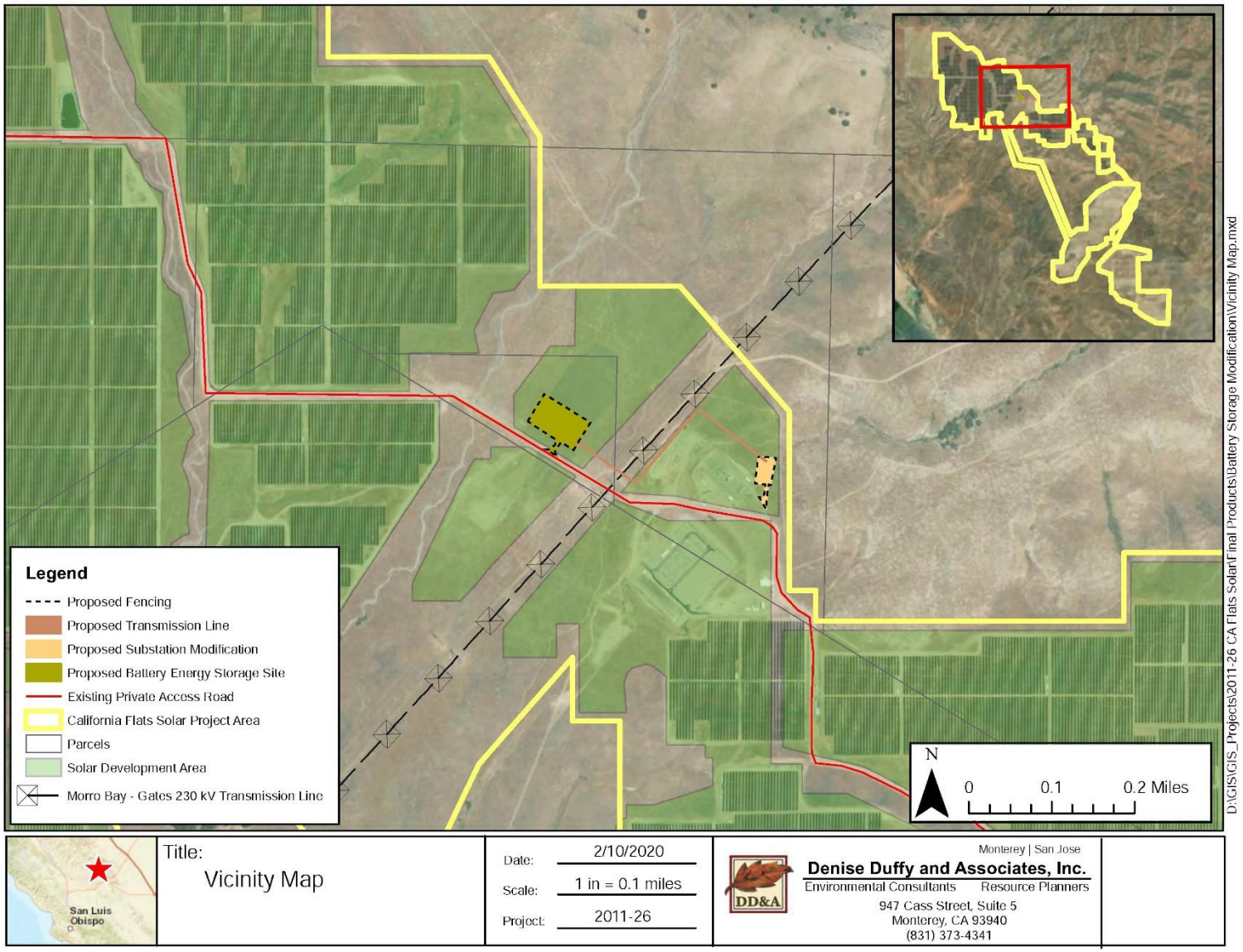

Figure 4. Location of the Proposed Battery Energy Storage System Modification within the California Flats Solar Project.

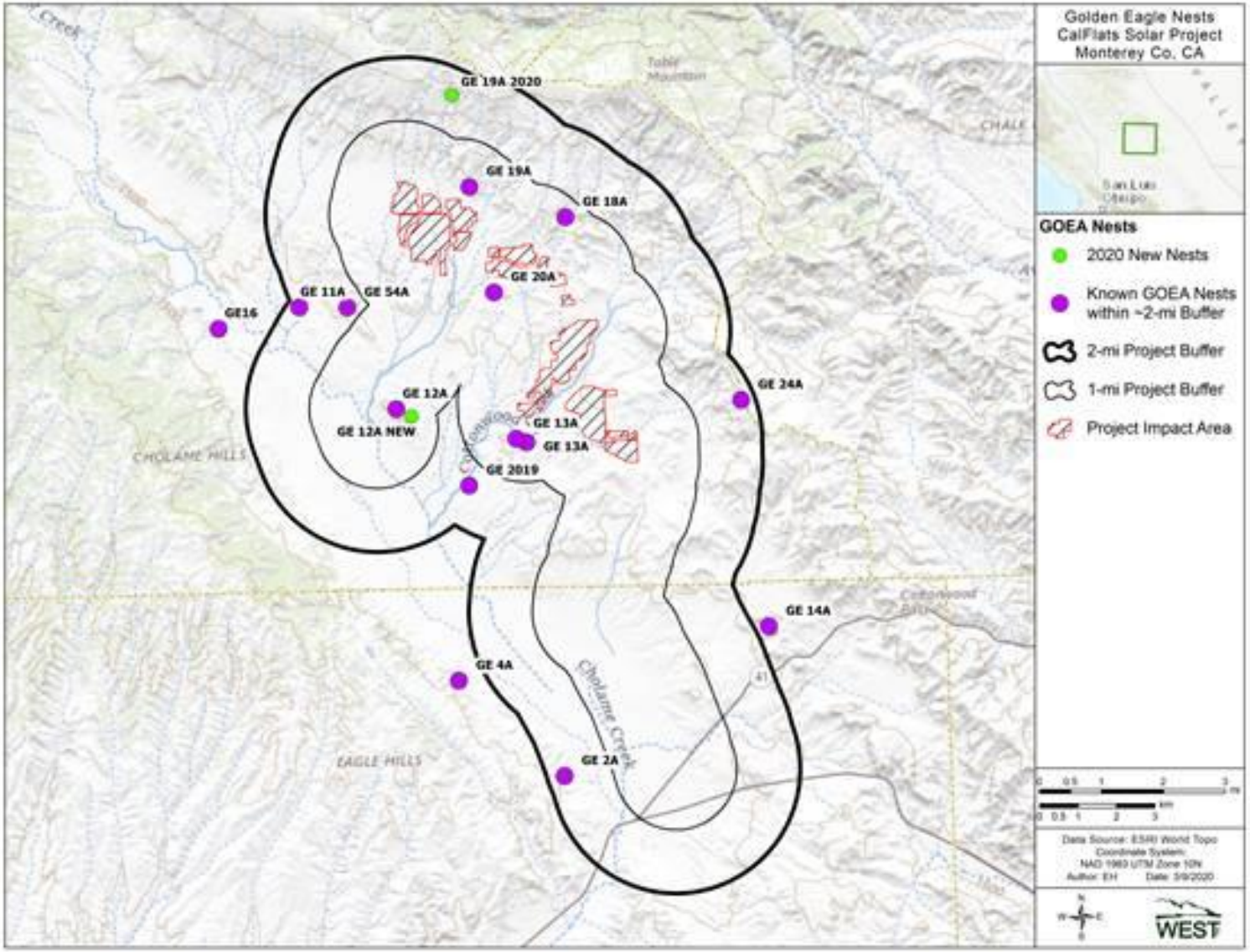

Figure 5. Golden eagle nests in the vicinity of the California Flats Solar Project.

Figure 6. Nest 20A located in Monterey County, California.

Table 1. Golden eagle nest status within 1.6 kilometers of the California Flats Solar Project, 2013--2020.

	Annual Nest Status[1]								
Nest ID	**2013[2]**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020[5]**	**Comments**
GE12A	A	F	A	A	F	F	UNK	-	2 young fledged in 2013, 2015, and 2016
GE12A New	-	-	-	-	-	-	-	A	Documented in 2020
GE13A	A	U	O	A	A[3]	A[3]	O	A	2 young fledged in 2013, 2016, 2017, and 2018
GE18A	O	F	O	O	A	A	O	U	2 young assumed to have fledged in 2017, 1 young fledged in 2018
GE19A	O	F	O	A	O	O[4]	O	A	2 young fledged in 2016
GE20A	O	U	O	U	U	U	UNK	A, F	
GE28A	O	U	-	-	-	-	-	-	Nest observed collapsed in 2015

[1] A = Active; F = Failed, O = Occupied; U = Unoccupied; UNK = Unknown.

[2] Data from H.T. Harvey & Associates (2013a).

[3] In 2017 and 2018, the GE13A pair used a second nest structure located ~218 yards (200 meters) from the original nest location.

[4] In 2018, the GE19A pair was observed at the GE19A nest and carrying nest material to two other locations on the GE19A hillside; however, they did not build substantive structures at either alternate location.

[5] Surveys for the 2020 season are ongoing.

Appendix B. California Flats Solar Project Eagle Management Plan

CALIFORNIA FLATS SOLAR PROJECT
Eagle Management Plan

Prepared for:

California Flats Solar, LLC

135 Main Street, 6th Floor
San Francisco, California 94105

Prepared by:

Todd Mattson and Eric Hallingstad
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December 2018

TABLE OF CONTENTS

TABLES

FIGURES

APPENDIX

1 INTRODUCTION

California Flats Solar, LLC (California Flats) is in the process of constructing and operating, and will eventually decommission, a 280-megawatt (MW) alternating current (AC) photovoltaic (PV) solar generating facility referred to as the California Flats Solar Project (Project) located in Monterey and San Luis Obispo counties, California. The U.S. Fish and Wildlife Service (USFWS) approved a Low-Effect Habitat Conservation Plan (LEHCP) and issued an Incidental Take Permit (ITP) for the Project on July 10, 2017, that provides coverage and outlines protection and mitigation measures for federally listed species during the operation and maintenance (O&M) of the Project (Althouse and Meade, Inc. 2016). In the course of discussions between California Flats and USFWS regarding voluntary nest buffers for golden eagles (*Aquila chrysaetos*) during Project construction, USFWS requested that California Flats apply for incidental take coverage to address potential impacts to golden eagles during Project O&M. Accordingly, this Eagle Management Plan (Plan) evaluates potential impacts and proposes additional conservation measures for golden eagles and provides support for incidental take coverage for golden eagles under an eagle-specific ITP for the Project (USFWS 2016b).

2 PROJECT BACKGROUND

The Project is located within an approximately 29,000-hectare (ha; 72,000-acre [ac]) private cattle ranch. The total developed footprint of the Project encompasses approximately 1,036 ha (2,562 ac; Figure 1). The Project comprises a 858-ha (2,120-ac) solar generating area (which includes solar arrays, electrical equipment, internal roadways, and fencing), two substations, an O&M facility, and approximately 24 ha (60 ac) of access roads. Additionally, the Project includes a switching station owned and operated by Pacific Gas and Electric Company (PG&E). Operations and maintenance activities at the PG&E switching station are not covered by the LEHCP and will not be covered by this Plan.

In addition to the Project footprint, the Plan Area includes a 2,510 ha (6,203 ac) compensatory mitigation area where golden eagle nesting and foraging habitat will be preserved for the duration of the Permit term (Figure 1). The Plan Area totals approximately 3,547 ha (8,765 ac) in southeastern Monterey and northern San Luis Obispo counties. The Plan Area is located within the Dark Hole, Cholame, and Cholame Valley U.S. Geological Survey 7.5-minute quadrangles and within Township 23S, Section 15E; Township 24S, Sections 15E and 16E; and Township 25S, Range 16E (Althouse and Meade, Inc. 2016). This Plan does not propose any changes to the Project or to the Plan Area.

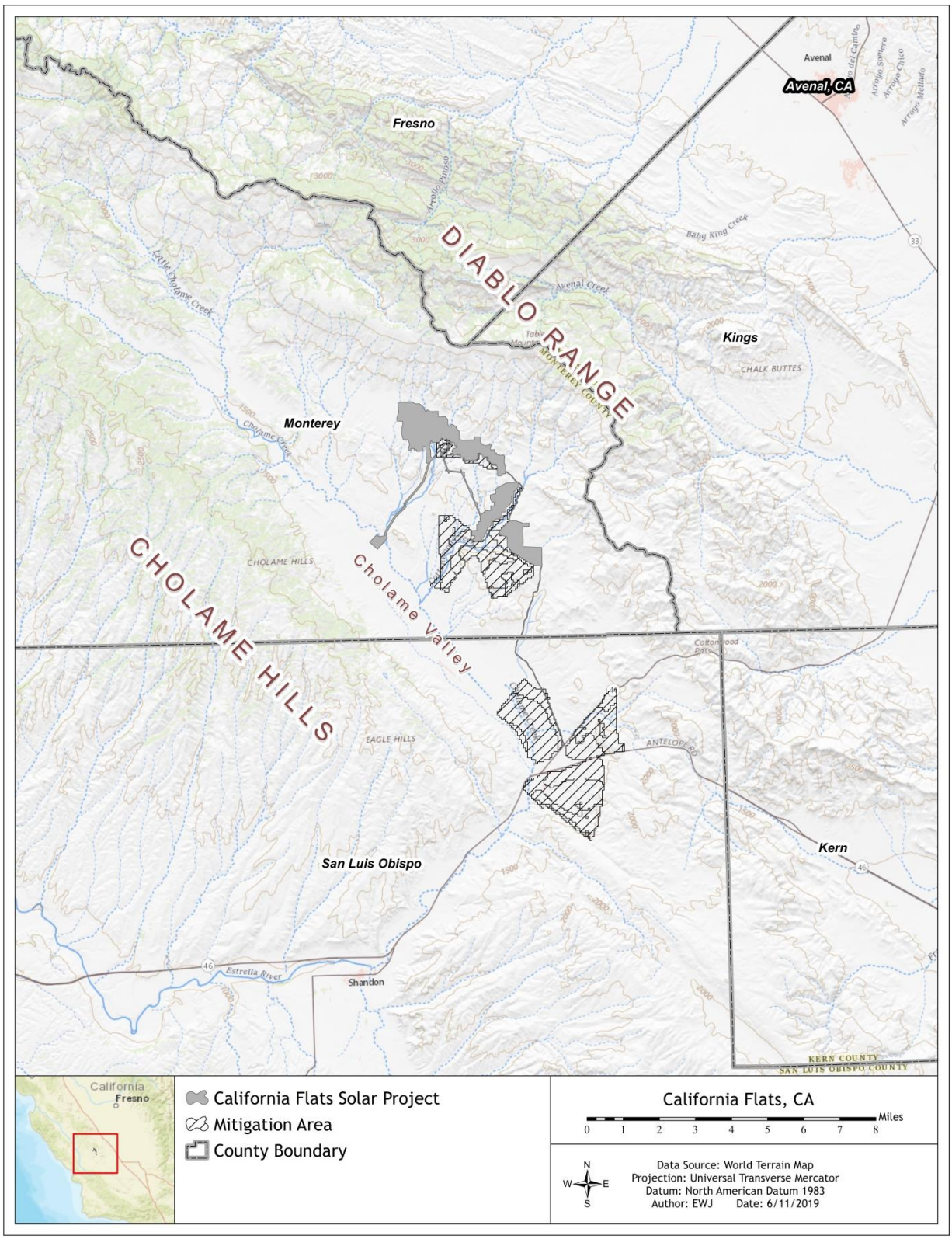

Figure 1. Vicinity map of the California Flats Solar Project.

3 ENVIRONMENTAL SETTING/BIOLOGICAL RESOURCES

The Project is located within the Pacific Flyway, in Coastal California Bird Conservation Region (BCR) 32. The Project is located in the interior portion of the California South Coast Ranges, in a northeastern extension of the Cholame Valley known as Turkey Flat. Turkey Flat is a gently undulating, largely treeless area incised by several springs and drainages; it is flanked on the east by the often steep hills of the Diablo Range. Elevations within the Project range from 488 to 640 meters (m; 1,600 to 2,100 feet [ft]) above mean sea level; the access road to the site descends to 358 m (1,175 ft), where it meets State Route 41 (Hwy 41). Grassland dominated by non-native grasses is the predominant vegetation community within the Plan Area followed by woodlands, wetlands, riparian scrub, upland shrublands and other (developed/ruderal and intensive agriculture). See the LEHCP for a full discussion of climate, soil types, hydrology and other environmental characteristics at the Project (Althouse and Meade, Inc. 2016).

4 REGULATORY FRAMEWORK

In addition to the regulations and codes described in the LEHCP (Althouse and Meade, Inc. 2016), the following federal statute is applicable to the golden eagle as proposed in this Plan.

4.1 Bald and Golden Eagle Protection Act

Golden eagles are afforded legal protection under authority of the Bald and Golden Eagle Protection Act (BGEPA), 16 US Code (USC) 668–668d. The BGEPA prohibits the take, sale, purchase, barter, offer of sale, purchase, or barter, transport, export or import, at any time or in any manner any bald (*Haliaeetus leucocephalus*) or golden eagle, alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as to include “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb,” and includes criminal and civil penalties for violating the statute. The USFWS further defines the term “disturb” to mean to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior (50 Code of Federal Regulations [CFR] 22.3). As the covered species in this Plan, take of a golden eagle would be authorized under the BGEPA when permit conditions set forth in 50 CFR 22.26 are met. As such, this Plan has been designed to meet the BGEPA permit issuance criteria, including the avoidance, minimization, and other mitigation measure requirements of 50 CFR 22.26

4.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) is the cornerstone of migratory bird conservation and protection in the U.S. The MBTA implements four treaties that provide for international protection of migratory birds. The statute states:

> "Unless and except as permitted by regulations…it shall be unlawful at any time, by any means, or in any manner to pursue, hunt, take, capture, kill…possess, offer for sale, sell…purchase…ship, export, import…transport or cause to be transported…any migratory bird, any part, nest, or eggs of any such bird….[The Act] prohibits the taking, killing, possession, transportation, import and export of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior…" (see 16 USC 703).

The word "take" is defined by regulation as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect…" (see 50 CFR 10.12).

Bald and golden eagles are protected by the MBTA in addition to BGEPA. The take prohibition in the statute does not require any proof of intent, knowledge, or negligence to establish an MBTA violation. Historically, in the absence of a USFWS permit or regulatory authorization—which the USFWS has not made available under the MBTA—the USFWS considered any action resulting in a "taking" or possession (permanent or temporary) of a protected species to be a violation of the MBTA. However, several federal courts have held that the MBTA does not apply to acts that only indirectly result in the death of migratory birds. (See *Newton County Wildlife Ass'n v. United States Forest Serv.*, 113 F.3d 110, 115 (8th Cir., 1996) (interpreting "take" and "kill" to mean "physical conduct of the sort engaged in by hunters and poachers" and not conduct that only "indirectly" results in the death of migratory birds); *see also United States v. Brigham Oil & Gas, L.P.*, 840 F.Supp.2d 1202 (N.D. 2012) (citing *Newton* and holding that "lawful commercial activity which may indirectly cause the death of migratory birds does not constitute a federal crime"). Most recently, on December 22, 2017, the Office of Solicitor of the U.S. Department of the Interior released a new legal opinion, M-37050, addressing the issue of incidental take under the MBTA, which withdraws and replaces a previous M-Opinion on the same topic issued near the end of the Obama administration, M-37041. The new M-Opinion concludes that, "consistent with the text, history, and purpose of the MBTA, the statute's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs" (U.S. Department of Interior [USDOI] 2017). Accordingly, the current interpretation and policy of the USDOI is that incidental take of migratory birds, including bald and golden eagles, that results from the operation of a wind farm is not regulated by the MBTA.

4.3 Permit Holder/Permit Duration

The requested ITP coverage for golden eagle take at California Flats would remain in effect for the maximum permit period of 30 years, or until the Project is decommissioned, whichever comes first. Thirty-four years is the anticipated life of the Project.

5 STAGE 1 PRELIMINARY SITE ASSESSMENT

5.1 Status and Distribution

The golden eagle is federally protected under BGEPA and MBTA and state-listed as a fully protected species (California Department of Fish and Wildlife [CDFW] 2013). The applicable population estimate for the Coastal California BCR is approximately 718 individuals with a density of 0.0043 eagles/square kilometer (km^2; 0.0112 eagles/square mile [mi^2]; USFWS 2016a). Data collected 1966–2015 for the Breeding Bird Survey program suggests a stable population rate of 0.01 in the Coastal California BCR (95% Confidence Interval: -1.53–1.57; Sauer et al. 2017). Golden eagles are considered an uncommon permanent resident and migrant throughout California, except the Central Valley and far southeast corner of the state, which is considered non-breeding, winter habitat (Kochert et al. 2002).

5.2 Habitat Characteristics/Use

In the interior central Coast Ranges of California, golden eagles forage in a wide variety of landscapes, preferably in open grasslands and oak savanna where small mammals are the preferred prey (Hunt et al. 1998). Dense chaparral, agriculture, and developed areas are typically not used during foraging. The primary prey base includes California ground squirrels (*Otospermophilus beecheyii*) and black-tailed jackrabbits (*Lepus californicus*) (Hunt et al. 1998); however, birds, carrion, and feral pig (*Sus scrofa*) are also used (H.T. Harvey & Associates 2014, WEST 2014b). While cliffs are the preferred nesting substrate in other regions, golden eagles in southern and central California commonly use trees and transmission towers (Smith 2012, Wiens et al. 2015). Nest building and maintenance may occur year round, with incubation typically initiated during February – March, hatching March – April, and fledging May – July (Hunt et al. 1998, H.T. Harvey & Associates 2013a). The risk of disturbance at nests varies throughout the nesting period, is highest during the courtship through the brooding period and decreases during the nestling and post-fledging periods (Whittington and Allen 2008).

5.3 Stage 1 Questions

1. Does existing or historical information indicate that eagles or eagle habitat (including breeding, migrating, dispersal, and wintering habitats) may be present within the geographic region under development consideration?
2. Within a prospective project site, are there areas of habitat known to be or potentially valuable to eagles that would be destroyed or degraded due to the project?
3. Are there important eagle use areas or migration concentration sites documented or thought to occur in the project area?
4. Does existing or historical information indicate that habitat supporting abundant prey for eagles may be present within the geographic region under development consideration (acknowledging, where appropriate, that population levels of some prey species such as black-tailed jackrabbits (*Lepus californicus*) cycle dramatically [Gross et al. 1974] such that they are abundant and attract eagles only in certain years [e.g., Craig et al. 1984]?

5. For a given prospective site, is there potential for significant adverse impacts to eagles based on answers to above questions and considering the design of the proposed project?

6 STAGE 2 SITE-SPECIFIC SURVEYS

Site-specific surveys and assessments for golden eagles and their preferred prey base have occurred at the Project since 2012 and include a variety of survey designs and methodologies. Site-specific studies that have occurred to date include eagle nest surveys, eagle use and activity survey, and eagle prey base assessments (Table 1).

Table 1. Pre-construction surveys that provide site-specific eagle data for the California Flats Solar Project.

Study Type	Timing	Methodology	Source
Small Mammal Surveys	October 2012 – December 2013	Transect, Camera Station, and Spotlighting Surveys, Scent Dog	H. T. Harvey & Associates 2014
Baseline Raptor Nest Surveys	March – June 2013	Aerial and Ground Surveys	H. T. Harvey & Associates 2013a
Baseline Avian Activity Surveys	March – August 2013	20-min. Point Count Surveys	H. T. Harvey & Associates 2013b
Eagle Nest Surveys	April – May 2014	Aerial Surveys	WEST, Inc. 2014
Eagle Use/Activity Surveys	March – December 2014	3-hour (hr) Point Count Surveys	Mattson et al. 2015
Eagle Nest Surveys	February – May 2015	Aerial and Ground Surveys	WEST, Inc. 2015
Eagle Nest Monitoring	March – August 1016[a]	Ground Surveys	Stansbury and Hallingstad 2016
Eagle Nest Monitoring	December 2016 – June 2017[a]	Ground Surveys	Hallingstad 2017
Eagle Nest Monitoring	January 2017 – August 2018[a]	Ground Surveys	Hallingstad 2018

[a] Some portions of the Project were under construction during these surveys.

6.1 Eagle Nest Surveys

6.1.1 Methods

Surveys for bald and golden eagle nests were conducted at the Project for five nesting periods, which included three nesting periods prior to construction (2013–2015) and three nesting periods during construction (2016–2018). Survey objectives changed over the course of the survey period due to the increased understanding of nest status and distribution, and in response to project siting, development, and construction activities. During 2013, the objective of eagle nest surveys was to determine the number, location, and status of nests within 16 kilometers (km; 10 miles [mi]) of the Project and included their nesting phenology and foraging territories. In subsequent years (2014–2015), the focus was on monitoring the status of known nests and searching for other previously undocumented nests. During the 2016–2018 surveys,

the statuses of nests within 1.6 to 3.2 km (1.0 to 2.0 mi) of the Project were monitored to avoid and minimize potential effects during Project construction (Figures 2 and 3). During 2013–2015, surveys were conducted from helicopters and ground vehicles within 16 km of the Project. Aerial surveys were conducted early in the nesting period (February – March) to locate and identify territory establishment and incubating individuals. Multiple follow-up surveys were conducted through June to recheck nesting status and search for previously undocumented nests. During focused monitoring in 2016–2018, the survey schedule coincided with construction activities and focused on watching active[1] eagle nests for potential behavioral responses to construction activities.

The characterization of nesting status used a combination of definitions (Pagel et al. 2010, USFWS 2013). In general, a nest was defined as active when: 1) it was found to contain eggs or young (dead or alive), or 2) an adult was observed on the nest in an incubating or brooding posture. An occupied nest contained 1) fresh nest materials that had been added during the current nesting season, or 2) had adults at or near a confirmed or probable eagle nest (H.T. Harvey & Associates 2013a). A nest was classified as unoccupied if none of these conditions were met and is synonymous with the term inactive. A successful nest was one that fledged at least one young that was at least 80% of its fledging age which was defined as greater than eight weeks old (56 days) during an observation (H.T. Harvey & Associates 2013a). A failed nest was an active nest that did not successfully fledge young either due to egg failure or nest predation.

Nest data from 2013–2015 were used to establish the baseline rates of annual nesting status, success, and productivity prior to Project construction from 2016 through 2018. Baseline nest characteristics were calculated using the following definitions (modified from Steenhof and Newton 2007):

- *Nesting Status*: the proportion of nests of a given classification (e.g., active, occupied, failed) for all nests within a particular nesting period.
- *Nesting Success*: The proportion of active nests with at least one young in the nest at the time of last survey observation and reported as the number of successful nests per total active nests.
- *Productivity*: The average number of young produced per occupied nest in a particular nesting period.

In cases where occupancy status was equivocal but field observations suggested that a pair of eagles may have occupied the territory that contained the nest, it was assumed that the nest was occupied during that season. This conservative approach undoubtedly overestimates the number of occupied nests within a territory but addresses the uncertainty in nest classification (Steenhof and Newton 2007).

[1] An active nest is hereby defined as a nest where (1) an adult was present on the nest in incubating position, (2) an egg or eggs were present, or (3) nestlings observed.

As discussed, nest success is typically achieved when a chick reaches a certain age (i.e., 56 days); however, assessment of nest productivity was not the primary survey objective during all years. Dismissing nests with fledglings' ≤56 days as undetermined due to the construct of survey timing or objectives may underestimate the number of successful nests in an area. For consistency, it was assumed that nests that contained live chicks at the time of the last survey observation were successful. However, this approach may overestimate nest success, as several young that were only a few weeks of age are assumed to have successfully fledged.

Nests were censored from the analyses if the structures no longer provided a suitable nesting platform (e.g., collapsed nests or blow-outs that rendered the nest so dilapidated that nest occupancy was highly improbable). Nests were also censored from analyses when the total nest size and material observed during follow-up visits determined initial mischaracterization of the nest as suitable for golden eagles. A full list of all confirmed, probable, and censored (*n*=3) golden eagle nests is found in Appendix A.

6.1.2 Results

In 2013, of the 29 occupied golden eagle nests located within 16 km of the Project, 12 (46%) were active. Of the 12 active nests, two nests failed to incubate and a third had a chick predated (Table 2), resulting in a nest success rate of 75%. The nine active nests contained 18 chicks at the time of last survey, of which four had reached 80% maturity. Based on the number of chicks and all occupied nests in the area, nest productivity was 0.62 young/nest. The remaining nests were considered occupied or presumed to be occupied but did not contain eggs or young (H.T. Harvey & Associates 2013a).

In 2014, of the 40 golden eagle nests located within 16 km of the Project[2], nine (23%) were considered active during the initial survey (WEST 2014a). Of the nine active nests, three nests fledged five young, which reached 80% maturity and six nests that contained eggs failed prior to last nest survey, resulting in a nest success rate of 33%. Nine nests were considered occupied or presumed to be occupied (23%) by the presence of an adult or a pair of adults near the nest (WEST 2014a). Based on the number of chicks and all occupied nests in the area, nest productivity was 0.28 young/nest. The remaining 22 nests were considered unoccupied during the 2014 nesting period. Three nests observed during 2013 were not relocated during 2014 surveys. In addition, there was evidence that nest 17A had fallen out of the tree.

In 2015, of the 51 golden eagle nests located within 16 km of the Project, seven (14%) were considered active as determined by the presence of an incubating adult on the nest (Mattson et al. 2015; Table 2). Of the seven active nests, three nests fledged five young which were < 80% maturity at last survey observation, two had adults sitting on nests at the last check on April 16 but no sign of young, and two nests failed to successfully lay eggs or incubate. The nest success rate was 43%. An additional fourteen nests had evidence of nest tending (e.g., fresh nest material or adults near the nest) or adults present early in nesting period (February –

[2] Additional nest structures were discovered during each aerial survey.

March); these nests were also considered occupied. Based on the number of young and all occupied nests in the area, nest productivity was 0.24 young/nest. Two nests (GE28A and GE41) were no longer present in the trees where the nests were documented in previous years.

In 2016, surveys focused on monitoring the status/phenology of nests located within 1.6 km of the Project during the construction phase (Stansbury and Hallingstad 2016). Of the five nests located within 1.6 km of the Project, three (60%; nests GE12A, GE13A and GE19A) were considered active and successfully fledged two young each (Table 3). Two nests remained inactive during the breeding and nesting period; however, one was considered occupied. Based on the number of chicks and all occupied nests in the area, nest productivity was 1.5 young/nest.

In 2017, surveys focused on monitoring nests within 3.2 km of the Project were performed during the construction phase (Hallingstad 2017). During this year of construction, a nest disturbance permit had been obtained to conduct construction activities near nest GE19A; construction activities during the 2017 breeding season were limited to areas more than one mile from the other nest sites. Of the five nests located within 1.6 km of the Project, four were documented as occupied early in the nesting season (GE12A, GE13A, and GE18A, and GE19A). In mid-May, only two of the occupied nests were occupied and active (GE13A, GE18A). Nest GE12A, which had an adult in incubation position on three occasions through March, is assumed to have failed in 2017 as chicks were never observed during subsequent visits in April and May. No egg laying was documented for the GE19A pair. Two fledglings were observed near the nest GE13A on July 6. Two fledglings were also observed near nest GE18A on June 8. Given this nest was well away from active construction areas, follow-up checks were not completed at nest GE18A; however, it was assumed to have successfully fledged two young. Nest GE20A was unoccupied throughout the 2017 nesting season.

In 2018, surveys once again focused on monitoring nests within 3.2 km of the Project and were performed during the construction phase (Hallingstad 2018). During this year of construction, a nest disturbance permit had been obtained to conduct construction activities near nest GE13A; construction activities during the 2018 breeding season were limited to areas more than one mile from the other nest sites. Of the five nests located within 1.6 km of the Project, four were documented as occupied early in the nesting season (GE12A, GE13A, and GE18A, and GE19A). However, by April only three of the occupied nests were occupied and active (GE12A, GE13A, GE18A), as egg laying was not documented for the GE19A pair. Nest GE12A had two nestlings in late May, but failed in early June when the tree limbs supporting the nest broke and the nest fell to the ground. High winds, combined with rotten areas within the tree limbs, are assumed to be the cause for the structure failure. The contents of the fallen GE12A nest structure were inspected and the remains of one nestling were discovered. It is assumed that both GE12A nestlings suffered mortality. Two fledglings were observed near nest GE13A on July 20. One fledgling was also confirmed near nest GE18A on July 6. Nest GE20A was unoccupied throughout the 2018 nesting season.

Table 2. Summary of golden eagle nesting status within 16 kilometers of the California Flats Solar Project, California, 2013–2015.

Nest Status[1]	Year			Comments
	2013[2]	2014[3]	2015	
Active/Fledged	1	3	0	5 nestlings in 2014 were > 8 weeks old
Active/Failed	3	6	2	
Active/Undetermined[4]	8	0	5	2 nestlings in 2013 were > 7 weeks old
Occupied/Inactive	17	10	14	
Unoccupied	0	25	33	
Total Nests	**29**	**47**	**54**	

[1] Active – adult observed on nest in incubating or brooding posture or nest contained eggs or young; Occupied – adults at or near confirmed or probable eagle nest; Unoccupied – no evidence of nesting or territory occupancy observed; Fledged – young older than 51 days observed in nest; Failed – eggs did not incubate successfully or disappeared, or previously observed young predated; Undetermined – young at nest younger than 51 days old at time of last survey.

[2] Data from H.T. Harvey & Associates (2013a).

[3] Of the 47 nests, three nests from the previous year were not relocated.

[4] Nestlings observed, but were ≤ 51 days-old. Status undetermined but assumed to have fledged (USFWS 2013).

Based on the three years of preconstruction monitoring data of nests within 16 km of the Project (2013–2015), an average 26% (range 14–41%) of the nests attempts were successful. Of the 28 active nesting attempts, 17 of the nests (60%) contained fledglings during the final nest survey of the nesting period. Average annual nest productivity was 0.38 young/year (range 0.24–0.62 young/year).

Based on six years of golden eagle nesting data, there is high annual variability of nesting activity and success of nests located within 1.6 km of the Project. Between 2013–2018, of the 26 times nests were occupied within 1.6 km of the Project, there were 15 nesting attempts of which 10 were successful (Table 3). These 15 nest attempts within 1.6 km of the Project successfully fledged young 67% (range 0-100%) of the time between 2013–2018 (Table 3). When nest productivity is calculated by occupied nests and averaged over the six-year monitoring period, the average nest productivity is 0.73 young/year (range 0–1.5; median 0.72). The number of eagles fledged per year included 4, 0, 2, 6, 4, and 3 at all of the nests within one mile of the Project from 2013 to 2018. Mean golden eagle nest productivity in the U.S. is 0.55 young fledged per breeding season per occupied nesting territory (with a 95% credible interval of 0.40 to 0.75; USFWS 2016a).

Give information from 2013–2018, which included more intensive monitoring than in previous years, there are four regularly occupied golden eagle nesting territories within 1.6 km of the Project (Nests GE12A, GE13A, GE18A, and GE19A).

Table 3. Golden eagle nest success within 1.6 kilometers of the California Flats Solar Project, 2013--2018.

Nest ID	Annual Nest Status[1]						Comments
	2013[2]	2014	2015	2016	2017	2018	
GE12A	A	F	A	A	F	F	2 young fledged in 2013, 2015, and 2016
GE13A	A	U	O	A	A[3]	A[3]	2 young fledged in 2013, 2016, 2017, and 2018
GE18A	O	F	O	O	A	A	2 young assumed to have fledged in 2017, 1 young fledged in 2018
GE19A	O	F	O	A	O	O[4]	2 young fledged in 2016
GE20A	O	U	O	U	U	U	
GE28A	O	U	-	-	-	-	Nest observed collapsed in 2015
Per Nest Productivity	**0.67**	**0.00**	**0.40**	**1.50**	**1.00**	**0.75**	

[1] A = Active; F = Failed, O = Occupied; U = Unoccupied.

[2] Data from H.T. Harvey & Associates (2013a).

[3] In 2017 and 2018, the GE13A pair used a second nest structure located ~218 yards (200 meters) from the original nest location.

[4] In 2018, the GE19A pair was observed at the GE19A nest and carrying nest material to two other locations on the GE19A hillside; however, they did not build substantive structures at either alternate location.

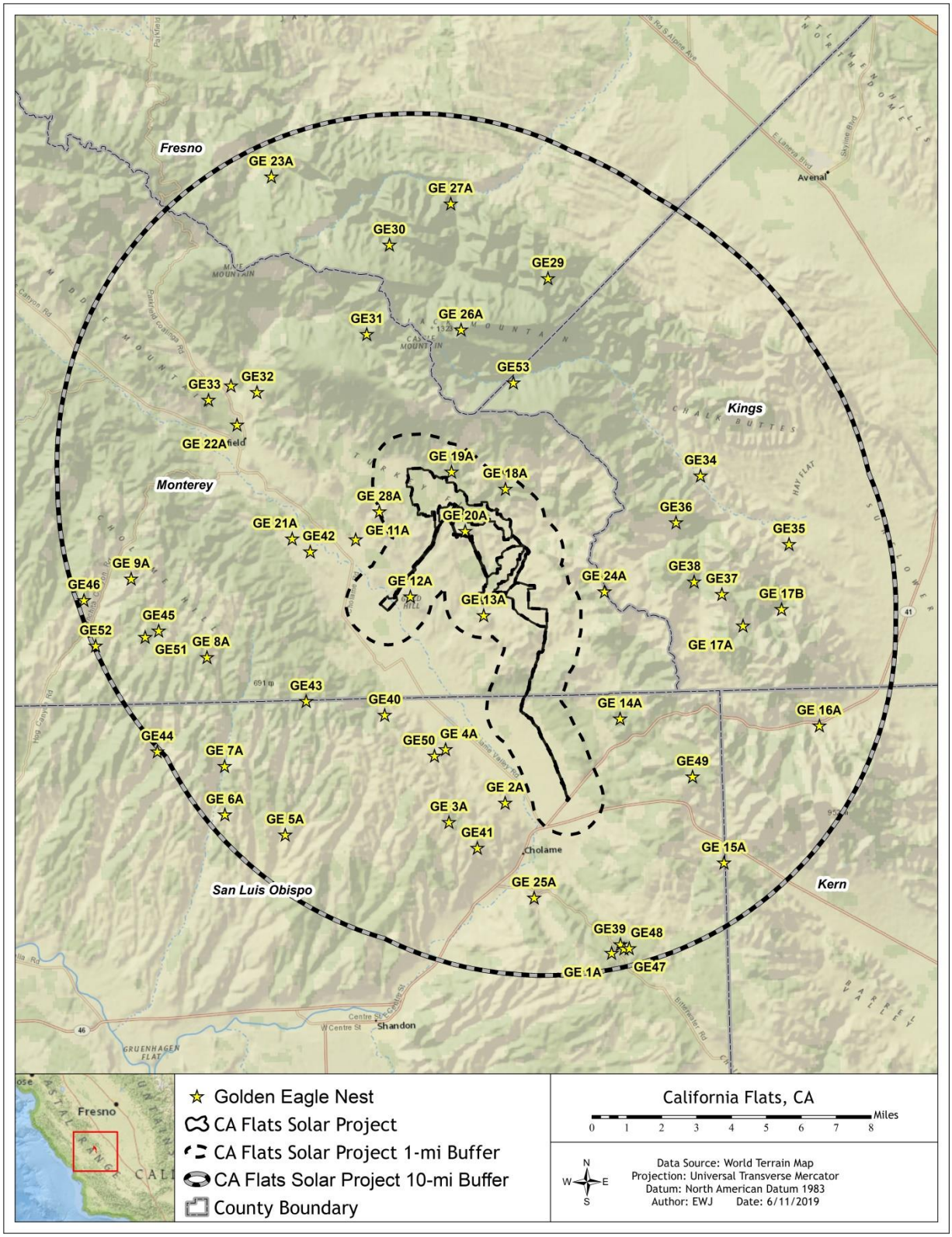

Figure 2. Golden eagle nests within 16 kilometers of the California Flats Solar Project.

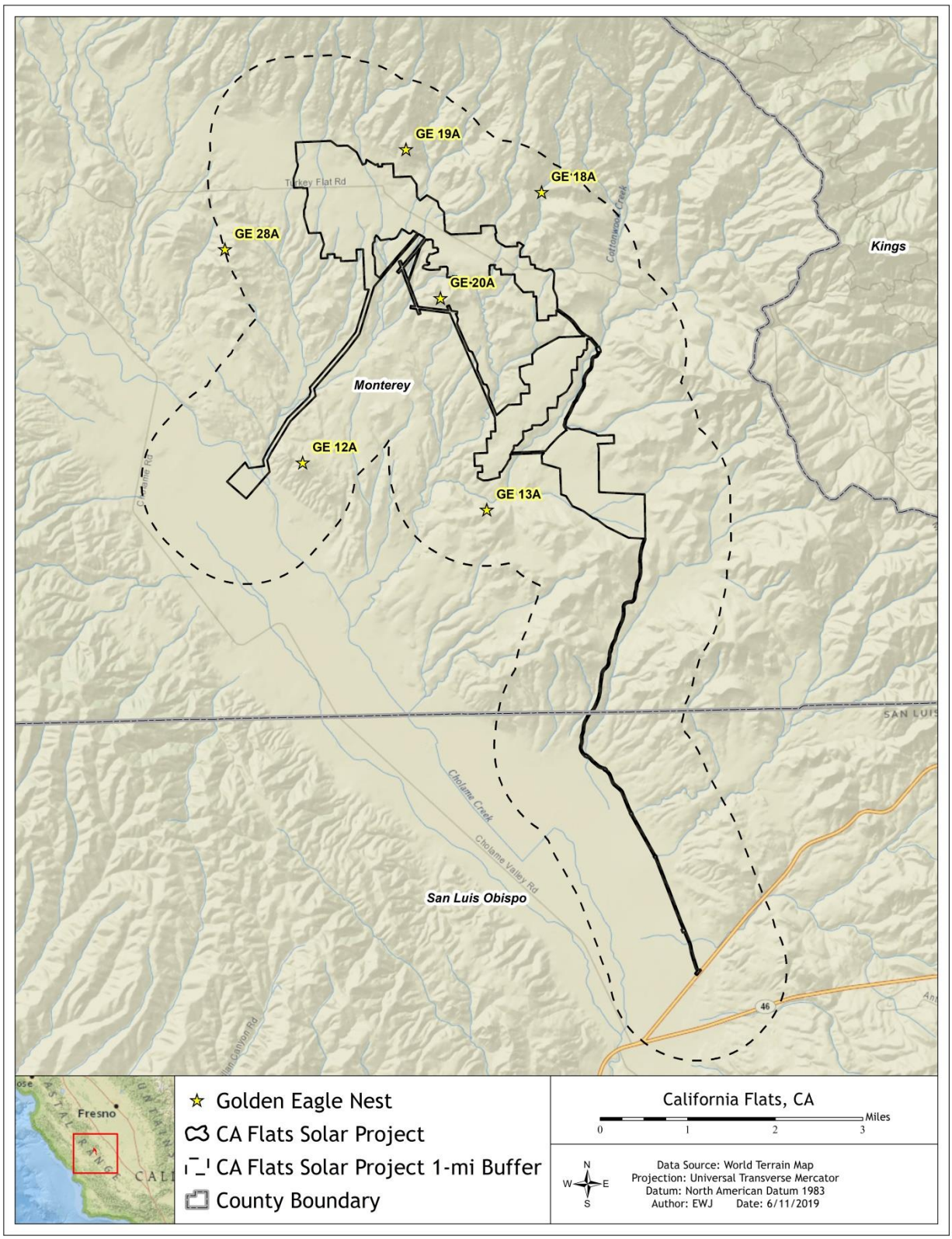

Figure 3. Golden eagle nests within 1.6 kilometers of the California Flats Solar Project.

6.2 Eagle Use Surveys

6.2.1 Methods

In addition to the nest surveys described in Section 3.2.1, general avian surveys were conducted at the Project during 2013 and 2014 that specifically included observations of golden eagles (H.T. Harvey & Associates 2013b and WEST 2015). In 2013, the survey objective was to quantify species occurrence and composition. Avian surveys were conducted from March 26 through August 22 at eight observation stations once every two to three weeks over the course of the six-month study. Surveys were conducted for 20 minutes within an 800-m (2,625-ft) survey radius of each station.

In 2014, the scope of the surveys focused on golden eagle use and activity (WEST 2015). The survey objective was to provide site-specific information on the seasonal and spatial use of the Project and surrounding landscape by golden eagles. To determine the spatial use of eagles at the Project, flight paths were recorded on topographic maps and evaluated for patterns of consistent use. Golden eagle surveys were conducted from March 10 through December 22 at 10 observation stations once every two weeks over the course of the 10-month study (Figure 4). Surveys were conducted for three hours and all golden eagles observations were recorded. Surveys were carried out during the late morning through early afternoon hours (approximately 9:00 am to 5:00 pm), the period of greatest activity for eagles and other raptors. Survey start times at stations varied from week to week such that different time periods were surveyed throughout the study at each station (i.e., early morning, late morning, afternoon).

6.2.2 Results

In 2013, seven observations of golden eagles occurred during 96 surveys for a total of 32 survey hours. Observed during 20 percent of all surveys, three golden eagles observations were recorded in spring and four during summer. Five of the observations were recorded along the proposed transmission line, in the vicinity of nest GE 20A, which has been inactive since nest surveys started in 2013 (Figure 4). In 2013, California Flats had an observation rate of 0.22 golden eagles/hour (H.T. Harvey and Associates 2013b).

In 2014, 216 observations of golden eagles occurred during 199 surveys for a total of 597 survey hours. Of the 216 observations, 71 occurred within the 800-m survey plot for an observation rate of 0.12 golden eagles/hour and a mean golden eagle use rate of 0.04 observation/20-minutes/800-m plot.

While the eagle use areas shown in Figures 4a–4e illustrate flight paths throughout the general Project area, eagles (particularly during the nesting season) are not using the landscape evenly. Regardless of season, most eagles were observed flying outside of the solar generating area (Figures 4c–4e). Another way to assess golden eagle use of the landscape is to place a grid over the surveyed area and determine the number of flight paths that passed through each grid cell. This “heat map” shows the varying levels of use that were observed throughout the Project (Figures 5a–5b).

Both the flight pathway and the heat maps illustrate that over extended periods of observation of the Project site in 2014, golden eagles did not appear to be consistently using substantial portions of the Project site, particularly in some of the flatter areas where the solar arrays are located. This may be due to a combination of factors that seem to attract higher levels of eagle use such as prey availability (prey availability may be higher in the areas adjacent to the Project boundary) and/or areas of steeper topography creating wind updrafts conducive to efficient soaring (LeBeau et al. 2015, Wiens et al. 2015).

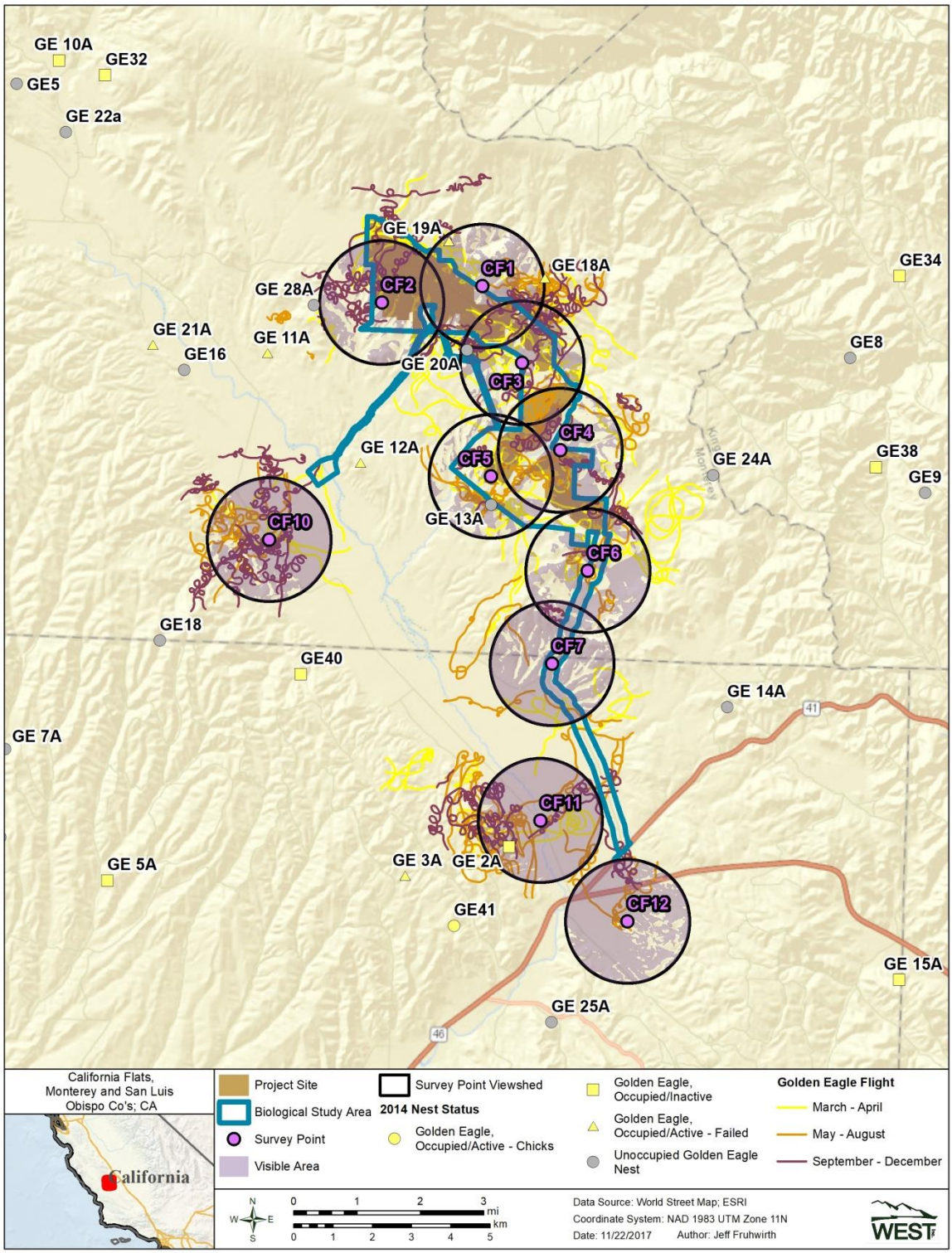

Figure 4a. Golden eagle flights recorded during eagle use surveys at the California Flats Solar Project. "Visible Area" indicates ground-level areas that were visible within 1.6 kilometers of each point.

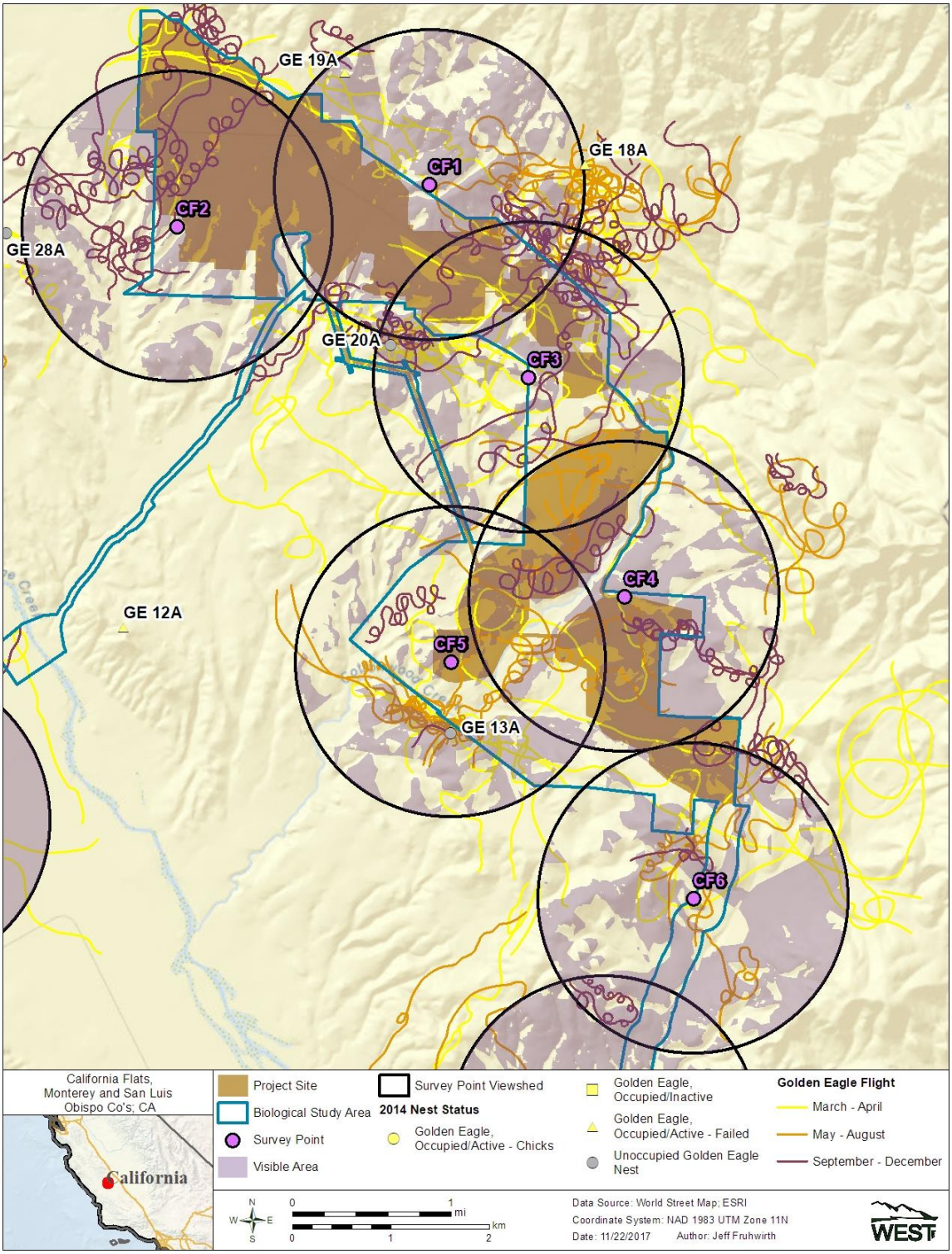

Figure 4b. All golden eagle flights recorded near the solar generating portion of the California Flats Solar Project.

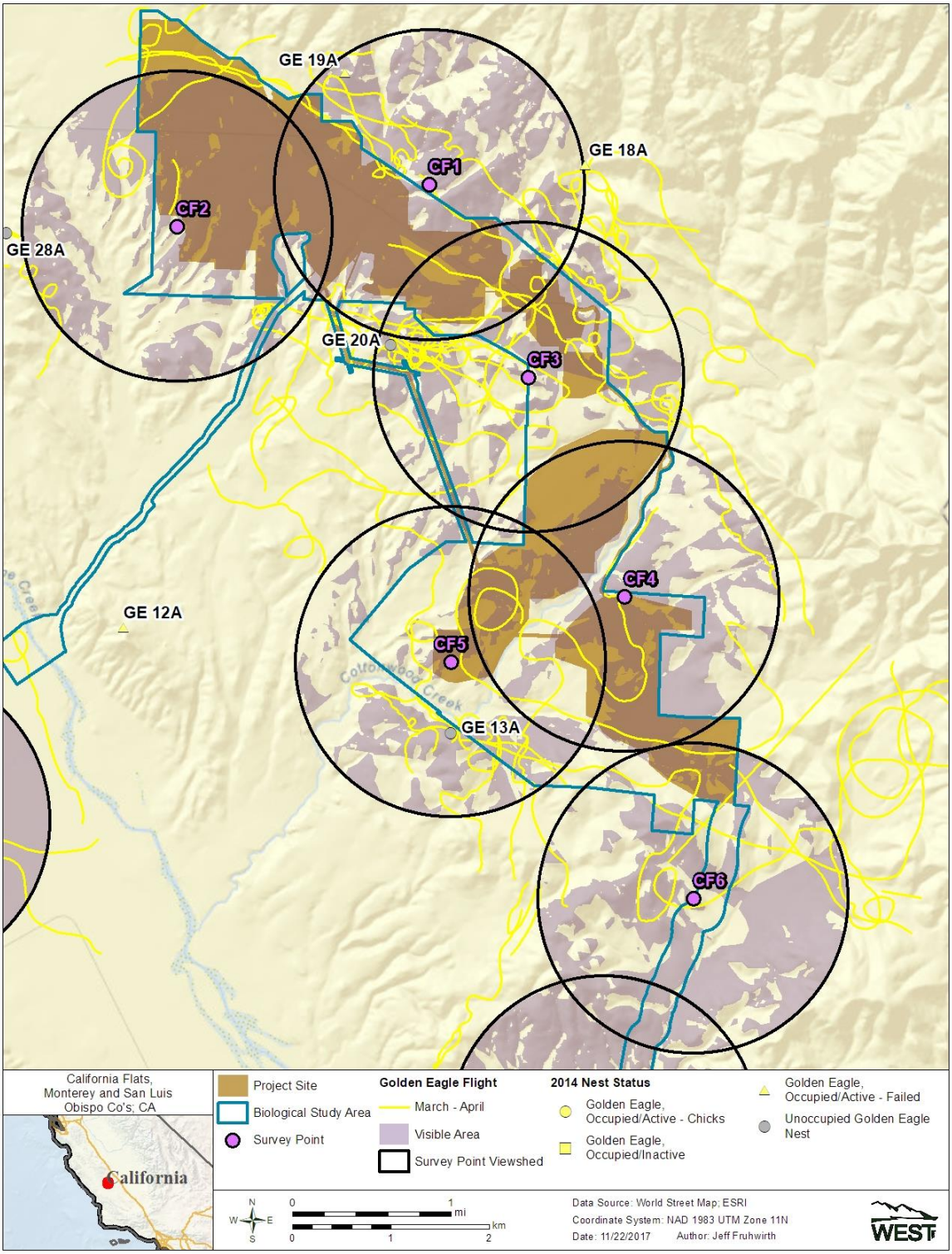

Figure 4c. Golden eagle flights recorded near the solar generating area during March and April eagle use surveys at the California Flats Solar Project.

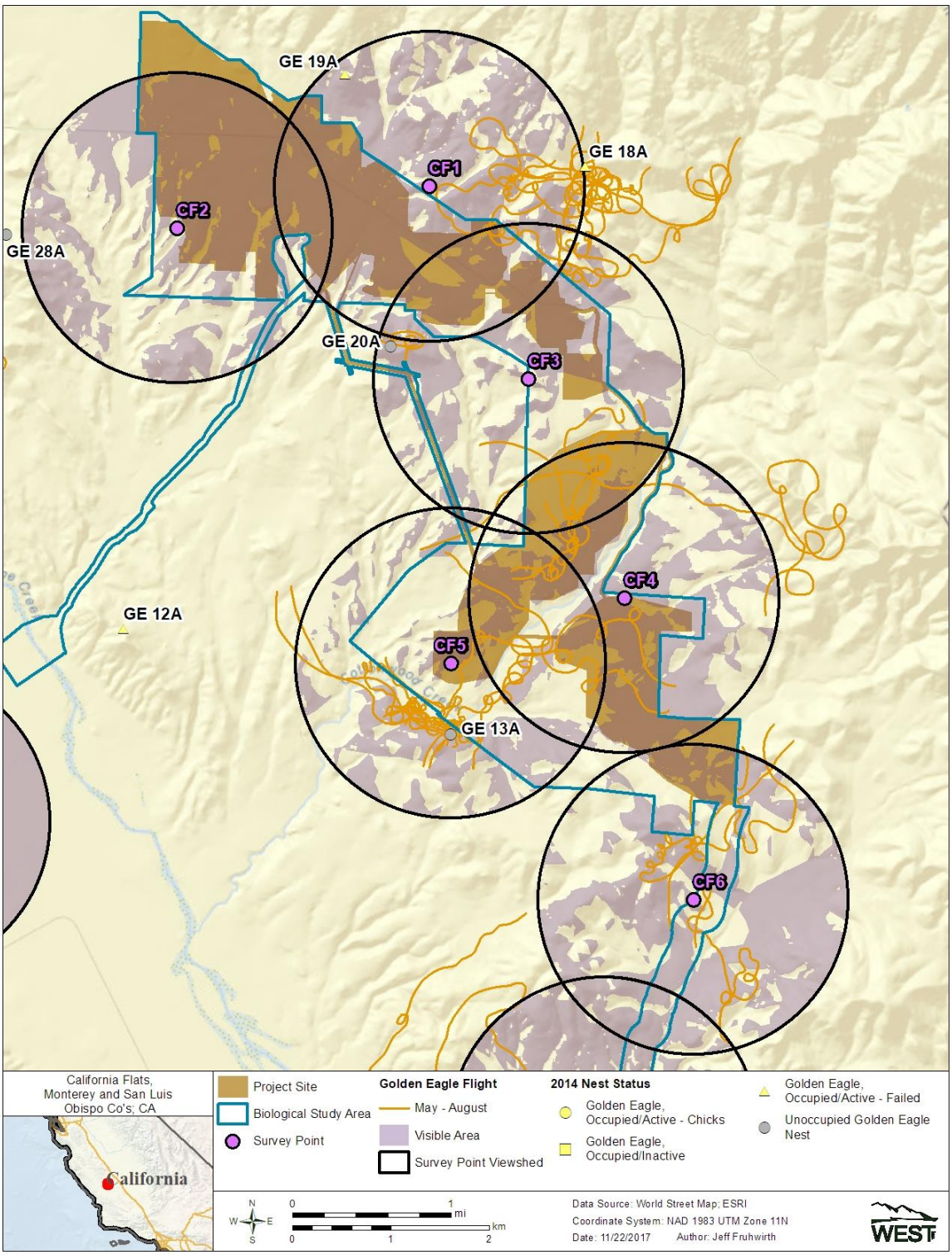

Figure 4d. Golden eagle flights recorded near the solar generating area during May - August eagle use surveys at the California Flats Solar Project.

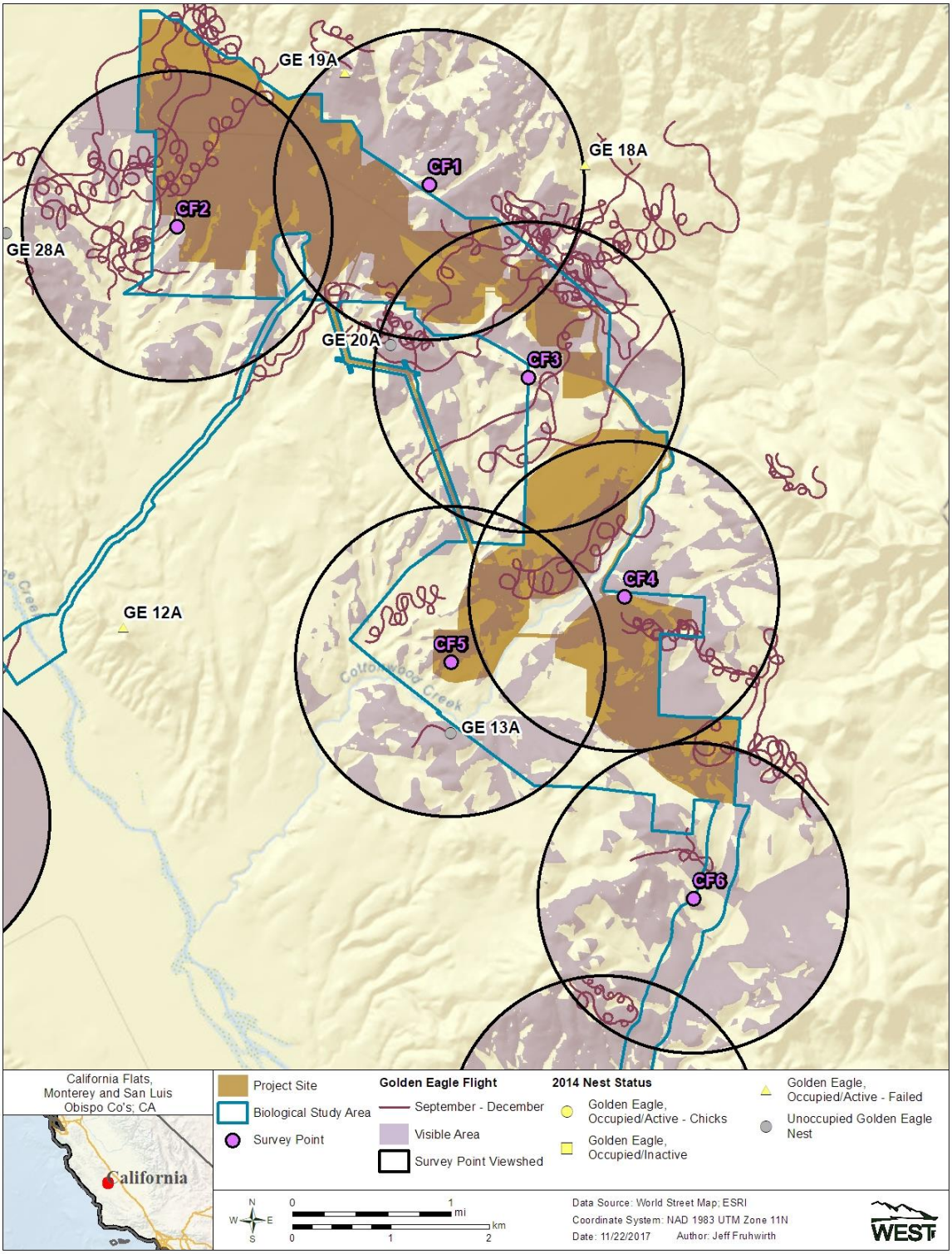

Figure 4e. Golden eagle flights recorded near the solar generating area during September - December eagle use surveys at the California Flats Solar Project.

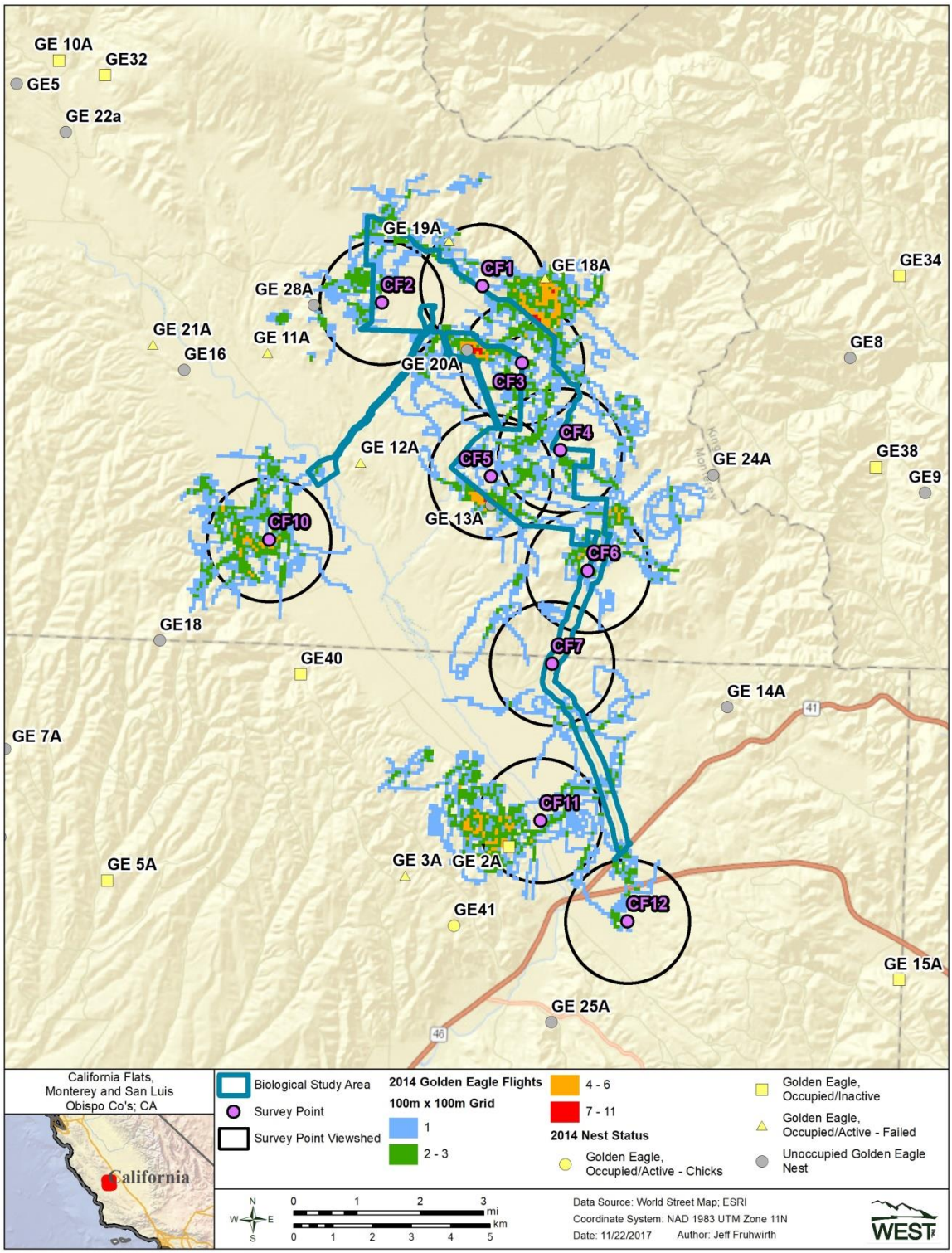

Figure 5a. Heat map of golden eagle flights recorded during eagle use surveys at the California Flats Solar Project. Grid cells are 100 meters by 100 meters.

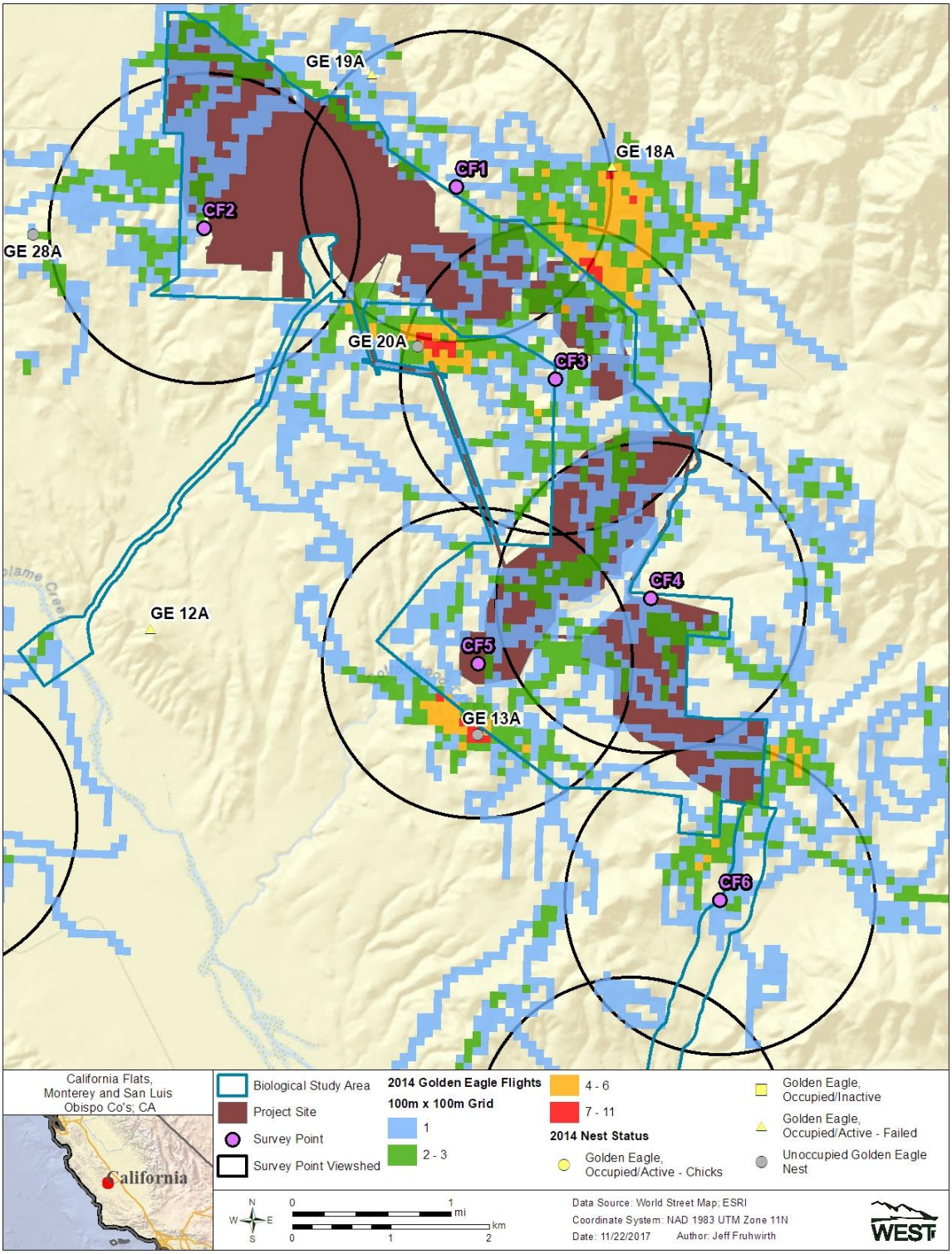

Figure 5b. Heat map of golden eagle flights recorded near the solar generating portion of the California Flats Solar Project. Grid cells are 100 meters by 100 meters.

6.3 Eagle Prey Surveys

6.3.1 Methods

Multiple surveys have been conducted since 2012 to understand the potential relationship between eagle nesting and activity patterns and the distribution of small-mammal prey in the vicinity of the Project (H.T. Harvey & Associates 2014; provided in Appendix B). A variety of methods were used to collect data of small mammal occurrence and distribution including infrared camera stations, ground transect surveys, scent dog searches, spotlight surveys, prey remains, and focal nest observations.

During October and November 2012, infrared, remote-sensing, camera-station surveys were conducted at multiple locations within the Biological Study Area (BSA) delineated around the Project site to collect observations of potential prey species (H.T. Harvey & Associates 2014).
In November 2012, systematic transect surveys were conducted to map all mammal observations across the entire BSA (H.T. Harvey & Associates 2014). Observers also mapped the locations of all burrow systems used by Heermann's kangaroo rat (*Dipodomys heermanni*), and all den or burrow systems that could be inhabited or were created by other special-status mammal species, such as American badger (*Taxidea taxus*), San Joaquin kit fox (*Vulpes macrotis mutica*), and California ground squirrel burrow systems.

During September and October 2013, scent dogs were used to locate San Joaquin kit fox scat to determine occupancy and distribution. Transect surveys covered a representative sample of the BSA, at 0.4- and 0.8-km (0.25- and 0.5-mi) intervals. The dog was trained to target and alert to fox scat but surveyors recorded all carnivore scat observed. Scats were confirmed to species through morphometric comparisons or DNA analyses (H.T. Harvey & Associates 2014).

During November and December 2012 and again in December 2013, spotlight surveys were conducted on three nights to record the occurrence of small mammals (H.T. Harvey & Associates 2014). Surveys were conducted along existing access roads that provided substantial coverage of the Project and surrounding area. Surveyors recorded each animal sighting as a location along the road where the sighting occurred.

During all biological surveys conducted in 2012 and 2013, biologists also recorded incidental observations of potential eagle prey species, including feral pigs and rabbits observed on or near the Project site (H.T. Harvey & Associates 2014).

Following the studies described above, recorded distributions of potential prey species were overlaid with the available observations of golden eagle nest sites (n = 12), observations made between November 2012 and December 2013 (n = 103), and recorded flight paths (n = 59; Figure 6). The overlays were then visually assessed for apparent patterns.

In July 2014, areas surrounding seven active golden eagle nests located within 16 km of the Project were searched for prey remains to determine the diet composition of golden eagles

(WEST 2014b). After it was determined that fledglings left the nest, surveyors searched the ground within 50 m (164 ft) of each nest and collected prey remains. Remains were classified to species if possible or grouped into general size categories that included small (e.g., rodents and rabbits), medium (e.g., jackrabbits [*Lepus* spp.], foxes [*Vulpes* spp.], skunks [*Mephitis* spp.], raccoons [*Procyon lotor*], badgers (*Taxidea taxus*), and weasels [*Mustela* spp.] and large mammals (e.g., feral pigs, deer [*Odocoileus hemionus*], and coyotes [*Canis latrans*]).

Finally, from March to July 2016, three active nests within 1.6 km of the Project were monitored to minimize nest disturbance resulting from construction activities (Stansbury and Hallingstad 2016). As part of the construction monitoring, eagle feeding schedules were monitored during all daylight hours. The frequency of the prey delivery to the nest and the species composition were collected to understand foraging frequency and activity budgets.

6.3.2 Results

A wide variety of species were observed during golden eagle prey surveys conducted between 2012–2016. Over 24,000 photographs recorded during camera-station surveys yielded 2,445 recognizable images of six potential prey species. Transect surveys detected four potential mammalian prey species, while five and 10 potential mammalian mammal prey species were detected during scent dog surveys and spotlight surveys, respectively (Appendix B). The most common species during all surveys included observation of California ground squirrel followed by Audubon cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit, and feral pigs. Ground squirrel colonies were widely distributed throughout the Project site and in most habitat types; however, there were generally lower densities of ground squirrel colonies in the larger, open, and flatter habitats found on the interior of the largest portions of the Project. Higher densities were found along road berms, near water sources, along fence lines, in wooded areas, and around homesteads, ranching developments, and other structures (see Figure 6; H.T. Harvey & Associates 2014). Patterns between prey occurrence and eagle use were not readily apparent; for nests near the Project, the spacing of nesting territories may be driving eagle use more than prey availability.

Ground squirrels comprised the majority of eagle diets followed by feral pig and black-tailed jackrabbit (WEST 2014b). During 676 hours of nest monitoring, eagle feeding activity was variable among nests and ranged throughout the day (e.g., 0600–1700) with peaks concentrated during mid-day (e.g., 1000–1300) (Stansbury and Hallingstad 2016).

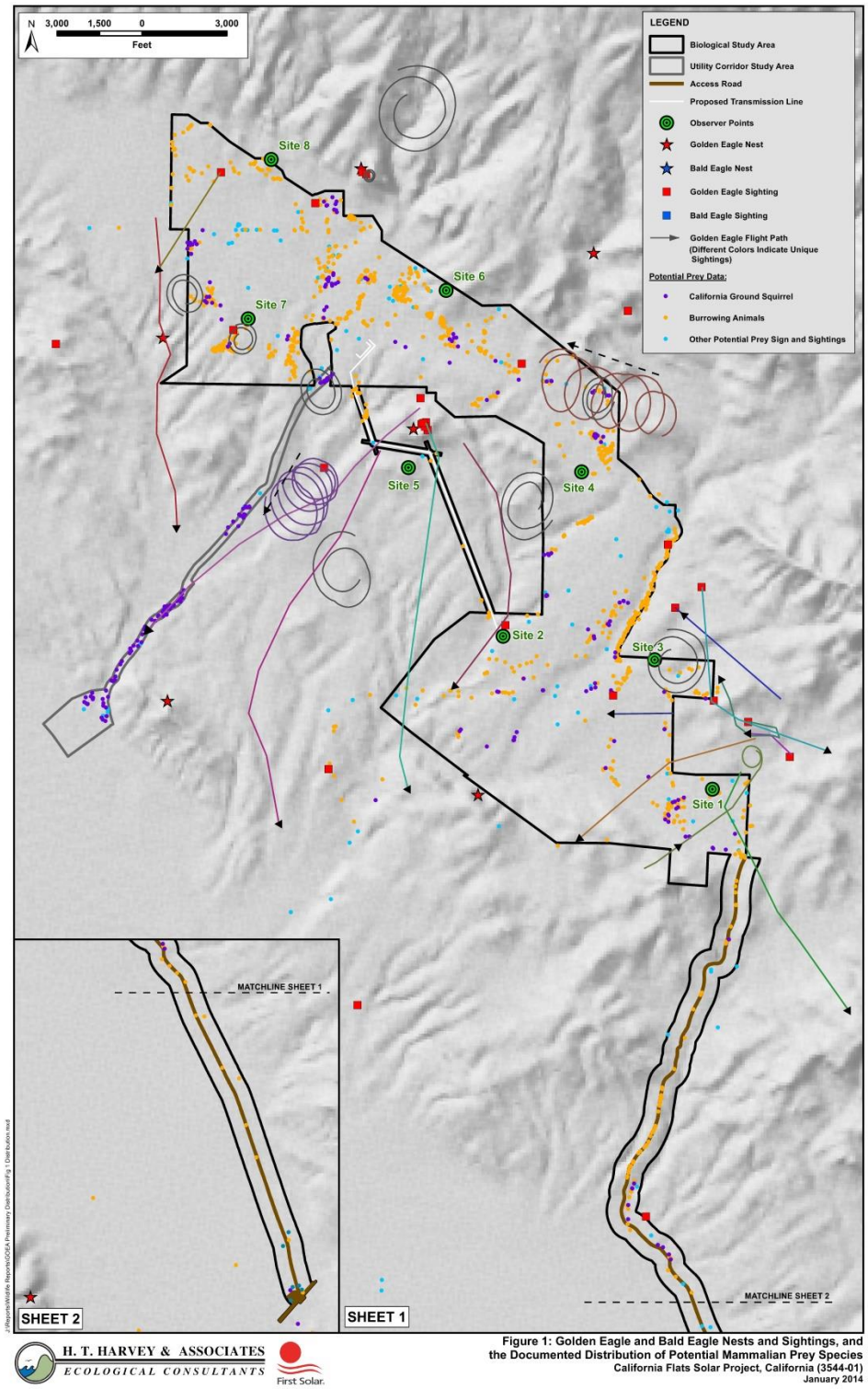

Figure 6. Golden eagle nests and sightings and documented distribution of mammalian prey species identified during all 2012 (October – December) and 2013 (September, October, December) eagle prey surveys of the California Flats Solar Project.

7 POTENTIAL BIOLOGICAL IMPACTS/TAKE ASSESSMENT

7.1 Potential Impacts to Golden Eagles

Unlike other forms of renewable energy (e.g., wind energy) that can result in eagle fatalities from collision or electrocutions, direct mortality to eagles is not anticipated from the Project.

Potential impacts on golden eagles during O&M of the Project could potentially include indirect impacts arising from two possible mechanisms: 1) noise or human activities; and/or 2) degradation of potential foraging habitat found in the vicinity of the nests (note the Project will not involve any direct impacts to the eagle nest trees).

Noise and human presence (such as that related to O&M vehicle traffic, ground disturbance associated with periodic maintenance activities such as might be associated with occasional road repairs, and minor equipment staging that could be needed for module replacement) near an eagle nest may decrease the potential for territory occupancy, result in nest abandonment, or affect the likelihood to successfully incubate or fledge young (Rosenfield et al. 2007).

It is assumed that not all golden eagle nests in the vicinity of the Project are susceptible to O&M disturbance due to long distances between nests and the Project, topography that screens the view of the Project from the nest, and anticipated O&M activities that will be limited in certain portions of the Project due to the type of infrastructure or absence of infrastructure in the relevant area. Based on this review, it was determined that there is a potential for effects associated with nests GE13A, GE19A, and GE20A from Project-specific O&M activities (although only GE13A and GE19A have been occupied nesting territories over the 2016 and 2017 seasons). The following provides background for the determination that impacts leading to take are not likely to affect other nearby nests including GE12A, GE18A, and GE28A.

- **Nest GE12A**: This nest is located over 3.2 km away from solar generating area. Only the utility corridor (overhead transmission line and associated poles, water pipeline) and an access road lie within a 1.6-km buffer of GE12A. Two areas of the utility corridor are both in view and within the 1.6-km buffer; only one of these is within 0.8 km (Hoffman 2016). The access road for the utility corridor is an existing ranch road that has been used routinely for decades during normal ranch operations. Regardless, the GE12A territory has produced two young in three out of the four monitoring years, suggesting the eagles are somewhat tolerant of vehicular traffic along the ranch road. California Flats will follow the avoidance and minimization measures outlined in Section 8.2 below when performing O&M activities associated with the utility corridor. For these reasons, no disturbance impacts related to Project O&M are anticipated at GE12A.

- **Nest GE18A:** This nest is located 1.1 km (0.7 mi) away from solar generating area. In four years of monitoring from 2013–2016, including three years of pre-construction data, no nesting attempts were documented at this nest. However, GE18A was active in 2017 (fledging two young) and 2018 (fledging at least one young). No Project infrastructure is

visible from GE18A, as the nest lies low in a drainage with a large hill between it and the Project. In addition to preventing visual disturbance, the topography will also minimize the potential for noise disturbance at the nest as a result of O&M activities. For these reasons, no disturbance impacts related to Project O&M are anticipated at GE18A.

- **Nest GE28A**: The nest was located just under 1.6 km away from the western edge of the solar generating area. However, the nest structure was no longer present during the 2015 aerial survey. Survey efforts in 2017 confirmed that a new nest has not been built to replace the old structure. Additionally, no eagles were seen occupying this territory during approximately 60 hours of monitoring an adjacent territory (19A) in 2017 (Hallingstad 2017). Future monitoring efforts will provide information on whether a new nest is eventually built within this territory and, if so, its location. However, given the distance of the original nest from the nearest Project infrastructure, and the assumption that any new nest would be built in the same general location, no disturbance impacts related to Project O&M are anticipated at GE 28A.

Other forms of impacts such as loss of foraging habitat and/or reduced foraging quality could also indirectly impact eagle productivity. Adult golden eagles may easily range a mile or more from their nest sites in search of prey, and their breeding-season home ranges often extend across more than 16 square kilometers (km^2; Kochert et al. 2002). The available data suggest that adult eagles most often forage within 1.0–3.0 km (0.6–1.9 mi) of their nest site while supporting chicks (Marzluff et al. 1997, Hunt 2002). That said, a nearest-neighbor analysis of the area within 16 km of the Project indicates that the approximate average territory of golden eagles nesting encompasses a radial area of only 1.6–2.4 km (1.0–1.5 mi), which translates to nesting territory sizes of 5.6–11.4 km^2 (3.5–7.1 mi^2). Given the proximity of the nests in the immediate vicinity of the Project, it is likely that the area within approximately 1.6 km encompasses a majority of the nesting territories for Nests GE19A, GE18A, GE20A, and GE13A (see Figure 7).

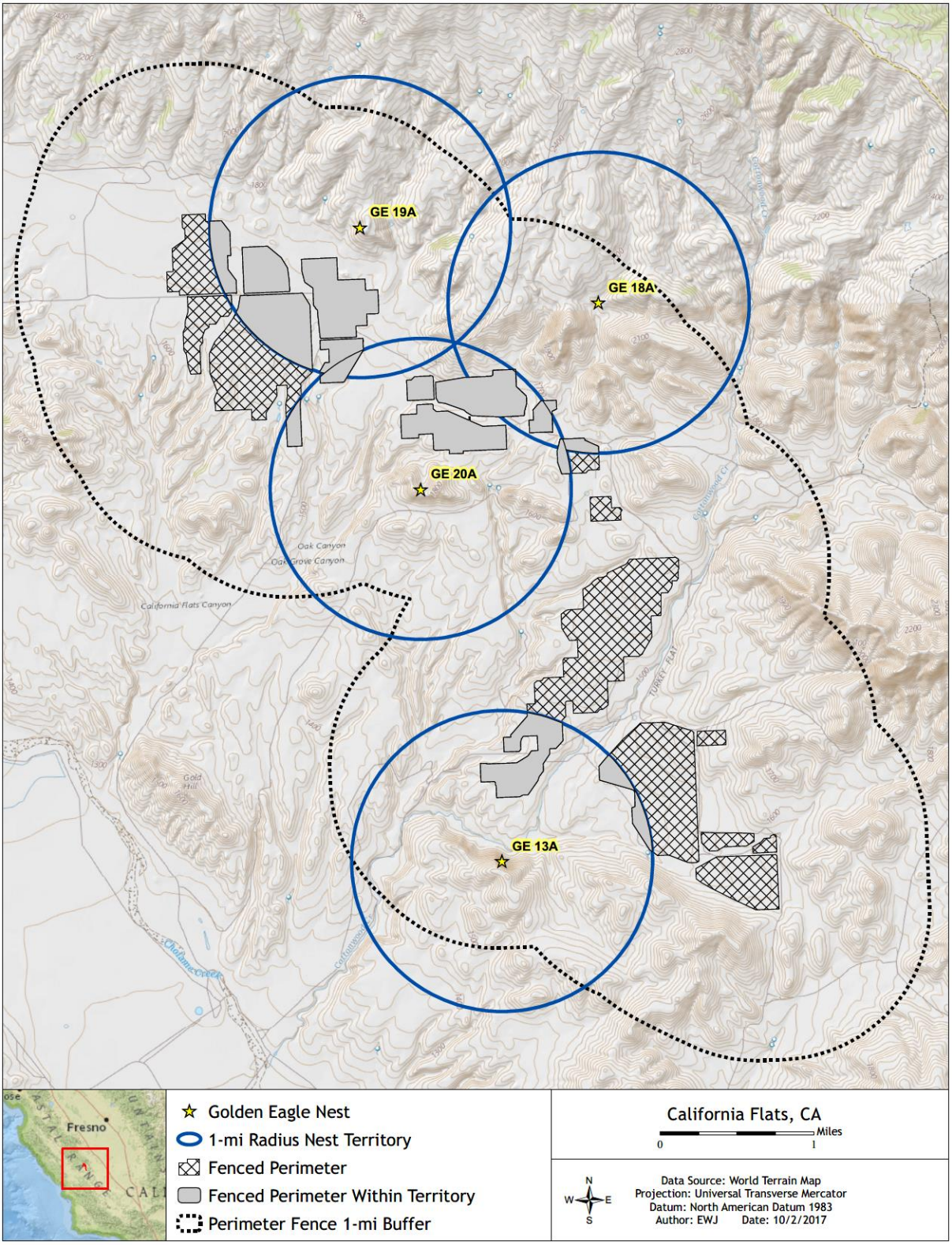

Figure 7. Golden eagle nests within 1.6 kilometers of the California Flats Solar Project. Nests GE28A and GE12A were not included in this figure as the GE28A nest structure is no longer present and GE12A falls further than 1.6 kilometers from the fenced perimeter of the Project facilities.

Golden eagles appear to preferentially use areas of more rugged topography surrounding the Project site (see Section 6.2.2). While grasslands can provide an important component of eagle habitat (Wiens et al. 2015), the removal of relatively small portions—from 4% to 17%—of the available grassland habitat within 1.6 km of the nest sites is not expected to result in reduced nest productivity and/or territory abandonment (see Table 4). Ground squirrels, rabbits, and feral pigs found in the foothills and grasslands both within and surrounding the Project location and adjacent to occupied eagle territories will continue to provide abundant foraging opportunities for eagles in the area.

Table 4. Acreage and percent of potential foraging habitat removed by Project facilities within 1.6 kilometers of eagle nests.

Nest	Buffer Area in km^2 (acres)	Project fenced perimeter within Buffer in km^2 (acres)	% of Project fenced perimeter in Buffer Area
GE12A	8.14 (2,011)	0	0
GE13A	8.14 (2,011)	0.49 (121.1)	6%
GE18A	8.14 (2,011)	0.31 (76.7)	4%
GE19A	8.14 (2,011)	1.31 (324.4)	16%
GE20A	8.14 (2,011)	0.97 (238.8)	12%
GE28A	8.14 (2,011)	0	0

7.2 Potential Take Assessment

"Take" is defined under the BGEPA as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" a bald or golden eagle (16 USC 668–668d). Similarly, "disturbance" under the BGEPA is defined to include agitating or bothering an eagle to a degree that causes, or is likely to cause, injury, or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (16 USC 668–668d). As described in Section 7.1, habitat loss or alternation resulting from the Project is expected to be insignificant and is not expected to rise to the level of "take." However, there is some potential risk that non-routine, non-equipment, or emergency maintenance activities could impact eagles during the nesting season without the implementation of conservation measures as described in the approved Bird and Bat Conservation Strategy (BBCS; WEST 2017) and this Plan.

Golden eagles are known to nest in the general vicinity of the Project and are expected to continue to do so in the future. Presumably, if eagles continue to nest in the vicinity of the Project, they would be tolerant to the presence of the Project facilities and routine O&M activities. As noted above, there is a potential for indirect effects associated with nests GE13A, GE19A, and GE20A from Project-specific O&M activities (although only GE13A and GE19A have been occupied nesting territories over the 2016 – 2018 seasons).

Based on annual monitoring completed between 2013 and 2016[3], the number of eagles fledged per year from the three nests within 1.6 km of the Project that are considered susceptible to disturbance is zero to four young/year (mean of 1.5 young/year). In total, these three nests were only active during four of the 12 nesting seasons available over this four-year period. With the implementation of the avoidance and minimization measures described in Section 8.2, very little if any loss in nest productivity is expected.

Mitigation and avoidance measures will be implemented that should minimize any potential disturbance to golden eagles during the nesting season. As stated in the BBCS, nesting eagles are expected to be tolerant to the presence of routine O&M activities given their ongoing exposure to ranching activities over the past several decades. No scientific studies provide a basis to quantify the potential effects of this type of disturbance and there is no evidence that the Project will result in adverse impacts to golden eagles, making it difficult to predict that there will be any reduction in nest productivity or disturbance resulting from habitat modifications caused by O&M activities. It is possible that any impacted eagles may simply shift to an alternative nesting location, resulting in little or no impacts on nest productivity. Nonetheless, after consulting with the USFWS, a worst-case scenario is assumed for this Plan in an effort to attempt to quantify and mitigate potential take. Therefore, it is assumed that for GE13A and GE19A, the two territories that are 1) considered susceptible to indirect impacts, and 2) also have a history of nest occupancy in recent years, reduced nest productivity may recur throughout the life of the Project (i.e., permanent territory loss). In the status report released by the USFWS in 2016 (USFWS 2016a), metrics for take as a result of territory loss are provided. Multiplying the average generation time for a golden eagle nest (11 years) by the mean annual loss of nest productivity (0.59 at 80th quantile) for golden eagles results in a loss of 6.5 eagles per lost territory (USFWS 2016a). Assuming these two territories are permanently lost, the worst case scenario results in the loss of 13 eagles over the 30-year permit term.

7.3 Cumulative Impacts

In the LEHCP, cumulative impacts are defined as incremental impacts of the action on the environment when added to other past, present, and reasonably foreseeable future actions. The geographic extent of for the analysis of cumulative impacts is within a 175-km (109-mi) radius surrounding the Project, which represents the average natal dispersal distance of golden eagles (USFWS 2016a). There is incomplete information available regarding the level of permitted golden eagle take in the region; thus, golden eagle take in the past, present, and foreseeable future is unknown. Additional solar facilities exist in the analysis area at various stages of development including: several small to medium sized solar facilities in the planning phase in Kings County; as well as several larger solar projects that are either in the planning, construction, or operational phase, including California Valley Solar Ranch in San Luis Obispo County (operational), Topaz Solar Farms in San Luis Obispo County (operational), Maricopa Sun Solar Complex in Kern County (planned), Kern Solar Ranch in Kern County (proposed),

[3] The 2017 and 2018 monitoring results were not included in this calculation since a construction disturbance permit was obtained for Nest GE19A during early 2017, potentially affecting the nest productivity data for 2017.

Panoche Valley Solar Farm in San Benito County (constructing), Tranquillity Solar Generating Facility in Fresno County (constructing), and Westlands Solar Park in Fresno and Kings counties (planned). The operational 166 turbine International Turbine Research Center is located in Merced County, approximately 145 km (90 mi) northwest of the Project. Additional sources of anthropogenic sources of impacts exist in the region such as land conversion projects and the development of transportation and energy transmission networks. Wind energy projects in California that have authorized golden eagle take (Shiloh IV and Alta East) fall outside of the 175-km radius of this analysis.

Operation and maintenance of the Project, in combination with other projects and activities in the region, has the potential to contribute toward cumulative effects on golden eagles. The USFWS will evaluate the effects of cumulative impacts during their NEPA review.

7.4 Anticipated Population Level Impacts of the Taking

The impact of any incidental take of a golden eagle as a result of activities covered by this Plan would be fully mitigated to meet the preservation standard of being "consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units and the persistence of local populations throughout the geographic range of each species" (USFWS 2016b). The maximum anticipated take in the form of two lost territories would not result in a net decrease of the golden eagle population once mitigation measures are applied (see Section 8.3). Furthermore, no direct impacts to nesting substrates would occur and the avoidance and minimization measures outlined in Section 8.2 are likely to result in some nest productivity at GE13A and GE19A during the permit term as environmental factors allow (e.g., weather, prey base).

In order to establish take limits to maintain stable or increasing golden eagle populations, the USFWS has identified take limits at two spatial scales: the Eagle Management Unit (EMU), defined as the Pacific Flyway, and the Local Area Population (LAP), defined as the 175-km natal dispersal distance for golden eagles (Figure 8; USFWS 2016a). To calculate the LAP, golden eagle population densities within BCRs are used and applied to the area of the LAP radius that overlaps each BCR. The allowable rate of golden eagle take within the EMU is either 1) zero unless otherwise mitigated for, 2) considered a concern when annual permitted take of ≥1% within the LAP may occur, or 3) considered the maximum allowed to meet the preservation standard when annual take of 5% is reached (USFWS 2016b).

The area within a 175-km buffer of the Project encompasses portions of two BCRs (Table 6). To calculate the LAP, the area of the BCR that is within the natal dispersal distance of the Project is multiplied by the regional eagle density. To calculate the 5% threshold within the LAP, the USFWS (2013) recommends using:

$$(\text{Local-area} \times \text{Regional Eagle Density}) \times 0.05$$

Using the equation above, an estimated local area population size for the Project is approximately 328 golden eagles. Based on this analysis, the local-area 5% benchmark would

be approximately 16 golden eagles annually (Table 5). The predicted annual take of 1.18 golden eagles per year (0.59 eagles per nest during the 11-year nest "generation time") at the Project represents 7.2% of the local area threshold.

Table 5. Bird Conservation Regions and golden eagle density estimates used to calculate the 5% local area benchmark at the California Flats Solar Project.

BCR Name	BCR #	2016 Eagle Population	BCR Size (km^2)	Regional Eagle Density (eagles/km^2)	Local Area (km^2) w/in 175 km	Local-area 5% Threshold
Sierra Nevada	15	72	52,872	0.0014	4,061	0.3
Coastal California	32	718	165,550	0.0043	75,032	16.1
					Total	**16.4**

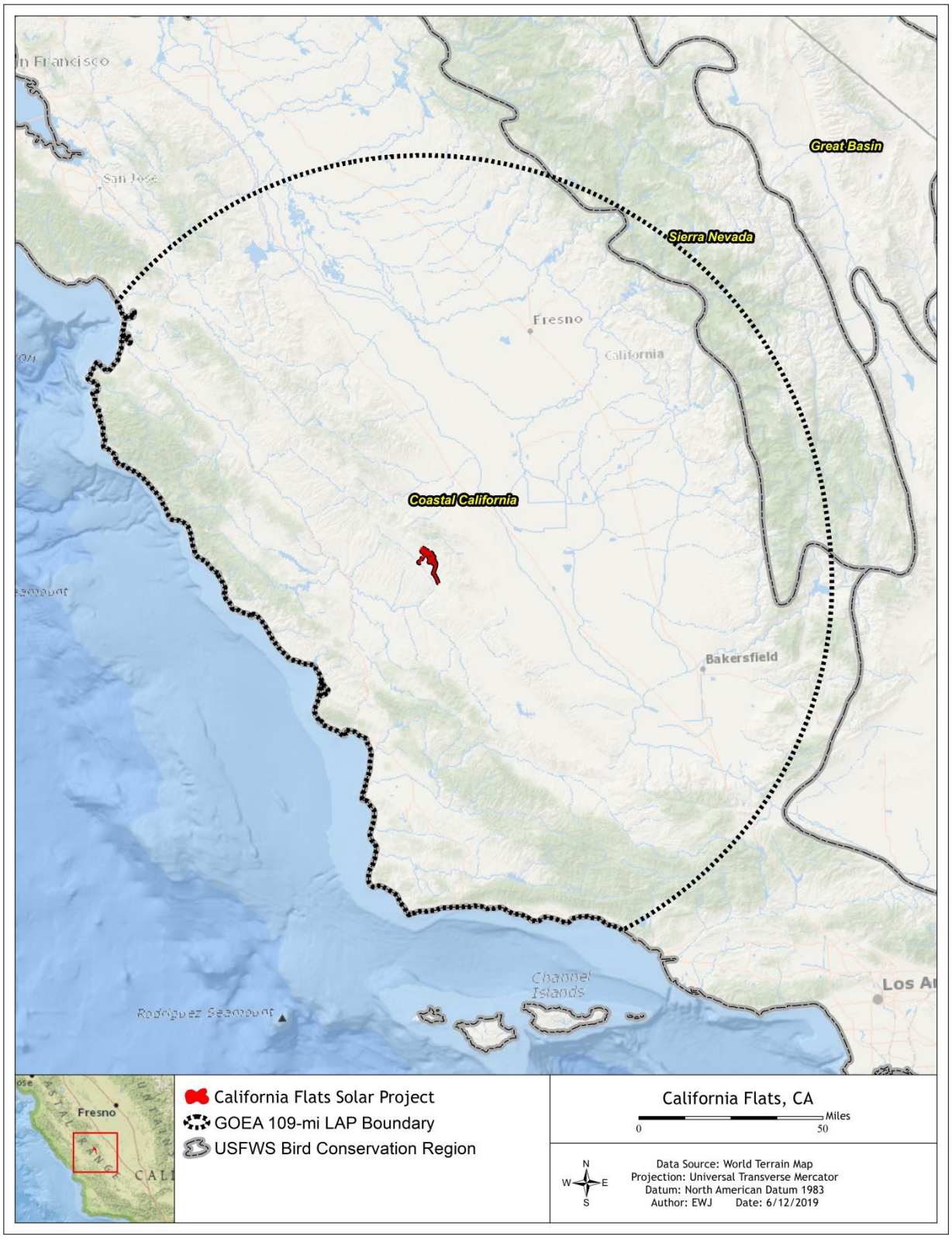

Figure 8. The Local Area Population for the California Flats Solar Project lies within the Pacific Flyway eagle management unit and overlaps two Bird Conservation Regions.

8 CONSERVATION PROGRAM/MEASURES TO MINIMIZE AND MITIGATE FOR IMPACTS

8.1 Biological Goals and Objectives

The purpose of the biological goals is to ensure that the operating conservation program in this Plan is consistent with the conservation and recovery goals established for the species. BGEPA states that any authorized take of golden eagles must be compatible with the preservation of golden eagles and consistent with the goal of maintaining stable or increasing golden eagle populations (USFWS 2009, 2016a). As such, the overall goal of this Plan is to support the persistence of a stable golden eagle population in the LAP and the EMU. The specific biological objectives of the Plan are as follows:

Objective 1: Activities covered by this Plan include practicable steps to avoid and minimize the loss of golden eagle nesting productivity as a result of O&M activities, for the duration of the ITP coverage period, and will include conservation measures to protect golden eagles in the area.

Objective 1.1: Reduce disturbance activities resulting from O&M activities within one mile of active nests during the nesting season (from about February 1 to as late as August 31, depending on the nesting season) as determined by biological monitors.

Objective 2: California Flats will enhance golden eagle habitat and populations in the region.

Objective 2.1: Provide for the protection of golden eagle habitat in the LAP in perpetuity.

Objective 2.2: Provide funds to help enhance golden eagle populations in the LAP.

8.2 Avoidance and Minimization Measures

Althouse and Meade (2016) identify 26 measures that will be taken during O&M to avoid and minimize impacts to species covered under the LEHCP. Additionally, the BBCS prepared for the Project also describes measures that would avoid and minimize impacts to avian species, including eagles (WEST 2017). A portion of these measures will also minimize impacts to golden eagles, including vehicle restrictions and speed limits, garbage abatement, limited rodenticide use, livestock carcass management, and employee awareness/training programs (Althouse and Meade 2016; WEST 2017). In addition to general measures listed in the LEHCP and BBCS, measures will be taken specifically for golden eagles that include a comprehensive nest management program to reduce the timing and duration of O&M activities surrounding active nests. Specific golden eagle avoidance and minimization measures that will be addressed in an environmental awareness/training program developed for O&M personnel include:

- **Routine Maintenance:** Routine maintenance activities generally utilize one to two vehicles or pieces of equipment with a minimum number of associated workers. This level of activity is consistent with ongoing ranching operations that have historically occurred in this area. Following discussions with the USFWS about unique site-specific conditions, it was decided that routine maintenance activities would not routinely require buffers and would not require further consultation with USFWS biologists.

- **Non-Routine Maintenance:** All non-routine maintenance activities will be scheduled to avoid the active golden eagle nesting season (February 1 – August 31) whenever practicable. If these non-routine O&M activities must occur within the one-mile radius of an historic or newly identified eagle nest in the area, a survey to confirm current nesting status will be completed. Consultation with USFWS will be conducted for non-routine O&M activities within one-mile of an active golden eagle nest (asides from nests GE13A and GE19A), whether inside or outside of the viewshed. Finally, if deemed appropriate after consultation with USFWS, a biological monitor will be present during all non-routine O&M activities that are within one mile of an active eagle nest (asides from nests GE13A and GE19A) during the first two years of operations.

  The biological monitor will have the authority to call for a Stop Work should the activity appear to be agitating the eagles or their nesting activities. If the golden eagles at the nest site appear to be habituated to or otherwise not disturbed by the activity, the nest monitor will document the eagle nest phenology, behavior of the eagles prior to and during the activities performed, and may determine that nest monitoring for this activity may no longer be necessary. In general, the biological monitor will also note the surrounding landscape topography, screening by topography or site infrastructure, and level of activity that result in a response from the eagles. These observations with be shared with the USFWS.

  Any future modifications to these avoidance or minimization measures during non-routine O&M activities will closely consider the level and type of activity, nest location and viewshed, and the stage of the nesting chronology. For example, on-site monitoring may lead to reducing the 1.6-km restrictive buffer to 0.8-km during the later stages of nesting (e.g., post-brooding and post-fledging dependency periods).

  Nests GE13A and GE19A will be excluded from these Non-Route Maintenance avoidance and minimization measures as disturbance and productivity loss are already assumed and mitigated for at these nesting territories.

- **Non-Equipment Maintenance**: Non-equipment maintenance activities may include vegetation management including mowing and grazing and the limited use of herbicides, biological surveys, road inspection and maintenance including re-grading and erosion repair, and, if necessary, general upkeep of the O&M facility. In-array vegetation management, including grazing and mowing, is described in the Project Habitat Restoration and Revegetation Management Plan (LSA Associates, Inc. 2016). Except as

needed to comply with regulatory requirements, mowing or road maintenance/re-grading will be performed outside of the eagle nesting season (February 1 – August 31) to the degree practicable. In the event mowing or road maintenance/re-grading must be completed during the nesting season within one mile of an active onsite golden eagle nest and inside the nest viewshed (excluding nests GE13A and GE19A), and for road maintenance/re-grading also outside the nest viewshed, California Flats will consult with USFWS biologists and ensure that a biological monitor is present.

- **Emergency Repairs:** Emergency repairs needed to keep the Project connected to the electrical grid and producing electricity as a result of major equipment malfunction, electrical grid malfunction, or a natural disaster (e.g., earthquake, fire, storm) will be conducted in an expedient manner with consideration of nesting eagles in the Project vicinity to the maximum extent practicable depending on the emergency.

8.3 Mitigation Strategy

For projects in operation after issuance of the Eagle Permit Rule in 2009 (see USFWS 2009; 50 CFR 22.26), the USFWS recommends offsetting compensatory mitigation to offset all predicted golden eagle take. The mitigation strategy for the Project includes a specific management component for the permanent preservation, management, and enhancement of golden eagle habitat within an approximately 2,510-ha (6,204-ac) parcel group located directly south of the Project (Figure 1). Similar golden eagle foraging and nesting habitat is found within the mitigation lands as was historically found within the Project site. The proposed mitigation lands would preserve important nesting and foraging habitat for golden eagles in perpetuity. The preservation of suitable nesting and foraging habitat will support and enhance overall eagle productivity rates in the general Project area. Importantly, these mitigation lands will be protected from other land use activities (including conversion for viticulture which is increasingly common in the area) that would be less beneficial to eagles over the long term. Additionally, grass will be maintained at levels that will support an abundance of eagle prey. California Flats has developed a *Habitat Mitigation and Monitoring Plan* and a *Conservation Lands Grazing Management Plan* that describes the existing conditions of the conservation lands, ongoing habitat management (including activities that specifically target maintenance and enhancement of golden eagle habitat) and monitoring tasks, reporting, and the long-term administration of these lands.

Additionally, California Flats will deposit additional compensatory mitigation funds into the *U.S. Fish and Wildlife Pacific Southwest National Fish and Wildlife Foundation Bald and Golden Eagle Mitigation Account* (R8 NFWF account) to address loss of productivity at the affected nesting territories (GE13A and GE19A). This would be done with a one-time payment at the time of permit issuance, which will fund enough power pole retrofits to offset the loss of 13 eagles due to the permanent loss of two nesting territories. The compensatory mitigation is based on the assumption that power pole retrofits following APLIC guidelines will avoid the potential for future loss of golden eagles through accidental electrocutions along power lines that are do not currently follow these guidelines. The power pole calculations will use the USFWS Resource Equivalency Analysis (REA) described in the *Eagle Conservation Plan*

Guidance, Module 1, Version 2, April 2013, as revised to reflect indirect take (see Section 11.0). A refund from the NFWF account may be available if realized retrofit costs are lower than anticipated; conversely, if realized retrofit costs are higher than anticipated, additional funds will be deposited to complete the necessary retrofits. The mitigation calculations will assume a standard 1.2:1 mitigation ratio is used (81 Federal Register 91494).

9 POST-CONSTRUCTION MONITORING

Monitoring will provide information to aid in the implementation of avoidance and minimization measures as well provide a feedback loop into the decision making process that will help inform future management decisions. Nest monitoring will be conducted by a third-party qualified biologist the first two nesting seasons after commencement of O&M activities for the full 280-MW Project, as per the Project's BBCS. Additional nest monitoring will be conducted the year before each 5-year check in for the permit term (e.g., if a permit is issued in 2019, monitoring will occur in 2023, 2028, and so on until the permit expires).

During all nest-monitoring years, monitoring will be conducted from the ground to identify any active eagle nests within one mile of Project facilities; good faith efforts will be made to obtain permission from neighboring property owners to increase this distance to two miles. The ground surveys to identify and assess eagle nests within 1.6 km of Project facilities will follow the recommendations included in the USFWS's Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010). Two surveys will conducted per season, at least 30 days apart. These surveys will be completed by a qualified biologist from the fence line of the Project and on the land of neighboring property owners that allow access for this purpose in a manner that will allow for a good view of potential nesting habitat (and historic nest sites) that fall within at least 1.6 km of the Project facilities. The first survey round will be conducted during February and/or early March. Nests and nesting territories will only be designated as unoccupied after two ground observation periods have been completed that are separated by at least 30 days (e.g., the first period in early February, followed by a second period at least 30 days later in March or April). Each of these observation periods will include a minimum of four hours of monitoring of eagle nests to confirm territory occupancy and/or nest activity. The qualified biologists conducting these surveys will have the equivalent of two season of intensive experience conducting survey and monitoring of golden eagles. A third visit may be conducted to active nests to document productivity during the late nesting stage (i.e., late May or early June).

9.1 Reporting

Reports will be prepared after each year of post-ITP monitoring. Reporting will include an annual summary describing the status of nests, including the number of young fledged from each nest located within 1.6 km of the Project facilities, as well as specific steps that were taken to avoid and minimize any potential impacts to occupied nests. The annual report will be submitted to USFWS by September 30 of each monitoring year.

9.2 Disposition of Dead or Injured Species

Given the Project will not result in direct fatality risks to eagles, dead or injured golden eagles are not expected to be encountered during the ITP term. In the event that a dead or injured eagle is encountered incidentally during the ITP term, California Flats will notify the Ventura U.S. Fish and Wildlife Office at (805) 644-1766 within 24 hours of its finding. Written notification will be made within five calendar days and will include the date, time, and location of the carcass; a photograph; cause of death, if known; and any other pertinent information.

10 ADAPTIVE MANAGEMENT STRATEGY

Adaptive management will be an integral part of avoidance and minimization measures that address the uncertainty related to the effects of O&M activities to golden eagles. Monitoring results from nests 13A and 19A will not be used to trigger adaptive management measures at the Project, as the permanent loss of those territories will have already been mitigated. The monitoring results from other golden eagle nests (such as 12A, 18A, or 20A) or new nests that appear after operations has begun will be used to adaptively manage the O&M activities as they relate to avoidance and minimization procedures required by this Plan. Annual review of the previous year's procedures and monitoring results (when applicable) will determine whether any changes to the Plan are needed to minimize potential impacts to nesting golden eagles.

11 RESOURCE EQUIVALENCY ANALYSIS

California Flats will compensate for the potential take of 13 golden eagles by funding power pole modifications. The original REA developed by the USFWS is intended to calculate mitigation requirement for an "average aged" eagle, as it is focused on circumstances where direct take may occur (e.g., wind turbine collision; USFWS 2013). At this Project, it is the potential indirect take resulting from reduced nest productivity that needs to be offset. Therefore, the original REA model needed to be revised to reflect the relatively lower value of a golden eagle nestling compared to an "average aged" eagle. The revised REA provided for the Project by the USFWS requires that 196 power pole modifications are needed to mitigate for the take of 13 golden eagle nestlings. Within 30 days of permit issuance, California Flats will deposit the necessary mitigation funds into the R8 NFWF account to facilitate the modification of these poles.

<u>Key assumptions of the alternative approach:</u>

- No direct loss of individuals (no eagles will be directly killed by the project)
- Only the indirect loss of potential offspring (and one subsequent generation) from two territories was calculated.

<u>Key results of the alternative approach based on those assumptions:</u>

- Total mitigation debit: 59.94 present-value bird-years
- Poles to be retrofitted: 162.8 (or 195.4 poles at a 1.2 to 1 ratio)*
- Total estimated cost of mitigation: $1,470,000

The proposed approach assumes no direct take, but only the loss of the reproductive capacity (i.e., indirect take or the potential offspring and a subsequent generation) for a single generation time (11 years) of the two pairs of nesting eagles.

12 LITERATURE CITED

16 United States Code (USC) § 668. 1940. Title 16 - Conservation; Chapter 5a - Protection and Conservation of Wildlife; Subchapter II - Protection of Bald and Golden Eagles; Section (§) 668 - Bald and Golden Eagles. 16 USC 668. [June 8, 1940, Chapter (Ch.) 278, Section (§) 1,54 Statute (Stat.) 250; Public Law (PL) 86–70, § 14, June 25, 1959, 73 Stat. 143; PL 87–884, October 24, 1962, 76 Stat. 1246; PL 92–535, § 1,October 23, 1972, 86 Stat. 1064].

16 United States Code (USC) § 703. 1918. Title 16 - Conservation; Chapter 7 - Protection of Migratory Game and Insectivorous Birds; Subchapter II - Migratory Bird Treaty; Section (§) 703 - Taking, Killing, or Possessing Migratory Birds Unlawful. 16 USC 703. [July 3, 1918, Chapter (ch.) 128, § 2, 40 Statute (Stat). 755; June 20, 1936, ch. 634, § 3, 49 Stat. 1556; Pub. L. 93–300, § 1, June 1, 1974, 88 Stat. 190; Pub. L. 101–233, § 15, December 13, 1989, 103 Stat. 1977; Public Law (Pub. L.) 108-447, division E, title I, § 143(b), December 8, 2004, 118 Stat. 3071.].

50 Code of Federal Regulations (CFR) § 10.12. 1973. Title 50 - Wildlife and Fisheries; Chapter I -United States Fish and Wildlife Service, Department of the Interior; Subchapter B Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 10 - General Provisions; Subpart B - Definitions; Section (§) 10.12. Definitions. 50 CFR 10.12. [38 Federal Register (FR) 22015, August 15, 1973, as amended at 42 FR 32377, June 24, 1977; 42 FR 59358, November 16, 1977; 45 FR 56673, August 25, 1980; 50 FR 52889, December 26, 1985; 72 FR 48445, August 23, 2007.].

50 Code of Federal Regulations (CFR) § 22.26. 2009. Title 50 - Wildlife and Fisheries; Chapter I - United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 22 - Eagle Permits; Subpart C - Eagle Permits; Section (§) 22.26 - Permits for Eagle Take That Is Associated with, but Not the Purpose of, an Activity. 50 CFR 22.26. [74 FR 46877, September 11, 2009, as amended at 79 FR 73725, December 9, 2013].

50 Code of Federal Regulations (CFR) § 22.3. 1974. Title 50 - Wildlife and Fisheries; Chapter I -United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 22 - Eagle Permits; Subpart a - Introduction; Section (§) 22.3 - Definitions. 50 CFR 22.3. [39 Federal Register (FR) 1183, January 4, 1974, as amended at 48 FR 57300, December 29, 1983; 64 FR 50472, September 17, 1999; 72 FR 31139, June 5, 2007; 74 FR 46876, September 11, 2009].

81 Federal Register (FR) 242: 91494-91554. 2016. Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests; Final Rule. Department of the Interior Fish and Wildlife Service. 81 FR 91494. December 16, 2016. Available online: https://www.gpo.gov/fdsys/pkg/FR-2016-12-16/pdf/2016-29908.pdf

Althouse and Meade, Inc. 2016. Low-effect Habitat Conservation Plan for issuance of an incidental take permit under section 10(a)(1)(b) of the Endangered Species Act for California Flats Solar Project, Operations and Maintenance Activities. Monterey and San Luis Obispo Counties, California. Prepared for California Flats Solar, LLC., San Francisco, California.

California Department of Fish and Wildlife (CDFW). 2013. Fully protected animals. California Department of Fish and Wildlife, Sacramento, California. Available online: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html#Birds

Craig, T. H., E. H. Craig, and L. R. Powers. 1984. Recent changes in eagle and buteo abundance in southeastern Idaho. Murrelet 65: 91-93.

ESRI. 2013. World Topographic Map. ArcGIS Resource Center. ESRI, producers of ArcGIS software. ESRI, Redlands, California. Last modified June 6, 2018. Available online: http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5bbf808f

Gross, J. E., L. C. Stoddart, and F. H. Wagner. 1974. Demographic Analysis of a Northern Utah Jackrabbit Population. Wildlife Monographs No. 40, The Wildlife Society.

Hallingstad, E. 2017. Golden Eagle Nest Observation and Status Updates – California Flats Solar Project. Technical Memorandum prepared by WEST for B. Hoffman, First Solar. 7 pages.

Hallingstad, E. 2018. Golden Eagle Nest Observation and Status Updates – California Flats Solar Project. Technical Memorandum prepared by WEST for B. Hoffman, First Solar. 15 pages.

H. T. Harvey & Associates. 2013a. Baseline raptor nest surveys for the proposed California Flats Solar Project, Monterey County, California Prepared for California Flats Solar, LLC, Minneapolis. Minnesota. San Luis Obispo, CA.

H. T. Harvey & Associates. 2013b. Baseline Avian Activity Surveys for the Proposed California Flats Solar Project in Monterey County, California: March – August 2013. Prepared by H. T. Harvey & Associates, San Luis Obispo, California. Prepared for California Flats Solar, LLC, San Francisco, California.

H. T. Harvey and Associates. 2014. California Flats Solar Project: Preliminary Assessment of Eagle Activity and Potential Relationships to Mammalian Prey Distribution. Prepared for California Flats Solar, LLC, San Francisco, California. San Luis Obispo, California.

Hoffman, B. 2016. California Flats Solar, LLC. Golden Eagle Nest Management. Letter to the US Fish and Wildlife Service. June 27. First Solar, San Francisco, California.

Hunt, W. G. 2002. Golden eagles in a perilous landscape: predicting the effects of mitigation for energy-related mortality. Report P500-02-043F. California Energy Commission, Wacramento, CA.

Hunt, W.G., R.E. Jackman, T.L. Hunt,.D.E. Driscoll and L. Culp. 1998. A population study of golden eagles in the Altamont Pass Wind Resource Area: population trend analysis 1997. Report to National Renewable Energy laboratory, Subcontract XAT-6-16459-01. Predatory Bird Research Group, University of California, Santa Cruz.

Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). *In* A. Poole and F. Gill, editors. The Birds of North America, No. 684. The Birds of North America, Inc., Philadelphia, Pennsylvania.

LeBeau, C. W., R.M. Nielson, E.C. Hallingstad, and D.P. Young, Jr. 2015. Daytime habitat selection by resident golden eagles (*Aquila chrysaetos*) in Southern Idaho, USA. Journal of Raptor Research 49: 29 – 42.

LSA Associates, Inc. 2016. Habitat Restoration and Revegetation Management Plan. The California Flats Solar Project. Prepared for California Flats Solar, LLC.

Marzluff, J. M., S. T. Knick, M. S. Vekasy, L. S. Schueck and T. J. Zarriello. 1997. Spatial use and habitat selection of Golden Eagles in southwestern Idaho. Auk no. 114:673–687.

Mattson, T., J. Pickle, and A. Chatfield. 2015. 2014 Golden Eagle Studies at the California Flats Solar Project, Monterey County, California. Prepared for California Flats Solar, LLC, San Francisco, California. Western Ecosystems Technology, Inc., Cheyenne, Wyoming.

North American Datum (NAD). 1983. Nad83 Geodetic Datum.

Pagel, J. E., D. M. Whittington, and G. T. Allen. 2010. Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance. US Fish and Wildlife Service (USFWS). February 2010. Available online: http://steinadlerschutz.lbv.de/fileadmin/www.steinadlerschutz.de/terimGoldenEagleTechnicalGuidanceProtocols25March2010_1_.pdf

Rosenfield, R. N., J. W. Grier, and R. F. Fyfe. 2007. Reducing research and management disturbance of nesting raptors. *In* Bird, D. M. and K. L. Bildstein, editors. Raptor research and management techniques. Hancock House. Blaine, Washington.

Sauer, J. R., J. E. Hines, J. E. Fallon, K. L. Pardieck, D. J. Ziolkowski, Jr., and W. A. Link. 2017. The North American Breeding Bird Survey, Results and Analysis 1966 - 2015. Version 01.30.2015 USGS Patuxent Wildlife Research Center, Laurel, Maryland.

Smith, J. P. 2012. Recent golden eagle nest surveys and nesting history in Yolo, Solano, and San Luis Obispo Counties, California. H.T. Harvey & Associates, Fresno, CA. Oral Presentation. California-Nevada Golden Eagle Working Group Research Symposium. McClellan, California. December 11.

Stansbury C., and E. Hallingstad. 2016. California Flats Solar Project 2016 Golden Eagle Nest Monitoring Summary. Prepared for First Solar, Inc. San Francisco, California. Cheyenne, Wyoming.

Steenhof, K., and I. Newton. 2007. Assessing nesting success and productivity. *In* Bird, D. M., and K. L. Bildsein, editors. 2007. Raptor Research and Management Techniques. Raptor Research Foundation. Handcock House Publishers, Blaine, Washington.

U.S. Department of the Interior (USDOI). 2017. Memorandum: The Migratory Bird Treaty Act Does Not Prohibit Incidental Take. Memorandum M-37050. Office of the Solicitor, Washington, D.C. December 22, 2017. 41 pp. Available online: https://www.doi.gov/sites/doi.gov/files/uploads/m-37050.pdf

U.S. Fish and Wildlife Service. 2009. Final environmental assessment. Proposal to permit take provided under the Bald and Golden Eagle Protection Act. U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Washington D.C., USA.

U.S. Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance: Module 1 - Land-Based Wind Energy, Version 2. US Department of the Interior, Fish and Wilife Service, Division of Migratory Bird Management. April 2013. Available online at: https://www.fws.gov/migratorybirds/pdf/management/eagleconservationplanguidance. pdf

U.S. Fish and Wildlife Service. 2016a. Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update. Division of Migratory Bird Management, Washington D.C., USA.

U.S. Fish and Wildlife Service. 2016b. Eagles Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests. Federal Register/Vol. 81, No. 242, 91494-91554. Friday, December 16, 2016.

Western Ecosystems Technology, Inc. 2014a. California Flats Solar Project 2014 Eagle Eagle Nest Survey Report. Prepared for California Flats Solar, LLC., San Francisco, CA. Cheyenne, Wyoming.

Western Ecosystems Technology, Inc. 2014b. California Flats Solar Project 2014 Eagle Prey Assessment Report. Prepared for California Flats Solar, LLC., San Francisco, CA. Cheyenne, Wyoming.

Western Ecosystems Technology, Inc. (WEST). 2015. 2014 Golden Eagle Studies at the California Flats Solar Project, Monterey County, California. Final Report. Prepared for California Flats Solar, LLC, Prepared by Western Ecosystems Technology, Inc. (WEST), Cheyenne, Wyoming.

Western Ecosystems Technology, Inc. 2017. California Flats Solar Project Bird and Bat Conservation Strategy. Prepared for California Flats Solar, LLC., San Francisco, CA. Cheyenne, Wyoming. July 26, 2017

Wiens, J.D., Kolar, P.S., Fuller, M.R., Hunt, W.G., and Hunt, Teresa . 2015. Estimation of occupancy, breeding success, and predicted abundance of golden eagles (Aquila chrysaetos) in the Diablo Range, California, 2014: U.S. Geological Survey Open-File Report 2015-1039, 23 p., http://dx.doi.org/10.3133/ofr20151039.

Whittington, D. M., and G. T. Allen. 2008. Guidelines for raptor conservation in the Western United States. US Fish and Wildlife Service, Division of Migratory Bird Management, Washington DC.

Appendix A. Summary of annual golden eagle nest status and productivity at the California Flats Solar Project, California.

Appendix A. Annual summary of golden eagle nest status and productivity at the California Flats Solar Project, California.

Nest ID[1]	Nest Substrate	Annual Nest Status[2]					Nest Productivity (eggs, young)[3]					Comments
		2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	
GE1A	Oak	Occupied	Unoccupied	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	2014:Nest condition poor
GE2A	Oak	Active	Occupied	Unoccupied	-	Occupied	0, 2	0, 0	0, 0	-	0, 0	
GE3A	Oak	Failed	Failed	Failed	-	-	0, 2	2, 0	0, 0	-	-	
GE4A	Oak	Active	?	Active	-	Active	0, 2	?, 0	?, 2	-	?, 1+	2014: could not locate; 2015: Nestlings @ 14 – 21 days old April 16; 2017: One fledgling confirmed
GE5A	Oak	Occupied	Occupied	Active	-	-	0, 0	0, 0	?, ?	-	-	
GE6A	Oak	Occupied	Unoccupied	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	Nest too small for eagle; *censored from analysis*
GE7A	Transmission tower	Occupied	Unoccupied	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	2014: Nest too small for eagle, nesting ravens; *censored from analysis*
GE8A	Gray Pine	Occupied	Unoccupied	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	2015: Nest too small for eagle – poor condition
GE9A	Gray Pine	Active	Occupied	Occupied	-	-	0, 2	0, 0	0, 0	-	-	
GE10A	Gray Pine	Active	Occupied	Unoccupied	-	-	0, 2	0, 0	0, 0	-	-	
GE11A	Gray Pine	Failed	Failed	Occupied	-	Unoccupied	?, 0	3, 0	0, 0	-	0, 0	2017: nest in disrepair

Appendix A. Annual summary of golden eagle nest status and productivity at the California Flats Solar Project, California.

Nest ID[1]	Nest Substrate	Annual Nest Status[2]					Nest Productivity (eggs, young)[3]					Comments
		2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	
GE12A	Oak	Active	Failed	Active	Active	Failed	0, 2	1, 0	?, 2	?, 2	?, 0	2015: Nestlings @ 35 days old; May 5; 2016: Successfully fledged early June; 2017; no nestlings observed following incubation
GE13A	Oak	Active	Unoccupied	Occupied	Active	Active	0, 2	0, 0	0, 0	?, 2	?, 2	2016: Successfully fledged late June; 2017: used new nest
GE14A	Oak	Active	Unoccupied	Active	-	Active	0, 2	0, 0	?, 2	-	?, 2	
GE15A	Oak	Active	Occupied	Unoccupied	-	-	0, 2	0, 0	0, 0	-	-	
GE16A	Cottonwood	Active	Active	Occupied	-	-	0, 2	0, 1	0, 0	-	-	2014: Nestling @60 days old May 23rd – standing in nest
GE17A	Oak	Occupied	-	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	2014: Nest apparently blown out of tree
GE17B	Oak	Occupied	Unoccupied	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	Alternate nest
GE18A	Gray Pine	Occupied	Failed	Occupied	Occupied	Active	0, 0	1, 0	0, 0	?, 0	?, 2	2014–15: Adults observed in tree w/nest in Feb.
GE19A	Oak	Occupied	Failed	Occupied	Active	Occupied	0, 0	1, 0	0, 0	?, 2	0, 0	2015: Adults observed near nest Feb., May 2016: Successfully fledged early and late June; both juveniles predated

Appendix A. Annual summary of golden eagle nest status and productivity at the California Flats Solar Project, California.

Nest ID[1]	Nest Substrate	Annual Nest Status[2]					Nest Productivity (eggs, young)[3]					Comments
		2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	
GE20A	Oak	Occupied	Unoccupied	Occupied	Unoccupied	Unoccupied	0, 0	0, 0	0, 0	0, 0	0, 0	2015: Adults observed near nest Feb., May; 2017: territory subsumed?
GE21A	Gray Pine	Occupied?	Failed	Failed	-	-	0, 0	2, 0	1, 0	-	-	
GE22A	Gray Pine	Occupied	Unoccupied	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	
GE23A	Cliff	Failed	Unoccupied	Unoccupied	-	-	?, 0	0, 0	0, 0	-	-	
GE24A	Oak	Occupied?	Unoccupied	Unoccupied	-	Unoccupied	0, 0	0, 0	0, 0	-	0, 0	2017: no adults observed in vicinity of nest
GE25A	Oak	Occupied?	Unoccupied	Unoccupied	-	-	0, 0	0, 0	0, 0	-	-	
GE26A	Cliff	Occupied?	?	Unoccupied	-	-	0, 0	?, ?	0, 0	-	-	2014: Could not locate, 2015: Verified location
GE27A	Cliff	Occupied?	?	Unoccupied	-	-	0, 0	?, ?	0, 0	-	-	2014: Could not locate, 2015: Verified location
GE28A	Oak	Occupied?	Unoccupied	Unoccupied	-	-	0, 0	0, 0	-	-	-	2014: Nest poor condition, 2015: Nest collapsed, *censored from analysis*
GE29[b]	Gray Pine	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	
GE30	Gray Pine	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	
GE31	Gray Pine	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	

Appendix A. Annual summary of golden eagle nest status and productivity at the California Flats Solar Project, California.

Nest ID[1]	Nest Substrate	Annual Nest Status[2]					Nest Productivity (eggs, young)[3]					Comments
		2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	
GE32	Gray Pine	-	Occupied	Occupied	-	-	-	0, 0	0, 0	-	-	2015: Greenery in nest March 5
GE33	Gray Pine	-	Unoccupied	Occupied	-	-	-	0, 0	0, 0	-	-	2015: Greenery in nest March 5
GE34	Cliff	-	Occupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	2014: Adult nearby
GE35	Oak	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	
GE36	Gray Pine	-	Unoccupied	Occupied	-	-	-	0, 0	0, 0	-	-	2015: Greenery in nest March 5
GE37	Oak	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	
GE38	Oak	-	Occupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	2014: Adult nearby nest
GE39	Oak	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	2015: Nest condition poor
GE40	Gray Pine	-	Occupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	2014: Adult nearby nest 2015: Nest condition poor
GE41	Oak	-	Active	Occupied	-	-	-	?, 2	0, 0	-	-	2014: Nestlings @55 days old May 23rd – one in nest one perched on branch 2015: Nest gone – adults present
GE42	Gray Pine	-	Unoccupied	Unoccupied	-	Active ?	-	0, 0	0, 0	-	?, 1+	2017: Nest structure could not be viewed; adults in area and food begging audible in early June.

Appendix A. Annual summary of golden eagle nest status and productivity at the California Flats Solar Project, California.

Nest ID[1]	Nest Substrate	Annual Nest Status[2]					Nest Productivity (eggs, young)[3]					Comments
		2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	
GE43	Gray Pine	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	
GE44	Gray Pine	-	Active	Unoccupied	-	-	-	?, 2	0, 0	-	-	2014: Nestlings @55 days old May 23rd – adult feeding in nest
GE45	Gray Pine	-	Unoccupied	Unoccupied	-	-	-	0, 0	0, 0	-	-	
GE46	Gray Pine	-	Unoccupied	Occupied	-	-	-	0, 0	0, 0	-	-	2015: Greenery in nest March 5
GE47	Oak	-	-	Active	-	-	-	-	?, ?	-	-	2015: Adult sitting on nest April 16
GE48	Oak	-	-	Unoccupied	-	-	-	-	0, 0	-	-	
GE49	Oak	-	-	Unoccupied	-	-	-	-	0, 0	-	-	
GE50	Oak	-	-	Unoccupied	-	-	-	-	0, 0	-	-	
GE51	Oak	-	-	Occupied	-	-	-	-	0, 0	-	-	2015: Greenery in nest March 5
GE52	Oak	-	-	Unoccupied	-	-	-	-	0, 0	-	-	
GE53	Oak	-	-	Occupied	-	-	-	-	0, 0	-	-	2015: Greenery in nest March 5

[1] Nest ID = alpha notation “A” for the first 29 nests as reported by H.T. Harvey & Associates 2013a. Nests discovered during successive years continued in numerical order.

[2] Active = an adult, eggs, or young was present in/on the nest, Occupied = fresh nesting material was built into nest suggesting maintenance during breeding period or if adults were observed nearby, Unoccupied = none of the conditions for Active or Occupied were observed; “-“ = Pre-2015 nests not found, Post-2015 nest not surveyed; “?” = Uncertain nest status based on adults in the area that could not be attributed to a specific nest.

[3] “?” = Undetermined number of eggs or young; “-“ = Pre-2015 nests not found, Post-2015 nest not surveyed.

Appendix B. California Flats Solar Project Preliminary Assessment of Eagle Activity and Potential Relationships to Mammalian Prey Distribution
(H.T. Harvey and Associates 2014)

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

California Flats Solar Project
Preliminary Assessment of Eagle Activity and Potential Relationships to Mammalian Prey Distribution

Project # 3544-01, 7-1

Prepared for:

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Prepared by:

H. T. Harvey & Associates

January 2014

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Table of Contents

Tables

Figures

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Introduction

This report provides a preliminary assessment of the activity patterns of eagles, especially golden eagles (*Aquila chrysaetos*), in the area proposed for development of the California Flats Solar Project (Project) in southeastern Monterey County, California, in relation to what is known about the distribution of potential mammalian prey species in the Project area. This assessment is based on ongoing baseline surveys conducted by H. T. Harvey & Associates (HTH) ecologists, including aerial nest surveys in 2013 covering a 10-mile radius around the Project site, general avian activity surveys conducted throughout the Project site semi-monthly from March through early December 2013, and various mammal surveys conducted in 2012 and 2013. The detailed results of most of these surveys were summarized in previous reports (HTH 2013a, b, c, d, e, f).

Methods

Potential Prey

Data on potential prey were collected as follows:

- Infrared, remote-sensing, camera-station surveys conducted in October and November 2012 at various locations within the Biological Study Area (BSA) delineated around the Project site.
- Full coverage, systematic, transect surveys conducted on foot or from UTVs in November 2012 across the entire BSA. Observers recorded the locations of all burrow systems used by Heermann's kangaroo rat (*Dipodomys heermanni*), and all den or burrow systems that could be inhabited or were created by other special-status mammal species, such as American badger (*Taxidea taxus*) and San Joaquin kit fox (*Vulpes macrotis mutica*). In addition, all California ground squirrel (*Otospermophilus beecheyi*) burrow systems were mapped on approximately 645 acres of the BSA.
- Systematic scent dog surveys were conducted in September and October 2013 across a representative sample of the BSA, at 0.25- and 0.5-mile intervals. The dog was trained to target and alert to San Joaquin kit fox scat, but the team recorded all carnivore scat observed. Scats were confirmed to species through morphometric comparisons, or, when DNA amplification was possible, mitochondrial DNA sequence data involving multiple (200+) comparative points (HTH 2013d).
- Spotlight surveys were conducted on three nights during late November and early December in 2012 and 2013. Surveys were conducted along existing access roads, and were substantially expanded in 2013 to include the PIA, Project vicinity, and publicly accessible areas adjacent to the Project site that provided substantial coverage of the project area. Areas that could not be accessed during spotlight surveys included portions of the transmission corridor (where it spans drainages or steep valleys) and the interior portion of the largest Project areas. In 2012, the surveyors recorded each animal sighting as a location along the road where the sighting occurred. During the 2013 surveys, the actual location of observed wildlife was approximated and recorded using iPads equipped with a GPS, GIS Kit® software.
- During site visits and biological surveys for a variety of natural resources (e.g., birds, special-status plant species, etc.), HTH biologists also recorded other opportunistic observations of potential eagle prey, including feral pigs and rabbits on or near the Project site.

Eagles

Data on the distribution of eagles and their activities were collected as follows:

- Aerial surveys conducted in late March and mid-May 2013 throughout a 10-mile radius area surrounding the Project site. Besides observations of nesting birds, these surveys resulted in other observations of foraging, roosting, and flying eagles in areas away from known nesting areas.

- Ground surveys for nesting raptors conducted monthly in the BSA from March through June 2013, covering on foot, and while driving along accessible roads, all areas where trees or rocky outcrops capable of supporting nesting raptors occurred. During these surveys, observers opportunistically recorded other observations of golden eagles and bald eagles within the BSA.
- General avian-activity point counts (Bird Use Counts [BUC]) conducted semimonthly from March through November 2013 across the Project site (see Figure 1 for count-site locations).
- Opportunistic recording of eagle sightings while traveling Project roads and through Cholame Valley to access the Project site.

During these surveys, all eagle sightings were either located on paper maps and later digitized, or were digitally mapped in the field using an iPad equipped with a GPS, GISKit® software, project schematics, and aerial imagery. In addition, during the semi-monthly avian activity counts, the approximate flight paths of all observed eagles were mapped.

Mapping Analysis

For the purposes of this analysis, we categorized potential mammalian prey species into three categories: 1) California ground squirrel; 2) other burrowing animals; and 3) other potential prey species. The first category included locations of California ground squirrel burrows and burrow complexes. The second category included burrowing owl sign and sightings, unknown mammal burrows (typically a single den or burrow system that was the appropriate size and shape to be inhabited by or created by a burrowing mammal species other than a California ground squirrel; e.g., American badger, San Joaquin kit fox, coyote [*Canus latrans*], and striped skunk [*Mephitis mephitis*]), and Heermann's kangaroo rat precincts. The third category included all confirmed sightings and sign of other species listed in Table 1, except California ground squirrel and Heermann's kangaroo rat. Many of the unknown mammal burrows, burrowing owl locations, and Heermann's kangaroo rat locations were situated among California ground squirrel colonies, with surveyors specifically describing many of these locations as being among California ground squirrel colonies. In these instances, we mapped the points as California ground squirrel burrows for the purpose of this analysis. Nevertheless, it is important to understand that the currently available data on the distribution of California ground squirrels—a key eagle prey species—on the Project site and in the surrounding landscape is substantially incomplete.

To provide a preliminary illustration of the degree to which eagle nesting and activity patterns around the Project site may reflect the distribution of potential prey species, we overlaid the recorded distributions of potential prey species, including California ground squirrels, and the available observations of eagle nest sites, sightings, and flight paths. We then visually assessed the overlays for apparent patterns.

Table 1. Potential Mammalian Prey Species for Golden Eagles Foraging in the Vicinity of the California Flats Solar Project

Species	Notes
American badger	Potential prey species
Audubon's cottontail	Known primary prey species
Black-tailed jackrabbit	Known primary prey species
Bobcat	Potential prey species
California ground squirrel	Known primary prey species
Coyote	Potential prey species
Domestic cattle	Scavenging resource
Feral pig	Known prey species (piglets) /scavenging resource
Heermann's kangaroo rat	Unlikely prey species
Long-tailed weasel	Potential prey species
Raccoon	Potential prey species
San Joaquin kit fox	Potential prey species
Striped skunk	Potential prey species
Pronghorn	Potential prey species/scavenging resource
Tule elk	Potential prey species (young calves)/scavenging resource
Feral cat	Potential prey species
Black-tailed deer	Potential prey species (fawns)/scavenging resource
Red fox	Potential prey species
Gray fox	Potential prey species
Domestic dog	Potential prey species

Results

Distribution of Potential Prey

A variety of potential mammalian prey species for golden eagles occur in the Project vicinity (Table 1). The most common include California ground squirrel, Audubon's cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), coyote, and young feral pigs (*Sus scrofa*). Among the 24,047 photographs recorded during camera-station surveys, 2,445 had recognizable images of 6 potential prey species. Full coverage ground surveys detected 4 potential mammalian prey species, scent dog surveys detected 5 potential mammalian prey species, and spotlight surveys detected 10 potential mammalian prey species.

Eagle Activity

The aerial surveys confirmed 12 active golden eagle nests and 1 active bald eagle nest, plus a variety of other known or potential eagle nests in the vicinity of the Project, but none on the Project site (Figure 1). Currently, our records contain 103 distinct observations of individual or multiple golden eagles or bald eagles, comprising a total of 103 golden eagle and 7 bald eagle observations on or adjacent to the Project site from November 2012 through 05 December 2013. Thirty-seven of those sightings were of perched birds (32 perched golden eagles, 5 perched bald eagles), 60 sightings were of birds in flight (59 flying golden eagles, 1 flying bald eagle), and 12 sightings (11 golden eagles and 1 bald eagle) did not have flight or perch information associated with the observation. We recorded 18 sightings of non-adults, 65 sightings of adults, and 20 sightings of unknown-age golden eagles. We recorded 2 adult and 5 subadult bald eagles on or near the Project site. During the non-breeding season (November 2012 – 15 January 2013 and 01 September – 05 December 2013), we recorded 23 observations of golden eagles: 5 adults, 9 non-adults, and 9 unknown-age eagles. During the breeding season (15 January – 31 August 2013), we documented 80 observations of golden eagles: 56 adults, 13 non-adults, and 11 unknown-age eagles. During the breeding season, we observed 4 adult and 4 subadult bald eagles. During the non-breeding season, we observed 1 subadult bald eagle.

We have not conducted any formal analysis of eagle distribution and habitat use; however, the observations collected to date have revealed a few areas of eagle activity (Figure 1). The southeast portion of the Project site near BUC sites 1 and 3 appears to be a relatively high use area, as does a centrally located area near BUC site 5 in the vicinity of the proposed powerline corridor. During the standardized avian point counts conducted through November 2013, eagles were observed on 9 occasions; 4 of these sightings occurred at BUC site 5. A number of sightings also occurred near BUC site 8 in the northern Project area.

N

3,000 1,500 0 3,000

Feet

LEGEND

- Biological Study Area
- Utility Corridor Study Area
- Access Road
- Proposed Transmission Line
- Observer Points
- Golden Eagle Nest
- Bald Eagle Nest
- Golden Eagle Sighting
- Bald Eagle Sighting
- Golden Eagle Flight Path (Different Colors Indicate Unique Sightings)

Potential Prey Data:

- California Ground Squirrel
- Burrowing Animals
- Other Potential Prey Sign and Sightings

Site 8
Site 7
Site 6
Site 5
Site 4
Site 2
Site 3
Site 1

MATCHLINE SHEET 1

MATCHLINE SHEET 2

SHEET 2

SHEET 1

J:\Reports\Wildlife Reports\GOEA Preliminary Distribution\Fig 1 Distribution.mxd

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ECOLOGICAL CONSULTANTS

First Solar

Figure 1: Golden Eagle and Bald Eagle Nests and Sightings, and the Documented Distribution of Potential Mammalian Prey Species
California Flats Solar Project, California (3544-01)
January 2014

Discussion

Distribution of Potential Prey

The California ground squirrel is the most abundant, and probably most important, prey species in the Project area for golden eagles. The ground squirrel colonies and burrow systems on the Project site are well established, many with an apparent long history of occupation and development. Our observations suggest that ground squirrel colonies are distributed widely across the Project site in most habitat types, but higher concentrations tend to occur along road berms, near water sources, along fence lines, in wooded areas, and around homesteads, ranching developments, and other structures. There are notable absences and generally lower densities of ground squirrel colonies in the larger, open, and flatter habitats that compose the interior portions of the largest Project areas. Some of these areas have been historically dryland farmed or disked, recently burned (summer 2012), or contain soils (heavier clay-mesic soil types) that have not been colonized (or re-colonized) and are less suitable for high-density ground squirrel occupation. In these habitats, the ground squirrel colonies are concentrated mainly along fence lines and in drainages and washes.

The distribution of burrowing owls, unknown mammal burrows, and Heermann's kangaroo rats were systematically mapped on the entire Project site (collectively represented as burrowing animals in Figure 1). There are some basic habitat preferences of burrowing owls, burrowing mammals, and Heermann's kangaroo rats that overlap those of the California ground squirrel. On the Project site, Heermann's kangaroo rats and California ground squirrels generally avoid the historically dryland farmed or disked areas, and areas that contain heavier clay-mesic soil types. However, Heermann's kangaroo rats are more restricted to the gentler slopes, flat areas, and more xeric soil types found on the Project site, and California ground squirrel colonies can be found in a broader variety of habitat types (e.g., on steeper slopes and in more mesic soils). Many of the burrowing owl sightings/sign and unknown mammal den locations also were recorded among California ground squirrel colonies.

We have not precisely quantified the degree of habitat overlap between California ground squirrels and other burrowing animals, but we observed an expected amount of co-existence between the relevant species groups. The locations of these other species and their sign can be used as a partial proxy for potentially suitable and occupied California ground squirrel habitat and, therefore, potential eagle foraging habitat; however, there are likely to be many areas inhabited by California ground squirrels that are outside of these mapped areas.

In addition to ground squirrels, potential prey species that our biologists recorded most frequently were feral pigs, Audubon's cottontails, and black-tailed jackrabbits, each of which may constitute significant proportions of the local eagles' diets. The distribution of cottontails and jackrabbits appears more patchily distributed than the distribution of ground squirrels, and they are likely found at much lower densities on the Project site than ground squirrels. Cottontails typically were seen around ranching structures and where large pipes and

culverts provided protection, and black-tailed jackrabbits were often observed where vegetation (grass, forb, shrub, or crop) provided sufficient cover. During daylight hours, feral pigs were most often observed in riparian corridors and wooded areas around the Project site, but sign of their foraging (ground disturbances) is evident across much of the Project site. Other larger species that may provide scavenging opportunities for foraging eagles include cattle, Tule elk (*Cervus canadensis*), and pronghorn (*Antilocapra americana*); to date, we have not recorded the latter two species on the Project site.

Eagle Activity

We regularly observed golden eagles, and bald eagles to a lesser extent, on and adjacent to the Project site throughout the year. We observed golden and bald eagles foraging on California ground squirrels (both on and off the Project site) and golden eagles feeding on road-killed feral pig (not on the Project site). However, based on the current mapping of prey distributions and the eagle activity data we have collected thus far, distinct patterns of association cannot be readily discerned. The specific distribution of nest sites is likely driven primarily by substrate availability and appropriate territory spacing, and the limited data on flight activity patterns that we have collected thus far may reflect primarily the territory dynamics of adjacent nesting pairs and flight dynamics related to topography and wind patterns favorable to soaring and general movement.

Many of the general sightings shown on Figure 1 were observations of adult eagles near known or suspected nests sites. In addition, several of the flight paths tracked from the BUC site 5 area, in particular, suggested connections to the active nesting territories located southwest of this area, with other sightings just north of this site involving other distinct adults that were located near another inactive nest in this area. In other words, it appeared that the concentration of activity in the BUC site 5 area might have reflected a boundary conjunction zone for multiple nesting territories. This is an area of mostly annual grassland habitat, with small sections of sparse oak woodland on some north facing slopes. At present, we have little specific information about the distribution of potential prey in this area, but there are likely more California ground squirrel colonies than depicted on Figure 1.

The southeast portion of the project site near BUC site 1, where eagle activity has been relatively high (Figure 1), is an area dominated by annual grassland, but with some ranching structures and debris (e.g., water storage sheds, windmills, discarded irrigation pipes etc.), areas of willow-cottonwood woodlands, riparian oak woodlands, and some non-native woodland. To the east, the hills rise to many exposed rocky outcrops and ridges. There are substantial concentrations of ground squirrel colonies in the area, and we often observed cottontails using the structures and debris in this area. The relatively high concentration of prey is not readily apparent on Figure 1, because our mapping was limited to the BSA and did not fully represent California ground squirrels (other areas mapped within the BSA also under-represent actual ground-squirrel densities, because mapping ground-squirrel colonies was not a primary objective of the previous mapping effort). One active golden eagle nest was located approximately 2 miles west and another 2 miles east of BUC site 1 and the nearby eagle concentration area, and some of the documented flights suggested connections between

eagles seen in the area and at least the nesting territory to the west (Figure 1). The eagle observations in this area included both adult and subadult eagles. Therefore, it appears that the southeastern sector of the Project area and the adjacent foothills may be a popular foraging area for the eagles that nest along the southwestern edge of the BSA, as well as for other young eagles, which potentially could be previous offspring of the nesting pair.

The other concentration area near BUC site 8, in the northern section of the Project site and the adjacent foothills (Figure 1), features annual grassland and scattered oak woodlands to the south, whereas to the north the elevation rises quickly and habitats change to a mixture of dense chaparral and gray pine-juniper woodland. The chaparral and gray pine-juniper woodlands do not provide quality foraging habitat for eagles, but the relatively steep terrain likely provides updrafts favored by soaring eagles. The sightings in this area likely reflect the activities of a breeding pair of eagles near an inactive nest site. These eagles also regularly perched in the old orchard trees south of the ranch house located immediately north of the Project site. Drawing conclusions about eagle activity relevant to prey distributions is not yet feasible for this area, because the current mapping of potential prey species does not adequately represent the distribution of key species such as the California ground squirrel.

Based on currently available information, we are unable to draw definitive conclusions about relationships between eagle activity patterns and prey distribution. We can, however, say that eagles frequently use the overall Project area and the surrounding habitats year-round. We have observed adult and subadult golden and bald eagles throughout the monitoring period. We observed more adult (56) than subadult (13) golden eagles during the breeding season, whereas the reverse may have been true during the non-breeding season (9 subadults, 5 adults, 9 unknown age). This suggests that the area may be important for wintering and migrating birds, as well as resident breeders and subadults.

In conclusion, we regularly observed golden eagles, and bald eagles to a lesser extent, on and adjacent to the Project site throughout the year. The current data on prey distribution and limited data on eagle activity do not suggest a distinct pattern of eagle habitat use related to prey distributions. More intensive, extended-duration eagle activity surveys, combined with expanded efforts to map and model prey distributions across both the Project site and surrounding areas, are required to clarify the territory dynamics of golden eagles and patterns of habitat use. One facet of particular importance will be extended observations of eagle activity conducted at sites that are not located in the middle of the proposed Project. The presence of observers in the middle of Project areas may influence eagle activity patterns and bias results (Pagel et al. 2010).

Literature Cited

[HTH] H. T. Harvey & Associates. 2013a. Baseline Raptor Nest Surveys for the Proposed California Flats Solar Project in Monterey County, California: 2013. Prepared by H. T. Harvey & Associates, San Luis Obispo, California. Prepared for California Flats Solar, LLC, Minneapolis, Minnesota.

[HTH] H. T. Harvey & Associates. 2013b. Baseline Avian Activity Surveys for the Proposed California Flats Solar Project in Monterey County, California: March – August 2013. Prepared by H. T. Harvey & Associates, San Luis Obispo, California. Prepared for California Flats Solar, LLC, San Francisco, California.

[HTH] H. T. Harvey and Associates. 2013c. California Flats Solar Project: Identification of Kangaroo Rats through Morphometric, Ecological, and Genetic Analyses. Prepared by H. T. Harvey & Associates, San Luis Obispo, California. Prepared for California Flats Solar, LLC, San Francisco, California.

[HTH] H. T. Harvey and Associates. 2013d. California Flats Solar Project, Monterey County, California: Scent Dog Survey Summary of Work. Prepared by H. T. Harvey & Associates, Fresno, California. Prepared for First Solar, Inc., Riverside, California.

[HTH] H. T. Harvey and Associates. 2013e. California Flats Solar Project Monterey County, California: Burrowing Mammals and Bird Surveys. Prepared by H. T. Harvey & Associates, San Luis Obispo, California. Prepared for California Flats Solar, LLC, Portland, Oregon.

[HTH] H. T. Harvey and Associates. 2013f. California Flats Solar Project: Spotlight Surveys for San Joaquin Kit Fox and American Badger. Prepared by H. T. Harvey & Associates, San Luis Obispo, California. Prepared for California Flats Solar, LLC, San Francisco, California.

Pagel, J. E., D. M. Whittington, and G. T. Allen. 2010. Interim golden eagle inventory and monitoring protocols, and other recommendations. Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Arlington, Virginia.

Appendix C. California Flats Solar Project Bird and Bat Conservation Strategy

California Flats Solar Project
Bird and Bat Conservation Strategy

Prepared for:

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July 26, 2017

Table of Contents

List of Appendices

1 INTRODUCTION

California Flats Solar, LLC (California Flats) proposes to construct, own, operate, and eventually decommission a 280-megawatt (MW) alternating current (AC) photovoltaic (PV) solar generating facility referred to as the California Flats Solar Project (Project). This Bird and Bat Conservation Strategy (BBCS) was developed to provide a written record of California Flats' efforts to understand potential project impacts to birds and bats and to document conservation measures that have or will be taken to avoid, minimize, and/or mitigate for those potential impacts. After introductory material on project description, the BBCS purpose, and regulatory framework, the BBCS includes the following major sections:

- baseline conditions
- risk assessment
- risk reduction and conservation measures
- construction and post-construction monitoring
- adaptive management

Background and Purpose

The BBCS is not intended to initiate formal consultation for take of federal or state listed or protected species; rather, it provides a summary of current biological conditions and describes conservation measures intended to avoid, minimize, and/or mitigate potential impacts to bird species. Information in this BBCS is intended to correspond to California Flats' proposed measures and mitigation to be described in environmental review documentation being prepared for the Project pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), and includes the following objectives:

- describe baseline conditions for bird and bat species present within the Project site, including results of surveys performed to date;
- present a risk assessment identifying activities during the construction and operation and maintenance (O&M) phases that may increase the potential of adverse effects to bird and bat species located on and adjacent to the Project components;
- specify conservation measures that will be employed to avoid, minimize and/or mitigate any potential adverse effects to these species;
- provide details for an Avian Fatality Monitoring Study to be conducted post-construction including applicable approved protocols that would be used for surveys and monitoring; and
- detail long-term monitoring and reporting goals for the Project.

Corporate Policy and Coordination

California Flats is committed to working cooperatively with federal and state agencies to minimize adverse impacts to protected bird and bat species. Through the planning stages of the Project, California Flats and its consultants have been working in coordination with federal and state agency personnel regarding necessary wildlife surveys and siting considerations to ensure that all parties understand the scope of the Project and potential issues that could be identified and addressed early in the planning process. California Flats will continue to work with the agencies to implement conservation measures intended to avoid, minimize, and/or mitigate potential impacts to bird species, including those measures identified in this BBCS.

2 SITE AND PROJECT DESCRIPTION

The California Flats Solar Project is a proposed 280-MW AC photovoltaic solar power plant located in southeastern Monterey County, California (Figure 1). When approved, the solar facility and related operational infrastructure will be built within an approximately 3,000 acre area of private ranchland. The solar generating portion of the Project (shown as "Project site" on the figures in this document) would be located on approximately 2,720 acres, including an approximately 2,120-acre solar development area. The Project will include construction, installation, and operation of energy-related infrastructure (e.g., solar panels, inverters, substations, a switching station to be owned and operated by Pacific Gas and Electric Company (PG&E), and new power poles and lines) and improvements needed to operate and maintain energy-related facilities (e.g., buildings, internal roadways, access roads, fencing, and lighting). The overall development will also include approximately 60-acres of improvements to an existing access road and its connection to the California Department of Transportation (Caltrans) right-of-way at California State Route (Hwy) 41, approximately 5 miles south of the Project site, as well as a new 155-acre utility corridor. Because the utility corridor was added to the Project plan after some of the initial surveys reported here began, some surveys summarized in the BBCS did not cover that area; however, the relevant area has been subsequently surveyed. The Project site and access road/Hwy 41 improvement areas constituted the original Project impact area (PIA), where all direct, Project-related impacts are projected to occur. A Biological Study Area (BSA) delineated around the PIA and the utility corridor identified the area in which most Project-related biological surveys and assessments were conducted (Figure 1).

California Flats has developed a plan to construct and operate the proposed Project within the Competitive Renewable Energy Zone, under the State's Renewable Energy Transmission Initiative. The Project site's elevation and generally flat, south-facing topography creates an ideal place for solar development. Sunlight is plentiful year round because the elevation places the site above the coastal marine layer, and the site does not receive winter fog from the Central Valley. The flat, south-facing topography minimizes the need for mass grading and alteration of landforms to position modules in a way that favors collection of solar energy. In addition, the Morro Bay–Gates 230-kilovolt transmission line crosses the Project site, with capacity sufficient to accommodate the Project.

Power Plant Operations and Maintenance

Power Plant Operations

Upon completion, the Project (Power Plant) generates commercial electricity during daylight hours, seven days per week. Some non-generating equipment remains on-line 24 hours per day and some equipment remains energized briefly after sunset due to capacitance.

Power plant operation is almost entirely automated via an advanced Supervisory Control and Data Acquisition (SCADA) system and redundant automatic controls, with 24 hour per day, seven day per week operational monitoring and event intervention provided through the offsite First Solar Operations Center (FSOC), located in Tempe, Arizona. Under normal operation, few operational tasks are executed by onsite personnel. During abnormal operational events, onsite personnel have the skill and ability to intervene in the highly unlikely event that programmed and redundant automatic safeguards fail to function as designed.

Power Plant Maintenance

Typically, a permanent onsite staff is employed to perform various equipment monitoring, inspection, maintenance, and repair tasks on photovoltaic (PV) generation and transmission equipment. Onsite personnel typically include a site manager/supervisor and 2 to 4 technicians depending upon the size of the power plant and technologies used. Upon assignment, onsite personnel receive thorough and specific training regarding permit conditions, environmental compliance and species-related requirements in effect during operations and maintenance.

For the purpose of this strategy, maintenance activities are separated into three categories, Routine Maintenance, Non-Routine Maintenance and Non-Equipment Maintenance. The large majority of these activities are conducted during daylight hours with rare exceptions that, for safety reasons, require nighttime work when photovoltaic electricity generation is off-line.

Greater than 89% of all maintenance tasks are routine in nature. Each of these tasks are typically executed by one technician that deploys to the field location via pick-up truck and employs only handheld tools and instruments. The large majority of these tasks are accomplished in less than one half hour, including transit time to and from the work location (which typically consumes more time due to distance and low speed limits than the actual task being done).

Non-routine and non-equipment maintenance/biological monitoring historically typically consumes remaining 11% of the time and is skewed by extremely infrequent events which will be discussed in the next two sections. Except in emergency situations, all vehicle traffic is confined to the defined plant roadways only, therefore, technicians park on the roadway adjacent to the work area and walk to the work site from that point.

Routine Maintenance

Routine *preventive* maintenance consists of inspections, calibrations, tests, scans and equipment cleaning pursuant to inspection (referred to as a clean/inspect task).

Routine *corrective* maintenance consists primarily of a wide variety of component replacements that are safely executed by one to two technicians using only handheld tools and equipment.

Non-Routine Maintenance

Non-routine maintenance consists of extremely infrequent tasks that require more than handheld tools or equipment. Across a plant management portfolio of 4.23GWac examples include fence repairs requiring a contracted crew, which has occurred once in the last 7 years; power conversion station (PCS) transformer replacement, which has occurred twice in the last 7 years; substation switchgear replacement which has occurred once in the last 7 years, and substation generator step-up (GSU) transformer replacement, which has occurred once in the last 7 years. Non-routine maintenance may require larger machinery, such as cranes, boom trucks, excavators, or heavy-haul transport.

Non-Equipment Maintenance

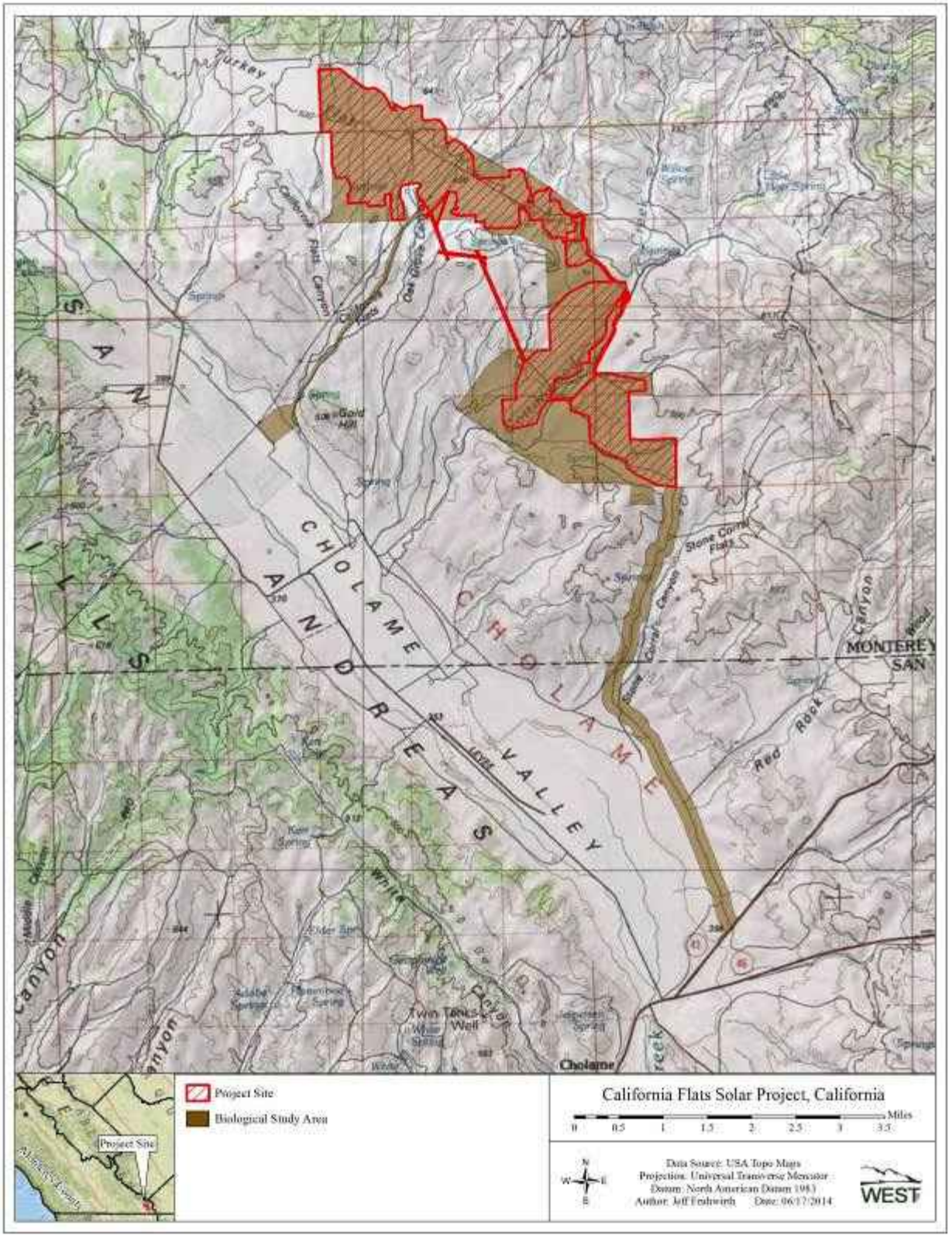
Non-Equipment Maintenance activities include work on other than solar power equipment. These activities consist primarily of compliance-related tasks such as various types of periodic biological surveys. The majority of these activities are conducted by a number of contracted personnel deployed by pick-up truck and afoot and typically occur on either a quarterly, semi-annual or annual basis. Certain power plants require vegetation management in order to maintain low fuel loading around electrical generation equipment. Site-wide vegetation management is characteristically conducted twice per year and may either be performed by livestock grazing or mechanical mowing depending upon permit conditions as indicated in the Project Habitat Restoration and Revegetation Management Plan (HRRMP) (LSA, 2016).. Grazing is the primary method for vegetation management. When vegetation management by grazing is applied, it is usually performed twice per year and entails delivery and retrieval of livestock by a typical livestock trailer most often being moved by a commercial pick-up truck. The livestock are typically shepherded from point-to-point on the hoof and not relocated by vehicle. Vegetation management by mowing is infrequent and typically entails the use of one or more small (sized to fit between array rows) commercial mowers that may either be fuel or electrically powered.

Emergency Repairs

Emergency repairs needed to keep the Project connected to the electrical grid and producing electricity as a result of major equipment malfunction, electrical grid malfunction, or a natural disaster (e.g., earthquake, fire, storm) will be conducted in an expedient manner.

PG&E would be responsible for inspecting, operating, and maintaining its own facilities in compliance with state and federal wildlife regulations, including the Project switching station and the existing Morro Bay–Gates transmission line. These facilities are not covered under this BBCS.

Figure 1. California Flats Project Location



3 REGULATORY REQUIREMENTS RELEVANT TO THIS BBCS

Several federal and state laws and regulations, including NEPA, Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), CEQA, California Endangered Species Act (CESA), and California Code of Regulations, provide or may provide the foundation for the development of the BBCS. This document represents a comprehensive plan to address the requirements of these regulatory mechanisms as they apply to birds and bats in the Project site.

National Environmental Policy Act

Under NEPA (42 U.S.C. §§ 4321-4370h), federal agencies are required to analyze the potential environmental effects of a major federal action. Because an Individual Permit will be necessary under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) is the lead federal agency responsible for the NEPA analysis for this Project and is in the process of preparing an Environmental Assessment to analyze the potential impacts of the Project.

Endangered Species Act

Certain species at risk of extinction, including many birds and bats, are protected under the federal ESA of 1973, as amended (16 U.S.C. §§ 1531-1544). The ESA 1973 defines and lists species as "endangered" and "threatened" and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. Section 7(a)(2) directs all federal agencies to insure that any action they authorize, fund, or carry-out does not jeopardize the continued existence of an endangered or threatened species or designated or proposed critical habitat (collectively, referred to as protected resources). The USACE is consulting with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7(a)(2) of the ESA.

Migratory Bird Treaty Act

The MBTA (16 U.S.C. §§ 703, et seq.), passed by the U.S. Congress and signed into law in 1918, makes it unlawful to "pursue, hunt, take, capture or kill; attempt to take capture or kill; possess; offer to or sell, barter, purchase, or deliver; or cause to be shipped, exported, imported, transported, or received (inclusively referred to as "take") any native migratory bird, part, nest, egg, or product" The MBTA, enforced by the USFWS, protects all MBTA-listed migratory birds from "take" as previously defined, within the United States. In the continental U.S., native non-covered species generally belong to the Order Galliformes. Common non-native species not protected from take by the MBTA include rock pigeon (*Columba livia*), Eurasian collared-dove (*Streptopelia decaocto*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*) (USFWS 2005). Although permits may be obtained to collect MBTA-listed birds for scientific purposes or to destroy depredating migratory birds, the MBTA does not provide any permit mechanism authorizing the incidental take of migratory birds in connection with otherwise lawful activities, as incidental mechanisms are not defined in the Act as a take. Nevertheless, federal agencies such as the USACE have been directed to evaluate the effects of its actions on migratory birds, with an emphasis on species of concern (per Executive Order 13186).

Bald and Golden Eagle Protection Act

BGEPA (16 U.S.C. §§ 668-668d) prohibits the take, defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb," of any bald eagle (*Halieetus leucocephalus*) or golden eagle (*Aquila chrysaetos*). Through recent regulation (50 C.F.R. § 22.26), the USFWS may authorize the take of bald and golden eagles when the take is associated with, but not the purpose of, an otherwise lawful activity and cannot practicably be avoided. The USFWS has issued Eagle Conservation Plan Guidance (USFWS 2013) for land-based wind energy projects to help project proponents avoid unanticipated take of bald and golden eagles and comply with the BGEPA. Although the guidelines were developed for land-based wind energy projects, certain components of eagle surveys and monitoring are applicable to other renewable energy projects, including PV solar plants, and have been incorporated into this BBCS.

California Environmental Quality Act

Under the California Environmental Quality Act (CEQA) as amended (Public Resources Code [PRC] Section 21000, et seq.), state and local agencies must identify the significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. The County (Monterey) is the public agency with the principal responsibility for approving the Project, and as such is the Lead Agency for this project under CEQA. The County has determined that the proposed Project is a project of regional importance and that it would have a potentially significant impact on the environment, and therefore is preparing an Environmental Impact Report (EIR), which will address the impacts. Potential impacts to birds and bats are being considered in this document.

California Endangered Species Act

The California Endangered Species Act (CESA; Fish and Game Code Sections 2050 to 2097) protects and preserves species designated by the Fish and Game Commission as either threatened or endangered in the state of California. These protected resources include native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction as well as those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation. CESA also allows for take that is incidental to otherwise lawful development projects.

California Fish and Game Code

Fully Protected Species

The California Fish and Game Code provides protection for a variety of species, referred to as fully protected species. Section 5050 lists fully protected amphibians and reptiles, Section 3515 lists fully protected fish, Section 3511 lists fully protected birds, and Section 4700 lists fully protected mammals. The California Fish and Game Code defines take as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research, all take of fully protected species is prohibited, and the California Department of Fish and Wildlife (CDFW) cannot issue take permits for fully protected species.

Section 3503 and 3503.5 (Protection of Birds and Raptors)

Section 3503 of the California Fish and Game Code prohibits the killing of birds and/or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and/or the destruction of raptor nests. Typical violations include destruction of active bird and raptor nests as a result of tree removal and failure of nesting attempts (loss of eggs and/or young) as a result of disturbance of nesting pairs caused by nearby human activity. Consultation with CDFW would be required if nesting would be affected by construction activities.

4 ENVIRONMENTAL SETTING AND PRELIMINARY SITE EVALUATION

The Biological Study Area (BSA) for the Project, which is intentionally larger than the Project site, comprises approximately 4,872 acres in an unincorporated area of southeastern Monterey County and northeastern San Luis Obispo County, California, near the Kings County and Fresno County borders (Figure 1). The BSA is located along the eastern rim of the Cholame Valley. The San Andreas Rift Zone trends northwest-southeast south of the BSA. The BSA is bounded by mostly undeveloped private land in all directions. Sparse residential settlements and small farms are located south and east of the BSA. The BSA is vacant and is currently a working landscape that includes cattle ranching. Most level areas of the BSA (i.e., the area north of the access road spur to Hwy 41) have been historically disked and dryland farmed for hay and small grain production. The BSA can be found on three U.S. Geological Survey (USGS) 7.5-minute quadrangle maps: The Dark Hole, Cholame Valley, and Cholame. Elevation ranges from 1,180 feet National Geodetic Vertical Datum (NGVD) at the intersection with Hwy 41 to approximately 1,860 feet NGVD along the northwest edge of the BSA. Topography within the BSA consists of steeply rolling hills along the edges of the Project site, with extensive alluvial terraces forming wide level plains, primarily within the Project site. These plains and hills are bisected by a number of drainages that typically flow from north to south, with drainage eventually to the Cholame Valley.

Based on vegetation mapping conducted in 2012 (H.T. Harvey and Associates [HTH] 2013a), the predominant natural community on the Project site and BSA includes California annual grassland dominated by non-native grasses typical of the region but also supporting a healthy complement of native forbs (Figures 2a – 2d). Other habitats within the Project site include wildflower fields, serpentine bunchgrass grasslands, valley needlegrass grasslands, grassland riparian, interior coast range goldenbush scrub, willow–cottonwood riparian woodlands, ornamental non-native woodlands, blue oak (*Quercus douglasii*) woodlands, valley oak (*Quercus lobata*) riparian woodlands, ephemeral streams, intermittent streams, perennial streams, perennial marsh, seasonal wetlands, and developed/ruderal grasslands. Habitat composition of the larger BSA is generally similar to that of the Project site with the exception that the BSA contains areas of shrubland (interior coast range goldenbush scrub) that is absent from the Project site. Acreages and the percent of the total land area of communities and habitats on the Project site and BSA, as well as the access road/Hwy 41 improvement areas, are listed in Tables 2 and 3, respectively, of the Biotic Report (Appendix A).

Figure 2a. Natural communities/biotic habitats present within the California Flats Solar Project site and Biological Study Area; based on vegetation mapping conducted by H.T. Harvey and Associates (2013a).

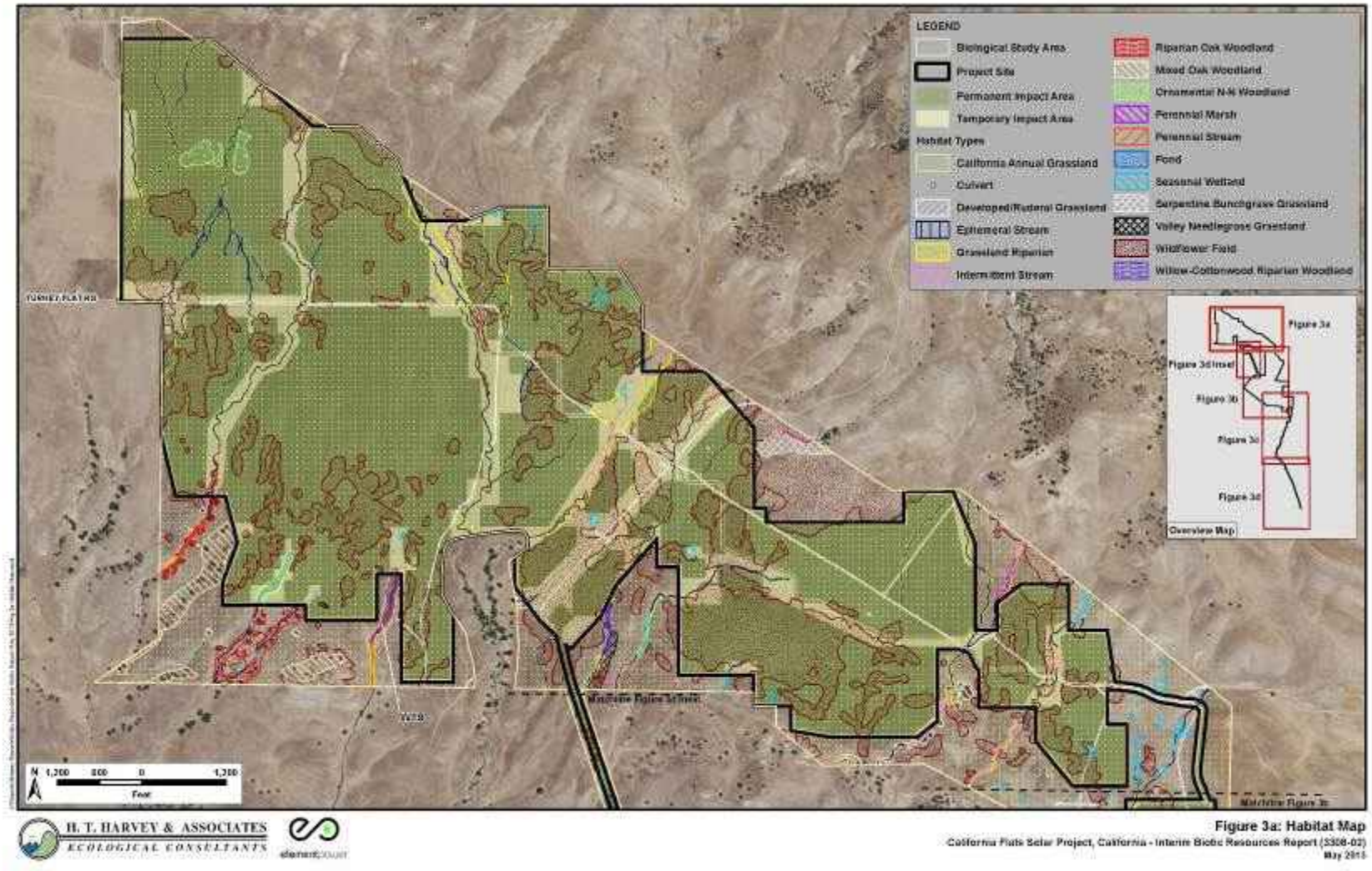


Figure 2b. Natural communities/biotic habitats present within the California Flats Solar Project site and Biological Study Area; based on vegetation mapping conducted by H.T. Harvey and Associates (2013a).

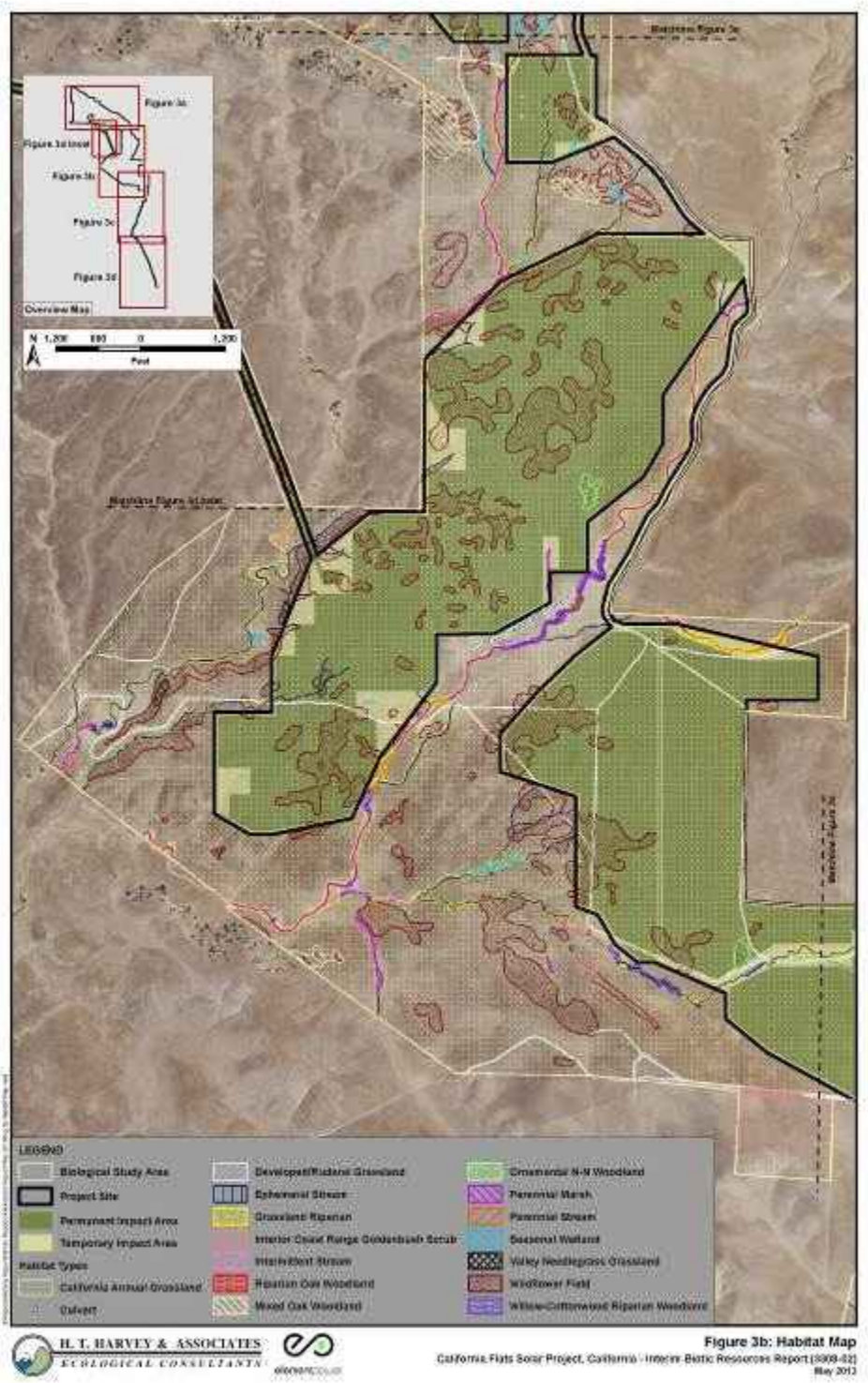


Figure 2c. Natural communities/biotic habitats present within the California Flats Solar Project site and Biological Study Area; based on vegetation mapping conducted by H.T. Harvey and Associates (2013a).

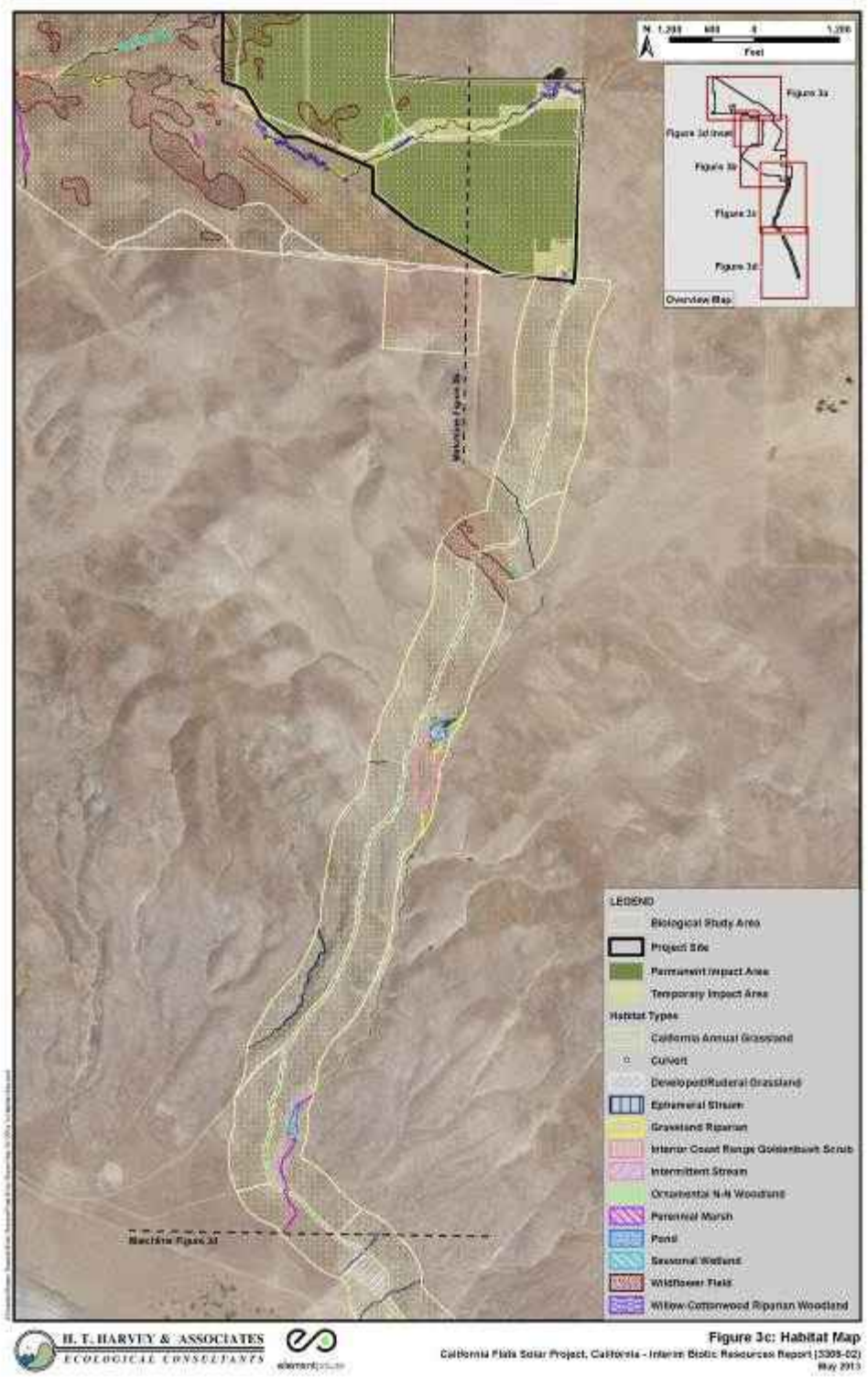
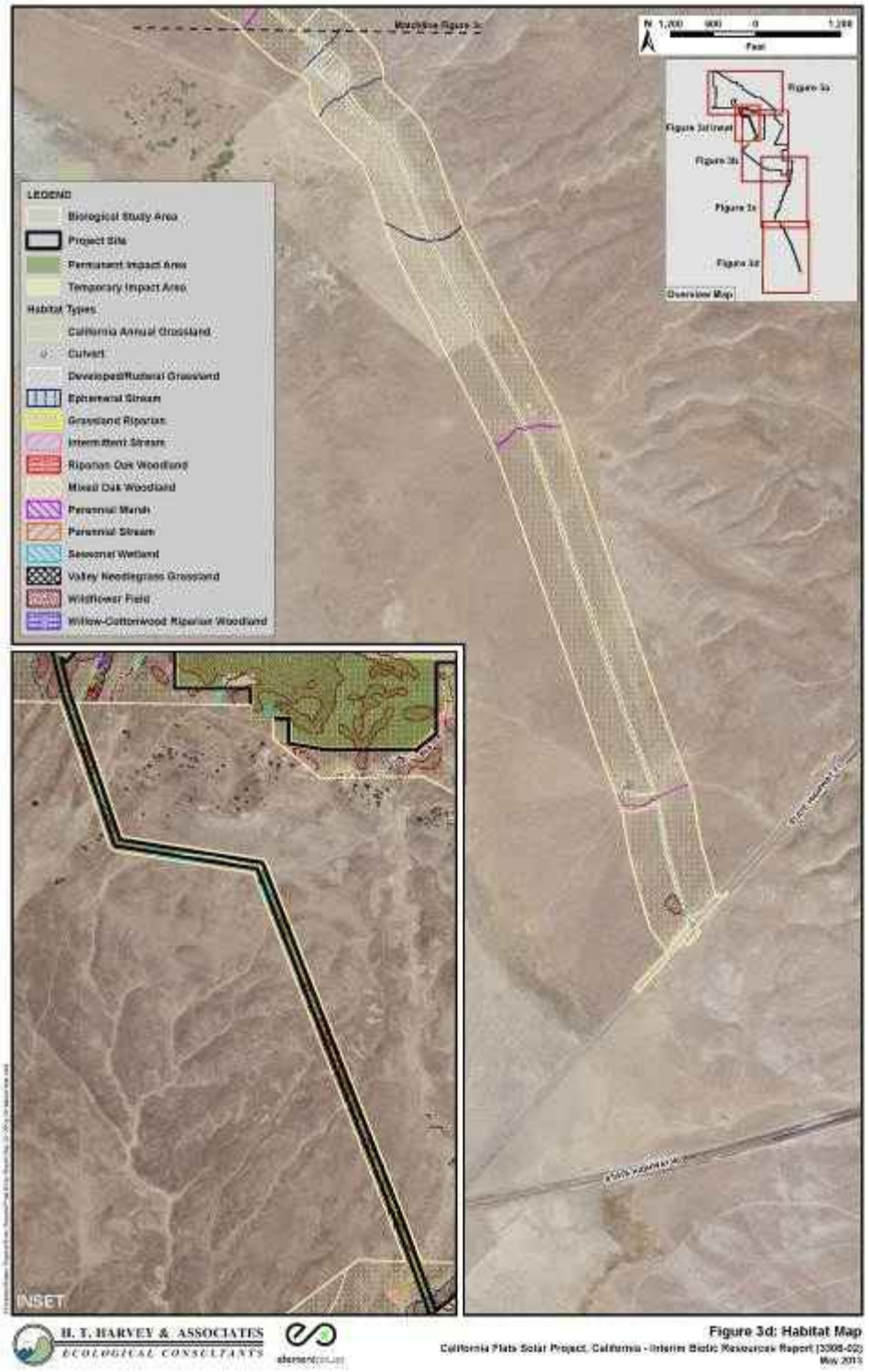


Figure 2d. Natural communities/biotic habitats present within the California Flats Solar Project site and Biological Study Area; based on vegetation mapping conducted by H.T. Harvey and Associates (2013a).



A preliminary evaluation of biological resources within the Project site and surrounding area was conducted by HTH through site visits and a desktop review of existing information. Site visits consisted of reconnaissance field surveys conducted within portions of the BSA on August 19 and 24, 2011 to identify biotic habitats, evaluate botanical and wildlife resources, and assess habitat suitability for special-status plant and animal species that may occur within the Project site. Additionally, HTH collected and reviewed published literature and datasets concerning threatened, endangered, and other special-status species and habitats in the Project vicinity (including the BSA and 5-mile radius). Information was obtained from the California Natural Diversity Database (CNDDB), National Wetlands Inventory, and technical publications.

A list of special-status bird and bat species with potential for occurrence in the Project site has been compiled based on the site evaluation conducted by HTH, an updated search of the CNDDB (2014), and the site-specific baseline studies conducted for the Project to date (see Section 5 and Appendices A, B, C and E; Table 1).

Table 1. Special-status bird and bat species with the potential for occurrence in the California Flats Solar Project.

Species	Scientific Name	Status[1] Fed/State	Detected During Baseline Surveys?
Birds			
Allen's hummingbird	*Selasphorus sasin*	BCC/-	No
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, BCC/SE, FP	Yes
Burrowing owl	*Athene cunicularia*	BCC/SSC	Yes
California condor	*Gymnogyps californianus*	E/E	No
Golden eagle	*Aquila chrysaetos*	BGEPA, BCC/FP	Yes
Grasshopper sparrow	*Ammodramus savannarum*	-/SSC	No
Lawrence's goldfinch	*Spinus lawrencei*	BCC/-	No
Lewis's woodpecker	*Melanerpes lewis*	BCC/-	Yes
Loggerhead shrike	*Lanius ludovicianus*	BCC/SSC	Yes
Long-billed curlew	*Numenius americanus*	BCC/SSC	Yes
Long-eared owl	*Asio otus*	-/SSC	No
Mountain plover	*Charadrius montanus*	BCC/SSC	No
Northern harrier	*Circus cyaneus*	-/SSC	Yes
Nuttall's woodpecker	*Picoides nuttallii*	BCC/-	Yes
Oak titmouse	*Baeolophus inornatus*	BCC/-	Yes
Oregon vesper sparrow	*Pooecetes gramineus affinis*	-/SSC	No
American peregrine falcon	*Falco peregrinus anatum*	BCC/FP	No
Purple martin	*Progne subis*	-/SSC	No
Short-eared owl	*Asio flammeus*	-/SSC	Yes
Swainson's hawk	*Buteo swainsoni*	BCC/T	Yes
Tricolored blackbird	*Agelaius tricolor*	BCC/SSC	Yes
White-tailed kite	*Elanus leucurus*	-/FP	No
Yellow-billed magpie	*Pica nuttalli*	BCC/-	Yes
Yellow warbler	*Dendroica petechia brewsteri*	BCC/SSC	No
Vaux's swift	*Chaetura vauxi*	-/SSC	No

Bats			
Pallid bat	*Antrozous pallidus*	-/SSC	Yes
Townsend's big-eared bat	*Corynorhinus townsendii*	-/SSC	No
western red bat	*Lasiurus blossevillii*	-/SSC	No
Western mastiff bat	*Eumops perotis californicus*	-/SSC	No

[1]Compiled from the California Natural Diversity Database (CNDDB) as well as baseline studies (CNDDB 2014; Appendices B-D).

E=Endangered (CDFW 2014); T=Threatened (CDFW 2014); BCC=USFWS Bird of Conservation Concern in Bird Conservation Region 32 (Coastal California; USFWS 2008); FP=Fully Protected (CDFW 2014); SSC=Species Special Concern (CDFW 2014); BGEPA= Bald and Golden Eagle Protection Act (BGEPA 1940)

5 SITE-SPECIFIC BASELINE AVIAN AND BAT STUDIES

A number of site-specific baseline avian and bat studies have been, and continue to be, conducted within the BSA (Table 2). Summaries of the baseline avian and bat studies are provided below and final reports are provided in Appendices B-E.

Table 2. Baseline avian and bat studies conducted at the California Flats Solar Project.

Study Type	Dates	Description	Report
Burrowing owl surveys	November 2012	Daytime grid surveys and nighttime spotlight surveys in Project site and access road/Hwy 41 improvement areas.	H.T. Harvey and Associates (2013a) (Appendix A)
Raptor nest surveys	March – June 2013	Aerial survey for golden eagle, bald eagle, and California condor nesting territories within 10 miles of Project and Swainson's hawk nests within 5 miles of Project; ground surveys for other raptors nesting within 500 m of Project.	H.T. Harvey and Associates (2013b) (Appendix B)
Aerial golden eagle nest surveys	March – June 2014	Aerial (helicopter) surveys to locate golden and bald eagle nests and assess nest productivity within 10 miles of Project site.	WEST (2014a) (Appendix B)
Bird use count surveys	March 2013 – March 2014	Fixed-point bird use surveys within 800-m survey viewshed conducted at eight locations throughout the BSA; 20-min surveys conducted at each point twice/month.	H.T. Harvey and Associates (2014a) (Appendix C)
Eagle use/distribution surveys	March – December 2014 (ongoing)	Eagle (and other raptor) use surveys within unlimited viewshed conducted at 10 points (6 in Project site and 4 in surrounding landscape); 3-hr surveys conducted at each point twice/month.	WEST (2014a) (Appendix D)
Bat habitat assessment	October 4 and 15, 2013	Driving/walking surveys to identify and evaluate potential bat habitat within the BSA.	H.T. Harvey and Associates (2014b) (Appendix E)

Acoustic bat surveys	October 16-24, 2013	Passive acoustic surveys at locations identified during initial habitat assessment as having potential for higher bat use or roosts.	H.T. Harvey and Associates (2014b) (Appendix E)

Burrowing Owl Surveys

Methods

Surveys for burrowing owls, and other burrowing animals, were conducted by HTH throughout the Project site over the course of 10 days in November 2012. Surveys were conducted by walking transects throughout the entire Project site and recording all direct observations of burrowing owls or owl sign (e.g., potential burrows and burrow systems, whitewash, pellets, feathers).

Additionally, spotlight surveys were conducted over three nights in November and December 2012 and six nights in September 2013 by two teams comprising two surveyors each. Surveyors searched from both sides of the vehicle with high output spotlights. Animals were identified using high-powered binoculars or spotting scopes.

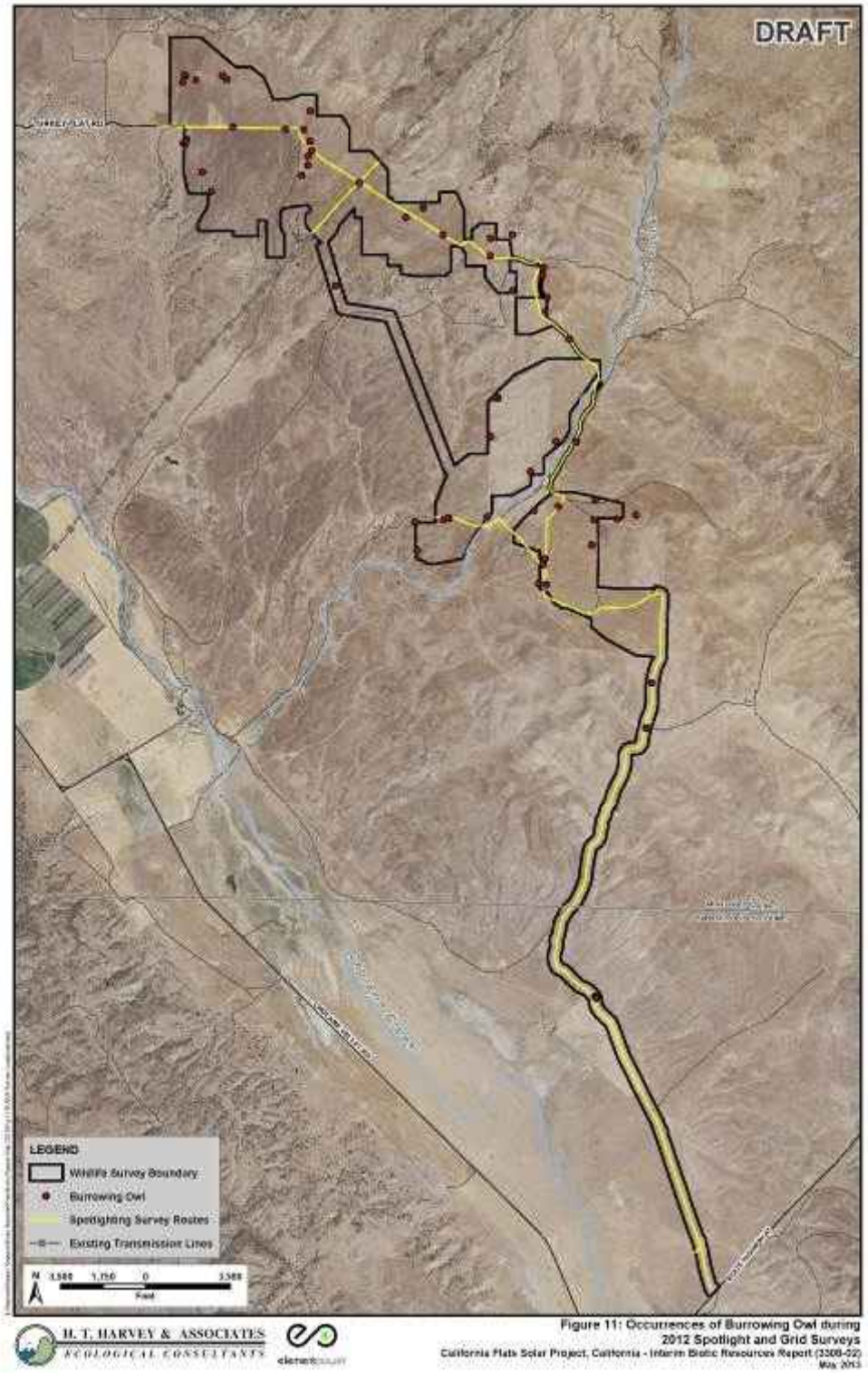
Results

Daytime transect surveys and nighttime spotlight surveys conducted in 2012 confirmed burrowing owls or their sign throughout most areas of the Project site and in several areas along the access road (Figure 3).

Conclusions

Nearly the entire Project site currently provides suitable foraging and breeding habitat for burrowing owls. The grassland, rolling foothill habitats and California ground squirrel (*Otospermophilus beecheyi*) burrow systems in the area provide suitable foraging, nesting, and sheltering opportunities for resident, wintering, and transient owls. Suitable habitat for the species is also present along the access road.

Figure 3. Occurrences of burrowing owl during 2012 spotlight and burrowing animal surveys, taken from Biotic Report by H.T. Harvey and Associates (2013a).



Raptor Nest Surveys

Methods

Ground and aerial surveys for nesting raptors within the Project vicinity were conducted by HTH during the 2013 breeding season (Appendix B). The goals of the surveys were to determine the degree to which Project development might influence the nesting and foraging activities of golden eagles whose home ranges overlap the Project site, and to assess the potential for Project development to adversely affect other raptors that nest or roost on or near the Project site. The study involved both aerial (helicopter) and ground surveys. The primary objectives of the helicopter surveys, conducted in late March and mid-May, were to: 1) achieve a comprehensive, baseline inventory of golden eagle, bald eagle, and California condor occupied nesting territories, nest locations, and nesting activity within 10 miles of the Project site (Figure 1); 2) search for potential Swainson's hawk nesting territories within 5 miles of the Project site; and 3) obtain an indication of nesting success and productivity for the local golden eagle population. The objective of the ground surveys, conducted from March through June 2013, was to collect additional information about raptor nesting activity on the Project site and within a 1,640-foot buffer area.

A second year of eagle nesting surveys was conducted by WEST during the 2014 breeding season (Appendix B). The goals of this survey effort were to identify the distribution of golden and bald eagle nests within a 10-mile radius of the Project site, as well as territory occupancy, hatching success, and fledgling production. An initial comprehensive nest survey that included initial notes on active nesting status was conducted on April 15-17 and a follow-up survey to further document and confirm nesting status and productivity was conducted on May 23, 2014. All aerial surveys, conducted during both 2013 and 2014, were consistent with the USFWS survey guidelines (Pagel et al. 2010).

Basic nest use was categorized consistent with definitions from the USFWS Eagle Conservation Plan Guidance (April 2013). Nests were classified as occupied if any of the following were observed at the nest structure: (1) an adult eagle in an incubating position, (2) eggs, (3) nestlings or fledglings, (4) occurrence of a pair of adult eagles (or, sometimes subadults), (5) a newly constructed or refurbished stick nest in the area where territorial behavior of an eagle had been observed early in the breeding season, or (6) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath. Occupied nests are further classified as active if an egg or eggs have been laid or nestlings are observed, or inactive if no eggs or chicks are present. A nest that is not occupied will be classified as inactive, as evidenced by no indication of recent use or attendance by adult eagles. Eagle nests are classified as unoccupied if no eagles were seen at the nest nor in the vicinity of the nest—evidence that the breeding territory itself may be unoccupied.

Results

2013 Surveys

During the 2013 survey effort, 12 occupied and active golden eagle nests and one occupied and active bald eagle nest were documented (Figure 4) within the survey area but outside of the

Project site. No Swainson's hawks or California condors were observed within the overall aerial survey area. A single bald eagle nest was located along the eastern edge of the Cholame Hills, 4.0 miles southwest of the Project boundary. Active golden eagle nest 13A was located in Cholame Valley on an oak-covered hillside southwest of the Project site and 0.3 mile from a proposed solar array location. Active golden eagle nests 11A and 12A were located 1.9–2.0 miles west of the Project site in Cholame Valley, in a gray pine and oak, respectively. Five other active golden eagle nests were located on oak hillsides ≤ 5 miles from the Project site or access road: golden eagle nests 14A and 15A were located south of the Project in the western foothills of the Diablo Range; golden eagle nests 2A and 4A were located in the southeastern Cholame Hills overlooking Cholame Valley; and golden eagle nest 3A was located in the southwestern Cholame Hills. The four remaining, active golden eagle nests (9A, 10A, 16A, and 23A) were located > 5 miles from the Project site or access road (Figure 4).

Figure 4. 2013 Raptor Nest Locations. Taken from H.T. Harvey 2013 Raptor Nest Survey Report

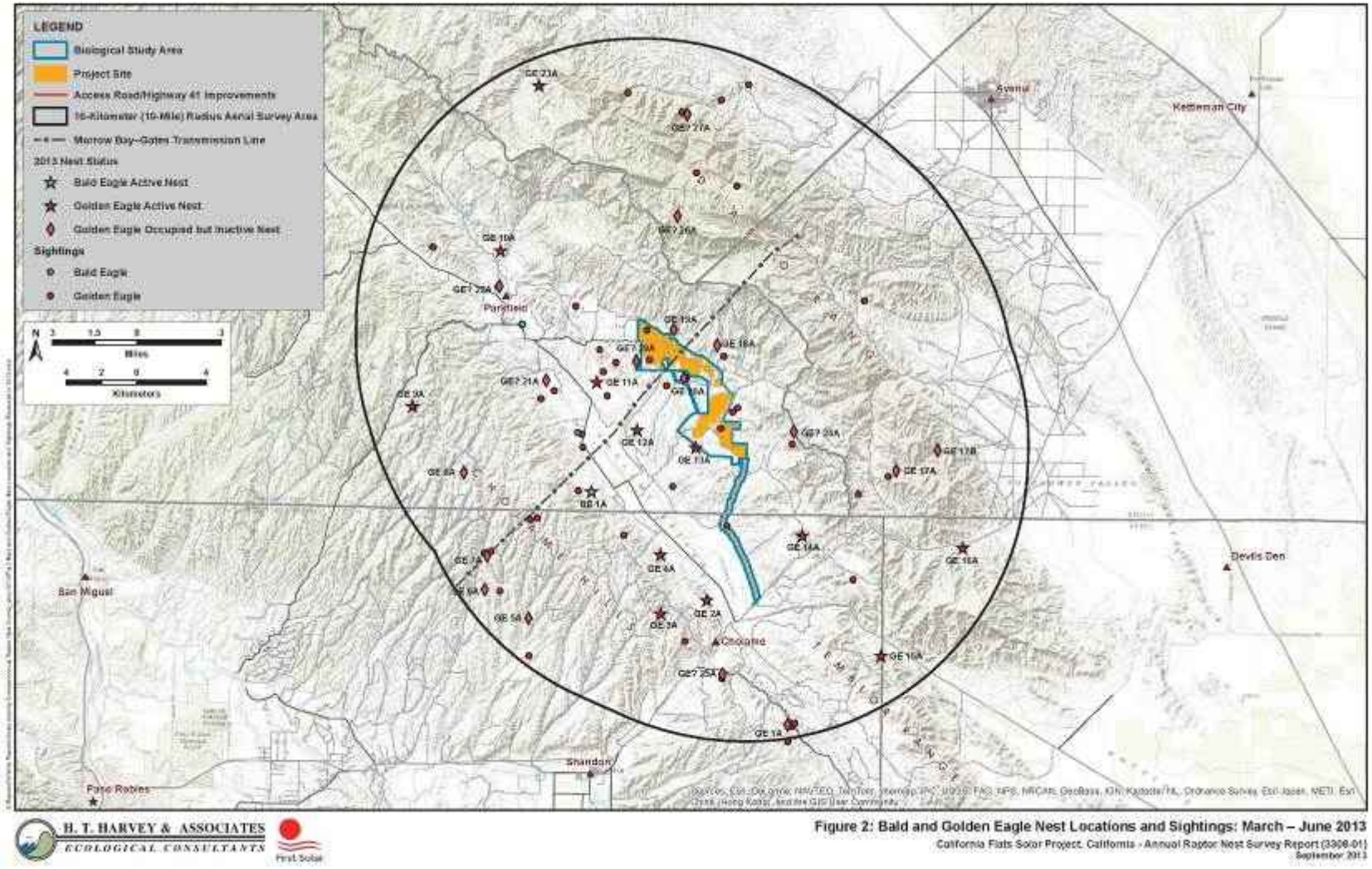


Figure 2: Bald and Golden Eagle Nest Locations and Sightings: March – June 2013
California Flats Solar Project, California - Annual Raptor Nest Survey Report (3308.01)
September 2013

H. T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

In addition to the 12 pairs tending active nests, five pairs of adult golden eagles were documented near an inactive nest or a nest that clearly did not belong to another pair's core nesting area. Two of these pairs were associated with large, distinctive eagle nests (1A and 18A) that were in good shape and had been built up over several years. The remaining three eagle pairs were observed at inactive nests 6A, 19A, and 20A. Although pairs of golden eagles were observed near each of these nests, the nest structures were not unequivocally classifiable as eagle nests. Two other locations (17A and 5A) clearly represented other distinct golden eagle nesting areas, but the presence of established breeding pairs was not confirmed (Figure 4).

While no eagle nests were documented within 1,640 feet of the Project site, a number of other raptor nests were identified in this area, including five active red-tailed hawk (*Buteo jamaicensis*) nests and one active great horned owl (*Bubo virginianus*) nest (Appendix B). No prairie falcon (*Falco sparverius*) nests were documented within, or in the immediate vicinity of, the Project site or access road; however, two active prairie falcon nests with chicks were documented 1.3 miles northwest of the Project site, and 2.0 miles east of the Project site (Appendix B).

2014 Surveys

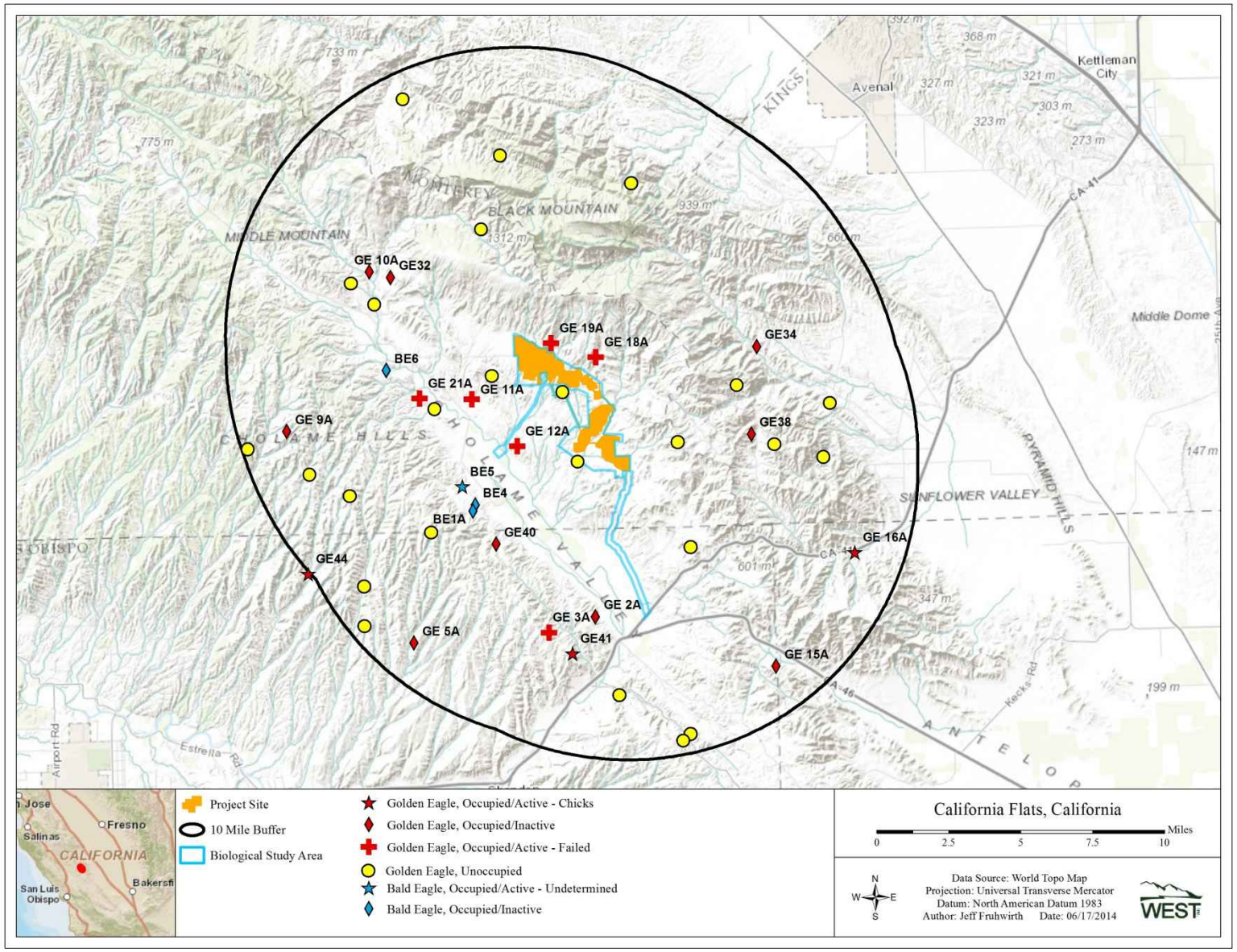
During the April 2014 eagle nesting survey, a total of nine occupied and active golden eagle nests and one occupied and active bald eagle nest were documented. Of the active nests, six golden eagle nests (GE18A, GE19A, GE11A, GE12A, GE3A, and GE21A) were determined to have failed and the remaining three active golden eagle nests (GE13, GE16A, and GE19) and the single active bald eagle nest (BE15) all successfully fledged young. Nine additional golden eagle nests and one bald eagle nest were documented as occupied but inactive, and 25 nests were documented as unoccupied golden eagle nests (Figure 5). Of the active nests, five failed golden eagle nests and one successful bald eagle nest are located within 8 km (5 miles) of the Project site. These include GE19A and GE18A which are 0.3-1.1 km (0.2-0.7 miles) northeast of the Project site, GE11A, GE12A, and GE21A which are 3.0–5.8 km (1.9–3.6 miles) west of the Project site, and BE15 which is approximately 6.7 km (4.2 miles) southeast of the Project site (Figure 5).

Of the 13 eagle nests identified as active in 2013, four were active again during the 2014 nest survey (GE16A, GE3A, GE11A, GE12A), four were occupied but inactive in 2014 (GE15A, GE2A, GE9A, GE10A) and the remaining five were unoccupied in 2014 (GE14A, GE4A, BE1A, GE13A, and GE23A).

Two occupied active, failed golden eagle nests (GE 18A and GE 19A) were located within 1.5 miles of the Project site. No other occupied (active or inactive) eagle nests were located within 1.5 miles of the Project site, although three unoccupied golden eagle nests were located within this distance.

Appendix B provides more information on the results of the 2013 and 2014 eagle nest surveys.

Figure 5. 2014 Raptor Nest Locations



Conclusions

The landscape in the Project vicinity is dominated by gently rolling terrain and grasslands, surrounded by woodlands and shrublands where various trees and rocky outcrops provide nest substrates suited to eagles. While eagle nesting substrate is lacking within the Project site, the site does provide potential foraging habitat for eagles nesting in the surrounding region. Results from the two years of eagle nest surveys suggest that the Project vicinity supports a relatively high density of nesting golden eagles.

One-half the mean inter-nest distance has been used as a coarse estimate for the territory boundary in a number of raptor studies (e.g., Soutullo et al. 2013). As such, the USFWS (2012, 2013) recommends using nearest-neighbor distances among occupied nests to estimate approximate territory size in the vicinity of a project. Typically, this involves measuring the distances between occupied nests and calculating a mean inter-nest distance, with half this value being the radius of an eagle territory. For this Project, both occupied bald eagle and golden eagle nests were used to calculate this distance, since it appears that the bald eagles in the Project are using similar foraging and breeding habitat as the golden eagles, and would therefore be assumed to affect the territory of adjacent breeding golden eagles. Nearest-neighbor distances among occupied nests (active and inactive) ranged from 0.38 to 7.71 km (0.24 – 4.79 mi) with a mean inter-nest distance of 3.42 km [2.12 mi]). Note that two of the occupied-inactive bald eagle nests (BE1A and BE4) are located 0.38 km from each other; based on field observations it is assumed that both of these nests and nest BE5 are all occupied by the same bald eagle pair. Therefore, the overall range and mean is likely conservative (i.e., indicating a smaller/denser territory size than is actually the case). In comparison, in 2013, the nearest-neighbor distances for occupied eagle nests (active and inactive) had a mean of 4.9 km (3.0 mi; HTH 2013).

Understanding that eagle territories are not perfectly circular, the nearest-neighbor calculations for this study population nevertheless suggest that the typical distance that nesting eagles are defending is on the order of 1.05 to 1.5 miles from the nest. This range of values suggests that the territories of eagles that nest within 1.5 miles could overlap the Project site. Based on the 2014 survey results, there were two occupied nesting territories that were outside of the Project site but were within 1.5 miles.

In other areas of the country where golden eagles are relatively common, the 3.42 to 4.9 km (2.12 – 3.0 mi) mean nearest distances recorded at the California Flats Project area in 2013 and 2014 appear comparable. For example, in 12 areas of Wyoming, mean distances between adjacent occupied golden eagle nests ranged from 3.1 to 8.2 km (1.9 – 5.1 mi, mean 5.3 km [3.3 mi]; Phillips et al. 1984). In Denali National Park, Alaska, among 72 golden eagle pairs, nearest-neighbor distances ranged from 1.5 to 8 km (0.9 – 5.0 mi, mean 6 km [3.7 mi]), and among 56 golden eagle pairs in southwest Idaho, nearest-neighbor distances were 0.8 to 16 km (0.5 – 9.9 mi, mean 4.3 km [2.7 mi]; Kochert et al. 2002).

One of the greatest densities of nesting golden eagles in California was documented in a radio-telemetry study conducted in Central California's oak savannah and woodland habitat near the

Altamont Wind Resource Area near the northern end of the Diablo Mountain range (Hunt et al. 1995, 1999; Hunt 2002, Hunt and Hunt 2006). In this study area near Altamont, extensive radio-telemetry research demonstrated minimum densities of about 1 golden eagle pair per 30 square kilometers (Hunt 2002). While the data collected in the California Flats project area does not provide for a direct comparison, it appears habitats and likely eagle nesting densities (and presumably territory sizes) in the Cholame Valley and the southern Diablo Range is roughly comparable to that found in similar habitats in the northern Diablo Range.

The relatively high density of occupied golden eagle territories recorded at the Project (2.12 to 3.0 mile mean inter-nest distance compared to 2.7 – 3.7 mile for other studies in the western U.S.) is likely in part due to the abundance of high quality foraging habitat located throughout the area. Preferred habitats include mountainous canyon land, rim-rock terrain of open desert and grassland areas, particularly those areas that are greater than 457 m (1,499 ft.) in elevation (Kochert et al. 2002). In central California, golden eagles nest primarily in open grasslands and oak savanna and to a lesser degree in oak woodland and open shrublands (Hunt et al. 1995, 1999), all habitats to be found in abundance surrounding the Project. In addition, golden eagles are common in grazed areas and much of the remaining habitat in central and southern California is found in patches of relatively inaccessible mountainous country, primarily livestock ranches (Thelander 1974) like those found within and surrounding the Project.

Eagle use surveys were specifically conducted to better understand eagle use of the Project site and the surrounding landscape (see Section 5.4).

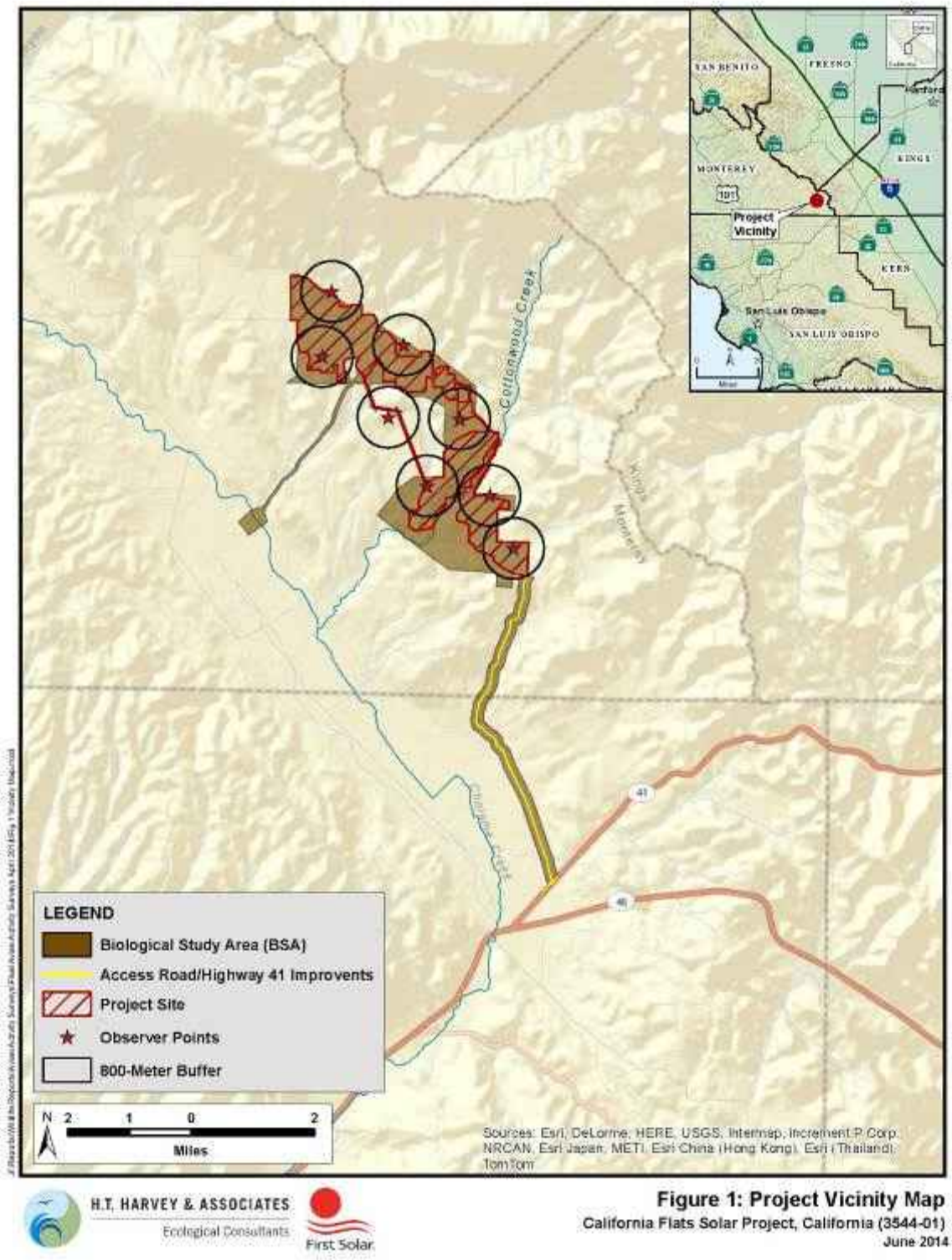
Bird Use Counts

Methods

Bird use count (BUC) surveys were conducted by HTH from late March 2013 through early March 2014 at eight locations chosen to represent the proposed Project site (Figure 6, Appendix C). The 0.5-mile-radius (800 meter) viewsheds of the eight survey plots collectively covered approximately 44% of the Project site, effectively representing the proposed development areas and the primary habitats found within the site. Each month, two 20-min surveys were conducted at each BUC location, one during morning hours and one during afternoon hours. Counts generally occurred semimonthly, on one day each, during the first and third weeks of the month. The order in which surveys occurred each month was based on a random-start, systematic-progression protocol designed to ensure equitable coverage of all sites during morning and afternoon hours. During each 20-min BUC, all birds seen or heard within 0.5 miles of each count location were recorded. For informational purposes, larger birds, such as eagles, seen beyond the 800-m plot were also occasionally and separately recorded; however, these observations were not included in the analyses.

For summary purposes, raw counts were translated into sightings per hour, and patterns of variation were examined for five distinct species groups: raptors (hawks, eagles, falcons, owls, and vultures), shorebirds (sandpipers, plovers, and allies), corvids (Corvidae: ravens, crows, magpies, and jays), icterids (Icteridae: blackbirds, orioles, and starlings), and other, mostly smaller, birds (passerines, hummingbirds, swallows/swifts, woodpeckers, quail, etc.). Metrics of activity were evaluated for the five groups of birds as a function of survey location and season.

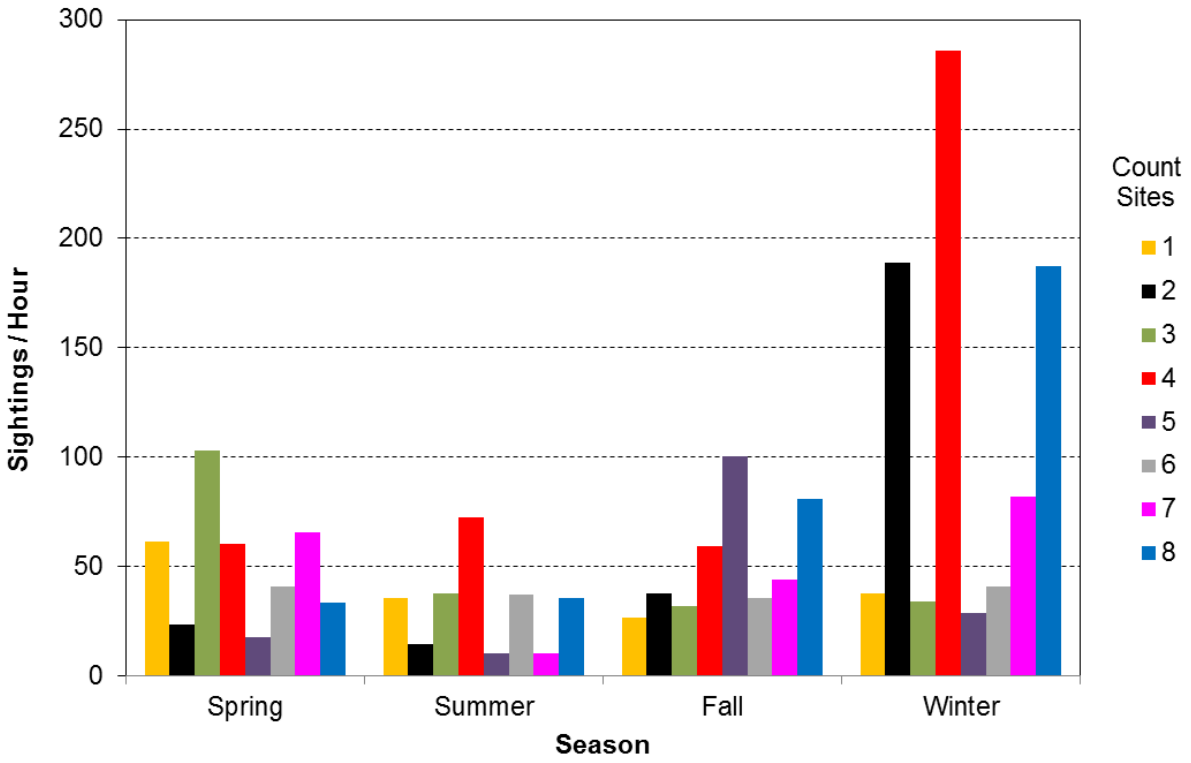
Figure 6. Bird Use Count Locations, and associated 800-m viewsheds, at the California Flats Solar Project, March 2013 – March 2014. Taken from H.T. Harvey 2013 Avian Activity Survey Report



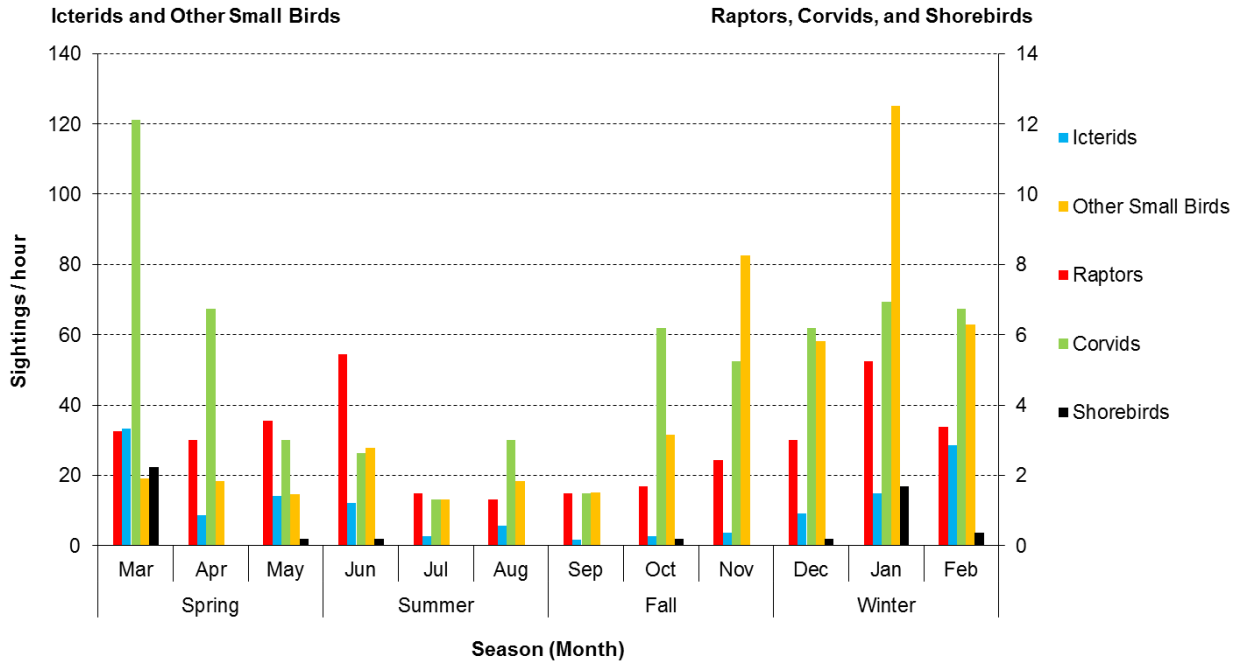
Results

From late March 2013 through early March 2014, a total of 200 20-minute BUCs were conducted, with each count site surveyed at least six times during each quarterly season (spring, summer, fall, and winter) across the year-long survey period. It should be noted that throughout the survey period, moderate to severe drought conditions prevailed across the entire region and Project site. The low precipitation resulted in minimal to no growth of grassland vegetation and limited seasonal development of wetlands and intermittent streams preceding and during the survey period.

A total of 4,061 individual bird observations, representing 45 species were recorded during the surveys (Appendix C). Species diversity was higher in spring and winter than in summer and fall (Appendix C). With data for all species combined and summarized across all seasons, the highest average activity rates occurred at BUC Site 4 (117 sightings/hour) and BUC Site 8 (82 sightings/hour), with slightly lower rates at BUC Sites 2, 3, and 7 (51–64 sightings/hour), and the lowest rates occurred at BUC Sites 1, 5, and 6 (38–41 sightings/hour) (Appendix C). The high overall activity rates at BUC Sites 4 and 8 mostly reflect relatively large wintering flocks of horned larks and house finches. Examination of site-specific activity rates across seasons revealed that most sites supported at least moderate activity during at least one season. At the species-group level, raptors, shorebirds, corvids, and icterids showed higher activity rates in spring, lower activity rates in summer, and then higher activity rates again from late fall through winter (Appendix C).



Graph 1. All-bird average activity rates by count site and season.



Graph 2. Seasonal activity pattern of primary species groups.

One hundred ninety-seven raptor and vulture observations, representing nine species, were recorded during surveys. Raptors and vultures accounted for 4.9% of total bird sightings (Appendix C). American kestrels (*Falco sparverius*; 39 sightings) and red-tailed hawks (113 sightings) were relatively abundant and recorded during all seasons. Golden eagles (16 sightings) were also recorded during all seasons and at all locations but Site 2, and turkey vultures (*Aura cathartes*; nine sightings) were generally present year round. Ferruginous hawks (*Buteo regalis*; 11 sightings) were observed relatively frequently during fall and winter; prairie falcons (five sightings) between October and June (they nested in the nearby foothills); and northern harriers (*Circus cyaneus*), burrowing owls, and Swainson's hawks only once or twice each during the scheduled fall, winter, and spring counts (Appendix C).

The modeling results confirmed marginally significant seasonal variation in overall raptor activity, as well as significant variation across sites. Average raptor activity was lower in fall and lower at BUC Sites 2, 5, 7, and 8. Sites 1, 3, and 4 encompassed active red-tailed hawk nests, and Sites 1 and 3 were among the survey areas closest to an active golden eagle nest. The analysis of shorebird activity rates indicated no overall seasonal variation, but indicated marginally higher activity at BUC Site 3 compared to the sites where no shorebird activity was observed (Sites 5, 6, and 8).

Five special-status bird species were observed during the scheduled surveys: Swainson's hawk (state threatened), golden eagle (state fully protected and federal bird of conservation concern [BCC]), northern harrier (state species of special concern [SSC]), burrowing owl (SSC and BCC), and loggerhead shrike (*Lanius ludovicianus*; SSC and BCC). Two short-eared owls (*Asio*

flammeus; SSC) and several small flocks of tricolored blackbirds (*Agelaius tricolor*; SSC and BCC) were also observed on the Project site outside of the scheduled survey times.

Conclusions

The species observed during BUCs constituted a diurnal assemblage typical of the open grassland, oak savanna woodland, and riparian habitats of the inner Coast Ranges of central California, with species representation varying by season. Species notably absent from the survey counts included waterfowl and most other aquatic-oriented species. These species generally are not expected in upland grassland habitats, but may be expected to be more prevalent in the area during years when drought conditions do not prevail, including in the seasonal wetland habitats identified on the Project site and along the riparian corridors that transect the area.

The overall seasonal patterns, much of the species composition, and the activity rates were similar to those documented over a two-year period (fall 2011 to fall 2013, and ongoing) at the California Valley Solar Ranch (CVSR) on the open grassland habitats of the Carrizo Plain, approximately 40 miles to the south (HTH 2014b). However, the Project site features a considerably greater abundance of woodland habitat than is found at CVSR, and the observed species composition therefore includes several additional species more characteristic of such habitats; e.g., Bullock's oriole (*Icterus bullockii*), ash-throated flycatcher (*Myiarchus cinerascens*), Lewis's woodpecker (*Melanerpes lewis*), Nuttall's woodpecker (*Picoides nuttallii*), and yellow-billed magpie (*Pica nuttalli*). In addition, the density and relative proximity of tree-nesting raptors such as golden eagles and red-tailed hawks is greater in this Project area. For most of these additional species, however, development of this Project is not expected to pose a substantial threat, because little woodland habitat will be directly affected. The occurrence of special-status species in the Project vicinity has been limited, with the exception of golden eagles, which are present in the Project vicinity.

Eagle Use Surveys

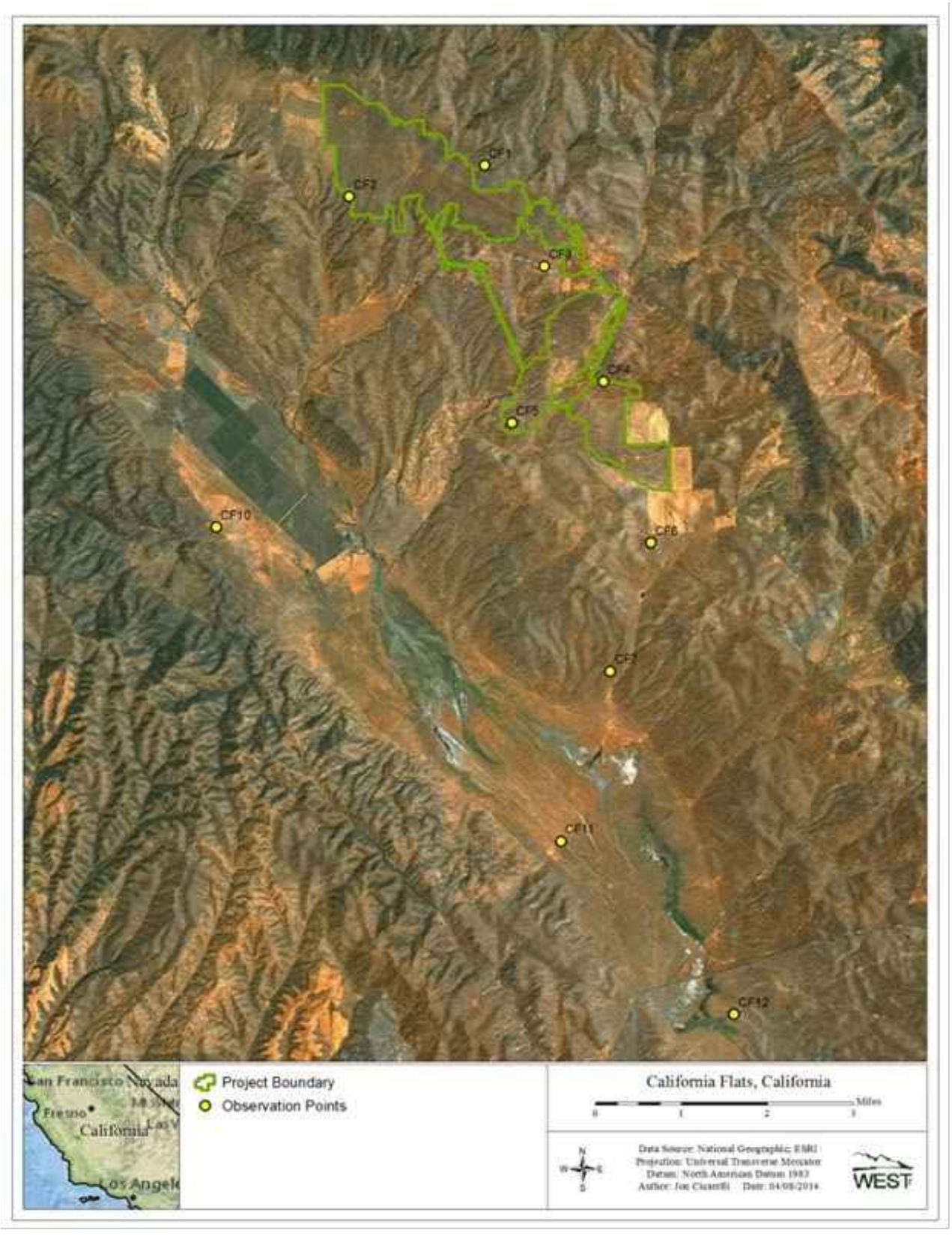
Methods

Eagle use/activity surveys were conducted by WEST from March 2014 through December 2014 (WEST 2015). The purpose of the surveys was to characterize use of the Project site and surrounding landscape by golden eagles, particularly the foraging habits of locally breeding, migrant, and wintering eagles. Surveys were conducted every two weeks from 10 observation points including six points located within or adjacent to the Project site, and four points located in areas to the west and south of the Project site (Figure 7). Observation points were established in locations that afford broad overviews of the Project site and surrounding landscape and allow for effective documentation of the activity patterns and home-range dynamics of resident breeders, as well as use of the region by migrant and wintering eagles. Documentation of flight paths and identification of potential high activity areas (foraging, perching, roosting) or seasons was the primary focus of the survey effort. Each observation point was surveyed every two weeks for a

continuous 3-hour period, with surveys scheduled such that observation periods covered most daylight hours (approximately 9:00 am to 6:00 pm) over the course of the 10-month study.

Although the focus of the surveys was eagles (particularly golden eagles), all raptors and other sensitive avian species seen or heard during each survey were recorded, as well as observations of these species made while in-transit between points. Data collected during each 3-hour survey included: date, start and end time of the observation period, plot number, species or best possible identification, number of individuals, sex and age class, distance from plot center when first observed, direction of flight, height above ground, activity, and habitat. Additionally, for each individual eagle observed during the survey period, the above data were recorded for each minute that eagle was in view.

Figure 7. Location of 2014 eagle use/activity survey stations at the California Flats Solar Project.



Results

As stated above, WEST began the eagle use/activity surveys in March 2014 and continued these surveys through December 2014. Surveys were conducted at 10 observation stations once every two weeks over the course of the ten-month study, for a total of 199 surveys totaling 597 hours of survey. During the course of the study, a total of 216 separate golden eagle observations (flying and perched) were recorded and 1,215 golden eagle flight minutes were recorded within an unlimited viewshed surrounding the survey stations. Eagle flight paths that were mapped during this time period are shown on Figure 8.

During the ten-month study period, the greatest overall golden eagle use occurred in the spring, with use appearing to gradually decrease throughout the summer, and increasing somewhat during the fall and early winter.

While the mapped flight paths shown on Figures 8 and 9 indicate golden eagles are clearly using the general Project area, they do suggest that golden eagles flying in the vicinity of the Project are not using the landscape consistently and/or evenly. Furthermore, the mapped flight pathways illustrate that over extended periods of observation of the Project site during the spring, summer, fall, and early winter of 2014, golden eagles did not appear to be consistently using substantial portions of the Project site, particularly in some of the flatter areas for the solar arrays. This may be due to a combination of factors that seem to attract higher levels of eagle use such as prey availability (based on a burrowing animal survey of the site, ground squirrel burrows appear particularly concentrated along the edge of drainages) and/or areas of steeper topography creating wind updrafts conducive to efficient soaring. Additionally, a substantial amount of the activity that was observed near point CF1 on the northeast edge of the Project site was associated with golden eagle activity in the vicinity of the two active (failed) nests (GE19A and GE18A), while activity near points CF3 and CF5 on the west and southwest edge of the Project site was associated with golden eagles traveling to and from trees in the ravines outside of the Project site, which they used as temporary perching points.

Figure 8. Digitized golden eagle flight paths recorded during eagle surveys at the California Flat Solar Project, March 10 to December 22, 2014.

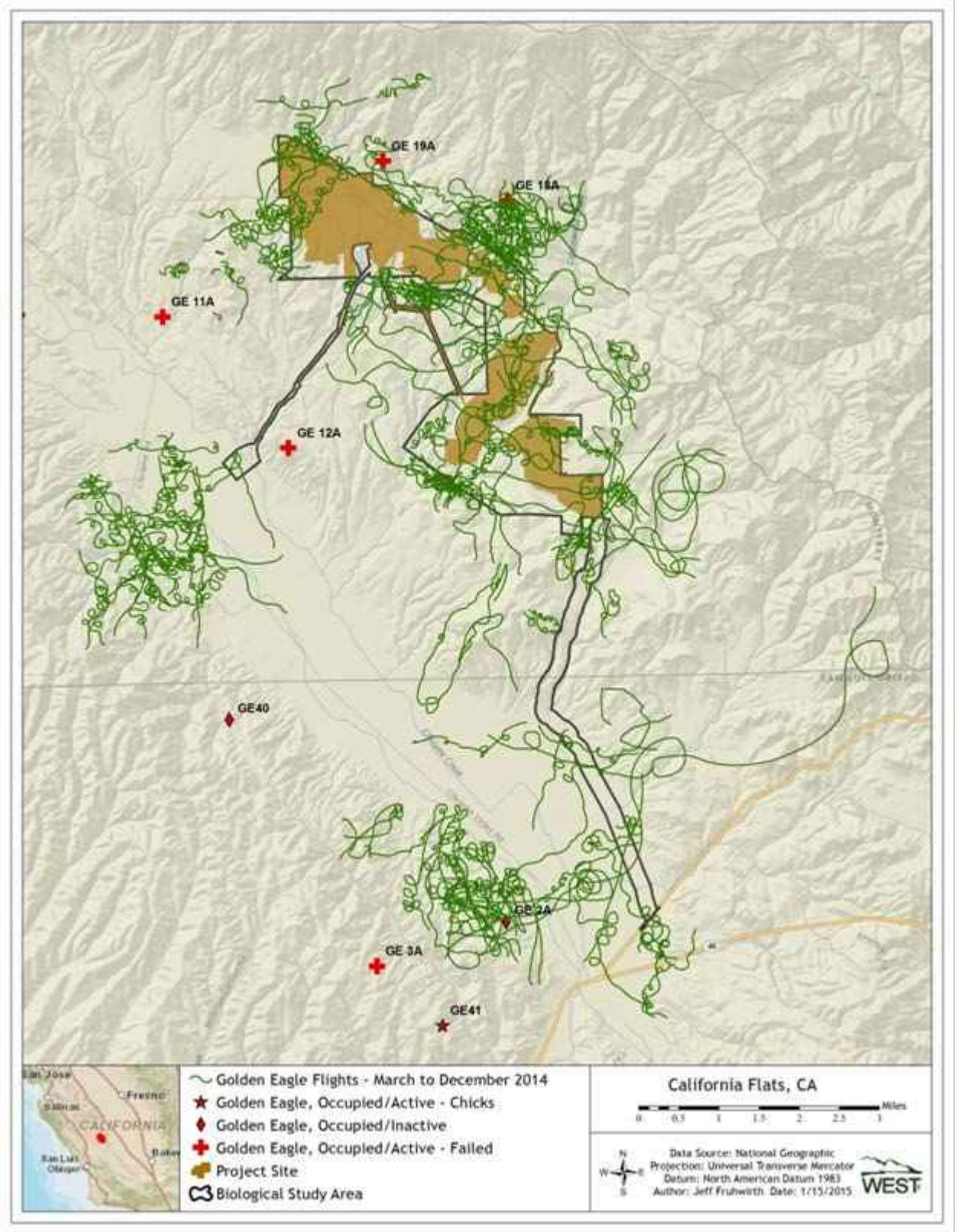
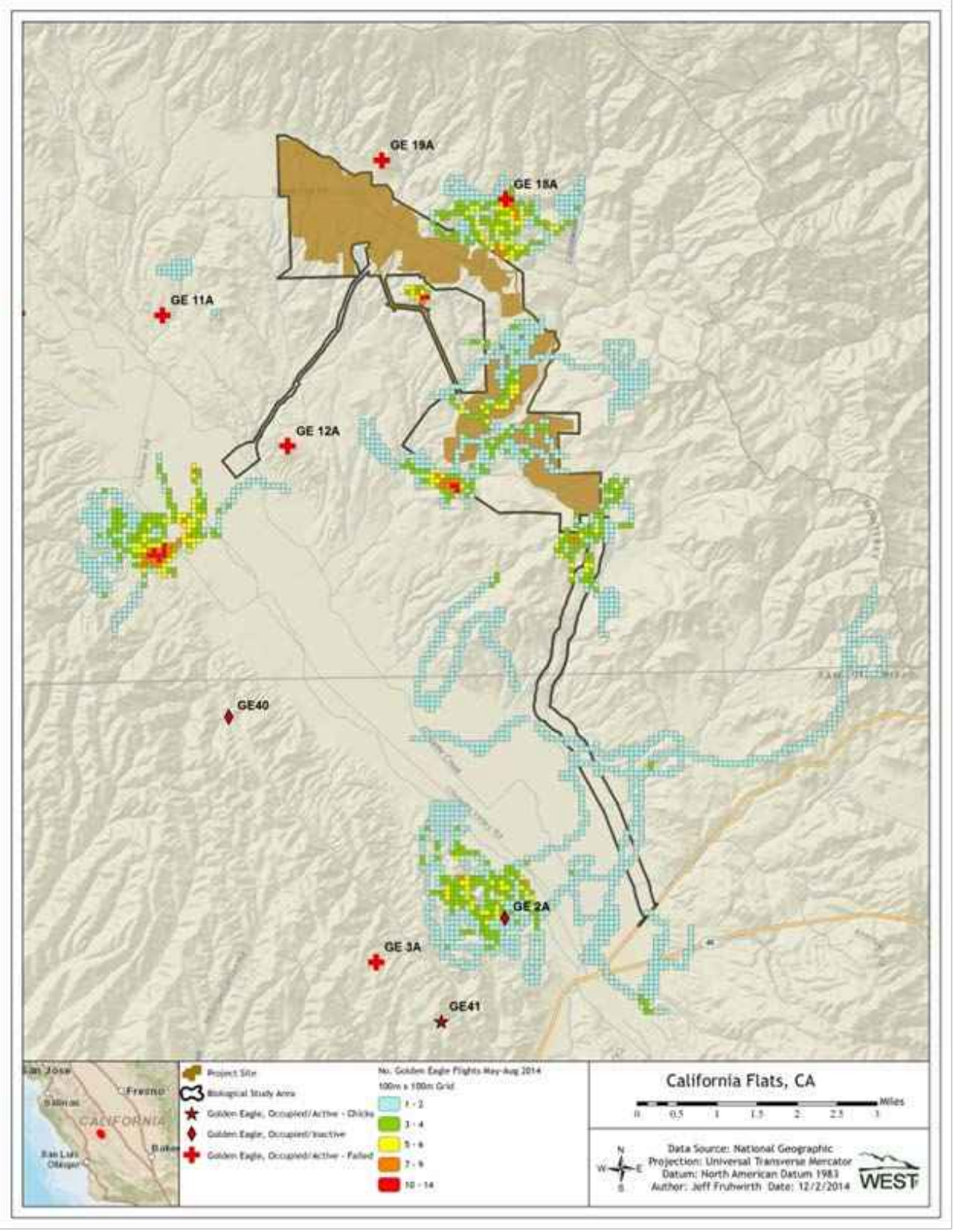
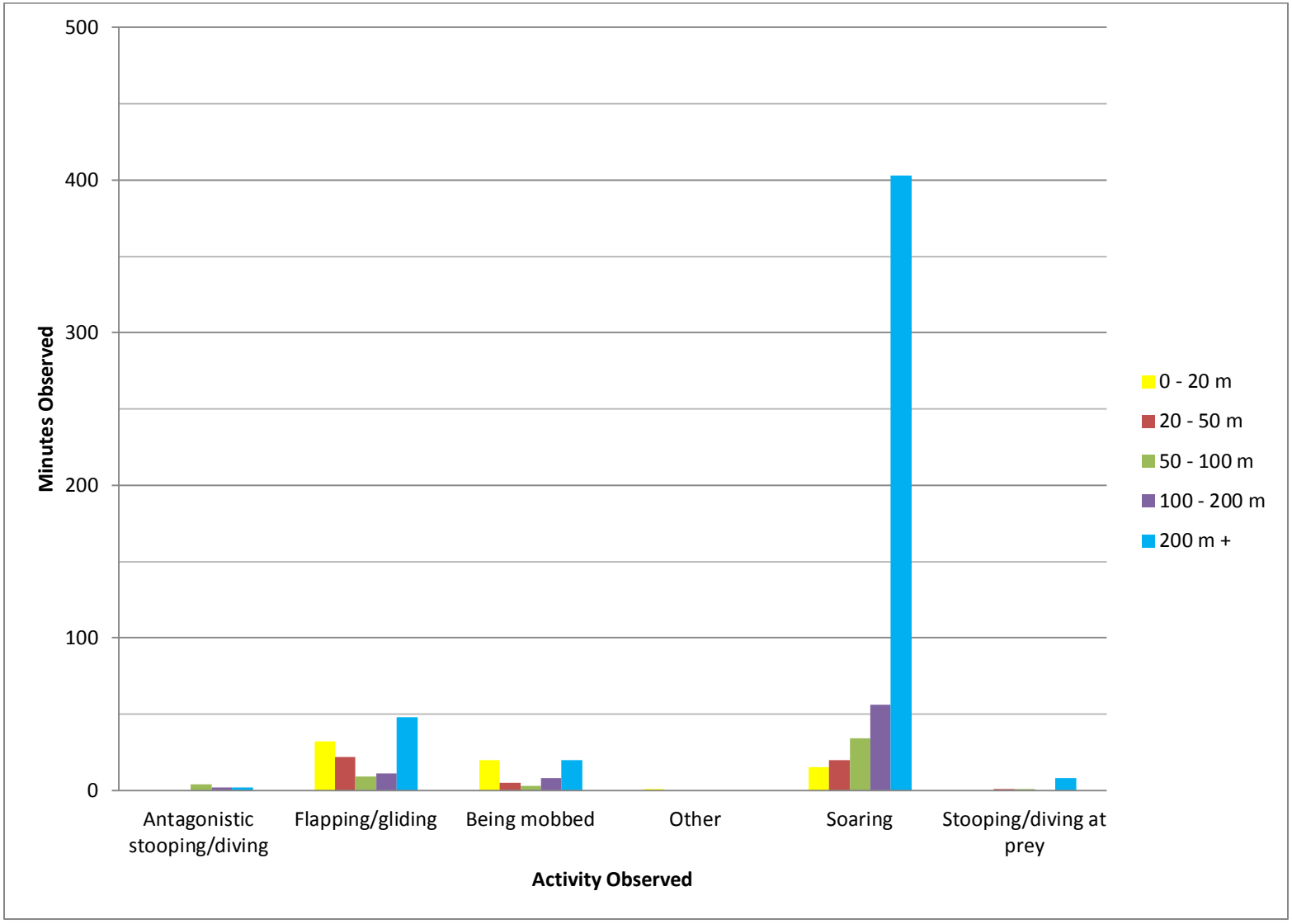


Figure 9. Golden eagle flights recorded during eagle use surveys at the California Flats Solar Project during May through August (late breeding season).



An examination of the flight height and type of activity indicates that the majority (56%) of observed golden eagle flight minutes were eagles soaring over 200 m. Overall, the majority (73%) of activity observed was soaring at various heights, with flapping/gliding activities occurring for approximately 17% of the minutes, eagles being mobbed by other birds occurring for approximately 8% of the minutes, and stooping/diving at prey, antagonist stooping/diving at other eagles or birds, and other activities each taking up less than 2% of the minutes. No hunting or kiting/hovering activities were recorded during this time period. The majority (66%) of all activities occurred at heights over 200 m, followed by 100 – 200 m (11%), 0 – 20 m (9%), and 20 – 50 m and 50 – 100 m (7% each). Figure 10 shows the height/activity breakdown for flights recorded between March 10 and June 24, 2014.

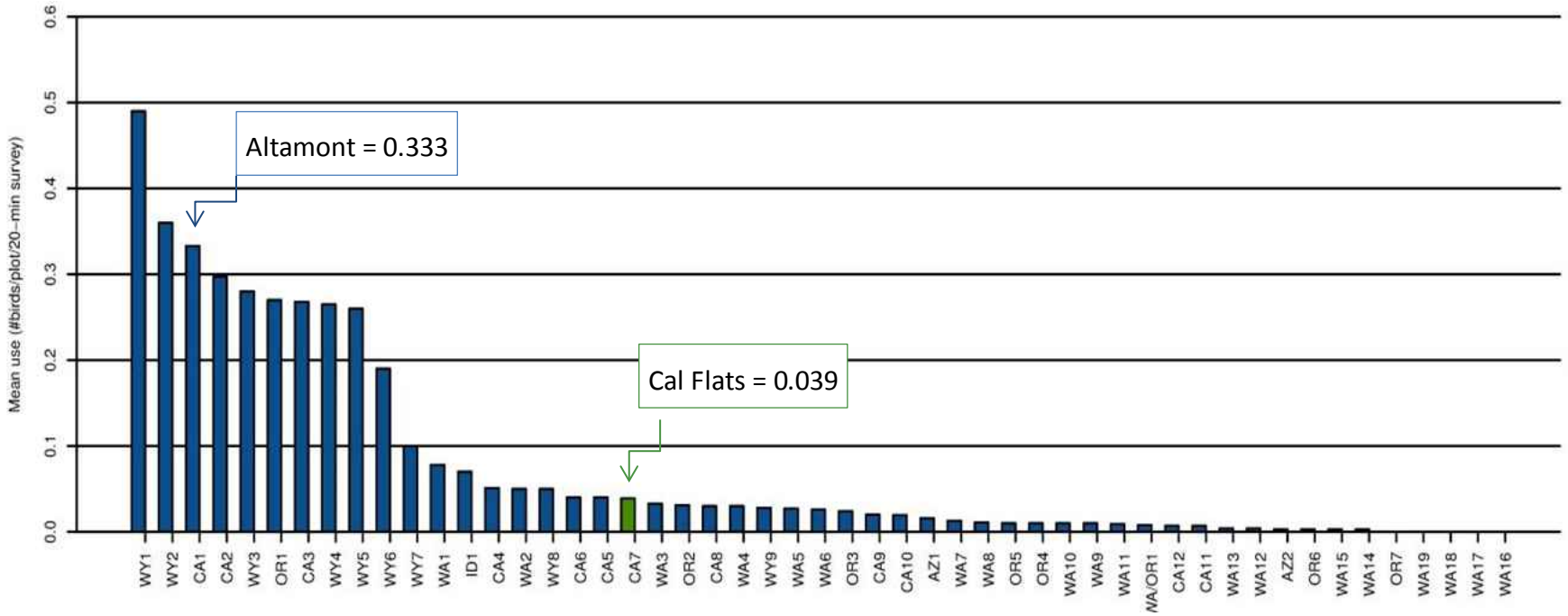
Figure 10. Golden Eagle Activity and Flight Height, March 10 – June 24, 2014.



Conclusions

As expected from the eagle nest surveys, the observed flight paths shown on Figures 7 – 9 indicate golden eagles are using the Project vicinity (while bald eagles were observed in Cholame Valley, they were not seen during surveys of the Project site). To compare the level of golden eagle use observed to date at the California Flats site to that of other projects in the western U.S., the eagle obs/hr use rate was examined for those eagles that were observed within 800 m of the survey points per 20 minutes of observation (whereas the use rates discussed in Section 5.4.2 include all eagle observations out to any distance where they are identifiable, and are shown per one hour of observation). This was done to provide a similar basis for comparison, since most publicly available eagle use information is limited to 800-m radius survey plots for 20-minute survey periods. Figure 11 shows that the mean eagle use rate for California Flats (0.039 obs/20-min) is within the lower range of mean use rates compared to other Projects; it is lower than the use found at six other sites in California, and higher than five California sites.

Figure 11. Comparison of Golden Eagle Use (Obs/20-min Survey/800 m) between California Flats and Other Projects in the Western U.S.



Bat Habitat Assessment and Acoustic Surveys

Methods

An initial bat habitat assessment was conducted by HTH on October 4 and 15, 2013 (Appendix E). The assessment was conducted by driving the entire main access road, beginning at the northern edge of the Project site at Turkey Flat Road and ending at the southern edge of the Project site, near Hwy 41. From the main road, biologists walked to many parts of the BSA such as rocky outcroppings and riparian areas. Aerial photos highlighting areas of rocky outcrops, trees, and buildings were used to target potential bat roosting habitat in the BSA and within 200 feet of the BSA. All rocky outcrops identified on the aerial photos were visually inspected and evaluated for their height, overhanging features, and the quality of cracks and fissures that could potentially support roosting bats. Trees within the Project site and along the access road were assessed by an unpublished evaluation system (D. Johnston, HTH) that assigns a number from 0 to 3 based on the probability of bats roosting in a given tree (0=no probability of roosting; 3=potentially occupied roosting habitat). In addition to rocky outcrops and trees, an abandoned granary building and several riparian areas with mature trees and snags were also examined by walking and visually inspecting these areas for the presence of cavities or gaps and guano (granary), and exfoliating bark or cavities (trees). Any tree that scored a 3 or any riparian area or rocky habitat that showed bat sign or the potential for bat roosting habitat was acoustically surveyed.

Based on the initial bat habitat assessment, HTH deployed five Song Meter SM2 BAT bat detectors (Song Meter) (Wildlife Acoustics Inc., Concord, MA, USA), to monitor for bat activity (Figure 12). One detector was deployed at each of five locations within the BSA: two rocky outcrops, the granary, a riparian area with a perennial stream and mature cottonwoods, and a stock pond. The detectors were set to record acoustic data from sunset to sunrise during the period of October 16 – 24, 2013. Data were analyzed using AnaLook, v.3.9c (Corben 2011), and examined for temporal and spatial activity patterns that would indicate the presence of maternity colonies in the area. Where possible, calls were identified to species, as described further in Appendix E.

Results

Habitat Assessment

The bat habitat assessment determined that low- to moderate-quality roosting habitat (rocky outcrops with crevices, deciduous trees and snags with cavities and exfoliating bark), and a few anthropogenic structures that have cave-like areas like attics, are present on the BSA for mostly solitary-roosting bats or small congregations of bats (Appendix E). Three rocky outcrop areas include crevices that could potentially provide day roosting habitat for solitary pallid bats (*Antrozous pallidus*) and canyon bats (*Parastrellus esperus*), although none of these appeared large enough to support maternity colonies of either species. Many trees within the riparian areas included cavities and exfoliating bark that would support roosting bats including small maternity roosts of pallid bats. The western red bat (*Lasiurus blossevillii*) is expected to roost in the foliage

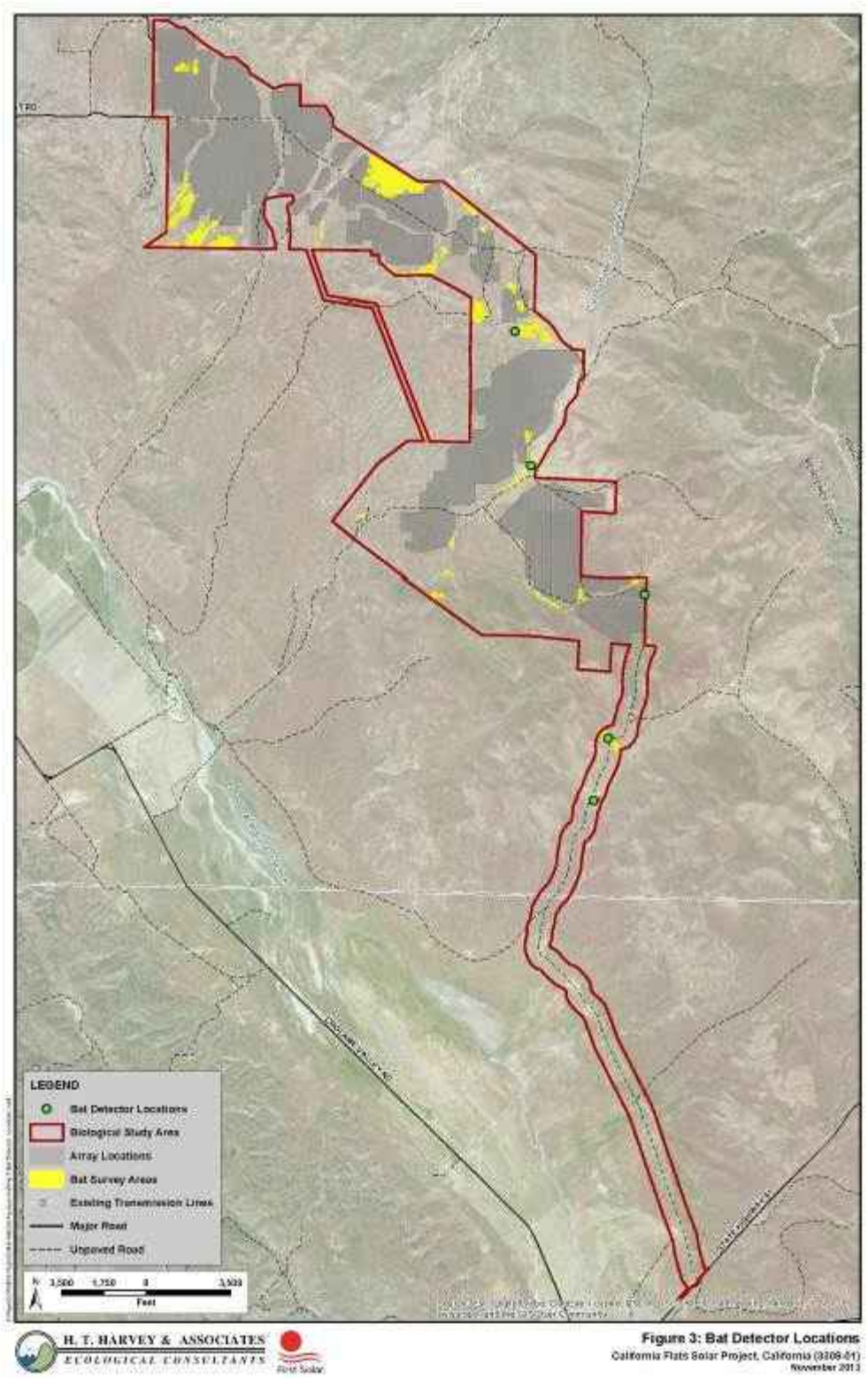
of riparian trees during spring and fall migratory periods, but is not expected to breed (raise young) in the BSA. Cavernous roosting habitat occurs in a very few areas of the BSA where structures provide potential habitat for the Townsend's big-eared bats (*Corynorhinus townsendii*). This species may occasionally occur as dispersed males, particularly in the winter, in buildings within the BSA. No western mastiff bat (*Eumops perotis*) roosting habitat occurs in the BSA, and no roosting habitat for any species of bats occurs within the Project site; however, pallid bats are expected to roost in small numbers in larger trees occurring in the riparian areas and as individuals in the crevices of rocky outcrops within the larger BSA.

Acoustic Surveys

The average minutes of activity per site per hour ranged from 1.8 minutes at the western outcrop to 18.2 minutes at the southern outcrop (Appendix E). Although only four nights of data were collected at the riparian site, this site showed the most activity in the early evening hours, and this activity was sustained over the evening, as would be expected in an area supporting aquatic foraging habitat. Recorded bat activity levels ranged from 0 to 60 minutes of activity per hour at each of the four sites where data were successfully collected. The general pattern of activity at all sites demonstrated a strong pulse of activity early in the evening that gradually tapered off until the following morning. There were no pulses of activity in the early morning hours at any of the sites, but rather very low levels of activity. There was no activity at the granary past 11 PM on any of the three nights during which data were collected. Because high activity levels were generally absent in the early morning hours, it is presumed that there are no large (> 75 individuals), sensitive colonial roosts in the BSA. Bats are generally most active in the early evening after sunset and then in the early morning before sunrise (Hayes 1997). Peaks in bat activity in early morning hours generally indicate final foraging and commuting before returning to day roosts (Kunz 1974), and if placed in proximity to a potentially suitable roost site, a bat detector may also detect the presence of a bat roost.

The species identified through acoustic analysis varied across the surveyed sites. At the granary site, the dominant frequency group detected was California/Yuma myotis bats (*Myotis californicus/Myotis yumanensis*). At the other three sites, there was considerably more species richness. At the southern outcrop, hoary/Mexican free-tailed bats (*Lasiurus cinereus/ Tadarida brasiliensis*), small-footed/long-legged bats (*Myotis ciliolabrum, Macrophyllum macrophyllum*), and canyon bats were detected. At the western outcrop, canyon bats as well as all four of the broader frequency groups were detected. All frequency groups were also detected in the riparian area. Given the known presence of pallid bats in the region and the high-quality foraging habitat for the pallid bat in the BSA, this sensitive species is presumed to be among the 30-kHz bats detected. Appendix E contains additional information on the results of the acoustic surveys.

Figure 12. Bat Detector Locations and Bat Survey Locations at the California Flats Solar Project. Taken from H.T. Harvey 2013 Bat Assessment Report



Conclusions

Four species of special-status bats (pallid bat, western mastiff bat, western red bat, and Townsend's big-eared bat) are expected to roost and/or forage in the BSA; however, no roosting habitat occurs within the Project site, and the BSA contains no high-quality roosting habitat in rocks, such as vertical or horizontal crevices on large or small rocky cliff faces, that could support a large maternity colony of pallid bats or other cliff-roosting bats. Additionally, no signs of pallid bat or any other bat roosts were detected in any of the areas inspected during the assessment. There were numerous small cracks, fissures, and crevices in the rocky outcrop areas that could support solitary roosting species or small congregations (two or three individuals) of pallid bats; however, these areas are not considered to have strong potential to support other potentially occurring special-status bats (Townsend's big-eared bat or western mastiff bat). The riparian areas support broadleaf trees such as sycamore (*Platanus occidentalis*), which could provide suitable roosting habitat for western red bat and small maternity colonies of the pallid bat. Western red bats were not detected during acoustic surveys and are expected to only winter or migrate through the BSA and then only within the small riparian area. Pallid or western red bats occurring in the riparian area would not be directly affected by the Project. Further, the Townsend's big-eared bat is considered mostly extirpated from the region but dispersed solitary males may occur occasionally in unused attics or other cavernous habitats within the BSA. The granary was the only building within the Project site considered to potentially support roosting bats. However, very little activity was detected at this site, suggesting few if any bats roosted at this location.

6 ASSESSMENT OF RISK TO BIRDS AND BATS

The prediction of impacts to birds and bats from the construction and operation of various types of solar facilities is somewhat speculative in nature as no systematic studies detailing the impacts to birds and bats from these types of facilities have been made publicly available to date. The following section discusses potential risks by referring to known information regarding impacts to birds from other types of facilities (e.g., wind) as well as presenting some information that is beginning to become available from a number of new and existing solar facilities where efforts have been made to collect data regarding impacts to birds. This emerging information appears to confirm that bats are not at risk for significant mortality during the operation of PV projects since they do not tend to collide with stationary (or slowly tracking) objects. This appears to be supported as no bats were found during formal wildlife fatality monitoring at three major PV facilities in California where reports are available (HT Harvey 2014c; Althouse & Meade 2014; WEST 2016).

Indirect Impacts

Indirect impacts include changes to the landscape with unintended and often unforeseen consequences to bird populations. Indirect impacts associated with habitat loss, land alterations and Project development on existing bird populations within the vicinity of the Project are not easily assessed or determined. Potential indirect impacts include:

- territory abandonment, nest and roost site abandonment;

- increased opportunities for predators of special status species;
- habitat fragmentation;
- human presence, noise and light;
- dust and hazardous materials; and
- altered hydrology

Territory abandonment, nest and roost site abandonment

Most wildlife species are susceptible to visual and noise disturbances caused by the presence of humans and construction equipment. Such disturbances can result in the alteration of species' behavior. Noise and visual disturbance caused by construction and vehicles would have the potential to cause nest abandonment or habitat avoidance directly adjacent to and within the proposed Project footprint. Birds avoiding habitat in the vicinity of the Project site may opt for less suitable habitat which could increase stress on these birds as a result of increased energetic costs. This would also place additional stress on available resources through increased density of birds in off-site areas.

Without the inclusion of avoidance and minimization measures (see Section 7), nest and roost site disturbances and territory abandonment could occur due to direct nest removal during vegetation removal activities.

Predation risk to special status species

The Project may indirectly result in mortality to wildlife through an increased risk of predation. Though some predators may avoid areas with human activity, some predator species such as ravens and coyotes are attracted to human activity. Installation of fencing and transmission towers create additional perching structures from which ravens and raptors may hunt for prey. Construction, operation, and maintenance of the Project would result in trash and debris that would further attract species such as ravens and coyotes. To avoid or minimize human impacts a Worker Environmental Awareness Program (WEAP) and trash abatement program will be implemented (see Section 7.2).

Habitat fragmentation

The permanent fencing of the Project area would possibly reduce access for terrestrial species resulting in habitat fragmentation. This fragmentation could cause wildlife to rely more heavily on habitat within the surrounding area for foraging, shelter, and nesting opportunities. This could have an indirect effect on wildlife inhabiting areas adjacent to the Project area. Wildlife inhabiting adjacent areas could be faced with increased competition as a result of the displaced individuals relocating into their home ranges.

Human Presence, Noise and Light

Indirect impacts to wildlife species would result from human presence, noise, and light in the Project site. Increased levels of noise and human activity could be detrimental to many wildlife species. Noise from construction activities could temporarily discourage wildlife from foraging and nesting immediately adjacent to the Project site. Many bird species rely on vocalization during the breeding season to attract a mate within their territory. Noise levels from certain construction,

operations, and decommissioning activities could reduce the reproductive success of nesting birds.

The most common wildlife responses to noise and human presence are avoidance or accommodation. Avoidance would result in displacement of wildlife from an area larger than the actual disturbance area. The total extent of habitat lost as a result of wildlife avoidance response is impossible to predict since the degree of this response varies from species to species, and can even vary between different individuals of the same species. Also, after initial avoidance of human activity and noise producing areas, certain wildlife species may acclimate to the activity and begin to reoccupy areas formerly avoided.

Artificial lighting impacts on wildlife species may include disorientation from and attraction to artificial light, impact-related mortality due to disorientation, and effects on the light-sensitive cycles of many species (Saleh 2007). Lighting plays a substantial role in collision risk because lights attract nocturnal migrant songbirds, bats, and major bird kill events have been reported at lighted communications towers (Manville 2001). Bright night-lighting close to the ground can attract bats and flying insects and disturb wildlife (e.g., nesting birds, foraging mammals).

Impacts associated with human presence, noise, and light would be reduced through implementation of mitigation measures for protection of wildlife and other resources (see Section 7.2).

Dust and Hazardous Materials

Direct habitat loss and degradation both inside and outside of the Project site could also occur if project activities resulted in release of dust or hazardous materials, resulted in modification of soil erosion or sedimentation rates, or introduced or encouraged the growth of noxious weeds. Hazardous material and pollutant releases could occur as a result of the Project. Materials released could include fuels and other materials used by work crews as part of routine construction and maintenance activities. Hazardous materials could also be released if construction-related excavation were to disturb areas that have existing environmental contamination. Hazardous materials release could impact biological resources by injuring or killing vegetation and wildlife through either short-term acute exposure or long-term chronic exposure. Soil erosion from site grading and use of heavy equipment, which affects vegetation and soil properties, could have an adverse effect on wildlife foraging and burrowing potential to lands outside of the Project boundaries. Noxious weeds could impact wildlife species by displacing native vegetation species necessary for forage or cover.

Impacts associated with dust and hazardous materials would be reduced through implementation of mitigation measures for dust control and the management of hazardous materials.

Altered Hydrology

Biological resources could potentially be impacted if the Project were to modify the availability or quality of surface water and/or groundwater. Although the Project would use groundwater, the size of the aquifer, depth to groundwater (23 to 64 feet), and implementation of erosion controls

and spill control and countermeasure plans suggest that the Project would not impact wildlife through groundwater depletion or impacts to groundwater quality.

The Project could potentially have an indirect effect on wildlife habitat adjacent to the Project site, if the Project were to modify down gradient sedimentation or erosion rates. This could occur as a result of the removal of soil-stabilizing vegetation or modification of onsite precipitation infiltration rates.

Impacts associated with modification of down gradient sedimentation and erosion rates would be reduced through implementation of mitigation measures for the protection of wildlife and other resources.

Habitat Loss

Construction of the Project will result in some habitat loss for avian species. The bird assemblages documented using the BSA, which includes area surrounding the Project that will not be developed, are typical of the open grassland, oak savannah woodland, and riparian habitats of the inner Coast Ranges of central California. A majority of the Project will be constructed in level areas that have been historically disked and dryland farmed for hay and grain production. A small portion of the Project will be constructed in woodland and forest habitat (11.75 ac; <1.0% of the Project), 77% of which has been identified as non-native ornamental woodland. There are large expanses of woodland and forested habitat types both adjacent to and further outside of the Project. Sparse residential settlements and small farms are located south and east of the BSA. The BSA is vacant and is currently a working landscape that includes cattle ranching. Potential causes of impacts to the surrounding area during construction could result from noise generated by construction equipment and machinery, artificial lighting, and possibly dust blown from the construction site. Any effects of habitat loss will be minimized and offset by the general avoidance and minimization measures outlined in Section 7. Additionally, the planned acquisition of off-site lands for long-term conservation will serve to preserve habitat and further offset habitat loss.

Electrocution potential

The potential for electrocutions depends of the arrangement and spacing of energized and grounded components of poles and towers that are sometimes used for perching, nesting and other activities (APLIC 2012). Research has found that nearly all electrocutions occur on smaller, more tightly spaced residential and commercial electrical distribution lines that are less than 69 kilovolts (APLIC 2012).

All transmission and sub-transmission towers and poles will be designed to be avian safe in accordance with the suggested practices outlined in, “Reducing Avian Collisions with Power Lines: State of the Art in 2012” (APLIC 2012).

Collision Risk

Siting in High Risk Areas

Based on a review of sources of avian mortality at three existing utility scale PV solar projects in California, fatality rates for solar arrays, while preliminary, are not high in relation to other anthropogenic mortality (WEST 2014). While concern over wind projects is primarily focused on raptor and bat mortality, few fatalities of those groups have been found at PV facilities. Overall, songbird fatalities appeared in the largest numbers at the PV facilities surveyed, which is consistent with their prolific population levels relative to other avian species. The observed mortality is spread out among species, with no species appearing to account for a large percentage of the fatality finds at all facilities.

Avian mortality concerns are typically elevated when projects are sited in high use areas for bird species, bird groups or taxa considered at risk from the particular mortality source. For example, concern over levels of raptor mortality at wind projects are elevated at sites with high raptor nesting, high prey base, topography that is believed to increase risk, and other factors. Although the Project site is located in an area of relatively high eagle use, the collision risk for raptors from a solar project, consisting of relatively low profile, unmoving or slowly tilting panels, is much lower than a wind project. Historically, raptor fatalities have been an issue of special concern at wind facilities. In North America, raptors compose up to 8% of fatalities and wind facilities, and 6% regionally. As a function of energy output, PV facilities are not expected to pose risk to raptors in the same way as wind energy facilities because PV facilities do not possess the density of tall structures found at wind facilities. As expected, a study of three PV facilities where avian fatality monitoring data is available, few raptor fatalities were associated with the solar facilities. Raptor fatalities at the three solar facilities composed just over 1% of all fatalities (range: 0-3%), and included fatalities potentially attributed to overhead power lines, which would be present at any utility-scale power facility (WEST 2014).

Waterfowl and waterbird collision risk with tall structures such as unmarked transmission lines is often elevated near wetlands, playas and other suitable habitat; however, as noted above there are relatively few waterfowl/waterbirds that utilize the Project site, and the 230-kV transmission line would be designed following the most recent APLIC guidelines for placing and installing bird flight diverters, to minimize avian collisions. Concerns over potential risk of collision for migrating songbirds with structures is often elevated when projects are located in high migration areas such as the Texas Gulf Coast, near significant migration stopover areas. However, night migration in the more arid western United States is known to be much less dense than in the eastern one-half of North America (Gauthreaux et al. 2003). As a result, we know of no large-scale fatality events at communication towers in the western United States, yet there are dozens reported from the eastern part of the country (Shire et al. 2000).

In evaluating avian issues at three utility scale solar project in the region, Walston et al. (2016) found there was considerable variability in mortality rates for bird carcasses with known project-related causes of death ranged from 0.50 to 10.24 birds/MW/year. Within the southern California study region, avian mortalities at utility scale solar facilities were within the range of mortalities

estimated for utility-scale wind energy facilities. The lower end of avian mortality was from the California Valley Solar Ranch Project in San Louis Obispo County (0.5 birds/MW/year), the closest utility scale solar site to this Project site that could be representative of the level of risk of migrating songbird collision with Project infrastructure (Walston et al. 2016).

Vehicle and equipment collisions

Equipment and vehicles could collide with slower-moving species, species in subsurface burrows, and ground-nesting birds resulting in injury or mortality. Some species of birds go into a state of torpor and become immobile during periods of cold weather (Fletcher el al. 2003), increasing the potential for impacts from vehicles or equipment. For most bird species, direct impacts would be limited to areas within the Project footprint or immediately adjacent to it. Active bird nests in shrubs or near the ground would be vulnerable to crushing during ground-disturbing activities.

During the construction phase, an increase in vehicle traffic from construction personnel, biologist and other project-related persons, potentially poses an increase risk to birds that inhabit remote desert regions. Birds nesting adjacent to project access roads are more likely to be impacted due to an increase in the number of vehicles using the road.

Due to a decrease in project personnel and habitat alterations, these types of risks will be lessened during the operations and maintenance phase, compared to the construction phase. Mitigation measures described in Section 7.2 would avoid and minimize this risk.

Height of Structures

A risk factor for avian collision mortality is the height of structures within a development. For songbirds, height of structures has been a very important risk factor, with taller structures (buildings, communication towers) typically affecting more birds than shorter structures (Kerlinger et al. unpublished; Gehring et al. 2011, Kerlinger et al. 2012). Particular dangers associated with buildings are the presence of windows and certain lighting regimes known to attract birds (Klem et al. 2009). Very tall structures represent greater risk to birds because most night migrating birds fly at heights between 1,350 and 6,560 feet (Kerlinger 2001), generally occurring in higher densities at greater heights above ground level (AGL). In a study by Gehring et al. (2011) and Kerlinger et al. (unpublished), the number of birds killed at communication towers was found to be positively correlated in a non-linear fashion with tower height. As the height of structures associated with the Project will be relatively low (10 to 13 feet), risk of collision will also be low accordingly. The northern half of the site will have underground electrical collection lines that daylight adjacent to the Project substation. The southern half will have above ground electrical collection lines on typical wooden poles.

Light Attraction

In most studies to date, poor weather has been associated with large-scale mortality events that have occurred at tall structures such as communication towers (Manville 2000, Kerlinger 2010, Longcore et al. 2012, 2013), as well as street lights, lighthouses, water towers, ski lifts, and other tall, lit structures. In addition, large-scale fatality events have even been reported to occur at natural gas compressor stations that are equipped with bright flood lights. These events usually

occur in inclement weather (fog, light rain, light snow, low ceiling) when navigational cues are obscured and as a result, attracted to the lights of facilities and structures, birds become disoriented and remain in the lighted zone where they circle the structures at risk of collision with the tower and its guy wires, and collisions with each other, or possible exhaustion (Gauthreaux and Belser 2006). Fortunately, recent studies have demonstrated that avian collisions with manmade structures can be reduced dramatically with the adoption of certain lighting regimes that do not attract birds (Gehring et al. 2009, Kerlinger et al. 2010, Patterson 2012). Further, most birds (approximately 90%) that die after being attracted to communication towers by lighting are killed when they collide with the guy wires that support those towers (Gehring et al. 2011). As described in Section 7, California Flats will minimize new lighting, and any lighting associated with the Project shall be designed to limit the lighted area (e.g., using shielding and/or downcast lights) to the minimum necessary.

"Lake Effect Hypothesis"

The concern over deaths at solar facilities of waterbirds or waterfowl is centered around the hypothesis that these species may potentially mistake the extensive solar arrays for water features on which the birds can land, usually at night. Such collisions which also occur at structures like parking lots and train yards (usually a black cinder surface), both of which resemble water bodies at night, often do not result in direct mortality because the angle of collision is relatively shallow. Such birds sometimes cannot take off after collisions because they are adapted to take off from water, not dry land. These birds can perish due to exposure to the elements and/or predators.

Finally, as noted in Section 5.3.3, the baseline avian surveys showed a low number of waterfowl/waterbird species using the California Flats area; even when drought conditions lessen it is still expected that relatively few of these aquatic-based birds would use the Project site in the absence of the project. However, there remains uncertainty in whether birds on migration might be attracted to the project post construction. Waterfowl or waterbirds have not been found in high numbers at the California Valley Solar Ranch site, a large solar project to the south of the Project that might be representative of avian risk for local utility scale solar projects (Walston et al. 2015).

Potential Risk to Special Status Species

Special status species were evaluated for their potential to occur within the BSA and included special status species for which focused surveys were conducted or sightings were recorded during general or other species-specific wildlife surveys. The subsequent section describes a risk assessment for these species. Those species that were not specifically surveyed for, or are considered to have a low potential for occurrence and were not observed during surveys were eliminated from further analysis. Detailed risk reduction and conservation measures are thoroughly described in Section 7.

Golden Eagle

Adult golden eagles may easily range a mile or more from their nest sites in search of prey, and their breeding-season home ranges often extend across more than ten square miles (Kochert et al. 2002). The available data suggest that adult eagles most often forage within 0.6–1.9 miles of

their nest site while provisioning chicks (Marzluff et al. 1997, Hunt 2002). That said, the nearest-neighbor analysis indicated that the approximate average territory of golden eagles nesting in the Project area encompasses a radial area of only 1.05–1.5 miles, which translates to nesting territory sizes of 3.5–7.1 square miles. These territory sizes suggest that the Project area supports a relatively high density of nesting golden eagles. The highest known density of nesting golden eagles is located in central California in the northern Diablo Range, in oak savannah and woodland habitat similar to that found in the vicinity of the Project (Hunt and Hunt 2006). In that study area, extensive radio-telemetry research demonstrated home-range sizes that are similar to those that the Project-related surveys suggested for the population nesting in Cholame Valley and the southern Diablo Range (Hunt et al. 1995, 1999; Hunt 2002). Elsewhere in the western U.S., population densities have ranged from 11–97 square miles/pair (Kochert et al. 2002).

Given the initial projections of nesting territory sizes and apparent density of nesting eagles in Cholame Valley and the adjacent hills, it appears unlikely that the golden eagles nesting in the Cholame Hills, in the eastern and southern portions of the Diablo Range, and in the northern Temblor Range would routinely, if ever, travel onto the Project site to provision their chicks. Instead, foraging on the Project site during the nesting season appears possible only for eagles occupying the confirmed and potential territories located in the eastern half of Cholame Valley and the adjacent western foothills of the Diablo Range. There is, however, a reasonable likelihood that the foraging home ranges of two to five golden eagle territories overlap the access road area (Figure 4). Regardless, the oak and pine woodlands and interspersed savannas that characterize Cholame Valley and the adjacent foothills of the Cholame Hills and Diablo Range provide ideal nesting and foraging habitat for golden eagles and even an atypical (see, for example, Boal et al. 2006) pair of bald eagles (possibly two). The ground squirrels, jackrabbits, and feral pigs found in the region provide a variety of food resources for the eagles.

The availability of suitable, natural nesting substrates clearly constrains most nesting golden eagles to the wooded and cliff/outcrop areas located primarily outside the Project site. The electrical transmission line that crosses the Diablo Range and the Project site from northeast to southwest is a possible exception (Figure 1). During both 2013 and 2014, although there were several active red-tailed hawk and common raven nests on the transmission towers, no active golden eagle nests were observed on this transmission line within the survey area. Surveys conducted for a nearby project located on the Carrizo Plain revealed several active golden eagle territories centered on transmission-tower nests (HTH 2012). Therefore, the potential exists for golden eagles to nest on the existing transmission towers in the Project vicinity.

Burrowing Owl

The grassland, rolling foothill habitats and abundant California ground squirrel burrow systems in the Project vicinity provide suitable foraging, nesting, and sheltering opportunities for resident, wintering, and transient owls. Therefore, nearly the entire Project site currently provides suitable foraging and breeding habitat for burrowing owls. However, risk of collision with Project infrastructure should be low. Monitoring at several solar facilities where burrowing owls are known to occur, have yielded no carcasses of the species exhibiting injuries suggesting collision with stationary objects was the cause of mortality.

California Condor

The Project site and access road lie within the historic and current range of the California condor, and most of the 3,000-acre Project currently provides potentially suitable foraging habitat for the species. The mountain ranges within the region provide conditions favorable to condor movement, and mortality of California ground squirrels, mule deer (*Odocoileus hemionus*), feral pig, pronghorn (*Antilocapra americana*), and other wildlife provides suitable foraging opportunities within the Project site and along the access road/Hwy 41 improvement areas.

The condor release locations closest to the Project are the Bitter Creek National Wildlife Refuge, approximately 80 miles southeast, and Pinnacles National Monument, approximately 62 miles north of the Project site. The Project site and access road do not occur within any designated critical habitat for California condors, the nearest being the East Unit of the Hi Mountain-Beartrap Condor Area approximately 35 miles south of the Project (USFWS 1977). Recent global positioning system (GPS) daytime tracking data indicate that captive-released
California condors periodically occur in the mountain ranges that border the Project site to the west, north, and east, and condors were recorded in the vicinity of the Project site in 2005 and 2006 (California Condor Wind Energy Work Group 2011, USFWS 2011a). Given the current distribution of condors, condors are unlikely to forage within the Project site and along the access road/Hwy 41 improvement areas. The solar generation facilities are not planned in an area that is expected to bisect a high-use flight path for the species. No condors were observed during nearly two years of BUC and eagle use surveys conducted for the Project. Although there is suitable roosting and nesting habitat for California condors in the surrounding mountain ranges, the Project site contains no such habitat.

Other Special Status Avian Species

Swainson's Hawk

Swainson's hawk is a state-listed (threatened) raptor species that breeds in much of western North America. Within California, nesting occurs in the Central Valley, Great Basin and Mojave and Colorado Deserts. Regular nesting also occurs in the high desert between the Tehachapi Mountains and Lancaster. This species winters in southern South America with a migration route of over 20,000 miles (Woodbridge 2008). Arrival at breeding areas generally occurs from late February to early May depending on geographical characteristics of the breeding area (Woodbridge 2008). Swainson's hawks prey on a wide variety of small vertebrates to crayfish and insects, although breeding success appears to be tied to availability of small mammals. In the Central Valley, nest sites are associated with riparian forest vegetation, whereas in the Great Basin, nest sites can be found within trees located in uplands.

The BSA is 20 miles from the nearest documented nesting records for this species, although moderately suitable nesting habitat is present in the riparian and oak woodland portions of Cholame Valley. This species was observed once in the spring during the 2013 avian use surveys, a migrant flying at an altitude over 492 feet; one individual Swainson's hawk was also observed incidentally as part of the 2014 eagle use surveys. One of the main objectives of the raptor nest survey effort was to search for nesting Swainson's hawks within 5 miles of the Project site. No

Swainson's hawks were detected during the nest search effort. Overall, this species is expected to have a relatively low potential for occurrence within the Project Site during the breeding season. Risks from the Project would generally be expected to be reduction of foraging habitat during migration. Potential for impacts to the species would be further reduced through implementation of mitigation measures for protection of wildlife and other resources, as described in Section 7.

Northern Harrier

The northern harrier is a State Species of Special Concern. Many California populations are resident, and migrating individuals may winter in California from sea level up to 10,000 feet elevation; others migrate through to Central and South America (MacWhirter & Bildstein 1996). Habitat includes fresh and saltwater wetlands, coastal dunes, grasslands, deserts, meadows, and crop lands, but they are rarely found in wooded areas. This species breeds in areas up to 5,700 feet above sea level, and builds nests on the ground, in upland fields or marshes. Northern harriers prey on a variety of small vertebrates and invertebrates, although they predominantly feed on small mammal, mainly microtus, species.

The BSA is within the edge of the documented breeding range for this species and nesting habitat is present in the BSA (Shuford et al, 2008). Project-specific BUC surveys, eagle/raptor use surveys, and nesting raptor surveys were designed to detect species such as northern harrier. Observations of northern harriers occurred in spring (1 sighting) and fall (1 sighting) during the 2013 avian use surveys; both sightings involved one adult coursing low over grasslands. One individual northern harrier was observed incidentally during the 2014 eagle use surveys conducted to date. One northern harrier individual was documented in the 2013 raptor nest surveys, approximately 1.5 miles northeast of the Access Road/Hwy 41 improvements; no nests were observed.

Direct and indirect impacts to these species would be similar as discussed above for golden eagles. Direct impacts also would include the potential for direct take of nests and permanent reduction of potential foraging and nesting habitat associated with development of the Project. Development of the Project would result in an incremental increase in noise and human presence, and these could cause an indirect impact to the northern harrier. The Project would also include gen-tie transmission line, which would present a potential collision hazard. Impacts to northern harrier would be reduced through implementation of mitigation measures for protection of wildlife and other resources, as described in Section 7.

Loggerhead Shrike

The loggerhead shrike is a State Species of Special Concern and a year-round resident in parts of the Southern California desert. It is typically found in open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. As a predatory bird, its diet consists of insects, amphibians, small reptiles, small mammals, and other birds. Shrikes typically build nests three to ten feet above the ground depending on the height of the vegetation. During surveys, this species

was observed within the BSA throughout the year (15 total observations), with suitable nesting and foraging habitat located within the Project Site.

Direct impacts would include the potential for direct take of nests and permanent reduction of potential foraging and nesting habitat associated with development of the Project. Development of the Project would result in an incremental increase in noise and human presence, and these could cause an indirect impact to the loggerhead shrike. The project would also include a gen-tie transmission line, which could present a potential collision hazard. Impacts to loggerhead shrike would be reduced through implementation of mitigation measures for protection of wildlife and other resources, as described in Section 7.

Short-eared Owls

The short-eared owl is a State Species of Special Concern. In California, it is a year-round resident in some areas; their populations are highly dependent on their prey's "boom or bust" cycles (particularly the California vole, *Microtus californicus*), and can vary dramatically. These owls nest on the ground, and require open country with sufficient microtine rodent prey species as well as herbaceous cover to conceal the nests. Suitable nesting habitat includes irrigated alfalfa or grain fields, marshes, old pastures and ungrazed grasslands. In the San Joaquin Valley and adjacent Coast Range valleys, nesting is generally episodic, usually after wet winters (Shuford et al, 2008).

The BSA is outside of, but relatively near (15 – 20 miles), the documented breeding range for this species and there is a lack of suitable grassland cover in the Project site (HTH 2013); overall, this species would have a relatively low potential for occurrence during the breeding season. Short-eared owls were seen incidentally during the 2013 raptor nest survey, and in November 2012 and April 2013 during visits to the site for the avian use surveys. Risks from the Project would generally be expected to be reduction of foraging habitat.

Impacts to short-eared owl would be reduced through implementation of mitigation measures for protection of wildlife and other resources, as described in Section 7.

Tricolored Blackbirds

The tricolored blackbird is a State Species of Special Concern, and is a permanent resident of California. Their range includes the Sacramento and San Joaquin valleys, coastal slope from Sonoma County to the Mexican border, and the foothills of the Sierra Nevada to Kern County. While many birds migrate extensively within this range, some blackbirds appear to reside within the Central Valley throughout the year. Nesting sites for this species have historically been located in marshes, where colonies of 20,000 to 30,000 nests have been documented. More recently, colonial nests have also been documented in blackberry and thistle, as well as in grain fields. The success of selected nesting sites depends on having a nearby source for abundant insect prey (primarily Coleopterans, Orhopterans and Hemipterans). Wintering blackbirds forage in agricultural fields and grasslands with low-growing vegetation (Shuford et al, 2008).

The BSA is within the documented breeding range for this species and some nesting habitat is present in some areas of Cholame Valley. Tricolored blackbirds were seen incidentally in the Project site in March 2013 and March 2014. The species is an expected winter resident and transient, due to the limited availability of potentially suitable breeding habitat in the immediate Project vicinity (HTH 2014). Risks to this species from development of this Project would generally be expected to be reduction of foraging habitat.

Impacts to the tricolored blackbird would be reduced through implementation of mitigation measures for protection of wildlife and other resources, as described in Section 7.

Grasshopper Sparrow

The grasshopper sparrow (*Ammodramus savannarum*) is a State Species of Special Concern that breeds in grasslands from the foothills of the Sierra Nevada and Cascade Range west and south to San Diego County (Shuford et al. 2008). The species is generally a summer resident of the state, occurring from March to September, with the breeding season extending from mid-March to August. The species is at least partially migratory, with rare winter sightings in California, generally occurring on the coastal slope of southern California (Shuford et al. 2008). The species nests on the ground in short to moderate height grasslands with patchy bare ground and/or sparse shrub cover, and they forage in dense grassland and low growing vegetation; in general, they are more likely to be found in large tracts of habitat (minimum of 75 to 250 acres) than in small tracts (Vickery et al. 1994; Herkert 1994). The CNDDB contains records of grasshopper sparrow observations approximately five miles south of the Project. While no grasshopper sparrows have been observed on the Project, there is suitable nesting and foraging habitat throughout the BSA. Risks to this species would include the potential for direct take of nests and permanent reduction of potential foraging and nesting habitat associated with development of the Project.

Impacts to grasshopper sparrows would be reduced through implementation of mitigation measures for protection of wildlife and other resources, as described in Section 7.

Bats

Four species of special-status bats are expected to roost and/or forage in the BSA; however, no roosting habitat occurs within the Project site. Although pallid bats were likely detected during acoustic surveys, and they have been documented in the region, they are expected to only forage, not roost, in the Project site. Numerous smaller cracks and crevices were observed in the rocky outcrop habitat in the BSA; these are likely suitable for only individual pallid bats or small congregations (i.e., two or three individuals). Although solitary roosting bats or small congregations of bats may roost in these outcrop areas or roost as maternity colonies in large riparian trees, these habitats are located outside the Project site, and would not be directly affected by the proposed activities. No roosting habitat occurs within the BSA for the western mastiff bat and the western red bat is expected to only winter or migrate through the BSA and then only within the small riparian area. Further, the Townsend's big-eared bat is considered mostly extirpated from the region but dispersed solitary males may occur occasionally in unused attics or other cavernous habitats within the BSA. The granary was the only building within the

Project site considered to potentially support roosting bats. However, because very little activity was detected at this site, the low activity levels suggest few if any bats roosted at this location.

The habitat assessment and acoustic surveys were conducted just after the high-activity season for bats (May through September) when data collection is optimal for assessing bat activity levels. Nevertheless, given the absence of high-quality roosting habitat and the fact that all roosting habitats occur outside the Project site, direct impacts on roosting bats are not expected to result from the Project. Because roosting habitat for pallid bats occurs immediately adjacent to the Project site, and because this species is expected to forage on the widespread high-quality foraging habitat that occurs throughout the Project site, a change in the foraging habitat within the Project site may result in indirect impacts to pallid bats. Prey species comprise primarily orthopterans (grasshoppers, crickets, etc.) and other ground-dwelling insects that pallid bats take mostly from the ground (Johnston and Fenton 2001). Although the ground disturbance was minimized at a nearby solar photovoltaic project, the California Valley Solar Ranch (CVSR) in San Luis Obispo County, preliminary acoustic results from that project suggest that pallid bats foraged less in completed solar arrays (activity = 0.12 calls/min) compared to the same areas before they were developed and compared to adjacent undeveloped conservation areas (activity = 0.19 calls/min) (H. T. Harvey & Associates 2013). Although pallid bats are expected to at least initially forage less in the Project site than adjacent undeveloped habitat, even a permanent decrease in pallid bat activity levels in the Project site is not expected to result in a significant impact to the pallid bat population of the region. Further, a reduction in optimal foraging habitat adjacent to maternity colonies could potentially result in a slight reduction in colony size for any colony located within three miles of the Project site. However, a potential small reduction in colony size would not be expected to result in a significant impact to the regional pallid bat population.

Good-quality foraging habitat for the western mastiff bat also occurs within the Project site. However, this species typically forages at 100 to 200 feet above ground level (Best et al. 1996). HTH (2013) reported that mastiff bat activity appeared unaffected by the development of solar arrays at CVSR, which suggests that mastiff bat activity may be unaffected within the Project site.

On a landscape scale, the addition of solar arrays to an area that previously had minimal structural attributes may affect bat activity in several ways. Bats are known to commute and forage along linear landscape elements (Verboom and Huitema 1997). At clearly demarcated edges, such as forest-field interfaces in early stages of succession, all bat species have been shown to increase their activity (Jantzen and Fenton 2013). Morris et al. (2010) found higher concentrations of flying insects on the leeward side of trees on windy nights. As such, it is possible that flying insects could similarly gather in higher concentrations at the leeward edges of the PV solar arrays on windy nights. As observed at CVSR, high frequency bats (California myotis, western small-footed bats, and canyon bats) that forage in situations with clutter (e.g., with shrubs and trees) are likely to take advantage of this effect and are expected to increase their activity at the leeward edges of the arrays (HTH 2013).

7 RISK REDUCTION AND CONSERVATION MEASURES

California Flats has developed the following risk reduction and conservation measures for the Project based on site-specific baseline avian and bat information. The project design features and conservation measures proposed herein represent California Flat's willingness to ensure the least harm to avian and bat species. The risk reduction and conservation measures presented in this document are being developed separate from the NEPA and CEQA processes, although mitigation measures adopted as part of those processes will coincide and be coordinated with measures proposed herein.

Risk Reduction Measures Implemented During Site Selection and Facility Design

California Flats sited the Project to avoid and minimize impacts to bird and bat species where possible, including the following macro-siting considerations:

- The Project is sited entirely within a working private ranch with a long history of cultivation. The majority (98%) of the Project site is composed of grassland, primarily California Annual Grassland.
- The Project is sited in an area without substantial riparian habitats or other features known to attract large concentrations of resident or migrating birds or bats. Less than 1% of the Project site is composed of riparian or ephemeral wetland habitats.
- The Project is sited outside designated critical habitats, Audubon Important Bird Areas, and important migratory pathways or stopover sites.
- The Project is sited immediately adjacent to existing transmission infrastructure with additional capacity such that minimal transmission gen-tie and system upgrades will be required.
- The Project site does not currently host avian nests used by species listed under the federal or state endangered species acts or the BGEPA, nor does it contain designated critical habitat for these species.

California Flats has made efforts during initial site selection and continues to make efforts during project design to micro-site infrastructure such that impacts to birds and bats are minimized. The following risk reduction measures have been incorporated into the design of Project facilities and have been committed to as part of the Final Environmental Impact Report (FEIR) developed by Monterey County Resource Management Agency (CMRMA, 2014).

- *Avoid and minimize impacts to wetlands (Mitigation Measure B-3(a) of the August 2014 DEIR).* Impacts to wetlands and other waters shall be avoided to the extent feasible. In consultation with a wetland ecologist, the project shall be designed, constructed and operated to avoid and minimize impacts to wetlands and other waters to the extent feasible, which may include minor changes to the panel layout and roadway configurations to avoid wetlands. General Project staging and laydown activities shall not occur within wetlands during construction. To avoid unnecessary egress into wetlands, all wetlands in the project impact area shall be clearly shown on Project plans and the limits marked with highly visible flagging, rope, or similar materials in the field. Access allowed within these features for the purposes of construction in and near such features (e.g., road crossings, pile placement, trenching) shall be clearly delimited on Project plan sets, and these allowed work limits shall also be staked in the field, to prevent construction personnel from causing impacts to areas outside of work limits. Where necessary, silt fencing or other measures may be used to protect adjacent wetlands from sediment transport or other indirect impacts that could result from adjacent construction. During the operation of the solar facility, maintenance activities shall not be staged within wetlands. Wetlands and other waters within construction areas that are to be avoided shall be fenced or flagged for avoidance prior to construction, and a biological monitor shall be present to ensure compliance with off-limits areas. All jurisdictional wetlands and waters shall be clearly shown on Project plan sets.

- *Avoid and minimize impacts wherever feasible by providing appropriate setbacks between Project improvements and avoided riparian and stream habitats (Mitigation Measure B-2(e) of the August 2014 DEIR).* As discussed above, some improvements near and within riparian habitats and streams would be necessary to construct road and fence crossings, stabilize banks, and construct other Project improvements. In other locations, where complete avoidance of reaches of perennial and intermittent streams is proposed, Project activities and Project work limits shall include an average 50-foot setback from the top of bank or the outer dripline of the riparian canopy of the avoided stream reaches. The 50-foot average shall apply to the avoided reach length. Although the average setback must be at least 50 feet over the length of the avoided reach, in some isolated locations it may be necessary to place structures within 50 feet of the avoided drainage. In these cases, a minimum 25-foot setback shall be observed from avoided perennial or intermittent riparian habitat in all locations (i.e., work limits may come no closer than 25 feet from the top of bank or the outer canopy dripline in any specific area along the avoided reach). Where existing roads occur parallel to and within 50 feet of avoided perennial or intermittent streams, it will be impossible to maintain a 50-foot average setback or even a 25-foot minimum setback, because even to realign the road, work near the avoided streams would be required. In these cases, Project activities and Project work limits shall be set back 10 feet from the top of bank. All work that must occur within the 50-foot setback shall be monitored by an authorized biologist to ensure direct impacts to sensitive habitat are minimized, and all impacts to special status species are avoided. Riparian setbacks and all riparian habitat to be avoided by the Project shall be fenced or flagged before construction occurs in adjacent areas. A biological monitor shall be present to ensure compliance with off-limits areas.

- *Avoid or minimize impacts on oak woodlands (Mitigation Measure B-2(d) of the August 2014 DEIR)).* If oak woodlands occur in or adjacent to (i.e., within 25 feet of) the Project impact area, an International Society of Arboriculture (ISA)-certified arborist shall establish a buffer of 25 feet from the driplines of native trees in the oak woodland habitat. No ground-based construction activities, including trimming of trees, shall be allowed within the buffer unless monitored by an ISA-certified arborist. All buffers shall be marked using highly visible flagging or fencing.

General Biological Measures Implemented During Construction and Operation

Construction of the Project will occur over a period of 12-24 months, with an expected operational life of 30 to 40 years. The following general biological measures will be implemented during construction and operation (as specified) to avoid or minimize risk to avian and bat species:

- *Prepare and Present a Worker Environmental Awareness Program (Mitigation Measure B-1(gg) of the August 2014 DEIR))*. California Flats shall retain a qualified biologist to prepare a Worker Environmental Awareness Program that shall be presented to all construction personnel and employees before any ground-disturbing activities commence at the Project site. This presentation shall explain to construction personnel how best to avoid the accidental take of special-status species during construction. The program shall consist of a brief presentation explaining endangered species concerns to all personnel involved in the Project. The program shall include a description of special-status species potentially on the Project site and their habitat needs; an explanation of the status of the species and their protection under the ESA, CESA, BGEPA, MBTA, and the California Fish and Game Code; specific mitigation measures applicable to special-status species; and the penalties for take.

  The program shall also explain to construction personnel how to avoid impacts to jurisdictional waters, including wetlands. The program shall include a description of jurisdictional waters on the site, specifically permitted impacts to jurisdictional waters, measures to protect waters to be avoided, and maps showing the location of jurisdictional waters and permitted impacts. The program shall be recorded electronically, and all future facility employees shall be required to review the recording before the initiation of work on the Project site.

  The Worker Environmental Awareness Program shall be implemented by California Flats before the start of ground disturbance and shall be continued through the construction phase for all construction personnel. A separate Worker Environmental Awareness Program shall be implemented by California Flats before project operation, for all permanent project employees. This program shall include all the information above, as applicable to project operations.

- *General Avoidance Measures and Construction Best Management Practices (Mitigation Measure B-1(ff) of the August 2014 DEIR).*

    - o Prior to ground disturbance, all permanent and temporary disturbance areas shall be clearly delineated by stakes, flags, or another clearly identifiable system.

    1. To minimize disturbance of areas outside the project site, all construction and operation vehicle traffic shall be restricted to established roads, construction areas, and other designated areas. These areas shall be included in pre-construction surveys and, to the extent possible, shall be established in locations disturbed by previous activities to prevent further impacts.

    2. Construction and operation vehicles shall observe a 20 mile-per-hour (MPH) speed limit during daylight hours within Project areas, except on county roads and state and federal highways. During limited nighttime activities, all construction and operation vehicles shall observe a 10 MPH speed limit. Speed limit signs shall be installed at the project site entrance from the driveway, every one mile along the project site access road, and at the end points of the driveway upon initiation of site disturbance and/or construction. One electronic speed monitoring sign shall be placed in both directions, at the approximate midpoint of the driveway.

        a) Due to the length of the approximately 5.6-mile-long driveway, USFWS recommended 20 MPH speed limits would be prohibitively slow and would negatively impact construction duration. Therefore, vehicles utilizing the access road (or "driveway") will observe a 25 MPH speed limit during daylight hours (7 AM–5 PM between 1 October and 31 May; and 7 AM–7 PM between 1 June and 30 September) and will observe a 20 MPH speed limit during the hours of 5 AM–7 AM and 5 PM/7PM–9 PM. During limited nighttime activities (9 PM–5 AM) within the driveway, all construction and operation vehicles shall observe a 10 MPH speed limit.

    3. All construction pipes, culverts, or similar structures greater than four inches in diameter, or greater than 1.5 inches in diameter within areas where CTS or CRLF may be present, stored or stacked on the project site for one or more overnight periods shall be either securely capped before storage or thoroughly inspected for wildlife before the pipe is subsequently moved, buried, capped, or otherwise used.

    4. Materials that could provide shelter/nesting habitat for birds during the nesting season may be covered with netting or treated with other exclusion methods, where feasible and appropriate, to prevent birds from constructing nests. In addition, materials such as wooden pallets, wooden power poles, and metal tubing, providing nesting and shelter habitat for

birds during the nesting season and artificial refugia for other special-status species shall be thoroughly inspected before use.

5. If encountered, wildlife within the project site shall be allowed to escape unimpeded, removed by a qualified biologist and placed in a designated safe area away from construction activities, or left in place when required by regulations, policies, permits, and/or conditions of approval. If wildlife removal by a qualified biologist is required, the qualified biologist shall be approved or permitted by CDFW and USFWS, as and if required by law, prior to removing such species.
6. To prevent entrapment of special-status wildlife, all excavations (e.g., steep-walled holes, or trenches) more than 6 inches deep shall be covered with plywood or similar materials when not in use or fitted with at least one escape ramp constructed of earth dirt fill, wooden planks, or another material that wildlife could ascend. All excavations more than 6 inches deep shall be inspected daily for entrapped wildlife before construction activities begin and once immediately before being covered with plywood. Before excavations are filled, they shall be thoroughly inspected for entrapped wildlife. Any wildlife discovered shall be allowed to escape unimpeded before field activities resume or shall be removed from excavated areas by a qualified biologist and released at a safe nearby location.
7. Avoidance and minimization of impacts on sensitive biological resources within active construction areas shall be aided by flagging or fencing.
8. Dust suppression shall occur during construction activities when necessary to meet air quality standards and protect biological resources.
9. Disturbance of ponds and in-stream pools shall be avoided to the extent practicable. When feasible, and to the extent practicable, all in-stream work shall occur during the dry season.
10. To the extent practicable, existing mammal burrows shall be preserved in place.
11. All general trash, food-related trash items (wrappers, cans, bottles, food scraps, cigarettes, etc.), microtrash (nails, bits of metal and plastic, small construction debris, etc.), and other human-generated debris scheduled to be removed shall be stored in animal-proof containers and removed from the site on a regular basis (weekly during construction, and at least monthly during operations). No deliberate feeding of wildlife or domestic animals shall be allowed.
12. To minimize potential for attracting predators that could impact special status animal species, Project personnel shall monitor the project site for animal carcasses, including wild animals and livestock. Monitoring shall be conducted by California Flats on a weekly basis during construction and operation. During construction, any road kill within the project site or

Access Road shall be reported to designated onsite personnel. Any animal carcasses detected on the project site shall be removed and disposed of as quickly as possible to avoid attracting predators. The removal and disposal shall be conducted by an individual in possession of appropriate federal and state permits, if any are required.

13. New light sources shall be minimized, and lighting shall be designed (e.g., using shielding and/or downcast lights) to limit the lighted area to the minimum necessary.
14. Use of chemicals, fuels, lubricants, or biocides shall be in compliance with all local, state, and federal regulations. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other state and federal legislation. Use of first- and second-generation rodenticides shall not be permitted except for the limited use of zinc phosphide, or a rodenticide approved by the County, and only after other means of pest control (e.g. rodent traps) have proven to be ineffective.
15. To prevent harassment and mortality of listed, special status, and common wildlife species and destruction of their habitats, no domesticated animals shall be permitted on the project site, with the exception of grazing animals prescribed for vegetation management and trained working animals used specifically for livestock management or species surveys (e.g., horses, livestock working dogs, scent tracking dogs).
16. No firearms shall be allowed on the project site, unless otherwise approved for security personnel.
17. During construction, an annual written report shall be prepared describing the status of Project construction, as well as the compliance and current implementation status of construction-related biological mitigation measures and general biological measures. The report shall be submitted to the County no later than 15 February the following year.

- *Implement measures to reduce risk of wildland fire (Mitigation Measure HAZ-4(a) of the August 2014 DEIR).* Prior to the issuance of any construction permit, California Flats shall submit a Final Fuel Management Plan to the County of Monterey RMA – Planning Department for review and approval. The Final Fuel Management Plan shall be prepared in consultation with the Fire Protection District and/or Cal Fire. The Final Fuel Management Plan shall identify emergency access routes, vegetation management measures (e.g. grazing, disking, mowing), road maintenance requirements, fuel modification zones and defensible spaces around structure, applicable emergency response procedures (e.g. notification requirements), and vehicle restrictions during the fire hazard season. Fuel protection zones, including defensible spaces and firebreaks, shall be established and maintained throughout the duration of the project in accordance with state and County minimum clearances and fuel modification standards.

- *Implement biological construction monitoring (Mitigation Measure B-1(ee) of the August 2014 DEIR).* Before the start of ground disturbance or site mobilization activities, qualified biologists shall be retained by California Flats. California Flats shall ensure that each qualified biologist(s) has demonstrated expertise with the listed and/or special-status plants, terrestrial mammals, birds, reptiles, and invertebrates of the region, such as San Joaquin kit fox (*Vulpes macrotis mutica*), California red-legged frog (*Rana draytonii*), and burrowing owl. Expertise must include the ability to recognize listed/special-status and common species of the region, as well as sign, including scat, pellets, tracks, hair, fur, feathers, dens, and burrows. The qualified biologists shall also, as necessary, have the ability to monitor, relocate, handle, and collect species, as authorized by CDFW and USFWS through the use of a Memorandum of Understanding (MOU), scientific collecting/incidental take permit, and/or federal take permit. The qualified biologist(s) shall be present during initial ground-disturbing activities immediately adjacent to or within habitat that supports populations of listed or special-status species.

  If a listed or special-status species is encountered during Project construction, the following protocol shall be implemented:

  1. All work that could result in death, direct injury, disturbance, or harassment of the individual animal shall immediately cease and the qualified biologist shall be contacted; and

  2. The qualified biologist shall remove the individual animal to an appropriate relocation site outside the Project impact areas, or the individual animal shall be allowed to leave unimpeded.

  Construction shall resume, as directed by the qualified biologist(s), as soon as the individual animal either leaves or is removed from the area.

- *Restore temporarily impacted habitats to prevent loss or degradation of sensitive communities and to preserve habitat functions and values for special-status wildlife species (Mitigation Measure B-2(b) of the August 2014 DEIR).* Areas where temporary, construction-related impacts have taken place shall be restored in accordance with a Habitat Restoration and Revegetation Plan (HRRP). The plan shall prescribe restoration actions needed to treat disturbed soils and vegetation, in order to restore disturbed areas. Only areas that were graded (i.e., where the soil resources were removed and replaced) shall be subject to active restoration; however, the vegetation in the temporarily disturbed areas on the Project site and in the areas Access Road shall be monitored to ensure success, maintenance, and/or establishment of target habitat. California Flats shall contract a qualified restoration biologist, knowledgeable in grassland and wetland habitat restoration to develop the HRRP.

  The HRRP shall set forth trigger points to identify where restoration shall be required in response to construction-related impacts. It shall also explicitly detail the process or processes required to restore habitats. The HRRP shall, at a minimum, include the following Project-specific information and sections:

  1. <u>Soils and Seed Bank Management</u>

a) A soil baseline study shall be conducted, by a qualified restoration ecologist with soils expertise, to inform soil requirements relative to habitat restoration for temporarily disturbed areas of the site. The results of this study shall be included in the HRRP and will be used to inform the development of a topsoil harvest and stockpiling plan outlined in the HRRP, and will outline methods for preserving the seed bank present in the removed topsoil.

b) The HRRP shall include details for topsoil salvage, if needed, and proper storage, and shall identify areas within the construction footprint where topsoil is present, supports native vegetation or common non-native grasses characteristic of the grasslands on the site, does not support dense weed infestations, and can be salvaged and stockpiled for later replacement following ground-disturbing activities. The soil baseline study shall characterize topsoil by its depth to impervious layer, nutrient levels, texture, organic matter, permeability, and water-holding capacity.

c) The HRRP shall also identify areas where topsoil stockpiling and replacement would not be warranted due to low development of the existing seed bank and organic material. The harvesting, stockpiling, and spreading of topsoil and seed bank shall also be monitored by a qualified restoration ecologist with a soils background.

d) The HRRP shall require that at least 6 inches of topsoil be salvaged from the areas identified in the plan. These stockpiles shall not be mixed with spoil material, trash, materials such as road base or aggregate, or topsoil containing heavy weed seed banks. The allowable duration for stockpiling and management of stockpiles that will maintain healthy soil conditions shall be stipulated in the HRRP. The HRRP shall stipulate BMPs to discourage erosion of the topsoil stockpiles, including planting cover crops, roughening the pile, using fiber rolls, employing temporary stabilization measures, or other measures, as determined by the potential for erosion of the pile from rain and wind.

e) All redistribution of stored topsoil shall be completed prior to final site inspection (for the close of Project construction work).

f) Soils temporarily disturbed by trenching activities shall be replaced immediately to the extent practicable following placement of cables, and the amount of time open trenches are left on site shall be minimized to the extent practical.

g) Areas where substantial soil compaction has occurred shall be treated with light ripping or other methods intended to rectify compaction, as recommended by the qualified restoration ecologist. The HRRP shall outline the methods for assessing whether substantial compaction requiring active restoration has occurred, based on information gathered in the soil baseline study.

h) No fertilization of disturbed soils shall be prescribed unless recommended by the qualified restoration ecologist. As appropriate, highly disturbed soils lacking topsoil replacement may be amended with certified weed-free mulch.

i) For wetlands and stream habitats where needs differ from the soil restoration needs in upland soils, the HRRP shall stipulate measures to completely restore fragile soils in wetlands and to maintain existing streambed substrate characteristics following restoration of these habitats after temporary disturbance.

2. Temporary Disturbance Mapping

   a) The HRRP shall include detailed figures showing the areas proposed to be temporarily disturbed during Project construction. Such figures shall be updated as needed to reflect design changes and areas requiring active restoration actions.

3. Supplemental Restoration Actions

   a) The HRRP will stipulate specific performance criteria that identify when areas require additional methods beyond topsoil replacement and soil restoration. In areas requiring active reseeding beyond topsoil replacement, the species composition proposed for reseeding shall be substantially similar to or improve on pre-construction vegetation community composition, excluding invasive non-native species and rare plant species. The latter may have very specific microhabitat requirements that may not be possible to replicate after disturbance. A range of seeding palettes will be stipulated in the HRRP, and these shall differ as needed between various habitat types. For example, native perennial grasses shall be required as a component of the palette for impacted areas of serpentine bunchgrass grasslands or Valley needlegrass grasslands. Non-native species that are dominant within and characteristic of disturbed habitats may be included, as long as they are not specifically prohibited by the project Vegetation and Invasive Species Management Plan (see measure B-2[c] below). The intent of the seeding palettes shall be to maintain or increase native species coverage, reduce establishment of damaging invasive species, and preserve current wetland vegetation types present on the site. A description of the preferred methods for planting (e.g., hydroseeding, drill seeding, aerial broadcast seeding, or others) within differing habitats or impact types shall be provided, as well as details regarding irrigation, if needed. If seed is to be collected for redistribution from onsite species, collection protocols and areas shall be outlined.

4. Monitoring

a) All areas subject to temporary disturbance and requiring restoration actions under the HRRP shall be monitored by a qualified restoration ecologist so that restoration success can be determined and relevant recommendations can be made for successful habitat establishment. Monitoring shall consist of both qualitative and quantitative assessment programs.

b) Both qualitative and quantitative monitoring shall be required in all restored areas for at least two years following construction. Failure to meet pre-defined success criteria after two years of at least average annual rainfall will trigger remedial actions; however, as vegetation growth is lower during below-average rainfall years failure to meet success criteria during years with lower than average rainfall will simply entail a longer monitoring duration until it can be determined that the restoration success requires remedial actions and the site is not simply being affected by below-average rainfall. Average rainfall is defined in this context as the 30-year average for the site (1981–2010), established by the Parameter-elevation Regressions on Independent Slopes Model (PRISM) Climate Group, or 13.12 inches per year (PRISM 2013). The actual annual rainfall must be measured using an onsite rain gauge, and if the actual measured precipitation does not meet this level by the end of the rainy season, these monitoring results will still be reported, but monitoring will continue until the monitoring data set includes at least two years in which this precipitation level is met or until success criteria are met in two monitoring years.

c) Qualitative survey results shall discuss species composition, growth and survivorship, germination success, invasive plant infestations, and areas where restoration was not successful in re-establishing adequate vegetation cover to prevent erosion and sedimentation-related impacts. Qualitative monitoring shall occur on a quarterly basis for the first year. This timing shall allow remedial actions to be identified and enacted as necessary following restoration to achieve success criteria in advance of the final success/failure determination. Monitoring reports shall be submitted to the County every six months (after two qualitative monitoring events) for the first year following restoration. Qualitative monitoring shall then occur once per year in conjunction with quantitative monitoring until two years of average rainfall have occurred or until successful restoration is achieved via attainment of the pre-defined success criteria.

d) Quantitative monitoring shall occur annually for years one and two, or longer until pre-defined success criteria are met in two years of monitoring as described above. As described above, failure to meet success criteria during below-average rainfall years will lengthen monitoring duration, but will not necessarily require the commencement of remedial actions until and unless it is determined in a year with normal precipitation these criteria are still not being met. In year one, quantitative monitoring shall take place in January, April, and July. In year two and in any subsequent years that this monitoring is required due to low rainfall and/or failure to meet success criteria, monitoring shall occur in May.

e) The HRRP will establish pre-defined success criteria for both qualitative and quantitative monitoring activities. A qualified restoration ecologist shall use baseline vegetation data from the impact areas or from reference areas to set comparative success criteria across the site. The success criteria will be defined separately for each habitat type. These criteria will: 1) identify the duration of monitoring sufficient to indicate that the restoration habitat is on a clear trajectory toward successful establishment if this differs from the minimum two years required (e.g., if a given habitat takes six years to reach full maturity, one might monitor it for three years to establish the restoration trajectory), 2) specify interim quantitative habitat performance criteria that can be used to track habitat development at intervals during the monitoring period-these may either be predetermined based on a vegetation survey of the impacted habitat or may be tied to reference sites, 3) specify final quantitative success criteria for each habitat that indicate that the habitat is likely to ultimately develop functions and values comparable to the impacted habitat, and 4) specify final qualitative and quantitative success criteria that demonstrate that the restoration areas exhibit minimal erosion and that invasive plant species cover does not exceed that of reference habitats.

f) Quantitative monitoring shall be conducted in one-square-meter quadrats and shall include the following data at a minimum:

   i. Species composition and cover data

   ii. Bare ground cover data

   iii. Canopy height

   iv. Hydric soil indicators (in wetlands)

g) These data shall be used to measure and report native species coverage, native and non-native species recruitment, and hydrology within restored wetlands, and to compare these to the pre-established success criteria. Based on these results, the restoration ecologist shall make specific recommendations for remedial actions, if required. Reports shall be submitted to the County twice annually for the first year of monitoring (by 31 January and by 31 July) and once annually by 31 January during all subsequent years of monitoring. Each HRRP monitoring report shall include the following information at a minimum:

i. The name, title, and company of all persons involved in restoration monitoring and report preparation

ii. Maps or aerials showing restoration areas, transect locations, and photo documentation locations

iii. An explanation of the methods used to perform the work

iv. An assessment of the treatment success

- *Manage Site Vegetation During Project Operations (Mitigation Measure B-2(c) of the August 2014 DEIR).* Before the construction permit is issued, California Flats shall retain a qualified restoration or plant ecologist with rangeland management experience to prepare a Project-specific Vegetation and Invasive Species Management Plan (PVIMP), to be administered during operation of the Project in the array fields and other applicable areas of the Project site. The comprehensive plan shall be intended to maintain acceptable fuel loads and prevent the introduction or spread of non-native invasive species associated with the disturbance resulting from the Project.

  The PVIMP shall be an adaptive management tool. Vegetation management strategies and weed control efficacy shall be evaluated over time. Modifications to the strategies used or to the techniques used to accomplish each strategy shall be implemented based on results, experience, and the latest research. If grazing is not feasible on the project site, comparable alternative methods of vegetation management (e.g., mowing) may be used.

  The PVIMP shall also describe BMPs to avoid the unintentional introduction of invasive species to and from the site, describe monitoring measures to ensure that any invasions are detected before they become substantial, and describe species-specific control measures that shall be implemented if invasions occur.

  The PVIMP shall be submitted to the County prior to the notice to proceed, and shall address the entire project site. This submittal shall further describe the process by which the PVIMP shall be implemented (e.g., the entity responsible for implementing it, funding mechanisms, and reporting procedures). The PVIMP shall include, but is not limited to, the following:

1. detailed measures to promote the persistence of native grassland species, including listed and rare plant species in the vicinity of, but not removed by, the Project;

2. a description of exclusion fencing, if warranted to protect avoided riparian habitats and jurisdictional waters within the arrays;
3. in areas subject to grazing management, development of an RDM monitoring plan that shall inform adaptive management and the rates, timing, and duration of livestock grazing actions planned from year to year, determined by annual climatic patterns and the response of herbaceous vegetation to impacts from the solar panels and plant operations (e.g., panel washing);
4. a plan for adaptive strategies to manage grazing or other vegetation management actions to benefit native wildlife and vegetation and avoid or minimize the establishment of invasive weeds, to the degree practicable;
5. a description of alternate acceptable vegetation control methods and triggers for their use, including weed whacking, mowing, herbicides, and others;
6. a description of annual monitoring stipulated for weeds within the Project site and measures for controlling weeds, both prior to ground disturbance and annually during operation of the Project;
7. a plan for the use and application of herbicides, which may be prescribed only by a licensed Pest Control Advisor and applied only by a licensed applicator; specific prohibitions on herbicide use and application (e.g., no application of herbicides when winds are in excess of 10 MPH or within 50 feet of wetlands) including prohibition near amphibian habitat shall be included;
8. a detailed plan for the washing of all ground-disturbing equipment before it is transported to the site or is used at another site, and for washing equipment within the site if it has worked in infested areas before being used elsewhere on the site;
9. a detailed plan for preventing the spread of New Zealand mud snails within the site; the plan shall include thorough washing of equipment and the footwear of construction personnel, or drying for two weeks following work in wetted stream channels that may support the species; and
10. details for placing and maintaining an onsite wash station for washing heavy equipment that has worked in infested areas before moving elsewhere on the site, and performance criteria for the control and disposal of wash water and collected sediment; and treatment and disposal requirements for weed-infested topsoil.

Conservation Measures Implemented During Pre-Construction and Construction

California Flats is committed to the following species-specific, as well as more general, avian and bat conservation measures to be implemented during the period immediately prior to construction and throughout the construction phase. Additionally, the Lake and Streambed Alteration

Agreement (1600 Permit) issued by the CDFW requires non-disturbance buffers for nesting avian and roosting bat species within aquatic work areas and a 250-foot radius. The 1600 Permit notes further that due to special status designations and differing nesting periods, separate avian survey and avoidance requirements are required for burrowing owl, golden eagle, bald eagle, and white-tailed kite.

1. *Conduct Pre-construction Surveys for Nesting and Breeding Raptors and Other Birds (Mitigation Measure B-1(r) of the August 2014 DEIR).* Not less than 30 days prior to initiation of construction activities (incl. mobilization, staging and ESA fence installation) during the breeding season (1 February to 15 September), a qualified biologist shall conduct preconstruction surveys for raptors and MBTA/state regulated birds. The survey for the presence of nesting raptors, including golden eagles, shall cover all areas within of the disturbance footprint plus a 1-mile buffer where access can be secured. The survey area for all other nesting bird species shall include the disturbance footprint plus a 300-foot buffer. The surveys shall be repeated during the breeding season for each subsequent year of construction to ensure that ongoing construction activities avoid impacts to nesting birds.

   If active nests (nests with eggs or chicks) are located, the qualified biologist shall establish an appropriate avoidance buffer ranging from 50 to 300 feet based on the species biology and the current and anticipated disturbance levels occurring in vicinity of the nest. The objective of the buffer shall be to reduce disturbance of nesting birds. All buffers shall be marked using high-visibility flagging or fencing, and, unless approved by the qualified biologist, no construction activities shall be allowed within the buffers until the young have fledged from the nest or the nest fails.

   For golden eagle nests identified during the preconstruction surveys, an avoidance buffer of up to one mile shall be established on a case-by-case basis in consultation with the USFWS, and shall depend on the existing conditions and disturbance regime, relevant landscape characteristics, and the nature, timing, and duration of the expected development disturbance. The buffer shall be established between 1 February and 31 August; however, buffers may be relaxed earlier than 31 August if a qualified ornithologist determines that a given nest has failed or that all surviving chicks have fledged.

2. *Preconstruction Surveys for Burrowing Owl (Mitigation Measure B-1(l) of the August 2014 DEIR).* No more than 14 days before the start of initial ground disturbing activities, a qualified ornithologist(s) shall conduct focused, pre-construction, take-avoidance surveys for burrowing owls within all areas proposed for ground disturbance that contain suitable owl habitat (CDFG 2012). Preconstruction surveys shall be consistent with CDFW-recommended methods described in the Staff Report on Burrowing Owl Mitigation (CDFG 2012; Appendix B), and be conducted on foot such that 100% of the survey area is visible, and shall cover the entire limits of disturbances plus a 500-foot buffer. If the project is developed in phases, the preconstruction surveys shall be timed to coincide with the start of each phase, rather than the entire site being surveyed at one time. All observations of burrowing owl and sign of burrowing owl (including suitable burrows, pellets, whitewash)

shall be mapped on a site-specific aerial image. A report of the survey finds shall be submitted to the County prior to initiation of construction activities.

If suitable burrows for burrowing owls are identified during preconstruction surveys, mitigation measure B-1(m) shall be implemented.

Burrowing Owl Avoidance and Minimization Measures (Mitigation Measure B-1(m) of the August 2014 DEIR). If suitable burrows for burrowing owls are found during preconstruction surveys on the project site; burrowing owl occupancy shall be determined through up to three additional focused surveys on potential burrows during the morning and/or evening survey windows as defined in the Staff Report on Burrowing Owl Mitigation (CDFG 2012; Appendix B). If the burrows are determined to be unoccupied, they shall be hand excavated by a qualified biologist in the same manner as described under B-1(g).

If the presence of burrowing owls is confirmed, the following avoidance measures shall be implemented.

a) Occupied burrows shall not be disturbed during the nesting season (1 February through 31 August) unless a qualified biologist verifies, through noninvasive methods, that either (1) the birds have not begun egg-laying and incubation, (2) a previously active nest has failed and renesting is highly unlikely, or (3) all juveniles from the occupied burrow are foraging independently and capable of independent survival. Owls present after 1 February shall be assumed to be nesting unless evidence indicates otherwise. Nest-protection buffers described below shall remain in effect until 31 August or, based upon monitoring evidence, until the nest has failed or all juvenile owls are foraging independently as determined by a qualified biologist.

b) Site-specific, no-disturbance buffer zones shall be established and maintained between Project activities and occupied burrows, using the distances recommended in the CDFW guidelines (CDFG 2012; Appendix B):

Time of Year	Level of Disturbance		
	Low	Med	High
April 1 – Aug 15	200 meters	500 meters	500 meters
Aug 16 – Oct 15	200 meters	200 meters	500 meters
Oct 16 – Mar 31	50 meters	100 meters	500 meters

The appropriateness of using reduced buffer distances or burrow-specific buffer distances shall be established on a case-by-case basis by a qualified ornithologist who may consult with CDFW, and shall depend on existing conditions (e.g., vegetation/topographic screening and current disturbance regimes). If necessary, buffer distances shall be carefully reassessed and relaxed or modified, based on future development plans (e.g., increased or

intensified construction activities), by a qualified biologist who may consult with CDFW. The buffer zones shall be clearly delineated by highly visible orange construction fencing, which shall be maintained in good condition through construction of project or until construction activities are no longer occurring in the vicinity of the burrow.

c) During the nonbreeding season (generally 1 September–31 January), a qualified ornithologist may passively relocate burrowing owls found within construction areas. Prior to passively relocating burrowing owls, a Burrowing Owl Exclusion Plan shall be prepared by a qualified biologist in accordance with Appendix E of the Staff Report on Burrowing Owl Mitigation (CDFW, 2012). The Burrowing Owl Exclusion Plan shall be submitted to the CDFW and County for review and approved by the County prior to implementation.

The biologist shall accomplish such relocations using one-way burrow doors installed and left in place for at least two nights; owls exiting their burrows will not be able to re-enter. Then, immediately before the start of construction activities, the biologists shall remove all doors and excavate the burrows to ensure that no animals are present the burrow. The excavated burrows shall then be backfilled. To prevent evicted owls from occupying other burrows in the impact area, the biologist shall, before eviction occurs, (1) install one-way doors and backfill all potentially suitable burrows within the impact area, and (2) install one-way doors in all suitable burrows located within approximately 50 feet of the active burrow, then remove them once the displaced owls have settled elsewhere. When temporary or permanent burrow-exclusion methods are implemented, the following steps shall be taken:

a) Prior to excavation, a qualified biologist shall verify that evicted owls have access to multiple, unoccupied, alternative burrows, located nearby (within 250 feet) and outside of the projected disturbance zone. If no suitable alternative natural burrows are available for the owls, then, for each owl that is evicted, at least two artificial burrows shall be installed in suitable nearby habitat areas. Installation of any required artificial burrows preferably shall occur at least two to three weeks before the relevant evictions occur, to give the owls time to become familiar with the new burrow locations before being evicted. The artificial burrow design and installation shall be described in the Burrowing Owl Exclusion Plan per Appendix E of the Staff Report on Burrowing Owl Mitigation (CDFW, 2012).

b) Passive relocation of burrowing owls shall be limited in areas adjacent to Project activities that have a sustained or low-level disturbance regime; this approach shall allow burrowing owls that are tolerant of Project activities to occupy quality, suitable nesting and refuge burrows. The use of passive relocation techniques in a given area shall be determined by a qualified biologist who may consult with CDFW, and shall depend on existing and

future conditions (e.g., time of year, vegetation/topographic screening, and disturbance regimes). *Conduct Pre-construction Golden Eagle Surveys (MM BIO-18).* Beginning in 2013, and continuing each year during construction, a qualified ornithologist shall conduct surveys for nesting golden eagles and monitor all occupied territories/nests located within 2 miles of the Project site and access road. This monitoring shall support implementation of appropriate no-disturbance nest buffers. The ornithologist shall monitor the success and productivity of all proximate nesting territories. These surveys shall follow guidelines outlined by USFWS (Pagel et al. 2010) and Driscoll (2010), and shall be scheduled to (1) enable accurate mapping of all occupied territories within 2 miles of the Project site and (2) generate estimates of nesting success and productivity, according to standards reflected in Steenhof and Newton (2007) and in the above references.

3. *Bat Preconstruction Surveys and Avoidance (Mitigation Measure B-1(q) of the August 2014 DEIR).* A qualified biologist shall conduct an acoustic survey during the maternity season (1 March to 31 July) before any grading or removal of trees, particularly trees 12 inches in diameter or greater at 4.5 feet above grade with loose bark or other cavities. An additional survey for non-maternity roosts shall be conducted not less than 30 days prior to the start of construction. If no active roosts are found, no further action shall be required.

   If active maternity roosts or hibernacula are found, the structure or tree occupied by the roost shall be fully avoided and not removed or otherwise impacted by Project activities during the maternity season. A minimum 100-foot ESA avoidance buffer shall be demarcated by highly visible orange construction fencing around active maternity roosts. No construction equipment, vehicles or personnel shall enter the ESA without clear permission from the qualified biologist. ESA fencing shall be maintained in good condition for the duration of the maternity season. The roost shall be removed only after the maternity season has ended, and shall be removed under the direction of a qualified biologist.

   If active non-maternity bat roosts (e.g., bachelor colonies, hibernacula) are found in trees scheduled to be removed or in rocky crevices within the grading footprint, the individuals shall be safely evicted (e.g., through installation of one-way doors) under the direction of a qualified bat biologist in consultation with the CDFW. In situations requiring one-way doors, a minimum of one week shall pass after doors are installed to allow all bats to leave the roost. Temperatures need to be sufficiently warm for bats to exit the roost, because bats do not typically leave their roost daily during winter months in coastal California. Eviction shall be scheduled to allow bats to leave during nighttime hours, thus increasing their chance of finding new roosts with a minimum of potential predation during daylight.

Conservation Measures Implemented During Construction and Operations

California Flats is committed to the following conservation measures to be implemented during the construction phase and remain in place throughout the duration of the Project, per Mitigation Measure B-1(s) of the August 2014 DEIR.

1. Cap Vertical Pipes and Piles. To prevent cavity-dwelling and -nesting birds from entering open vertical pipes and piles, all open vertical pipes and piles shall be capped or otherwise modified to prevent use by birds. Caps or other modifications shall be put in place before or immediately after pipe or pile installation. All caps or other exclusionary modifications shall be maintained for the duration of construction and operation. A qualified biologist shall periodically monitor the site to ensure that all pipes or piles are appropriately capped.
2. Avian/Power Line Collision Avoidance and Minimization. Install bird flight diverters in accordance with the Avian Power Line Interaction Committee (APLIC) guidelines for reducing avian collisions with power lines. California Flats shall construct the 230-kV transmission line in accordance with the applicable measures for installing bird flight diverters, of the most recent APLIC guidelines for minimizing avian collisions (Reducing Avian Collisions with Power Lines; APLIC 2012). Details of design components shall be indicated on all construction plans. California Flats shall monitor for new versions of the APLIC collision guidelines and update designs or implement new measures as needed during Project construction, provided these actions do not require the purchase of previously ordered transmission line structures. All bird flight diverters shall be maintained for the duration of construction and operation.
3. Avian Electrocution Avoidance and Minimization. Implement Project-specific design measures in accordance with the APLIC guidelines for minimizing avian electrocutions. California Flats shall construct and maintain all transmission facilities, towers, poles, and lines in accordance with applicable policies set forth in the most recent APLIC guidelines for minimizing avian electrocutions (Avian Protection Plan Guidelines; APLIC 2006). Specific APLIC guidelines to be incorporated into the design of the transmission lines to minimize avian electrocutions shall include the following:
    1. Design the tops of structures to be safe for perching raptors.
    2. Provide 60 inches separation between energized conductors and:
        i. energized conductors,
        ii. grounded or neutral conductors,
        iii. pole line hardware that could provide a perch or nesting place, and
        iv. overhead shield wires, including optical ground wire shield wire.
    3. Ensure that all exposed jumper cables are completely covered with a cover of a qualified insulation rating.
    4. Ensure insulation of all energized arresters with covers and insulated cables.

    Details of design components shall be indicated on all construction plans. California Flats shall monitor for new versions of the APLIC guidelines and update designs or implement new measures as needed during Project construction, provided these actions do not require the purchase of previously ordered transmission line structures.

In addition to Mitigation Measure B-1(s) as described above, California Flats will implement an avian fatality monitoring program at the start of operation and will continue for at least two years (see Section 8.0), will follow nest management practices for new bird nests discovered during operations (see Section 9.0), and will develop a Wildlife Incident Reporting System (WIRS) to be implemented for the life of the Project (see Section 10).

Compensatory Habitat Mitigation

San Joaquin Kit Fox and Other Grassland Species

To mitigate the permanent loss of potential San Joaquin kit fox habitat, California Flats shall provide compensatory mitigation acreage, adjusted to reflect the final Project footprint. For purposes of the compensatory mitigation strategy, the San Joaquin kit fox has been identified as an "umbrella species," as its habitat requirements overlap with many other species potentially affected by the Project. Through the compensatory mitigation described below for both the general nested compensatory measures and the kit fox mitigation measures, California Flats shall provide mitigation habitat of equal or greater habitat value for kit fox and the following grassland-dependent species: American badger (*Taxidea taxus*), raptors and other special-status birds, golden eagle, San Joaquin coachwhip (*Coluber flagellum ruddocki*), coast horned lizard (*Phrynosoma blainvillii*), western spadefoot toad (*Spea hammondii*) upland habitat, and pronghorn. Therefore, discussion of this mitigation is included in the BBCS due to the overlapping benefits to grassland-dependent avian and bat species.

Nested Compensatory Mitigation (Mitigation Measure B-1(a) in August 2014 DEIR). California Flats shall provide conservation easements or funds for acquisition of conservation easements as compensatory mitigation to offset impacts to vegetative communities and listed or special status plants and wildlife. The compensatory mitigation shall incorporate the conditions specified in incidental take permits that could be issued by CDFW and USFWS for this project, but shall meet the minimum standards specified in this measure. Compensatory mitigation shall be provided at a ratio of not less than those specified in mitigation measures B-1(e), B-1(j), B-1(n), B-1(v), B-1(z), and B-1(cc). Compensatory mitigation for multiple species may be combined to mitigate for impacts to multiple species simultaneously (i.e. nested compensatory mitigation). Areas proposed for preservation and serving as compensatory mitigation for special status species impacts must contain verified extant populations of the special status species that would be impacted by the project. Compensatory mitigation areas shall have a restrictive covenant prohibiting future development/disturbance and shall be managed in perpetuity to encourage persistence and enhancement of the preserved target species. Compensatory mitigation lands cannot be located on land that is currently held publicly for resource protection. The compensatory mitigation areas shall be managed by a conservation lands management entity or other qualified easement holder.

California Flats shall either provide conservation easements or provide funds for the acquisition of such easements to a qualified easement holder as defined below. The CDFW and organizations approved by CDFW that meet the criteria below may be considered qualified easement holders for those species for which the CDFW has regulatory authority. To qualify as a "qualified easement holder" a private land trust must at a minimum have:

1. Substantial experience managing conservation easements that are created to meet mitigation requirements for impacts to special-status species;

2. Adopted the Land Trust Alliance's Standards and Practices; and

3. A stewardship endowment fund to pay for its perpetual stewardship obligations.

Other specific conditions for qualified easement holders may be outlined in incidental take permits that could be issued by CDFW and USFWS for this project.

The County shall determine whether a proposed easement holder meets these requirements. California Flats shall also be responsible for donating to the conservation easement holder fees sufficient to cover administrative costs incurred in the creation of the conservation easement (appraisal, documenting baseline conditions, etc.) and funds in the form of a non-wasting endowment to cover the cost of monitoring and enforcing the terms of the conservation easement in perpetuity. The amount of these administrative and stewardship fees shall be determined by the conservation easement holder in consultation with the County.

The primary purpose of the conservation easement(s) shall be conservation of impacted species and habitats, but the conservation easement(s) shall also allow livestock grazing when and where it is deemed beneficial for the habitat needs of impacted species. Conservation easement(s) shall be held in perpetuity by a qualified easement holder (as defined above), be subject to the management requirements outlined in the Habitat Mitigation and Monitoring Plan (HMMP; see measure B-1[b]), and be subject to a legally binding agreement that shall: (1) Be recorded with the County Recorder(s); and (2) Contain a succession clause for a qualified easement holder if the original holder is dissolved.

Land Acquisition Requirements. The following factors shall be considered in assessing the quality of potential mitigation habitat: (1) current land use, (2) location (e.g., habitat corridor, part of a large block of existing habitat, adjacency to source populations, proximity to potential sources of disturbance), (3) vegetation composition and structure, (4) slope, (5) soil composition and drainage, and (6) level of occupancy or use by all relevant species.

To meet the requirement that the mitigation habitat is of value equal to, or greater than, the Project site, the mitigation habitat must be either "suitable habitat" or "enhanced habitat":

Suitable Habitat. To meet the requirements for suitable habitat that provides equal or greater habitat value for special status animal species than the impacted habitat, the habitat must:

1. provide habitat for special status animal species, such that special status animal species populations can regenerate naturally when disturbances are removed;

2. not be characterized by (or adjacent to areas characterized by) high densities of invasive species, such as yellow star-thistle, or species that might jeopardize habitat recovery and restoration;
3. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and
4. not be located on land that is currently publicly held for resource protection.

Enhanced Habitat. If suitable habitat is unavailable, or in lieu of acquiring already suitable special status animal species habitat, California Flats may enhance potential habitat that:

1. is within an area with potential to contribute to habitat connectivity and build linkages between known San Joaquin kit fox populations;
2. consists of actively farmed land or other land containing degraded habitat that will support enhancement;
3. supports suitable soils, slope, and drainage patterns consistent with special status animal species requirements;
4. cannot be located on land that is currently held publicly for resource protection; and
5. does not contain hazardous wastes or structures that cannot be removed to the extent that the site could not provide suitable habitat.

Enhanced Habitat Standards. For enhanced habitat conditions to equal or exceed habitat conditions on the project site, the enhanced habitat shall meet the following habitat criteria. After five years, these sites must consist of annual grasslands, other grassland vegetation, suitable aquatic habitat, suitable foraging habitat (e.g. habitat is within 10 miles of known nesting golden eagles) or other habitat characteristics (e.g. suitable burrows for burrowing owls, small mammal burrows in upland habitat for CTS, etc.) that are consistent with the known ecology of the special status animal species to which compensatory mitigation is being applied.

Compensatory Habitat Mitigation for San Joaquin Kit Fox (Mitigation Measure B-1(j) in August 2014 DEIR). To mitigate for the loss of potential San Joaquin kit fox habitat from the installation of all new facilities, except the SDAs, California Flats shall provide compensatory mitigation acreage, adjusted to reflect the final Project footprint, at a 3:1 ratio (preserved habitat: affected habitat). The compensatory mitigation must provide equal or greater habitat value than the Project site.

To mitigate for the impacts to potential San Joaquin kit fox habitat within the SDAs, California Flats shall provide compensatory mitigation acreage, adjusted to reflect the final footprint of the SDAs in consultation with CDFW, but at a minimum of 2:1 ratio. All compensatory mitigation must comprise habitat of value equal to, or greater than, the Project site.

Compensatory mitigation areas for San Joaquin kit fox can be combined with mitigation for multiple species as outlined in measure B-1(a) for nesting mitigation. Compensatory mitigation for San Joaquin kit fox shall be consistent with the conditions outlined in the above measure B-1(a), and managed and monitored under the HMMP as outlined in mitigation measure B-1(b) (Section 7.5.5).

Streams and Riparian Habitat (Mitigation Measure B-2(j) in August 2014 DEIR)

Discussion of mitigation measures that will be utilized to offset impacts to stream and riparian habitat are included in the BBCS due to the overlapping benefit to avian and bat species that will utilize the preserved and enhanced habitat.

Perennial stream/channel wetlands and associated riparian habitat shall be preserved and enhanced to compensate for permanent impacts to riparian and stream habitats, in a manner that achieves no net loss in acreage or function, and should be consistent with the USFWS Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998) if possible. Enhancement of the preserved habitat shall be site-specific, according to opportunities available at the preservation site and may include riparian vegetation plantings, weed removal, and alteration in grazing management such as changes in stocking, timing, or installation of riparian exclusion fencing.

Permanent impacts to perennial streams and the associated riparian habitat shall be mitigated at a 3:1 ratio (linear feet of stream and associated riparian corridor preserved and enhanced: linear feet of perennial stream and associated riparian corridor impacted); impacts to intermittent streams shall be mitigated at a 2:1 ratio (linear feet preserved and enhanced: linear feet impacted); and impacts to ephemeral streams shall be mitigated at a 1:1 ratio (linear feet preserved: linear feet impacted). The design, monitoring schedule, and success criteria for the mitigation site shall be described in a Project Wetland Mitigation and Monitoring Plan (described in detail in mitigation measure B-3(d) [Section 7.5.3], below) that demonstrates no net loss in acreage or function. Preserved riparian corridors, and any surrounding uplands above the top of bank within the area to be preserved, shall be placed in a conservation easement or similar legal mechanism and managed in perpetuity.

Wetlands (Mitigation Measure B-3(d) in August 2014 DEIR)

Discussion of mitigation measures that will be utilized to offset impacts to wetlands are included in the BBCS due to the overlapping benefit to avian and bat species that will utilize the created, preserved and enhanced habitat.

To compensate for permanent impacts to wetlands on site, offsite wetlands shall be created, preserved, and managed in perpetuity at a 2:1 mitigation ratio (acres created and preserved: acre impacted). Permanent loss includes all wetlands affected by permanent fill placement (which may occur, for example, from mass grading or new road or structure placement, including panel footing placement). In the areas of seasonal wetlands under solar panels (i.e., not the area affected by fill placement but the remainder of the wetland area under the array), some degradation of the wetland is expected; however, it is also anticipated that these areas would continue to provide

residual wetland functions and values in at least a portion of the affected wetland. As such, these areas shall be mitigated through creation of offsite wetlands at a 1.5:1 ratio (acres created and preserved: acre impacted). Permanent impacts to wetlands within streams that will be affected by construction of road crossings (see Impact B-2 in the DEIR) shall be mitigated by creating off-site wetlands at a 1:1 ratio; these areas shall also be mitigated through preservation and management of riparian and stream habitat (see mitigation measure B-2[i] in the DEIR). By concurrently providing 1:1 wetland creation mitigation for such impacts, no net loss of wetlands will occur, and lost values and functions will be compensated (Table 4).

Temporary impacts to wetlands and other waters shall be mitigated through onsite restoration as described in mitigation measure B-2(b) (HRRP), if impacts are restored within a single year, with most restoration expected to occur at the onset of the rainy season to enhance germination success (i.e., areas impacted in a given year must be restored prior to 1 March of the following year to be considered temporary and require no additional mitigation). Areas of construction access-related temporary impacts that cannot be restored prior to 1 March the following year and would remain exposed during the dry season shall be restored the following fall. Compensatory mitigation for such long-term temporarily impacted areas shall be provided at the offsite location at a ratio of 0.5:1 of wetland creation (acres created and preserved off site: acres temporarily impacted for more than one rainy season). Impact areas left unrestored for two rainy seasons shall be compensated off site at a 1:1 ratio, and additionally shall be restored on site. Temporary impacts to groundwater-fed wetlands due to hydrological interruption from a new well(s) shall be determined per mitigation measure B-3(c) of the DEIR and shall be mitigated off site at a ratio of 1:1 if success criteria are met and the wetlands are restored to pre-Project function within three years of the date of well construction. If functions and values are lost for more than three years, the impacts shall be considered permanent, and compensatory mitigation shall be provided at a 2:1 ratio (Table 4). Permanent impacts to any streams fed by such wetlands shall be mitigated as per mitigation measure B-2(i). Table 4 below provides a summary of the various mitigation ratio requirements for each impact type. The permanent protection and management of the constructed mitigation wetlands shall be ensured through an appropriate mechanism, such as a conservation easement granted to a public or private entity authorized by Section 815.3 of the California Civil Code to acquire and hold conservation easements, deed restriction, or fee title purchase.

Table 4. Mitigation Ratios for Wetland Impacts (Ratios to Be Applied to Actual Impacts Determined from Construction Plans and Well Monitoring)

Impact Type	Wetland Type and Action	Mitigation Ratio (Acres Created and Preserved to Acres Impacted)
Permanent fill	Seasonal wetland and perennial marsh impacts due to fill placement and loss (including panel footing areas)	2:1
Permanent shading	Seasonal wetland impacts from solar panel shading and placement (not including panel footing areas)	1.5:1
Permanent fill for road crossings	In-stream wetland impacts from road crossing construction	1:1
Temporary access (unrestored for longer than one rainy season)	Seasonal wetland and perennial marsh impacts from construction access not restored before 1 March of year following impact (but restored before two rainy seasons)	0.5:1
Temporary access (unrestored for more than two rainy seasons)	Seasonal wetland and perennial marsh impacts from construction access restored after two rainy seasons	1:1
Temporary dewatering (less than three years)	Groundwater-fed wetlands temporarily dewatered by new construction wells for three years or less	1:1
Permanent dewatering (greater than three years)	Groundwater-fed wetlands temporarily dewatered by new construction wells for more than three years, or failure to meet success criteria after three years following construction of well	2:1

A Project Wetland Mitigation and Monitoring Plan (WMMP) shall be prepared by a qualified restoration ecologist and shall include, at a minimum, the following information:

1. wetlands and waters impacts summary (as described by MM B-48 and this measure) and habitat mitigation actions;
2. goals of the restoration to achieve no net loss;
3. a map depicting the location of the mitigation site(s) and a detailed description of existing site conditions; and
4. a detailed description of the mitigation design, including:
5. location of the new wetlands;
6. proposed site construction schedule;
7. description of existing and proposed soils, hydrology, geomorphology, and geotechnical stability, as well as results of applicable soils testing conducted at the mitigation site;

8. a detailed description of the steps required for site preparation and a conceptual grading plan—a formal package for plan sets, specs, and estimates for the grading and mitigation construction work shall be prepared based on the concepts set forth in the WMMP no fewer than fifteen days prior to starting work at the mitigation site;
9. a description of recommended soil amendments and other site preparation;
10. development of a planting plan including details on plant procurement, if necessary, propagation, allowable species for seeding and relative pounds/acre, and application;
11. maintenance plan for the created wetlands and riparian plantings;
12. a description of specific monitoring metrics, and objective performance and success criteria, such as delineation of created area as jurisdictional wetland per USACE methods within five years of construction, minimum riparian tree and canopy cover measures in the enhanced stream reaches within ten years of restoration, and others;
13. monitoring methods for vegetation and soils, and measures stipulating quantitative monitoring to occur once per year for at least five years following construction of the wetlands or until success criteria are met;
14. a list of reporting requirements and reporting schedule; and
15. a contingency plan for mitigation elements that do not meet performance or final success criteria within five years for created wetlands and ten years for riparian enhancement; this plan shall include specific triggers for remediation if performance criteria are not being met and a description of the process by which remediation of problems with the mitigation site (e.g., presence of noxious weeds) shall occur.

Native Oak and Riparian Trees (Mitigation Measure B-5(b) in August 2014 DEIR)

Discussion of mitigation measures that will be utilized to offset impacts to native trees are included in the BBCS due to the overlapping benefit to avian and bat species that would utilize the replacement plantings.

Native tree loss is not anticipated to occur. However, if the project results in unavoidable or inadvertent loss of protected trees, as identified by the ISA-certified arborist during monitoring of work within any Tree Protection Zones (see also mitigation measure B-5[a] of the DEIR), California Flats shall replace the lost protected trees (native trees 6 inches or more in diameter at breast height) at a 3:1 ratio (replacement trees: removed trees). Mitigation plantings may be integrated with the mitigation of impacts to riparian woodlands and oak woodlands on the project site. Replacement trees shall be chosen to correspond to the habitat impacted by the tree removal; for example, valley oaks and blue oaks may be planted to replace trees removed from mixed oak woodlands or riparian oak woodlands, and cottonwood or willow may be planted to replace trees removed from willow-cottonwood riparian woodland. Individual planting locations shall be predetermined and mapped by a qualified restoration ecologist. Oak, cottonwood, and willow replanting stock shall be grown from native seed stock gathered within 25 miles of the project site. The removal of oak trees shall be further mitigated by preserving existing mature oak woodland at a 2:1 ratio (canopy preservation area: canopy removal area).

Habitat Mitigation and Monitoring Plan (Mitigation Measure B-1(b) in August 2014 DEIR)

To ensure the success of compensatory mitigation sites required for compensation of permanent impacts to vegetative communities and listed or special status plants and wildlife, California Flats shall retain a qualified biologist to prepare a Habitat Mitigation and Monitoring Plan (HMMP). The HMMP shall be submitted to the County within 12 months after the issuance of the grading permit. The HMMP shall include, at a minimum, the following information:

1. a summary of habitat and species impacts and the proposed mitigation for each element;
2. a description of the location and boundaries of the mitigation site(s) and description of existing site conditions;
3. a description of any measures to be undertaken to enhance (e.g., through focused management) the mitigation site for special status species;
4. identification of an adequate funding mechanism for long-term management and identification of a conservation lands management entity to manage the conservation easement lands;
5. a description of management and maintenance measures intended to maintain and enhance habitat for the target species (e.g., weed control, fencing maintenance);
6. in areas subject to grazing management, compilation of a dedicated, site-specific managed grazing plan, prepared by a Certified Rangeland Manager, for grassland habitats within the mitigation site(s), employing Residual Dry Matter (RDM) monitoring, and a description of the adaptive management scheme for this plan;
7. a description of habitat and species monitoring measures on the mitigation site, including specific, objective performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc.; monitoring shall document compliance with each element requiring habitat compensation or management;
8. a contingency plan for mitigation elements that do not meet performance or final success criteria within described periods; the plan shall include specific triggers for remediation if performance criteria are not met and a description of the process by which remediation of problems with the mitigation site (e.g., presence of noxious weeds) shall occur;
9. a requirement that California Flats shall be responsible for monitoring, as specified in the HMMP, for at least three years post-construction; during this period, regular reporting shall be provided to the County;
10. reporting shall include:
    a) an annual monitoring report to be submitted to the County; and
    b) for any species listed under the ESA or CESA, demonstration that the compensatory mitigation and management (1) will fully mitigate for any take of a CESA-listed species as defined by CESA, (2) minimize and mitigate any take of an FESA-listed species to the maximum extent practicable as defined by ESA, and (3) ensure that impacts from the project are not likely to jeopardize the listed species continued existence as defined by ESA.

8 POST-CONSTRUCTION MONITORING

Appendix F provides details of the avian and bat fatality study to be conducted during the post-construction period of the project. This study will be implemented for two years post-construction by an avian survey team. Data and results of the study will be used to inform adaptive management decisions, if necessary, and serve as a basis for fatality comparisons across other regional renewable energy projects.

9 NEST MANAGEMENT

9.1 GENERAL NEST MANAGEMENT

During construction, the Project must follow the avian protection and nest avoidance measures outlined in Project's Conditional Use Permit (CUP) issued by Monterey County as well as those listed in the CDFW 1600 permit – see Section 7 for a discussion of these measures. In addition, off-site mitigation for avian species is outlined in the Project's Habitat Mitigation and Monitoring Plan (HMMP).

Documentation of active nests located on Project structures will occur opportunistically by operations staff and during fatality or nest monitoring (see Section 8.0). Any discovered active nests whose presence does not compromise facility operations or personnel safety (e.g., such as a nest that creates a fire hazard or potential for a short-circuit when near/on exposed and energized equipment), will be allowed to proceed undisturbed until an approved biologist confirms that all young have fledged or the nest has failed. Provisions for minimizing disturbance of such nests (e.g., non-disturbance spatial buffers) will necessarily depend on the species, nest location, and proximity to essential facility operations and activities, and will be developed in consultation with a qualified biologist. Typically, these buffers will be 50 to 300 feet based on the species biology; raptor nest buffers could be up to 1,640 to 5,280 feet depending on the species (e.g., as described in Section 9.2, golden eagles could require buffers up to 5,280 feet). Finally, the Project will follow the 2003 USFWS *Migratory Bird Permit Memorandum, Nest Destruction Guidelines* to avoid destroying nests.

If necessary, procedures for removing problematic active nests (e.g., such as a nest that creates a fire hazard or potential for a short-circuit when near/on exposed and energized equipment) during the breeding season or inactive nests outside of the breeding season will follow existing state and federal regulations and be done in accordance with standard practices outlined in APLIC guidance (APLIC 2006). For ongoing nesting issues, it may be appropriate to 1) encourage birds to nest in desired areas through the installation of nesting platforms, boxes, or tubes, or 2) discourage nest construction in undesired locations through the installation of plastic piping, triangles, model owls, and/or small spikes on Project facilities (see APLIC 2006).

9.2 GOLDEN EAGLE NEST MANAGEMENT

Golden eagles are known to nest in the general vicinity of the Project and may continue to do so in the future. Presumably if eagles continue to nest in the vicinity of the Project, they would be expected to be tolerant to the presence of the Project facilities and routine O&M activities. Nevertheless, eagle nest surveys will be completed for the first two nesting seasons after operations of the Project has begun to better inform future golden eagle nest management. At the beginning of the golden eagle nesting season (February-March), these surveys will be conducted from the ground to identify any active eagle nests within at least one mile of Project facilities; good faith efforts will be made to obtain permission from neighboring property owners to increase this distance to two miles.

The ground surveys to identify and assess eagle nests within at least one mile of Project facilities will follow the recommendations included in the USFWS's Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010); good faith efforts will be made to obtain permission from neighboring property owners to increase this distance to two miles. These surveys will be completed by a qualified biologist from the fence line of the Project and on the land of neighboring property owners that allow access for this purpose in a manner that will allow for a good view of potential nesting habitat (and historic nest sites) that fall within at least one mile of the Project facilities. Surveys will be conducted during February and/or early March. Nests and nesting territories will only be designated as unoccupied after two ground observation periods have been completed that are separated by at least 30 days (e.g., the first period in early February, followed by a second period 30 days later in early March). Each of these observation periods will include a minimum of 4 hours of monitoring of eagle nests to confirm territory occupancy and/or nest activity. The qualified biologists conducting these surveys will have the equivalent of two season of intensive experience conducting survey and monitoring of golden eagles.

9.2.1 ROUTINE OPERATIONS AND MAINTENANCE ACTIVITIES

Routine O&M activities occur as needed and include module inspection, testing, maintenance, repair and replacement; equipment inspection, testing, maintenance, repair, and replacement; electrical production and facilities inspection and reporting, fence and security systems inspection, and module cleaning, as necessary. Most routine operations within one mile of any active onsite golden eagle nests can be performed outside of the nesting season. Other routine inspections and repairs occur throughout the year (e.g., once per month checks of major electrical equipment, biological surveys), and are typically completed with 2-4 workers in pickup trucks.

As discussed in Section 2, onsite personnel typically include a site manager/supervisor and 2 to 4 technicians depending upon the size of the power plant and technologies used. Upon assignment, onsite personnel receive thorough and specific training regarding permit conditions, environmental compliance and species-related requirements in effect during operations and maintenance.

Non-equipment site maintenance activities may also include vegetation management including mowing and grazing and the limited use of herbicides, biological surveys, fence and security systems maintenance and repair, road inspection and maintenance including re-grading and erosion repair, if necessary, and general upkeep of the O&M facility. In-array vegetation management, including grazing and mowing, is described in the Project Habitat Restoration and Revegetation Management Plan (HRRMP) (LSA, 2016). Except as needed to comply with regulatory requirements, mowing or road maintenance/re-grading will be performed outside of the nesting season. In the event mowing or road maintenance/re-grading must be completed during the nesting season within one mile of an active onsite golden eagle nest and inside the nest viewshed, and for road maintenance/re-grading also outside the nest viewshed, the Project will consult with USFWS biologists and ensure that a biological monitor is present.

Routine O&M activities generally utilize one to two vehicles or pieces of equipment with a minimum number of associated workers. This level of activity is consistent with ongoing ranching operations that have historically occurred in this area. The USFWS has provided general recommendations for eagle nesting and breeding protections (Appendix G). However, following discussions with the USFWS about unique site-specific conditions, it was decided that routine O&M activities, except as noted above for mowing and road maintenance/re-grading, would not routinely require buffers and would not require further consultation with USFWS biologists.

9.2.2 NON-ROUTINE OPERATIONS AND MAINTAINANCE ACTIVITIES

Non-routine O&M activities may periodically be required at the Project that involves more extended work activities and/or heavier equipment (see Section 2.0). Occasional non-routine repair or replacement of Project components (e.g., transformers, invertors, combiner boxes, etc.) may be needed. These non-routine repair or replacements – called “Corrective Maintenance” – may require larger machinery, such as cranes, boom trucks, excavators, or heavy-haul transport. All of these activities would be scheduled to avoid the active golden eagle nesting season whenever practicable.

If these non-routine O&M activities must occur within the one-mile radius of an historic or newly identified eagle nest in the area, a survey to confirm current nesting status will be completed. Consultation with USFWS will be conducted for non-routine O&M activities within one-mile of an active golden eagle nest, whether inside or outside of the viewshed. Finally, if deemed appropriate after consultation with USFWS, a biological monitor will be present during all non-routine O&M activities that are within one mile of an active eagle nest during the first two years of operations.

The biological monitor will have the authority to call for a Stop Work should the activity appear to be agitating the eagles or their nesting activities. If the golden eagles at the nest site appear to be habituated to or otherwise not disturbed by the activity, the nest monitor will document the eagle nest phenology, behavior of the eagles prior to and during the activities performed, and may determine that nest monitoring for this activity may no longer be necessary. In general, the biological monitor will also note the surrounding landscape topography, screening by topography

or site infrastructure, and level of activity that result in a response from the eagles. These observations with be shared with the USFWS.

Any future modifications to this eagle nest management protocol during non-routine O&M activities will closely consider the level and type of activity, nest location and viewshed, and the stage of the nesting chronology. For example, on-site monitoring may lead to reducing the 1-mile restrictive buffer to 0.5-mile during the later stages of nesting (e.g., post-brooding, and post-fledging dependency periods).

9.2.3 EMERGENCY REPAIRS

Emergency repairs needed to keep the Project connected to the electrical grid and producing electricity as a result of major equipment malfunction, electrical grid malfunction, or a natural disaster (e.g., earthquake, fire, storm) will be conducted in an expedient manner with consideration of nesting eagles in the Project vicinity to the maximum extent practicable depending on the emergency.

10 ADAPTIVE MANAGEMENT STRATEGY

The Department of the Interior defines adaptive management as “an iterative decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood” (Williams and Brown, 2012). California Flats has implemented adaptive management at the Project throughout pre-construction baseline data collection efforts and during project planning, siting, and design. Adaptive management measures will be implemented during construction and post-construction, as necessary. This adaptive management approach will include the following six key concepts described by Williams and Brown (2012):

1. problem assessment
2. design
3. implementation
4. monitoring
5. evaluation
6. adjustment

To facilitate meeting the BBCS objectives, California Flats will review the technical procedures of the monitoring studies, assess the scientific data and findings, and adjust various practices or measures, as necessary. California Flats will coordinate with the USFWS, CDFW and the County regarding the results of monitoring surveys and any proposed response action. This procedure does not replace regulatory authority or responsibility of these agencies.

The Project will submit survey results to the agencies in accordance with the post-construction monitoring program (see Appendix F). Based on results of post-construction monitoring, adaptive management measures could be considered based on an evaluation of certain relevant criteria:

1. take of an individual of a bird or bat species listed as endangered/threatened under the federal or state Endangered Species Act;
2. take of bald or golden eagles within the meaning of the BGEPA or
3. significant levels of mortality of unlisted species of birds or bats. Significance will be determined in coordination with wildlife agencies and will be based on the latest information available, including the most recent data on species' population sizes and trends. For example, even relatively high levels of mortality of common species may not be significant. Conversely, lower levels of mortalities of less common species may be of more concern, particularly if these species appear to be at risk (e.g., USFWS's Birds of Conservation Concern, California Species of Special Concern).

If impacts are determined to be at an unacceptable level, an assessment of why impacts are occurring will be conducted to aid in developing appropriate actions to further avoid, minimize or mitigate the impacts. If causation for impacts is unknown, California Flats will coordinate with wildlife agencies to determine the appropriate measures to implement in order to better assess causation. Potential adaptive management responses include but are not limited to:

1. additional monitoring to assess if impacts represent ongoing and significant risk;
2. modify prey-base or habitat to reduce ongoing risk (e.g., additional on-site carcass removal, increased frequency of vegetation management), as appropriate;
3. installation of bird deterrent devices that have been scientifically proven to be effective within solar arrays and/or along fence lines; or
4. additional anti-perching, anti-nesting, anti-electrocution, or flight diverter devices to transmission/collector lines or within substations/switchyard, as appropriate.

Post-construction Project-related impact assessment is highly complex, particularly with regard to relatively new technologies such as utility-scale solar PV projects. It is therefore critical for stakeholders and resource managers to incorporate statistically sound modeling into any iterative feedback cycle prior to implementation of additional or modified control measures (Williams and Brown 2012).

11 WILDLIFE INCIDENT AND HANDLING SYSTEM

In addition to the post-construction fatality monitoring study described in Section 8.0, California Flats will implement a Wildlife Incident Reporting System (WIRS) at the start of operations, and it will remain active for the life of the Project. The purpose of the WIRS is to standardize the actions taken by site personnel in response to wildlife incidents encountered at the Project and to fulfill the obligations for reporting wildlife incidents. The WIRS will be utilized by site operations and maintenance personnel who encounter dead or injured wildlife incidentally while conducting

general facility maintenance activities. The WIRS is designed to provide a means of recording and collecting (but only if the appropriate permits such as a Special Purpose Utility (SPUT) permit have been previously obtained) fatalities at the Project to increase the understanding of solar panel and wildlife interactions. During the standardized post-construction monitoring studies, any carcass found incidentally by site operations and maintenance personnel will be reported to the contractor conducting the post-construction monitoring studies so that the contractor can process the carcass (see Appendix F). Additionally, injured wildlife found within the Project may be taken to the nearest appropriate wildlife rehabilitation facility (see Section 12). Any incident (i.e., mortality or injury) involving a federally listed threatened or endangered species or a bald or golden eagle must be reported to the USFWS within 24 hours of identification. California Flats maintains an ongoing commitment to investigate wildlife incidents involving company facilities and to work cooperatively with federal and state agencies in an effort to prevent and mitigate future bird and wildlife fatalities. It will be the responsibility of California Flats employees and subcontractors to report all avian incidents to their immediate supervisor.

After the formal monitoring program has concluded, operations and maintenance personnel will complete a wildlife incidental reporting form for all injured or dead wildlife that are found near Project facilities. This incident form will include, but not be limited to, the following information: date, time, weather, observer, location, habitat description, photographic documentation (including scale), and description of fatality (i.e., condition, any/all observations). Incident reports will be entered into a spreadsheet or searchable database. All incident reports will be reviewed for quality control issues by the site supervisor and periodically by California Flats' environmental manager. Upon request, California will also periodically provide summary reports of all incidental finds to the USFWS.

12 WILDLIFE REHABILITATION

If during operations, injured wildlife is found within the Project facility, a qualified biologist will be contacted to confirm the species and coordinate for the disposition of the injured animal. Common species may be left in place. However, any injured raptor or state or federal endangered or threatened species will be taken to the nearest appropriate wildlife rehabilitation facility. The wildlife facilities potentially contacted include, but are not limited to:

- Wild Rescue: Moss Landing, Monterey County; telephone (866) WILD-911
- SPCA of Monterey County: Monterey, Monterey County; telephone 831(373-2631 ext. 227
- Pacific Wildlife Care: Morro Bay, San Luis Obispo County; (805) 543-9453

Other potential wildlife rehabilitation facilities potentially contacted include those approved by the CDFW and include those listed at:

https://www.wildlife.ca.gov/Conservation/Laboratories/Wildlife-Investigations/Rehab/Facilities

Handling or transportation of injured wildlife will only be completed under the direction of a qualified biologist and with the appropriate permits and/or agency approvals. The transportation of migratory birds to a wildlife rehabilitation center is authorized under a Good Samaritan clause of the MBTA.

13 REFERENCES

Althouse and Meade, Inc. 2014. Topaz Solar Farms 2013 Fourth Quarter/Second Annual Report for Avian and Bat Protection Plan and Bird Monitoring and Avoidance Plan. Prepared for Topaz Solar Farms LLC, Santa Margarita, California. Prepared by Althouse and Meade, Inc., Paso Robles, California. March 2014.

Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC, Washington D.C.

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Public Interest Energy Research Program (PIER) Final Project Report CEC-500-2006-022. Edison Electric Institute, APLIC, and the California Energy Commission. Washington D.C. and Sacramento, California.

Bald and Golden Eagle Protection Act (BGEPA). 1940. 16 United States Code (USC) § 668-668d. Bald Eagle Protection Act of 1940, June 8, 1940, Chapter 278, § 2, 54 Statute (Stat.) 251; Expanded to include the related species of the golden eagle October 24, 1962, Public Law (P.L.) 87-884, 76 Stat. 1246. As amended: October 23, 1972, P.L. 92-535, § 2, 86 Stat. 1065; Nov. 8, 1978, P.L. 95-616, § 9, 92 Stat. 3114.

Best, T. L., W. M. Kiser, and P. W. Freeman. 1996. Eumops perotis. American Society of Mammalogists, Mammalian Species 534:1–8

Boal, C. W., M. D. Giovanni, B. N. Beall, 2006. Successful nesting by a bald eagle pair in prairie grasslands of the Texas panhandle. Western North American Naturalist 66:246-250.

California Department of Fish and Game (CDFG). 2012. Staff Report on Burrowing Owl Mitigation. http://www.dfg.ca.gov/wildlife/nongame/docs/BUOWStaffReport.pdf

California Endangered Species Act (CESA). 1984. Fish and Game Code § 2050 - 2115.5.

Calvert, A. M., C. A. Bishop, R. D. Elliot, E. A. Krebs, T. M. Kydd, C. S. Machtans, and G. J. Robertson. 2013. A Synthesis of Human-Related Avian Mortality in Canada. Avian Conservation and Ecology 8(2): 11; http://dx.doi.org/10.5751/ACE-00581-080211.

Carrete, M., and J. L. Tella. 2010. Individual consistency in flight initiation distances in burrowing owls: a new hypothesis on disturbance-induced habitat selection. Biology Letters 6(2):167-170.

Condor Wind Energy Work Group. 2011. California Condor Wind Energy Work Group-outreach presentation. Online: http: //www.fws.gov/ventura/species_information/CA_condor_wind_energy/docs/CACO-wind%20Work%20Group%20Outreach%20Presentation_7_13_2011.pdf.

Corben, C. 2011. Analook for Windows. http://users.lmi.net/corben/anabat.htm#Anabat%20Contents

County of Monteray Resource Management Agency (CMRMA). 2014. California Flats Final Environmental Impact Report. Available online at http://www.co.monterey.ca.us/planning/major/California%20Flats%20Solar/California_Flats_Solar.htm

Driscoll, D. E. 2010. Protocol for Golden Eagle Occupancy, Reporduction, and Prey Population Assessment. Apache Junction, AZ: American Eagle Research Institute.

Endangered Species Act (ESA). 1973. 16 United States Code (USC) § 1531-1544, Public Law (PL) 93-205, December 28, 1973, as amended, PL 100-478 [16 USC 1531 et seq.]; 50 Code of Federal Regulations (CFR) 402

Fletcher, Q.E., R. Fisher, C. Willis and R. Brigham. 2004. Free-ranging Common Nighthawks Use Topor. Journal of Thermal Biology. 29: 9-14.

Gauthreaux, S.A. Jr. and C. G. Belser. 2006. Effects of Artificial Night Lighting on Migratory Birds. Pp. 67-93. In: Ecological Consequences of Artificial Night Lighting. C. Rich and T. Longcore, eds. Island Press, Washington, D.C.

Gauthreaux, S.A. Jr., C. G. Belser, and D. van Blaricom. 2003. Using a Network of Wsr 88-D Weather Surveillance Radars to Define Patterns of Bird Migration at Large Spatial Scales. Pp. 335-346. In: Avian Migration. P. Berthold, E. Gwinner, and E. Sonnenschein, eds. Berlin: Springer.

Gehring, J., P. Kerlinger, and A.M. Manville, II. 2009. Communication Towers, Lights, and Birds: Successful Methods of Reducing the Frequency of Avian Collisions. Ecological Applications 19(2): 505-514.

Gehring, J., P. Kerlinger, and A.M. Manville, II. 2011. The Role of Tower Height and Guy Wires on Avian Collisions with Communication Towers. Journal of Wildlife Management 75: 848-855.

H. T. Harvey & Associates. 2013a. California Flats Solar Project, Monterey County, California, Biotic Report. Prepared for California Flats Solar, LLC.

H. T. Harvey & Associates. 2013b. Baseline Raptor Nest Surveys for the California Flats Solar Project, Monterey County, California. Prepared for California Flats Solar, LLC.

H. T. Harvey & Associates. 2013c. California Flats Solar Project Bat Habitat Assessment and Acoustic Surveys. Prepared for California Flats Solar, LLC.

H. T. Harvey & Associates. 2013. California Valley Solar Ranch 2012 Annual Bat Report, July through December 2012. Prepared for California Flats Solar, LLC.

H. T. Harvey & Associates. 2014a. Baseline Avian Activity Surveys for the Proposed California Flats Solar Project in Monterey County, California, March 2013 – March 2014. Prepared for California Flats Solar, LLC.

H. T. Harvey & Associates. 2014b. California Valley Solar Ranch, San Luis Obispo County, California, Avian Activity Surveys Report: October 2011–October 2013. San Luis Obispo, California. Prepared for HPR II, LLC, Santa Margarita, California.

H.T. Harvey and Associates. 2014c. California Valley Solar Ranch Project Avian and Bat Protection Plan Annual Postconstruction Fatality Report: 16 August 2012 – 15 August 2013. Project # 3326-03. Prepared for HPR II, LLC, California Valley Solar Ranch, Santa Margarita, California. Prepared by H.T. Harvey and Associates, San Luis Obispo, California. March 28, 2014.

Heckert, J.R. 1994. The effects of habitat fragmentation on midwestern grassland bird communities. Ecol. Applications 4:461-471.

Hunt, W. G. 2002. Golden eagles in a perilous landscape: predicting the effects of mitigation for energy-related mortality. Report P500-02-043F. California Energy Commission, Wacramento, CA.

Hunt, W.G., and T. Hunt. 2006. The trend of golden eagle territory occupancy in the vicinity of the Altamont Pass Wind Resource Area: 2005 survey. Final project report CEC-500-2006-056. California Energy Commission, Sacramento, CA.

Hunt, W. G, R.E. Jackman, T. L. Brown, J. G. Gilardi, D. E. Driscoll, and L. Culp. 1995. A pilot golden eagle population study in the Altamont Pass Wind Resource Area, California. Predatory Bird Research Group, University of California, Santa Cruz, CA.

Jantzen, M. K., and M. B. Fenton. 2013. The depth of edge influence among insectivorous bats at forest-field interfaces. Canadian Journal of Zoology 91:287-292.

Johnston, D. S., and M. B. Fenton. 2001. Individual and population-level variability in diets of pallid bats (Antrozous pallidus). Journal of Mammalogy 82(2). [online]: http://www.jstor.org/pss/1383717.

Kerlinger, P., J. L. Gehring, W. P. Erickson, R. Curry, A. Jain, and J. Guarnaccia. 2010. Night Migrant Fatalities and Obstruction Lighting at Wind Turbines in North America. Wilson Journal of Ornithology 122(4): 744-754.

Kerlinger, P., R. Curry, L. Culp, A. Hasch, and A. Jain. 2009. Post-Construction Avian Monitoring Study for the Shiloh I Wind Power Project, Solano County, California. Final Report: August 2009. Prepared for Iberdrola Renewables, Inc. (IRI). Prepared by Curry and Kilinger, LLC. MAY NOT BE PUBLIC. Revised February 2010 for submittal to Solano County

Klem, D. Jr. 2009. Avian Mortality at Windows: The Second Largest Human Source of Bird Mortality on Earth. Pp. 244-251. In: Proceedings of the 4th International Partners in Flight Conference: Tundra to Tropics. T. D. Rich, C. Arizmendi, D. Demarest, and C. Thompson, eds. McAllen, Texas.

Longcore, T., C. Rich, P. Mineau, B. MacDonald, D. G. Bert, L. M. Sullivan, E. Mutrie, S.A. Gauthreaux, Jr., M. L. Avery, R. L. Crawford, A.M. Manville, II, E. R. Travis, and D. Drake. 2012. An Estimate of Avian Mortality at Communication Towers in the United States and Canada. PLoS ONE 7(4): e34025. doi: 10.1371/journal.pone.0034025.

Longcore, T., C. Rich, P. Mineau, B. MacDonald, D. G. Bert, L. M. Sullivan, E. Mutrie, S.A. Gauthreaux, Jr., M. L. Avery, R. L. Crawford, A.M. Manville, II, E. R. Travis, and D. Drake. 2013. Avian Mortality at Communication Towers in the United States and Canada: Which Species, How Many, and Where? USDA National Wildlife Research Center - Staff Publications. Paper 1162. http://digitalcommons.unl.edu/icwdm_usdanwrc/1162

LSA Associates, Inc. 2016. Habitat Restoration and Revegetation Management Plan. The California Flats Solar Project. Prepared for California Flats Solar, LLC.

Kochert, M.N., K. Steenhof, C.L. McIntyre, and E.H. Craig. 2002. Golden Eagle (Aquila chrysaetos). No. 684 in A. Poole and F. Gill (Editors), The Birds of North America. The Birds of North America, In.c, Philadelphia, PA.

Manville, A. 2000. Avian Mortality at Communication Towers: Background and Overview. Pp. W. R. Evans and A. M. Manville, II, eds. Proceedings of the Workshop on Avian Mortality at Communication Towers; 1-5. l

Marzluff, J. M., S. T. Knick, M. S. Vekasy, L. S. Schueck, and T. J. Zarriello. 1997. Spatial use and habitat selection of golden eagles in southwestern Idaho. Auk 114:6673-687.

Migratory Bird Treaty Act (MBTA). 1918. 16 United States Code (USC) § 703-712. July 13, 1918.

Morris, A. D., D. A. Miller, M. C. Kalcounis-Rueppell. 2010. Use of forest edges by bats in a managed pine forest landscape. Journal of Wildlife Management 74(1):26–34.

National Environmental Policy Act (NEPA). 1970. 42 United States Code § 4321-4347. January 1, 1970.

Pagel, J. E., D. M. Whittington, and G. T. Allen. 2010. Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance. US Fish and Wildlife Service, Division of Migratory Birds, Arlington, Virginia.

Parameter-elevation Regressions on Independent Slopes Model (PRISM) Climate Group. 2013. PRIMS Products Matrix. http://prism.oregonstate.edu.

Patterson, J.W. Jr. 2012. Evaluation of New Obstruction Lighting Techniques to Reduce Avian Fatalities. DOT/FAA/TC-TN12/9. May 2012. Available online from the Federal Aviation Administration William J. Hughes Technical Center at: http://www.faa.gov/about/office_org/headquarters_offices/ang/offices/tc/library/

Poulin, R., L. D. Todd, E. A. Haug, B. A. Millsap, and M. S. Martell. 2011. Burrowng owl (Athene cunicularia). No. 061 in A. Poole (Editor), The Birds of North America Online. Ithaca, NY: Cornell Lab of Ornithology. http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/061.

Richardson, C. T., and C. K. Miller. 1997. Recommendations for protecting raptors from human disturbance: a review. Wildlife Society Bulletin 25:634-638.

Romin, L. A., and J. A. Muck. 2002. Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances. Salt Lake City, UT: Us. S. Fish and Wildlife Service, Utah Field Office.

Shire, G. G., K. Brown, and G. Winegrad. 2000. Communication Towers: A Deadly Hazard to Birds. A Report Compiled by American Bird Conservancy Documenting the Killing of 230 Bird Species. American Bird Conservancy, Washington, DC.

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Conern: A ranked assessment of species, subspecies and distinct populations of birds of immediate conservation concern in California. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Suter, G. W., II, and J. L. Joneds. 1981. Criteria for golden eagle, ferruginous hawk, and prairie falcon nest site protection. Raptor Research 15:12-18.

U.S. Fish and Wildlife Service (USFWS). February 2010. Available online at: http://steinadlerschutz.lbv.de/fileadmin/www.steinadlerschutz.de/terimGoldenEagleTechnicalGuidanceProtocols25March2010_1_.pdf

U.S. Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance. Module 1 - Land-Based Wind Energy. Version 2. Division of Migratory Bird Management, USFWS. April 2013. Available online at: http://www.fws.gov/migratorybirds/Eagle_Conservation_Plan_Guidance-Module%201.pdf

U.S. Fish and Wildlife Service (USFWS). 2011. Condor tracking data 2003-2011. Data and maps provided by the U.S. Fish and Wildlife Service, Ventura, CA.

Verboom, B., and H. Huitema. 1997. The importance of linear landscape elements for the pipistrelle Pipistrellus pipistrellus and the serotine bat Eptesicus serotinus. Landscape Ecology 12(2):117–125. doi:10.1007/BF02698211.

Vickery, P.D., Hunter, M. L., Jr. and Melvin, S. M. 1994. Effect of habitat area on the distribution of grassland birds in Maine. Conserv. Biol. 8:1087-1097.

Walston, L.J., K.E. Rollins, K.P. Smith, K.E. LaGory, K. Sinclair, C. Turchi, T. Wendelin, and H. Souder. 2015. A review of avian monitoring and mitigation information at existing utility-scale solar facilities. ANL/EVS-15/2. Report prepared by Argonne National Laboratory and the National Renewable Energy Laboratory prepared for U.S. Department of Energy, April 2015.

Walston, L.J., K.E. Rollins, K.E. LaGory, K.P. Smith, and S.A. Meyers. 2016. A preliminary assessment of avian mortality at utility-scale solar energy facilities in the United States. Renewable Energy 92: 405-414.

Western EcoSystems Technology, Inc. (WEST). 2014. Sources of Avian Mortality and Risk Factors Based on Empirical Data from Three Photovoltaic Solar Facilities. Unpublished review paper.

Western Ecosystems Technology, Inc. (WEST). 2015. 2014 Golden Eagle Studies at the California Flats Solar Project, Monterey County, California. Final Report. Prepared for California Flats Solar, LLC, Prepared by Western Ecosystems Technology, Inc. (WEST), Cheyenne, Wyoming.

Western Ecosystems Technology, Inc. (WEST). 2016. Avian and Bat Monitoring at the Desert Sunlight Solar Farm Project Riverside County, California, 2015 – 2016 Annual Report. Prepared for Desert Sunlight 250, LLC and Desert Sunlight 300, LLC, Juno Beach, Florida. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne Wyoming.

Williams, B. K., and E. D. Brown. 2012. Adaptive management: the U.S. Department of the Interior applications guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

Zarn, M. 1974. Burrowing owl, report no. 11. Habitat Management Series for Unique or Endangered Species. Denver, CO: U.S. Department of the Interior, Bureau of Land Management.

Appendices of the California Flats Solar Project Bird and Bat Conservation Strategy are available upon request. Please contact fw8_eaglepermits@fws.gov to request these, including "California Flats Solar BBCS Appendices" in the subject line.

Appendix D. Results of the golden eagle local area population (LAP) analysis for the California Flats Solar Project – Project modification, Proposed Action

Focal Project: California Flats Solar Project – Project modification

Predicted eagle take (annual)	**1.18**

Local Area Population (LAP) Estimates by Local Area Density Unit (LADU):

Focal Project_Density Unit	Estimated Number of Eagles
California Flats_COASTAL_CALIFORNIA	242.52
California Flats_SIERRA_NEVADA	3.47
California Flats LAP (total)	**245.99**

1% LAP Benchmark	**2.46**
5% LAP Benchmark	**12.3**

Permitted Projects with Overlapping LAPs:

Project ID	Estimated Annual Take	Percent Overlap With Focal Project	Overlapping Area (SqMi)	Overlapping Take
Project 00542B	0.6	34.37%	12056.95	0.21
Project 41348D	2.4	13.67%	3924.35	0.33
Project 67633A (California Flats Solar Project Long-term Permit)	1.18	100.00%	28962.86	1.18
All Projects (total)	**4.18**			**1.72**

Known Unpermitted Take Summary				
Cause of take	**All Known (1950-2019)**	**Reported Years**	**# Years**	**Average Annual Take**
Electrocution;Starvation	1	2002-2002	1	1
Unknown	69	2001-2020	20	3
Electrocution;Poisoned (pesticide)	2	2015-2015	1	2
Other	3	2013-2015	3	1
Trauma	5	2001-2018	18	0.28
Collision with wind turbine;Infection	1	2014-2014	1	1
Poisoned (lead);Infection	1	2000-2000	1	1
Electrocution	41	1993-2019	27	1.52
Collision with wind turbine	119	1997-2020	24	4.96
Collision with wind turbine;Poisoned (pesticide)	2	2014-2015	2	1

Other;Trauma	1	2016-2016	1	1
Other;Starvation	1	2016-2016	1	1
Collision with wire	2	2017-2018	2	2
Collision with vehicle;Poisoned (pesticide)	2	2014-2015	2	1
Poisoned (lead)	6	1997-2018	22	0.27
Poisoned (pesticide);Starvation	1	2015-2015	1	1
Poisoned (pesticide);Infection;Starvation	1	2016-2016	1	1
Shot	1	2004-2004	1	1
Collision with vehicle	6	2002-2018	17	0.35
Trauma;Starvation	1	2015-2015	1	1
Collision/electrocution	2	2018-2019	2	2
Poisoned (pesticide)	2	1996-2014	19	0.11
Total				**26.94**

Cumulative Take Results	**Number of Eagles (Annual)**	**Percent of LAP**
Permitted Take		
Total Overlapping Take	1.72	0.70%
Focal Project Predicted Take	1.18	0.48%
Total Permitted Take (Focal Project + Total Overlapping Take)	2.90	1.18%
Unpermitted Take	26.94	10.95%

Appendix E. Results of the golden eagle local area population (LAP) analysis for the California Flats Solar Project – Project modification, Alternative 2

Focal Project: California Flats Solar Project – Project modification

Predicted eagle take (annual)	**0.59**

Local Area Population (LAP) Estimates by Local Area Density Unit (LADU):

Focal Project_Density Unit	Estimated Number of Eagles
California Flats_COASTAL_CALIFORNIA	242.52
California Flats_SIERRA_NEVADA	3.47
California Flats LAP (total)	**245.99**

1% LAP Benchmark	**2.46**
5% LAP Benchmark	**12.3**

Permitted Projects with Overlapping LAPs:

Project ID	Estimated Annual Take	Percent Overlap With Focal Project	Overlapping Area (SqMi)	Overlapping Take
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Project 67633A (California Flats Solar Project Long-term Permit)	1.18	100.00%	28962.86	1.18
All Projects (total)	**4.18**			**1.72**

Known Unpermitted Take Summary				
Cause of take	**All Known (1950-2019)**	**Reported Years**	**# Years**	**Average Annual Take**
Electrocution;Starvation	1	2002-2002	1	1
Unknown	69	2001-2020	20	3
Electrocution;Poisoned (pesticide)	2	2015-2015	1	2
Other	3	2013-2015	3	1
Trauma	5	2001-2018	18	0.28
Collision with wind turbine;Infection	1	2014-2014	1	1
Poisoned (lead);Infection	1	2000-2000	1	1
Electrocution	41	1993-2019	27	1.52
Collision with wind turbine	119	1997-2020	24	4.96
Collision with wind turbine;Poisoned (pesticide)	2	2014-2015	2	1

Other;Trauma	1	2016-2016	1	1
Other;Starvation	1	2016-2016	1	1
Collision with wire	2	2017-2018	2	2
Collision with vehicle;Poisoned (pesticide)	2	2014-2015	2	1
Poisoned (lead)	6	1997-2018	22	0.27
Poisoned (pesticide);Starvation	1	2015-2015	1	1
Poisoned (pesticide);Infection;Starvation	1	2016-2016	1	1
Shot	1	2004-2004	1	1
Collision with vehicle	6	2002-2018	17	0.35
Trauma;Starvation	1	2015-2015	1	1
Collision/electrocution	2	2018-2019	2	2
Poisoned (pesticide)	2	1996-2014	19	0.11
Total				**26.94**

Cumulative Take Results	**Number of Eagles (Annual)**	**Percent of LAP**
Permitted Take		
Total Overlapping Take	1.72	0.70%
Focal Project Predicted Take	0.59	0.24%
Total Permitted Take (Focal Project + Total Overlapping Take)	2.31	0.94%
Unpermitted Take	26.94	10.95%