Environmental Assessment

for the Issuance of a Long-Term Incidental Eagle Take Permit
for the Strauss Wind Energy Project

California

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U.S. Fish and Wildlife Service Pacific Southwest Region
Migratory Bird Program
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Abbreviations

Applicant	Strauss Wind LLC
CFR	Code of Federal Regulations
CUP	Conditional Use Permit
EA	Environmental Assessment
Eagle Act	Bald and Golden Eagle Protection Act
ECP	Eagle Conservation 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
O&M	operation and maintenance
PEIS	Programmatic Environmental Impact Statement for the Eagle Rule Revision
Permit	Applicant requested incidental eagle take permit
Project	Strauss Wind Energy 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
USGS	United States Geological Survey

1 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 et seq.), of the U.S. Fish and Wildlife Service (Service) issuing an incidental eagle take permit (Permit) for the take of bald eagles (*Haliaeetus leucocephalus)* and golden eagles (*Aquila chrysaetos*) associated with operational activities at the Strauss Wind Energy Project (Project). The applicant for the Permit, Strauss Wind LLC (Applicant), 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] § 22.80) for bald and golden eagles. Issuance of an incidental eagle 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 and alternative 1 to issue an eagle incidental take permit to the Applicant, as well as a no action alternative.

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 (EMUs) and the persistence of local populations throughout the geographic range of each species" (50 CFR § 22.6).

The Applicant has applied for an incidental eagle take permit for 30 years for bald and golden eagle fatalities due to anticipated turbine collisions and reductions in breeding productivity at a golden eagle territory near the Project due to intermittent nest disturbance from all operation and maintenance (O&M) activities, including those required by the CUP.

This EA evaluates whether issuance of the Permit will have significant impacts on the existing potentially affected environment and the degree of the effects of the action, beyond those previously analyzed in the PEIS. In considering this, 40 CFR § 1501.3 directs an agency to consider the affected area (national, regional, or local) and its resources. In evaluating the degree of the effects, we must also consider short-term, long-term, beneficial, and adverse effects; impacts to public health and safety; and compliance with other environmental protection laws.

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.

1.1 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. §§ 668-668d) and its regulations (50 CFR § 22). Applicants whose otherwise lawful activities may result in take of eagles can apply for incidental eagle 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; it is associated with, but not the purpose of, the activity; and it cannot be practicably avoided (50 CFR § 22.80 and 81 Federal Register [FR] 91494).

The need for this federal action is a decision on an incidental eagle take permit application submitted by the Applicant that is in compliance with all applicable regulatory requirements set forth under the Eagle Act in 50 CFR § 22.

1.2 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. §§ 668-668d) 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.

1.3 Background

The Project is on a site that was previously approved for a different wind project, the Lompoc Wind Energy Project (LWEP). The Final Environmental Impact Report (EIR) and the Santa Barbara County Conditional Use Permit (County CUP) were approved in 2009. The Santa Barbara County Planning Commission approved the Project in 2019, and in 2020 the Project received a Zoning Clearance Permit and began construction. The Project is located on rural and agricultural lands approximately 1.8 miles (mi) southwest of Lompoc in Santa Barbara County, California. (Figure 1). The Project boundary defines the area in which Project-related infrastructure is situated (Figure 1), with the exception of the O&M facility, which will be located within Lompoc. The Project consists of 27 wind turbine generators (WTGs), access roads, a 34.5-kilovolt (kV) overhead and underground collector cable system, overhead and underground communication lines in the same locations as the collector cables, a 60-meter (m) un-guyed meteorological (met) tower, a sonic detection and ranging (SODAR) unit, a Project substation acting as the starting point for a 7.3-mi, 115-kV transmission line, the transmission line, three IdentiFlight units, a switchyard, and PG&E facilities (Figure 1).

Eagle, avian use, and raptor nest field surveys were conducted from 2002 to 2022. Detailed results are presented in the Project's Bird and Bat Conservation Strategy (BBCS; DUDEK 2020), and a summary of the results as well as the analysis of risk and potential impacts for the Project are addressed in the ECP and this EA.

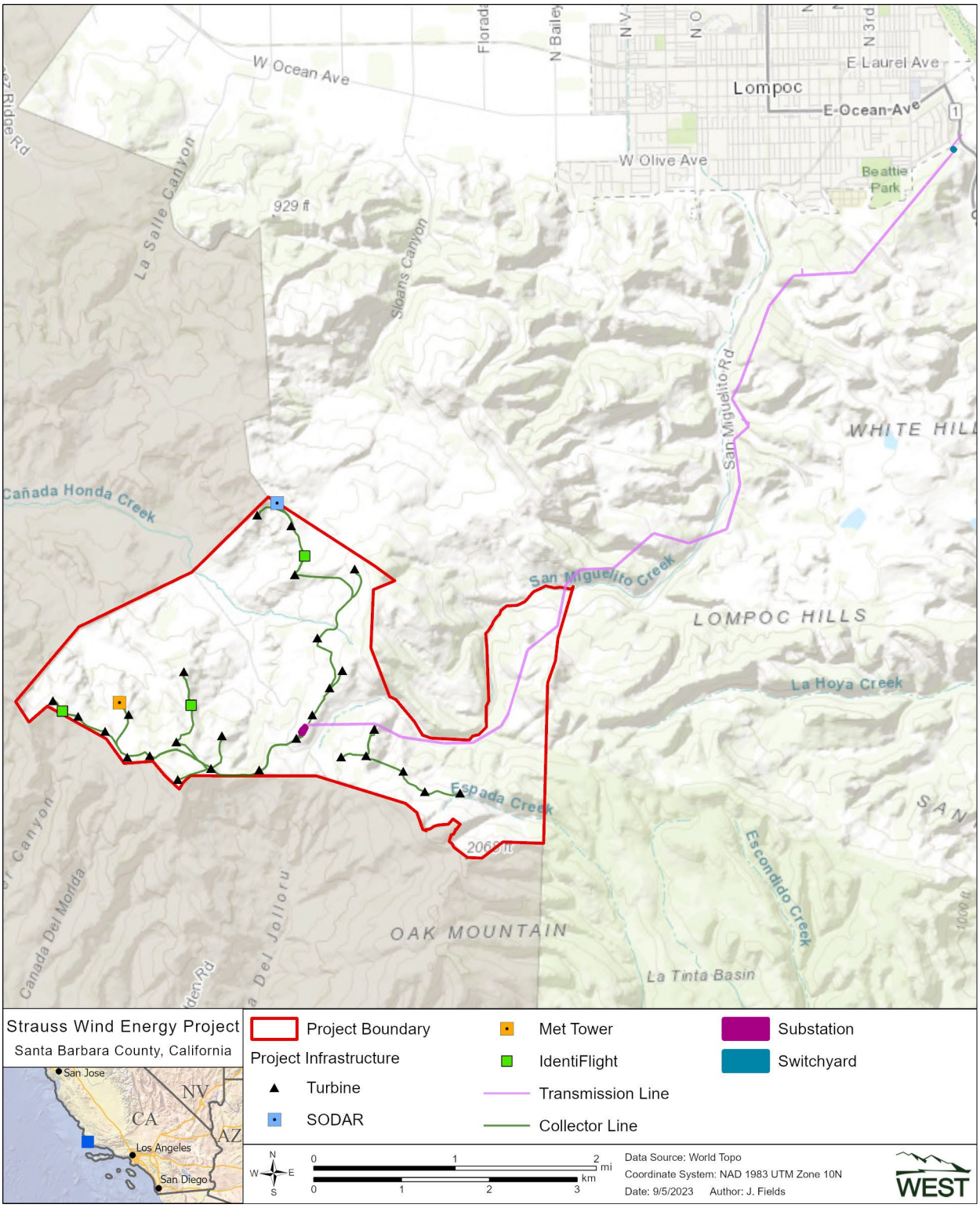

Figure 1. Location and infrastructure layout of the Strauss Wind Energy Project, Santa Barbara County, California.

1.4 Scoping, Consultation and Coordination

This EA incorporates by reference the scoping performed for the PEIS (USFWS 2016a: Chapter 6, page 175). This EA will be made public on the Service's website.[1]

1.5 Coordination with Tribal Governments

Tribal participation is a key component of the Service's decision to issue an eagle take permit, and an integral part of the National Historic Preservation Act (NHPA) and NEPA processes. Cultural and religious concerns regarding incidental take of eagles on a national scale 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 in consideration of individual eagle take permit applications, 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 with the American Indian Religious Freedom Act.

To notify Tribes regarding potential issuance of the requested Permit, the Service sent letters on October 3rd, 2023 to two 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 and offering the opportunity for formal consultation regarding potential issuance of the Permit. The Service has received no response to date from any of the Tribes contacted.

2 Proposed Action and Alternatives

2.1 Proposed Action

We propose to issue a 30-year incidental eagle take permit, with associated conditions, to Strauss Wind LLC for take of up to 0.4 bald eagle and 15.0 golden eagles per year, or approximately 12 bald eagles and 450 golden eagles over the Permit term ("Proposed Action"). For bald eagles, the estimated take is associated with anticipated mortality due to collision with turbines. For golden eagles, the estimated take is associated with both anticipated mortality due to collision with turbines at 14.40 golden eagles per year, or 432 golden eagles over the Permit term; and lost productivity from up to 30 occurrences of nest disturbance within 1 mile of Project O&M

[1] https://www.fws.gov/library/collections/pacific-southwest-region-nepa-documents-eagle-permits

activities during the breeding season at an additional 0.59 golden eagle per occurrence, or 18 golden eagles over the Permit term.

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

***Avoidance and Minimization Measures*:** The Applicant would implement the following avoidance and minimization measures during operations under the terms of this Permit and the County CUP, as described in the ECP (Section 5.3) and the Project's Bird and Bat Conservation Strategy (BBCS):

- To the extent possible, implement avoidance measures for nesting eagles, such as
    - conducting O&M activities within 1 mile of in-use golden eagle nests outside of the breeding season (December 1 through fledging [approximately July 31]) based on eagle nest surveys, or
    - monitoring in-use golden eagle nests within 1 mile of O&M activities to ensure activities do not disturb golden eagles, and immediately stopping work if eagles show signs of disturbance.
- Activate three IdentiFlight units.
- Continue the carrion removal program per the County CUP (MM BIO-16c).
- Develop and implement an Adaptive Management Plan per the conditions of this Permit and the County CUP.

The Applicant will implement an Adaptive Management Plan they have developed and incorporated into the ECP under the terms of this Permit for bald and golden eagles, as well as into the Project BBCS based on requirements in the County CUP's Conditions of Approval (see ECP Section 7.0 and Section 4 of this document). The Adaptive Management Plan, in conjunction with the survey and monitoring plans described below, would help ensure bald and golden eagle mortality remains within the authorized take limit of the Permit. In communication with the appropriate agencies, the Applicant would discuss the need for and implement avoidance and/or minimization measures identified in the Adaptive Management Plan if it is determined eagle take is higher than anticipated based on take values estimated from the results of post-permit (i.e., post-permit issuance) eagle fatality monitoring.

Compensatory Mitigation: The Applicant would fully offset the take of 450 golden eagles over the 30-year Permit term. A compensatory mitigation ratio of 1.2:1 is the minimum required in the Eagle Act regulations (81 FR 91494). When a project's estimated take exceeds 5% of the golden eagle LAP, in order to remain consistent with the preservation standard we may apply either a compensatory mitigation ratio of 2:1, or a project may use the 1.2:1 ratio and undertake other means to substantially contribute to the persistence of the local population.

It is anticipated that mitigation would focus on providing funding to retrofit power poles with a high risk of avian electrocutions within the golden eagle EMU, in accordance with APLIC 2006

guidelines. This Project's estimated golden eagle take is higher than 5% of the golden eagle LAP, so the higher compensatory mitigation ratio of 2:1 would be applied for power pole retrofits or the project may use the 1.2:1 ratio and undertake other means to substantially contribute to the persistence of the local population approved by the Service.

The compensatory mitigation requirements for the Project for retrofitting electric power poles have been determined by the Service using Resource Equivalency Analysis (REA; USFWS 2013) based on the final predicted take for the Project. Based on the results of the REA for collision mortality, the Applicant would retrofit up to 6,700 to 15,395 power poles at a 2:1 mitigation ratio for golden eagles for the full 30 year permit term. Based on the results of the REA for nest disturbance take, the Applicant would retrofit up to 345 to 793 power poles based on the REA for the full 30 year permit term, for a total of 7,045 to 16,188 power poles at a 2:1 mitigation ratio. The final power pole number depends on the type and expected longevity (either 10 or 30 years) of each retrofit. The Applicant would pay up front for the first three years of anticipated take. If take estimates are less than the mitigated take after the first review period, the excess mitigated take would be credited to the Applicant for any take that occurs during subsequent review periods. If estimated take is higher, additional compensatory mitigation would be required.

Although the REA focuses on power pole retrofits, other compensatory mitigation options may become available, such as support for lead abatement programs, carcass removal along highways, habitat restoration/prey enhancement programs, or funding for mitigation banking efforts (Allison et al. 2017). The 1.2:1 ratio could be applicable to other options depending on the mitigation benefit per eagle. The Applicant would work with the Service to develop a mitigation plan to offset the impacts of the predicted eagle take within six months of ETP issuance (USFWS 2013).

Surveying and Monitoring: Monitoring is a requirement for issuing the Permit under the 2016 Eagle Rule and the County CUP. Under the Proposed Action, the Applicant would conduct the following monitoring activities pertinent to eagles, as described in Sections 5 and 6 of the ECP:

- Post-permit systematic eagle fatality monitoring under the terms of this Permit during an initial 3-year review period, followed by 2- or 5-year review periods, as determined in coordination with the Service.
- Optional productivity monitoring of in-use golden eagle nests within 1 mile of Project O&M activities that occur during the breeding season throughout the life of the Permit.
- One year of post-construction avian use surveys, including large bird (e.g., raptor) point counts all year, and small bird counts in the spring and fall, per County CUP conditions.
- At least two years of post-construction bird and bat fatality monitoring study per County CUP conditions.

A detailed post-permit monitoring plan under the terms of this Permit will be developed in coordination with the Service. Details of the County CUP post-construction avian use studies and bird and bat fatality monitoring are described in the BBCS. The Applicant, in coordination with

the USFWS and California Department of Fish and Wildlife (CDFW), when applicable, will use monitoring data to inform take estimates and whether additional eagle-specific minimization and/or avoidance measures identified in the Adaptive Management Plan are needed.

Criteria for issuance of an eagle take permit are codified in 50 CFR § 22.80(f). The Applicant's application for an incidental eagle take permit meets all the regulatory issuance criteria and required determinations (50 CFR § 13.21 and 50 CFR § 22.80) for eagle take permits.

2.2 Alternative 1: Permit for Eagle Take with Turbine Curtailment

Under Alternative 1, the Service would issue a 30-year eagle incidental take permit for bald and golden eagle and nest disturbance take with the same avoidance, minimization, and mitigation measures as the Proposed Action, but with the addition of blanket turbine curtailment within 1 mile of in-use golden eagle nests during the breeding season. Permitted take of bald eagles would be the same as under the Proposed Action (0.4 bald eagle per year, and 12 bald eagles over the Permit term). While take of golden eagles could be lower under Alternative 1 based on the added curtailment, there is no reasonable basis to estimate reduced take since it cannot be known when or how often golden eagles would be nesting within 1 mile of a Project turbine. Therefore, permitted take of golden eagles would be the same as under the Proposed Action (15.0 golden eagles per year, 450 golden eagles over the Permit term).

***Avoidance and Minimization Measures*:** The same avoidance and minimization measures would be included as under the Proposed Action. In addition, the Project would implement blanket curtailment during the breeding season, as detailed below.

- Implement blanket curtailment by feathering all turbines from sunrise to sunset from December 1 through April 15 (generally the latest date for nest establishment) within 1 mile of a potential nest.
- If an in-use nest is established before or after April 15, continue curtailing turbines within 1 mile of the nest until fledging (approximately July 31) or until nest failure, should nest failure occur after April 15.

The Adaptive Management Plan would be the same as under the Proposed Action.

Compensatory Mitigation. The compensatory mitigation plan would be the same as under the Proposed Action.

Surveying and Monitoring. Surveying and monitoring would be the same as under the Proposed Action, in addition to monitoring during the breeding season, as detailed below.

- Follow USFWS monitoring recommendations to monitor for potential and in-use golden eagle nests within 1 mile of Project turbines during the breeding season from December 1 through fledging (approximately July 31) or until nest failure, should nest failure occur after April 15 (generally the latest date for nest establishment).

2.3 Alternative 2: No Action

Under the No-Action Alternative, the Service would take no further action on the Applicant'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, operations would likely be conducted without an eagle take permit being issued. Thus, for purposes of analyzing the No-Action Alternative, we assume that the Applicant would implement all measures required by other agencies and jurisdictions to conduct the activity at this site (including requirements under the County CUP), 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 would not be protected from enforcement for violating the Eagle Act should take of an eagle occur, and any eagle take that occurs would not be offset by compensatory mitigation.

2.4 Other Alternatives Considered but Not Evaluated in this Environmental Assessment

The Service considered an additional alternative to the Proposed Action, but concluded that this alternative did not meet the purpose and need underlying the action because it was 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 this alternative. Below is a summary of the additional alternative considered but eliminated from further review.

2.4.1 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 or the application fails to meet all regulatory permit issuance criteria and required determinations listed in 50 CFR § 22.80.

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 the Applicant. 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 § 22.80(f). The Applicant's application

meets all the regulatory issuance criteria and required determinations (50 CFR § 22.80) 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 § 22.80, denial of the permit is not a reasonable option. Therefore, this alternative—denial of the Permit—was eliminated from further consideration.

3 Affected Environment

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

3.1 Bald Eagles

Project-relevant information on bald eagles is provided below, but general information on the taxonomy, ecology, distribution, and population trends of bald eagles can be found in Section 3.2 of the PEIS (USFWS 2016a) and is incorporated herein by reference. The Project is in the bald eagle Pacific Flyway South EMU (the Pacific Flyway EMU south of 40° north latitude).

In southern California, bald eagles occupy large bodies of open water, including rivers, lakes, and reservoirs where there is an adequate food supply where they can prey on fish and waterfowl (Polite and Pratt 1999). Bald eagles have been observed throughout Santa Barbara County. The closest observation recorded in eBird was at Jalama Beach County Park in 2019 and 2020, located 3.7 miles south of the Project, but bald eagles were observed at the Project during the Tier 3 pre-construction surveys. The highest concentration of bald eagles occurs at Lake Cachuma, located 28.9 miles east of the Project (eBird 2023). The closest known nesting location is located 24 miles east of the Project, at Alisal Reservoir.

Bald eagle use of the Project area was monitored during pre-construction use surveys and nest surveys in 2002, 2005 through 2006, 2008, 2013, and 2016 through 2023, and using raptor point counts from 2018 to 2020, as described in the ECP and BBCS. The summaries below provide an overview of bald eagle data gathered from all of these studies. As noted in the ECP, studies conducted between 2002 and 2017 were conducted at a previously proposed Project layout. While they were referred to during Project development and discussions with the USFWS, coordination between the Applicant and the USFWS indicated that the most relevant studies were those conducted since 2018.

Surveys yielded only two bald eagle observations, which were made during the raptor point count surveys in 2018 (Section 3.1.8). Further details are provided below.

3.1.1 Raptor Transect Survey (2002, 2005)

Bird surveys were conducted on six dates from May 31, 2002 through September 25, 2002, and on seven dates from April 13, 2005 through August 26, 2005. The 2002 surveys were conducted

during the afternoon due to the persistence of fog during the mornings. Most of the 2005 surveys also took place in the afternoon. No bald eagles were observed during the 2002 or the 2005 raptor transect surveys.

3.1.2 Winter Bird Surveys (2006, 2008)

The 2006 winter bird surveys included 18 survey points. Surveys were conducted out to a 2,625-ft (800-m) radius for 20 min, each point was surveyed three times between December 5 and December 21, 2006. No bald eagles were observed during the surveys.

The 2008 winter bird surveys included a 164-ft (50-m) search area at 54 sites, supplemental bird counts along 10 transects, incidental bird counts, raptor nest surveys, and diurnal raptor surveys. The surveys were performed from February 4 through March 27. A total of 71 surveys were conducted, adding up to 208 survey hours. No bald eagles were observed during the 2008 winter bird surveys.

3.1.3 Fall Migration Surveys (2008, 2016)

Fall migration surveys were conducted between August 28 and November 8, 2008. They included early morning flight counts at one site, line transect bird counts at two sites, incidental bird counts, a 2.5-hour point count at one of the met towers for 14 days, raptor nest surveys, and dusk surveys. A total of 124 surveys were conducted, totaling 280 survey hours. No bald eagles were observed during the surveys.

Biologists conducted surveys for 17 days in November and December 2016. Survey types were early morning flight counts, line transects, diurnal raptor transects, single-point counts, dusk surveys, and general reconnaissance. Methods were consistent with the 2008 fall migration survey methods. No bald eagles were observed during the surveys.

3.1.4 Spring Migration and Summer Breeding Season Surveys (2008, 2017)

The 2008 spring migration, spring bird, and breeding season surveys included a 164-ft (50-m) search area at 54 sites, line transect counts at two sites, incidental bird counts, a 2.5-hour point count at the met tower for 14 days, raptor nest surveys, and dusk surveys. The surveys were performed from April 8 through May 31 and again from June 11 through June 26. A total of 98 surveys were conducted, adding up to 250 survey hours. No bald eagles were observed during the 2008 spring migration or summer breeding season surveys.

The 2017 spring migration and spring bird surveys occurred on a total of 13 days in March and April, 2017. Survey types included line transects, diurnal raptor transects, area search counts, single-point counts, dusk surveys, and general reconnaissance. Survey methods for each survey type were consistent with the methods of the 2008 surveys. No bald eagles were observed during the 2017 spring migration and spring bird surveys.

3.1.5 Aerial Raptor Surveys (2013, 2016)

Aerial raptor surveys were conducted by helicopter on March 18 and 19, 2013; and November 7, 2016. Biologists surveyed the Project area along with land out to 10 miles for raptors and their nests. No bald eagles or bald eagle nests were observed during either survey.

3.1.6 Spring and Fall Migration Avian Point Counts (2018)

Avian point counts were conducted at 50 locations from April 20 through June 1, 2018, and again from September 25 through October 12, 2018. Each point was surveyed for 15 minutes, twice in the spring and twice in the fall. All species seen or heard within a 164-foot (50-m) radius of the observer were recorded. No bald eagles were observed during the 2018 spring and fall avian point counts.

3.1.7 Eagle Nest Surveys (2018 – 2022)

Aerial and ground-based eagle nest surveys were conducted between 2018 and 2022, including aerial surveys using helicopters in 2018 and 2019 out to 10 miles from the Project area, followed by ground-based surveys focused on golden eagle nesting activity detected in 2019, 2020, 2021, and 2022 (see additional discussion for golden eagles). No bald eagle nesting activity or nests were observed.

3.1.8 Raptor Point Count Surveys (2018 – 2020)

Surveys occurred weekly at five locations inside the Project boundary from April 6, 2018 through April 25, 2019, and then biweekly from May 9, 2019 through February 29, 2020. Each point was surveyed for two hours at a time. Information recorded included flight paths, perch locations, nests, minutes of eagle flight within the rotor swept zone (RSZ; when the eagle is within a 2,625-ft [800-m] radius from the observers and below 656 ft [200 m] in height), number of individuals, and behavior. A total of 776 survey hours were recorded from April 6, 2018 through February 29, 2020.

Observers recorded two bald eagle sightings during the surveys. A juvenile bald eagle was observed soaring in the southern portion of the Project area on September 28, 2018. A juvenile bald eagle, potentially the same eagle, was again observed soaring in the same area on October 4, 2018. A total of 28 minutes of bald eagle flight minutes were observed. No bald eagles were observed in 2019 or 2020.

3.2 Golden Eagle

Project-relevant information on golden eagles is provided below, but general information on the taxonomy, ecology, distribution, and population trends of golden eagles can be found in

Section 3.3 of the PEIS (USFWS 2016a) and is incorporated herein by reference. The Project is in the golden eagle Pacific Flyway EMU.

Golden eagles are susceptible to anthropogenic stressors and disturbances near roosting and foraging areas (USFWS 2011, Wiens et al. 2017). Infrastructure associated with renewable energy projects can cause mortality in golden eagles through collisions with energy-related infrastructure and vehicles, and because of electrocution risk from power poles (Wiens et al. 2017). The vicinity of the Project area in southern California consists mainly of rural, agricultural lands, and herbaceous vegetation. Additional present habitat types are scrub/shrub, woodlands, and riparian. In this area, golden eagles forage in grassy and open shrub habitat for a variety of prey, including mammals and fish. Their nests are typically found in remote rocky cliffs and slopes, and rarely within trees; they also avoid populated areas (USFWS 2011, Polite and Pratt 2015).

Breeding golden eagles occupy discrete territories, which are typically used continuously for many years (Kochert et al. 2002, Kochert and Steenhof 2012). Nesting territories are often occupied for decades as golden eagle pairs establish and defend breeding territories that may contain multiple alternative nests (Millsap et al. 2015). Individual nests are frequently re-used within a territory, but some nests can go for decades between use (Kochert and Steenhof 2012). Breeding begins earlier at southern latitudes, but in general occurs with the start of courtship in many areas in January and extends through fledging of young, mostly in June and July in temperate latitudes, but into August at the northern extent of the range (Kochert et al. 2002). For a complete discussion of golden eagle biology and population status, see the Service's PEIS (USFWS 2016a). Surveys prior to and during construction for golden eagles occurred at the same time as those for bald eagles, listed above, so all survey methods are the same.

Surveys yielded golden eagle observations within and/or adjacent to the Project area in all years, ranging from solitary eagles to mating pairs. In-use nests were documented within 1 mile of the Project boundary. Further details are provided below.

3.2.1 Raptor Transect Survey (2002, 2005)

Survey methods and dates followed those described under bald eagles. One golden eagle was observed incidentally on June 20, 2002, but none were observed during the survey windows along the survey transects. Golden eagle(s) were observed on April 15, 2005, while surveying turbine locations at Sudden Bench – NW, Sudden Bench – NE, and Sudden Ridge – East, which are all in or just outside of the eastern portion of the Project. No golden eagles were observed during the other six dates.

3.2.2 Winter Bird Surveys (2006, 2008)

The 2006 survey methods for golden eagles were the same as for bald eagles, above. A golden eagle was observed during each of the three surveys spaced one week apart in December 2006. The observations were made along Signorelli Ridge and South Ridge, located in the south-

western portion of the Project. During the 2008 winter bird surveys, a single immature golden eagle was observed in March near North Ridge in the northwestern portion of the Project.

3.2.3 Fall Migration Surveys (2008, 2016)

During the 2008 fall migration surveys, golden eagles were observed during 10 of the 35 survey days between August 28 and November 8, 2008. Most instances were of a single bird, but one adult pair was documented. All observations were of eagles hunting along ridgetops and grasslands. At least four different golden eagles were observed: one immature, one sub-adult, and two adults. Four of the observations were of eagles flying at 100 to 250 feet above ground level. During the 2016 fall migration surveys, eight groups of ten individuals were observed.

3.2.4 Spring Migration and Summer Breeding Season Surveys (2008, 2017)

During the 2008 spring migration, spring bird, and breeding season surveys, five golden eagle observations were made. Single golden eagles were observed hunting over grasslands and scrub on April 29, May 4, and May 9. The ages of the birds were immature, sub-adult, and unknown, respectively. Two additional golden eagles were observed on April 15 over grasslands. During the 2008 summer breeding season surveys, no golden eagles were observed. During the 2017 spring migration and spring bird surveys, six observations resulting in a total of eight individual golden eagles were observed.

3.2.5 Aerial Raptor Surveys (2013, 2016)

During the 2013 aerial raptor survey (see description for bald eagles), five adult golden eagles (one pair and three solitary adults) and a golden eagle nest were observed. Two sightings were made approximately 1.5 miles southwest of the Project, one approximately 5 miles northeast of the Project, and one, along with a golden eagle nest, approximately 5 miles southeast of the Project. An unidentified raptor nest was also documented approximately 3 miles south of the Project. During the 2016 aerial raptor survey, three golden eagles were observed: a male and female pair approximately 4 miles west of the Project, and an immature male approximately 1.5 miles east.

3.2.6 Spring and Fall Migration Avian Point Counts (2018)

During the 2018 spring and fall migration avian point counts, one juvenile golden eagle was observed in September.

3.2.7 Eagle Nest Surveys (2018 – 2022)

Aerial eagle nest surveys were conducted by helicopter in 2018 and 2019, followed by ground-based surveys during the nesting season in 2019, 2020, 2021, and 2022. Three golden eagle nests were documented during aerial and ground-based nest surveys between 2018 and 2022. All

three nests were located within 10 miles north or northeast of the Project boundary. A solitary golden eagle was also observed 7.9 miles southeast of the Project during the surveys, but did not appear to be associated with a nest. Nest details are provided below.

Aerial eagle nest surveys documented an in-use golden eagle nest approximately 4.0 miles northeast of the Project boundary along the Santa Ynez River, and over 1 mile from the Project transmission line. It fledged one young on March 25, 2018.

A second golden eagle nest was detected through a combination of aerial surveys, ground-based surveys, and remote aerial photography in 2019 approximately 0.10 mile (500 ft) northeast of the Project boundary. A fledging had been documented in this area in 2018, and evidence indicated that the nest fledged one or two young in 2019 and 2020, and one in 2021. A third golden eagle nest was detected approximately 0.2 mile (1,056 ft) east of the Project boundary in April 2021, but appeared to be an alternate nest based on a lack of activity and continued use of the initial nest. Continued observations of the third nest indicated that it was used to fledge one young in 2022. No in-use nests were observed at either of these nests in 2023.

One of the two nests documented within 1 mile of the Project boundary was about 0.14 mile (740 ft) northeast of the nearest turbine (north of the Project), while the second nest (east of the Project) was about 1.39 mile (7,339 ft) northeast of the nearest turbine, and 0.15 mile (792 feet) southeast of the Project transmission line. In addition, the two nests were located approximately 1.5 miles apart. Given that golden eagle territories can exceed 5 miles (Katzner et al. 2020), and since nests have not appeared to be in use in the same year, it is likely that the two nests represent a single golden eagle territory near the Project.

3.2.8 Raptor Point Count Survey (2018 – 2020)

During the 2018 through 2020 raptor point count surveys, surveyors recorded 535 observations of golden eagles. Of these, 283 were the first detection of an individual during the 2-hour survey period, and the other 202 were records of individuals recorded previously during the 2-hour survey period. Of the 776 hours of survey data collected during the 2018 through 2020 raptor point count surveys, golden eagles were observed in flight for 2,880 minutes (48 hours), with the majority of these in the northeast portion of the Project area by the in-use nest approximately 500 feet outside the Project boundary. Flight paths occurred within the RSZ 50% of that time, or for 1,497 eagle minutes.

3.3 Migratory Birds

Effects to migratory birds from issuing eagle take permits have been analyzed in the PEIS, and those analyses are incorporated by reference here.

3.4 Species Listed under the Endangered Species Act

Section 7 of the ESA requires Federal agencies to consult to "ensure 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)). 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.

3.5 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 alternative 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.

3.6 Climate Change

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

4 Environmental Consequences

This section summarizes the effects on the environment of implementing the Proposed Action or alternative 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.

4.1 Proposed Action

4.1.1 Bald Eagles

4.1.1.1 Effects

Under the proposed action, we estimate 0.4 bald eagle may be taken annually, totaling 12 over the life of the permit (i.e., 30 years). This prediction is based on a conservative approach that is expected to overestimate annual and cumulative take at the outset of permit. We anticipate the prediction will decrease as we incorporate Project-specific monitoring data into the predictive model as part of the permit's adaptive management process. The proposed conservation

measures include adaptive management that could result in additional monitoring and operational adjustments. Adaptive management measures will be implemented. The eagle fatality monitoring associated with this alternative (e.g., evaluating all turbines during a monitoring year) will allow the Service and permittee to estimate the total number of annual eagle fatalities. Monitoring is a critical component of adaptive management. Together, these conservation measures ensure there will be no significant impacts to bald eagles.

The annual take of bald eagles that would be authorized by this permit does not exceed the Pacific Flyway South EMU take limit of 15 eagles per year; therefore, compensatory mitigation for bald eagles is not required for Project take (USFWS 2016a,b, 2022). Compensatory mitigation required for golden eagles may benefit bald eagles by retrofitting high-risk power poles and alleviating the risk of electrocution associated with those structures (see Section 4.1.2).

4.1.1.2 Cumulative Effects

Take of eagles has the potential to affect the larger eagle population. Accordingly, the 2016 PEIS analyzed the cumulative effects of permitting take of bald and golden eagles in combination with ongoing unauthorized sources of human-caused eagle mortality and other present or foreseeable future actions affecting bald and golden eagle populations. As part of the analysis, the Service determined sustainable limits for permitted take of bald eagles within each EMU. The bald eagle take that would be authorized by this permit does not exceed the EMU take limit for bald eagles, so it will not significantly impact the EMU bald eagle population. The avoidance and minimization measures for eagles that would be required under the permit, along with the additional adaptive management measures, are designed to further ensure the permit is compatible with the preservation of bald and golden eagles at the regional EMU population scale.

Additionally, to ensure that eagle populations at the local scale are not depleted by cumulative take in the local area, the Service analyzed in the 2016 PEIS the amount of take that can be authorized while still maintaining the Local Area Population (LAP) of eagles. In order to issue an EITP, cumulative authorized take should not exceed 5%, nor can cumulative unauthorized take exceed 10%, of an LAP, unless the Service can demonstrate why allowing take to exceed that limit is still compatible with the preservation of eagles. The EITP regulations require the Service to conduct an individual LAP analysis for each permit application as part of our application review.

We, therefore, considered cumulative effects to the 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 the Project 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 (i.e., known eagle take at nearby wind farms, electrocution, and documented mortalities due to anthropogenic and natural causes) to estimate cumulative impacts to the LAP. The scale of our LAP analysis is an 86-mi (138-km) radius around the Project site for bald eagles. We conducted our cumulative effects analysis as described in Appendix F of the Service's Eagle Conservation Plan Guidance (USFWS 2013).

Results from our bald eagle LAP effects analysis for the Proposed Action are summarized in Appendix B. The LAP of bald eagles for the Project is approximately 9.52 eagles, and the annual 1% and 5% benchmarks for this LAP are about 0.10 and 0.48 bald eagle, respectively. The Service is aware of up to 63 other wind facilities[2] in the vicinity of the LAP that may be operational and have the potential to take bald eagles but are not yet permitted for bald eagle take based on the most up-to-date information in the USGS United States Wind Turbine Database (USGS et al. 2024). Past take of bald eagles at these facilities is unknown to the Service. Therefore, only the Project's take, estimated at 0.4 bald eagle per year, is available for this cumulative analysis. This would result in a total annual take that is 4.2% of the LAP, which is below the 5% benchmark. 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 impacts in this EA.

We also documented, through an assessment of unpermitted take, that bald eagles are experiencing high levels of unpermitted take in the LAP. Based on the Service's eagle mortality database (which tracks sources of unpermitted take), there were 17 reported bald eagle mortalities within the LAP between 2013 and 2022, for an average of 1.7 per year. These mortalities were due more to anthropogenic causes (e.g., electrocution, shooting, poisoning, and collision with wind turbines) than to natural causes. On an annual basis, 1.7 unpermitted bald eagle mortalities equal about 18% of the total estimated bald eagle population in the LAP. This is above the 10% threshold for unpermitted take within the LAP, such that take from a Project in these circumstances might not be permitted or could require mitigation if the Service finds the additional take could threaten the preservation of bald eagles.

To assess the risk to bald eagles given the high levels of unpermitted take, we reviewed population trend data and found that bald eagle populations throughout California appear to be increasing. The North American Breeding Bird Survey showed a positive population trend estimate for bald eagles in California, most of which is in the Pacific Flyway South EMU, of 6.4% between 1966 to 2019 (U.S. Geological Survey [USGS] 2023). In addition, recent research indicates that this population increase includes southern California where the Project is located (P. Bloom, Bloom Biological Inc., pers. comm., 2024). These trends are consistent with the increase in bald eagle populations across the rest of the country, which saw an approximately 10% increase outside the Pacific Flyway South EMU between 2016 and 2019 based on an analysis by the Service (an update for the Pacific Flyway South was not completed at the time due to a lack of data) (USFWS 2020).

An increasing bald eagle population in California, including southern California, indicates that the unpermitted anthropogenic take in the Project LAP is likely sustainable, and that permitting additional take from the Project, at 0.4 bald eagle mortality per year, would not threaten the preservation of the population in the LAP. In addition, the proposed minimization and avoidance measures described in Section 2.1 and the ECP (Appendix A) could reduce take at the Project.

[2] This estimate may be high since decommissioned wind facilities could be included in this number, depending on the status of the data.

These measures include the implementation of an IdentiFlight system, carcass removal, avian fatality monitoring, and implementation of an adaptive management strategy. Furthermore, the mitigation being proposed for golden eagles involving the retrofitting of high-risk electric utility power poles (see Section 4.1.2), could also contribute to a reduction in unpermitted bald eagle take in the LAP, particularly since 41% of the unpermitted anthropogenic take (or 0.7 bald eagle per year) was caused by electrocutions (see Appendix B).

Based on our analysis, Project scale effects of the Applicant's proposed approach for issuance of an incidental eagle take Permit on bald eagle populations would not be significant and are therefore compatible with the preservation of bald eagles.

4.1.1.3 Monitoring

Under all action alternatives under which we consider issuance of an eagle take permit, the monitoring protocols for the Project include annual post-construction (post-permit) monitoring for eagles. It is our current policy that project-level monitoring of eagle injuries/fatalities is required of all permits issued to wind facilities, and that they achieve a site-wide probability of detecting eagle remains (if take has occurred) of 35% (i.e., a probability of detection of 0.35) averaged over each 5-year period of the permit tenure. The Applicant will work with the Service to develop its post-permit fatality monitoring plan, which will include details concerning reporting requirements and the survey frequency, monitored turbines, and search plots that would achieve the required probability of detection. In addition, data from the Project's monitoring programs under the County CUP may help inform consideration of additional eagle-specific conservation measures. Monitoring per County CUP conditions includes one year of post-construction avian use surveys (including raptor point counts year-round), and post-construction bird and bat mortality monitoring, as summarized below and described in Section 6 of the ECP.

Under the terms of the County CUP, avian use surveys will be completed in the first year of operations, consistent with the study design and survey protocols from the Project's 2018 to 2019 and 2021 to 2022 surveys (see Section 6.2 of the ECP). The objective is to compare pre- and post-construction avian use, including raptor use, at the Project.

Post-construction bird and bat mortality monitoring will also be conducted for at least the first two years of Project operations under the terms of the County CUP (see Section 6.1 of the ECP). The intent is to estimate mortality rates for different species or species groups for mortalities attributed to operations. The methods are described in detail in the ECP and the Project's BBCS.

Any incident involving a state- or federally listed threatened or endangered species or a bald or golden eagle would be reported to the USFWS and CDFW within 24 hours of identification.

4.1.1.4 Adaptive Management

Under the Proposed Action, federal eagle permitting regulations would require the permittee to provide the Service with eagle monitoring information at a minimum of once every five years (50 CFR § 22.80(c)(7)(iii)). The reporting frequency of the methods and results of the post-permit eagle fatality monitoring would be established in the post-permit monitoring plan in coordination with the Service (see above). The Service would use this information to assure the

permittee remained compliant with the Permit, assess if there were any needed adjustments to the Permit, determine future mitigation payment needs, and help determine if adaptive management measures need to be implemented to reduce take. Adaptive management for bald eagles is described in the Project's Adaptive Management Plan in Section 7 of the ECP. The framework for the plan involves a stepwise process to guide the implementation of additional conservation measures as needed to reduce impacts to bald eagles (Table 1).

Table 1. Adaptive management framework for bald eagle take at the Strauss Wind Energy Project in Santa Barbara County, California under the Proposed Action and Alternative 1, consistent with the Santa Barbara County Conditional Use Permit Conditions of Approval [a]

Step	Bald Eagle Threshold (number of remains)*	Adaptive Management Response [a,b]
1	1 bald eagle fatality found during surveys or incidentally in any consecutive 12-month period	• **County CUP Response:** o Notify the USFWS, CDFW, and Santa Barbara County Planning and Development Department (County P&D) within 24 hours of confirming a bald eagle fatality (CUP response). o Implement an enhanced monitoring program approved by Santa Barbara County that increases the carcass search frequency in the vicinity of the specific turbines suspected of causing the fatality (CUP response). o Record wind velocity data for the area of fatalities to provide to the County P&D if requested (CUP response). • **USFWS Permit Response:** o Continue implementation of ECP o Investigate new potential risk factors. o Consider additional avoidance/minimization measures based on identified potential risk factors; for example: roadkill removal efforts or landowner outreach if roadkill or livestock carcasses are found to be attracting eagles or monitor flight movements at a newly constructed nest near turbines or install perch deterrents if frequent perch locations are identified near turbines.
2	2 bald eagle fatalities found during surveys or incidentally in any consecutive 12-month period	• **County CUP Responses:** o Notify the USFWS, CDFW, and Santa Barbara County P&D within 24 hours of confirming the second bald eagle fatality. o Implement adaptive measures and an effectiveness evaluation program to reduce fatalities if the County P&D and a qualified

Step	Bald Eagle Threshold (number of remains)*	Adaptive Management Response [a,b]
		biologist determine the fatality was caused by turbine operations, such as: ▪ habitat modifications ▪ Project modifications ▪ selective curtailment of turbine operation ▪ increasing the turbine cut-in speed to 5.0 m/s or greater • **USFWS Permit Response:** o Consult with the USFWS to determine if the take limit for the Project should be adjusted and the permit amended.
3	>1 bald eagle fatality found in a 15-year period	• **County CUP Response:** o See Step 1 or 2, as applicable • **USFWS Permit Response:** o Consult with the USFWS to determine if the take limit for the Project should be adjusted and the permit amended.

[a] The Santa Barbara County CUP includes Conditions of Approval (Attachment 2 of the County CUP). Conditions for a California Fully Protected Species apply for bald eagles; Condition No. 38 (MM BIO-16) and 42 (MM BIO-16d).

[b] Bald eagle thresholds are based on County CUP Condition No. 42 (MM BIO-16d) and on the number of eagles found assuming a permitted take rate of 0.18 bald eagle/year and a minimum average detection probability (*g*) of 0.35 for each review period and using a 50% credible interval.

4.1.2 Golden Eagles

4.1.2.1 Effects

Project construction began in 2020. Foraging and nesting eagles in the Project vicinity may have been temporarily disturbed or displaced during construction. In most survey years (2006, 2008, and 2018 through 2022), golden eagles were observed during all seasons in the Project area. During the 2018 through 2020 raptor point counts, 535 golden eagle observations totaling 2,880 minutes were documented, 50% of which occurred in the RSZ. Flight paths occurred throughout the Project area, with the highest concentration in the northeastern portion of the Project near the golden eagle nest located approximately 0.14 mile northeast of the nearest turbine, which successfully fledged young from 2018 through 2021. This was also near the second closest golden nest located approximately 1.39 miles northeast of the nearest turbine and 0.15 mile southeast of the Project transmission line, which successfully fledged young in 2022. Impacts to golden eagles were likely small given the minimization and avoidance measures implemented during Project design and construction, including a 1-mile no-disturbance buffer around in-use nests during the breeding season (see sections 5.1 and 5.2 of the ECP), with successful reproduction during construction (in 2020, 2021, and 2022).

The effect of O&M on golden eagles could consist of mortality through collision with turbines; lost productivity due to the loss of one or both adults in a nesting pair; nest disturbance during the breeding season from O&M activities resulting in lost productivity; or loss of reproductive, roosting, or foraging territory due to disturbance or displacement by operations. If operations result in the loss of a breeding adult, it could temporarily reduce productivity. However, there is evidence that suggests golden eagles will find new mates, indicating that productivity could recover (USFWS 2023).

To analyze potential effects and the likelihood that disturbance take of golden eagles or territory loss may occur, we overlay the areas associated with each Project component with the approximated eagle territory boundaries and all known nests within the territories. Project activities within territories or within 1 mile of known nests are analyzed on a territory-by-territory basis to determine the potential impacts to territories, known nests, and important use areas. When considering the potential for effects to eagles from Project components, we also take into account the possibility for golden eagle pairs to build nests in new locations that may be closer or farther away from Project activities, as well as the knowledge that eagle territory boundaries can be dynamic over time, with shifts in territory arrangement possible. Disturbance take authorization would only be necessary when breeding eagles have an in-use nest (see 50 CFR § 22.6 for "in-use nest" definition)[3] within 1 mile of Project activities, as nesting eagles within this distance have increased likelihood of disturbance. As noted above, two in-use golden eagle nests were identified in alternate years within 1 mile of Project infrastructure (also see Section 3.2.7). Because Project O&M activities may disturb these nests, the Applicant has included nest disturbance take in their application in compliance with 50 CFR § 22.

We estimated take from turbine collisions using the USFWS collision risk model, which determined the estimated annual take of golden eagles to be 15.0 golden eagles per year, or 450 golden eagles over the 30-year Permit term. Take from nest disturbance was estimated based on 30 anticipated occurrences of nest disturbance resulting in lost productivity (i.e., nest failures) caused by O&M activities within 1 mile of an in-use nest during the breeding season. Potential O&M activities that could occur during the breeding season within 1 mile of the two golden eagle nests identified in Section 3.2 include the following:

- turbine maintenance and repair of project facilities, including
    - wind turbine
    - transmission line
    - substation
    - IdentiFlight units
- IdentiFlight and bat deterrent use

[3] An "in-use nest" is a bald or golden eagle nest containing eggs, young, or that has been attended to in the past ten days during the breeding season by adult eagles.

- bird and bat mortality monitoring
- carcass and carrion removal
- Bird and Bat Adaptive Management Plan implementation
- restoration and weed control

The estimate is also based on the number of territories that could be affected, as established in the 2016 PEIS (USFWS 2016a). As noted in Section 3.2.7, the nests within 1 mile of Project infrastructure likely belong to the same territory based on their proximity to each other. Surveys documenting that only one of these nests has been in use in a single year further supports this conclusion. The 2016 PEIS estimated the annual loss per territory from nest disturbance to be equal to the EMU-specific productivity, which is 0.59 in all EMUs for golden eagles (USFWS 2016a,b). Therefore, with one golden eagle territory within 1 mile of Project infrastructure, we estimate a loss of 0.59 golden eagle per nest failure. Estimating 30 occurrences or years of nest failure equates to 18 golden eagles over the life of the Permit term. Total take from both turbine collisions and nest disturbance would therefore equal on average 15.0 golden eagles per year, or 450 golden eagles over the 30-year Permit term.

Whether nest disturbance take due to O&M activities occurs in any given year depends on a number of factors, including proximity of O&M activities to an in-use nest, when the activity occurs relative to breeding activities or the development stage of young eagle(s), and the status of the nest or young eagle(s) following the activity. The Project operator would need to determine the outcome of an in-use nest (i.e., fledged young or nest failure) for the breeding season of the given year when the activity occurred. They could choose to assume nest failure (disturbance take), which would automatically require compensatory mitigation, or conduct monitoring to determine if the nest is successful, or if it fails and compensatory mitigation is required. If O&M activities (incursions) occur within 1 mile of an in-use eagle nest during the breeding season, the breeding adults could abandon the nest or leave it long enough for the nest to fail, or nestlings may be at risk of fledging early. Additionally, fledglings may use the nest during the post-fledging period, particularly if they fledge early and return to the nest.

Given these and other considerations, nest outcomes will be assessed differently depending on when the incursion occurs. If an incursion occurs before a nestling reaches 7 weeks of age and no subsequent work occurs within the 1-mi buffer, the nest will be considered successful if a nestling at least 8 weeks old is observed in the nest, or if a fledgling is subsequently observed near the nest. If an incursion occurs after a nestling has reached 7 weeks of age and is still in the nest, the nest will be considered successful if it is observed in the nest or a fledgling is observed near the nest at least 1 week after the incursion.

Specifically, the criteria for determining take from O&M activities within 1 mile of an in-use nest based on nest outcome are as follows:

- If the Project operator does not conduct monitoring, they may assume that a nest has failed due to the O&M activity, in which case, the incursion would constitute take and compensatory mitigation would be required.

- If periodic monitoring shows that the nest, or an alternative nest in the territory, is successful (as defined above), no take associated with the O&M activity occurred and no mitigation would be required.
- If periodic monitoring shows that the nest is unsuccessful, regardless of the potential reasons for the nest becoming unsuccessful, the O&M activity would constitute take and mitigation for nest disturbance would be required.

In determining the significance of effects of the Project on eagles, we confirmed that the Proposed Action does not deviate from 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 also assessed Project-specific effects to eagles that were not covered in the PEIS analyses. These effects may occur at the project scale, at the local-area eagle population scale, and at the regional EMU scale.

The primary risk to golden eagles under all of the alternatives is mortality or injury from collision with rotating turbine blades or loss of productivity due to nest disturbance during the breeding season. One risk factor for eagles colliding with turbines is related to the density and availability of small mammal prey resources, such as colonial burrowing rodents and rabbits, which, typically, are important prey species for golden eagles. Assemblages of prey resources could attract eagles to the Project to forage and create a potential for the risk of collision. All alternatives have the potential to result in the future take of eagles, whether permitted or not, as the Project infrastructure is in place and ready to begin operations.

To ensure that eagle populations at the local scale are not depleted by combined 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, all annual authorized take within a LAP must not exceed 5% of the LAP unless the Service can demonstrate why allowing take to exceed that limit is still compatible with the preservation of eagles.

The LAP for this Project is estimated to be 122.83 golden eagles. Given that 5% of that population would be 6.14 golden eagles per year, and the Proposed Action is projected to result in the take of 15.0 golden eagles per year (12.2% of the LAP), estimated take is expected to be higher than the 5% threshold for sustainable take. To address this potential elevated risk to golden eagles, the Proposed Action incorporates additional measures to minimize, avoid, and mitigate eagle take to the maximum degree practicable, as required by regulation. The proposed minimization and avoidance measures are described in Section 2.1, as well as in the ECP (Appendix A) and include the implementation of an IdentiFlight system, avian fatality monitoring, and implementation of an adaptive management strategy.

Along with implementing these minimization and avoidance measures, the Applicant would provide compensatory mitigation to offset the estimated take at a 2:1 ratio or 1.2:1 ratio, the latter of which is the minimum required in the Eagle Act regulations (81 FR 91494). It is anticipated that the Applicant would provide funding to retrofit electric power poles that are an

electrocution risk to golden eagles. Using the higher 2:1 ratio for compensatory mitigation than is required in the Eagle Act regulations would help address the take exceeding the 5% threshold for the LAP and achieve 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). Alternatively, the Applicant may identify alternative mitigation that would substantially contribute to the persistence of the local population, in addition to the 1.2:1 ratio. Alternative mitigation options could include support for lead abatement programs, carcass removal along highways, habitat restoration/prey enhancement programs, or funding for mitigation banking efforts (Allison et al. 2017). The Applicant would coordinate with the Service if alternative mitigation options become available.

The retrofitting of high-risk electric utility power poles can be used to offset authorized take of golden eagles given that 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 effect of retrofitting power poles has been quantified "per eagle," allowing use of REA to calculate the number of power pole retrofits needed to offset the authorized take of golden eagles (USFWS 2013).

The Service ran the REA to determine the number of power poles that would need to be retrofitted to offset the estimated golden eagle take. Incorporating the 2:1 compensatory mitigation ratio, the Applicant would need to retrofit 6,763 to 15,770 power poles to offset the take of 15.0 golden eagles each year at the Project, including 6,700 to 15,395 power poles for take due to collisions, and 345 to 793 power poles for 30 years of nest disturbance take. The final number of poles retrofitted will depend on several factors, including the type and expected longevity (e.g., 10 or 30 years) 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. The Applicant would pay up front for the first three years of anticipated take. If take estimates are less than the mitigated take after the first review period, the excess mitigated take would be credited to the Applicant for any take that occurs during subsequent review periods. If estimated take is higher, additional compensatory mitigation would be required. If the applicant proposes, and the Services approves, of alternative mitigation that would substantially contribute to the persistence of the local population, the retrofits above would be reduced to the 1.2:1 ratio.

Along with the benefit to eagles of reducing mortalities by electrocution, retrofitting 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 EMU in which the take occurs (50 CFR § 22.80(c)(1)(iii)(B)). The Project is located in the Pacific Flyway EMU for golden eagles. Therefore, the Applicant or in-lieu fee program manager would coordinate with

electric utility companies to determine locations of power poles within this EMU that are appropriate for retrofitting to prevent golden eagle electrocutions. The retrofits conducted as compensatory mitigation for this 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.

Even though the take that would be authorized by the permit would exceed 5% of the LAP for golden eagles, the compensatory mitigation provided by the Applicant described above would fully offset the estimated take by Project activities and create a net benefit to the species. Therefore, Project scale effects of the Applicant's proposed approach for issuance of an incidental eagle take Permit on golden eagle populations would not be significant and are therefore compatible with the preservation of golden eagles.

4.1.2.2 Cumulative Effects

The Service also assessed 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, it is not anticipated that annual take of 15.0 golden eagles over the 30-year Permit term would contribute to cumulative impacts resulting in a net reduction in golden eagle populations based on the implementation of the additional avoidance, minimization, and mitigation measures described above and in the ECP (Appendix A).

As discussed above, all annual authorized take within a LAP must not exceed 5% of the 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 10%, 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 § 22.80(e)). We, therefore, considered 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 impacts to the LAP. We conducted our LAP effects analysis as described in the Service's *Eagle Conservation Plan Guidance* (USFWS 2013).

Results from our golden eagle LAP effects analysis for the Proposed Action are summarized in Appendix C. As noted, the LAP is estimated to be 122.83 golden eagles, with a 5% benchmark of 6.14 golden eagles per year for sustainable take. The Project alone would exceed this benchmark at 15.0 golden eagles (11% of the LAP) per year. Three other wind projects that overlap with the Project's LAP would contribute an additional 0.5 golden eagle per year of

authorized take in the LAP (0.4% of the LAP), for a cumulative annual authorized take estimate of 15.5 golden eagles (11.4% of the LAP).

The Service does not have any indication that unauthorized take may exceed 10% of the LAP. A summary of available data of unauthorized take is provided in Appendix C and suggests that unauthorized take of eagles in the LAP may be around 6.3% of the LAP per year, which is below the 10% threshold for unauthorized anthropogenic take.

Among other sources of unauthorized take, the Service is aware of up to 66 other wind facilities[4] in the vicinity of the LAP, based on the most up-to-date information in the United States Wind Turbine Database, that may be operational and likely to take eagles but the majority are not yet permitted for eagle take. Past take of eagles at these facilities is unknown 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. The additional avoidance, minimization, and mitigation measures described for the Proposed Action would address these potential cumulative effects in the LAP.

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 the Applicant would provide mitigation to offset cumulative effects in the LAP, LAP-scale effects of issuance of the requested incidental eagle take Permit on golden eagle populations would not be significant and would therefore be compatible with the preservation of golden eagles.

Finally, take of eagles also has the potential to affect the larger eagle population. Therefore, the Service defined regional EMUs and analyzed the 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 1.2:1 (81 FR 91494). As described, the Applicant would offset the authorized take at a higher 2:1 ratio given that take exceeds 5% of the LAP. Therefore, the take that would be authorized under the Proposed Action would not significantly impact the EMU eagle population. The avoidance and minimization measures that would be required under the Permit, along with monitoring, are

[4] This estimate may be high since decommissioned wind facilities may be included in this number, depending on the status of the data.

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 and affect larger eagle populations, will be addressed by avoidance, minimization, and mitigation measures provided by the Applicant, such as the use of IdentiFlight units and compensatory mitigation at a 2:1 ratio to fully offset take, the Proposed Action of issuance of the requested incidental eagle take Permit would cause no significant adverse effects on golden eagle populations and is compatible with the preservation of golden eagles.

4.1.2.3 Monitoring

Monitoring commitments are the same as those listed above for bald eagles, in addition to optional productivity monitoring of in-use golden eagle nests within 1 mile of Project O&M activities that occur during the breeding season throughout the life of the Permit. When impacts to reproduction are calculated, if the Applicant chooses not to monitor productivity those nests will be assumed to have failed.

4.1.2.4 Adaptive Management

Requirements for reporting the methods and results of post-permit eagle fatality monitoring are described in the Adaptive Management section for bald eagles. As noted for bald eagles, the Service would use this information to assure the permittee remained compliant with the Permit, assess if there were any needed adjustments to the Permit, determine future mitigation payment needs, and help determine if adaptive management measures need to be implemented to reduce take. Adaptive management for golden eagles is described in the Project's Adaptive Management Plan in Section 7 of the ECP. The framework for the plan involves a stepwise process to guide the implementation of additional conservation measures as needed to reduce impacts to golden eagles (Table 2).

Table 2. Adaptive management framework for golden eagle take at the Strauss Wind Energy Project in Santa Barbara County, California under the Proposed Action, consistent with the Santa Barbara County Conditional Use Permit Conditions of Approval [a]

Step	Golden Eagle Threshold (number of remains)[b]	Adaptive Management Response [a]
1a	• 1 golden eagle fatality found during surveys or incidentally in any consecutive 12-month period	• **County CUP Response:** o Notify the USFWS, CDFW, and Santa Barbara County Planning and Development Department (County P&D) within 24 hours of confirming an eagle fatality (CUP response). o Implement an enhanced monitoring program approved by Santa Barbara County that increases the carcass search frequency in the vicinity of the specific turbines suspected of causing the fatality (CUP response). o Record wind velocity data for the area of fatalities to provide to the County P&D if requested (CUP response). • **USFWS Permit Response:** o None
1b	• Disturbance take of one or more nests occurs	• **County CUP Response:** o Notify the USFWS, CDFW, and Santa Barbara County Planning and Development Department (County P&D) within 24 hours of confirming an eagle fatality (e.g., nestling or fledgling) (CUP response). • **USFWS Permit Response:** o None: the Project may choose to implement additional avoidance and minimization measures in subsequent years to reduce the risk of nest disturbance take.

Step	Golden Eagle Threshold (number of remains)[b]	Adaptive Management Response [a]
1c	• ≥ 1 golden eagle found in any 5-year period	• **County CUP Response:** o See Step 1a or 2a, as applicable. • **USFWS Permit Response:** o Continue implementing the ECP. o Assess eagle fatalities to determine if cause or risk factor can be determined (e.g., season, weather, presence of prey/carrion, fire, or other event). Pay particular attention to any common elements among fatalities. o Provide eagle fatality data and other relevant data, with suspected cause of death, to the USFWS.
2a	• 2 golden eagle fatalities found during surveys or incidentally in any consecutive 12-month period	• **County CUP Response:** o Notify the USFWS, CDFW, and Santa Barbara County P&D within 24 hours of confirming the second golden eagle fatality. o Implement adaptive measures and an effectiveness evaluation program to reduce fatalities if the County P&D and a qualified biologist determine the fatality was caused by turbine operations, such as: ▪ habitat modifications ▪ Project modifications ▪ selective curtailment of turbine operation ▪ increasing the turbine cut-in speed to 5.0 m/s or greater • **USFWS Permit Response:** o None

Step	Golden Eagle Threshold (number of remains)[b]	Adaptive Management Response [a]
2b	• ≥ 25 eagles found in first 5 years, or • ≥ 48 eagles found in first 10 years, or • ≥ 70 eagles found in first 15 years	• **County CUP Response:** o See Step 1a or 2a, as applicable. • **USFWS Permit Response:** o Implement Step 1c adaptive management response. o Consider additional studies (e.g., eagle use/nest surveys) to better understand risk factors. o If cause or risk factor can be identified, consider additional avoidance or minimization measures. o Coordinate with USFWS to determine if additional studies would provide useful information to better understand risk.
3	• ≥ 52 eagles found in first 10 years, or • ≥ 75 eagles found in first 15 years, or • ≥ 100 eagles found in first 20 years	• **County CUP Response:** o See Step 1a or 2a, as applicable. • **USFWS Permit Response:** o Implement Step 1a and Step 2b adaptive management response. o If a specific risk factor has been identified under Step 1a or 2b, consider one or more avoidance or minimization measures designed to reduce the likelihood of future take, such as: ▪ Reducing eagle use near turbines (i.e., deterrent), ▪ Reducing the source of collision (i.e., curtailment), such as installment of additional automated eagle detection technology, or human biological monitors, or ▪ Other measure(s) agreed upon in consultation with the USFWS. o If avoidance and minimization measures have proven effective at reducing eagle fatalities in subsequent 5-year period, elimination or reduction of measures will be considered in consultation with the USFWS. o Consider if level of take authorization remains appropriate or if a permit amendment may be warranted (e.g., based on additional studies conducted under Step 2b).

Step	Golden Eagle Threshold (number of remains)[b]	Adaptive Management Response [a]
4	• ≥ 104 eagles found in first 20 years, or • ≥ 125 eagles found in first 25 years	• **County CUP Response:** o See Step 1a or 2a, as applicable. • **USFWS Permit Response:** o Immediately upon meeting this trigger, implement the following: ▪ If technology, biological monitors, or other minimization and avoidance measures have previously been implemented at the Project, alter the programming of implementation of those effort(s) to enhance effectiveness, or implement another avoidance or minimization measures agreed upon in consultation with the USFWS. The effectiveness of any measure or enhanced measure much be studied with the study design approved by the USFWS. ▪ Consult with USFWS to determine if the take limit should be adjusted and the permit amended (e.g., based on additional studies conducted under Step I or Step II).

[a] The Santa Barbara County CUP includes Conditions of Approval (Attachment 2 of the CUP). Conditions for a California Fully Protected Species apply for golden eagles; Condition No. 38 and 42, Condition No. 38 (MM BIO-16) and 42 (MM BIO-16d).

[b] Golden eagle thresholds are based on CUP Condition No. 42 (MM BIO-16d) and the number of eagles found assuming a permitted take rate averaging 15.0 golden eagles/year and a minimum average detection probability (*g*) of 0.35 for each review period and using a 50% credible interval.

4.1.3 Migratory Birds

Issuance of the Permit to the Project may 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.

Impacts to migratory birds from the issuance of incidental eagle take permits were fully analyzed in the PEIS (USFWS 2016a); no further adverse effects to migratory birds are anticipated from issuance of the eagle take Permit to the Project.

4.1.4 Species Listed under the Endangered Species Act

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)). 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.

4.2 Alternative 1: Permit for Eagle Take with Turbine Curtailment

4.2.1 Bald Eagles

4.2.1.1 Effects

Under Alternative 1, the same level of bald eagle take would be authorized as under the Proposed Action, and effects, avoidance and minimization measures, mitigation, surveying and monitoring, and adaptive management would be the same (see Section 4.1.2).

4.2.2 Golden Eagles

4.2.2.1 Effects

Under Alternative 1, impacts due to mortality of breeding eagles from turbine collisions would likely be reduced compared to the Proposed Action with the implementation of breeding season monitoring and curtailment. However, as noted in Section 2.2, authorized take from turbine collisions would be the same as the Proposed Action at 15.0 golden eagles per year, or 450 golden eagles over the 30-year Permit term, since there is no reasonable basis to estimate what the reduced take might be. As such, take under Alternative 1 is estimated to be greater than the 5% threshold for sustainable authorized take in the LAP.

To remain in compliance with the Eagle Act, the estimated compensatory mitigation plan, along with other monitoring requirements and avoidance and minimization measures, would be the

same as under the Proposed Action. As such, Project scale effects from issuance of an incidental eagle take Permit on golden eagle populations under Alternative 1 would not be significant and are therefore compatible with the preservation of golden eagles.

4.2.2.2 Cumulative Effects

As noted, Alternative 1 would likely take fewer golden eagles and contribute less to the cumulative authorized take in the LAP than under the Proposed Action, although this reduction cannot be quantified at this time. Therefore, the estimated cumulative effects for Alternative 1 is the same as for the Proposed Action, which would be greater than the 5% threshold for sustainable cumulative authorized take in the LAP. Because the Applicant would provide the same compensatory mitigation to fully offset golden eagle take and create a net benefit to golden eagles as under the Proposed Action, issuance of the requested incidental eagle take Permit would cause no significant adverse effects on golden eagle populations and is compatible with the preservation of golden eagles.

Sources of unauthorized take, the impact of other unpermitted wind facilities, and effects of future wind development are the same as described in the Proposed Action, with no evidence indicating that unauthorized take may exceed 10% of the LAP.

4.2.2.3 Monitoring

Monitoring commitments for golden eagles are the same as those listed for the Proposed Action (see Section 4.1.2.3).

4.2.2.4 Adaptive Management

The Adaptive Management Plan would be the same as for the Proposed Action (see Section 4.1.2.4).

4.2.3 Migratory Birds

The environmental consequence on migratory birds would not differ from the Proposed Action. Impacts to migratory birds from the issuance of incidental eagle take permits were fully analyzed in the PEIS (USFWS 2016a); no further adverse effects to migratory birds are anticipated from issuance of the eagle take Permit to the Project.

4.2.4 Species Listed under the Endangered Species Act

The environmental consequences for species listed under the endangered species act would not differ from the Proposed Action. 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.

4.3 Alternative 2: No Action

4.3.1 Bald Eagles

If, under the No-Action Alternative, the Service took no action on the Applicant's Permit application, should take of eagles occur, the Applicant would be in violation of the Eagle Act. Under this No-Action Alternative, although all eagle conservation measures required by other agencies and jurisdictions should be implemented at the Project, additional measures required under the Permit would not be implemented to avoid or minimize risk to eagles of the Project activities. Therefore, the risk to eagles is expected to be higher under this alternative as compared to the Proposed Action. Under this No-Action Alternative, impacts of the Project on the eagle population are anticipated to be take of 12 bald eagles over the 30-year life of the Project.

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 adverse effects to bald eagles described above, effects that are not compatible with the preservation of bald eagles.

4.3.2 Golden Eagles

If, under the No-Action Alternative, the Service took no action on the Applicant's Permit application, should take of eagles occur, the Applicant would be in violation of the Eagle Act. Under this No-Action Alternative, although all eagle conservation measures required by other agencies and jurisdictions should be implemented at the Project, additional measures required under the Permit would not be implemented to avoid or minimize risk to eagles of the Project 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, impacts of the Project on the eagle population are anticipated to be take of 450 golden eagles over the 30-year life of the Project.

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.

4.3.3 Migratory Birds

Any incidental benefits to migratory birds from avoidance, minimization, and mitigations required under the Permit would not be realized under the No-Action Alternative.

4.3.4 Species Listed under the Endangered Species Act

As the Service would be taking no action under this alternative, and therefore there would be no requirement to provide compensatory mitigation to offset eagle take, there is no potential for effects to ESA-listed species from retrofitting of power poles. Therefore, there would be no effects to ESA-listed species under this No-Action alternative.

4.4 Comparison of Alternatives

The following table compares the effects of the Proposed Action and alternatives (Table 3).

Table 3. Comparison of the Proposed Action and other alternatives.

	Proposed Action: Issue permit for bald and golden eagle incidental take and golden eagle nest disturbance take	Alternative 1: Issue permit for bald and golden eagle incidental take and golden eagle nest disturbance take with seasonal blanket curtailment	Alternative 2: No Action
Eagle Take Levels	• 12 bald eagles; • 450 golden eagles	• 12 bald eagles; • 450 golden eagles	• 12 bald eagles; • 450 golden eagles
Avoidance and Minimization	• Use of IdentiFlight as specified in the ECP • Adaptive Management Plan • Carrion removal program • Avoidance measures for nesting golden eagles to the extent feasible	• Use of IdentiFlight as specified in the ECP • Adaptive Management Plan • Carrion removal program • Avoidance measures for nesting golden eagles to the extent feasible • Implementation of turbine curtailment during the breeding season	• Use of IdentiFlight (optional) • Adaptive Management Plan (per the CUP only) • Carrion removal program (per the CUP only)
Compensatory Mitigation	• Power pole retrofitting to offset golden eagle take and nest disturbance take at a 2:1 ratio for retrofitting power poles, or other mitigation option.	• Power pole retrofitting to offset golden eagle take and nest disturbance take at a 2:1 ratio for retrofitting power poles, or other mitigation option.	• None
Unmitigated Eagle Take/Effects	• 12 bald eagles	• 12 bald eagles	• 12 bald eagles; • 450 golden eagles
Data Collection /Monitoring	• Post-permit eagle fatality monitoring • Post-permit golden eagle nest monitoring within 1 mile of O&M	• Post-permit eagle fatality monitoring • Post-permit golden eagle nest monitoring within 1 mile of O&M	• One year of post-construction avian use

	Proposed Action: Issue permit for bald and golden eagle incidental take and golden eagle nest disturbance take	Alternative 1: Issue permit for bald and golden eagle incidental take and golden eagle nest disturbance take with seasonal blanket curtailment	Alternative 2: No Action
	activities during the breeding season (optional) • One year of post-construction avian use surveys (per the County CUP) • Two years of post-construction bird/bat mortality studies (per the County CUP)	activities during the breeding season (optional) • One year of post-construction avian use surveys (per the County CUP) • Two years of post-construction bird/bat mortality studies (per the County CUP)	surveys (per the County CUP) • Two years of post-construction bird/bat mortality studies (per the County CUP)
Applicant Liability for Eagle Take	No if in compliance with the Permit	No if in compliance with the Permit	Yes
Meets Eagle Act Statutory and Regulatory Requirements	Yes	Yes	No

5 List of Preparers

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Appendix A. Eagle Conservation Plan for the Strauss Wind Energy Project

Draft Eagle Conservation Plan for the Strauss Wind Energy Project

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ACROYNYMS AND ABREVIATIONS

Acronym/Abbreviation	Definition
APLIC	Avian Power Line Interaction Committee
BBCS	Bird and Bat Conservation Strategy
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BRTR	Biological Resources Technical Report
CDFW	California Department of Fish and Wildlife
CPUC	California Public Utilities Commission
CRM	Collision Risk Model
CUP	Conditional Use Permit
ECP	Eagle Conservation Plan
ECPG	Eagle Conservation Plan Guidance
EIR	Environmental Impact Report
EMU	Eagle Management Unit
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FR	Federal Register
GO95	CPUC General Order 95
GWh	gigawatt-hour
IEEE	Institute of Electrical and Electronics Engineers
kV	kilovolt
LWEP	Lompoc Wind Energy Project
m	meter
MBTA	Migratory Bird Treaty Act
met tower	meteorological tower
MW	megawatt
NEPA	National Environmental Policy Act
NPS	National Park Service
O&M	operations and maintenance
PG&E	Pacific Gas and Electric
POI	Point of Interconnection
Project	Strauss Wind Energy Project
RSZ/RSH	rotor swept zone/rotor swept height
SMR	Santa Margarita Road
SCADA	Supervisory Control and Data Acquisition
SODAR	sonic detection and ranging units
Strauss	Strauss Wind LLC
USFWS	U.S. Fish and Wildlife Served
VSFB	Vandenberg Space Force Base
WEG	Land-based Wind Energy Guidelines
WIRS	Wildlife Incident Reporting System
WTG	wind turbine generators

1 INTRODUCTION

1.1 Background and Purpose

Strauss Wind LLC (Strauss; the Applicant, an affiliate of BayWa r.e. Wind LLC) has developed the Strauss Wind Energy Project (Project), located on the site of the previously approved Lompoc Wind Energy Project (LWEP). A Final Environmental Impact Report (EIR) was certified, and a Conditional Use Permit (CUP) was granted for the LWEP in 2009. The Santa Barbara County Planning Commission approved the Project in November 2019, and a Zoning Clearance Permit was issued in April 2020. Construction of the Project initiated in March 2020.

This Eagle Conservation Plan (ECP) serves as a supporting document for a formal application for an incidental take permit (ITP) under the Bald and Golden Eagle Protection Act (BGEPA). This ECP provides detailed information on the Project, environmental conditions and eagle studies conducted to date, an assessment of potential impacts to eagles, and the measures that have been implemented and will continue to be implemented to avoid and minimize the impacts to eagles. Therefore, this ECP defines the plan for complying with regulatory requirements and avoiding and minimizing the unintentional "take" of eagles because of the Project.

The format for this ECP is based the U.S. Fish and Wildlife Service (USFWS) *Land-Based Wind Energy Guidelines* (WEG; USFWS 2012), the *Eagle Conservation Plan Guidance: Module 1 – Land-based Wind Energy Version 2* (ECPG; USFWS 2013), and updates to the eagle permit rule issued by the USFWS in 2016 (USFWS 2016b). These documents are described in more detail in Section 1.4, *Guidance Documents*.

Overall, the analysis for this ECP considers data available from the following sources:

- Final Environmental Impact Report, Lompoc Wind Energy Project (County of Santa Barbara 2008)
- Strauss Wind Energy Project, Biological Resources Technical Report (BRTR) (Sapphos 2018)
    - Lompoc Wind Energy Project, Biological Resources (Olson and Rindlaub 2006)
    - Lompoc Wind Energy Project Results of Winter Bird Surveys (Thomas Olson Biological Consulting 2007)
    - Lompoc Wind Energy Project Final Winter Season Avian Pre-Construction Survey Technical Report (Sapphos 2008a)
    - Lompoc Wind Energy Project Final Avian Spring Migration Pre-Construction Survey Technical Report (Sapphos 2008b)

  - Lompoc Wind Energy Project Final Avian Breeding Season Pre-Construction Survey Technical Report (Sapphos 2008c)
  - Lompoc Wind Energy Project Final Avian Autumn Migration Pre-Construction Survey Technical Report (Sapphos 2008d)
  - Memorandum for the Record No. 2 – Autumn 2016 Avian Migration Survey (Sapphos 2016a)
  - Memorandum for the Record No. 3 – Autumn 2016 Aerial Raptor Surveys (Sapphos 2016b)
  - Memorandum for the Record No. 7 – Spring 2017 Avian Migration Survey (Sapphos 2017)
- Memorandum for the Record No. 12 – Inferred Baseline and Impact Analysis for Avian Species at the Lompoc Wind Energy Project Site, Santa Barbara County, California (Sapphos 2008e)
- Strauss Wind Energy Project Survey 2018 (BRC 2018)
- Strauss Wind Energy Project Survey 2019 (BRC 2019)
- Publicly available databases (U.S. Geological Survey 2018; California Department of Fish and Wildlife [CDFW] 2019; USFWS 2019)

Likewise, the 2018 and 2019 helicopter eagle surveys, 800-meter (m) raptor point count surveys, seasonal avian point count survey were requested during coordination with the USFWS (Dietsch, pers. comm. 2018). The results of these studies pertinent to eagles have been incorporated into this ECP. The 800-m raptor point count surveys were continued throughout the construction period and are currently ongoing. Consistent with ECPG recommendations, only the results of 800-m point count survey conducted prior to the start of construction, from April 2018 through February 2020, are used to inform the Project's eagle take analysis.

1.2 Project Location and Description

Most of the Project Area is located near the City of Lompoc in the unincorporated territory of Santa Barbara County, California, within the southeastern section of the Lompoc, and north-central section of the Punta De La Conception, Land Grant boundaries (Figure 1). The Project Area is located on a portion of parcels totaling 5,887 acres[1] of primarily rural, agriculturally zoned land within the coastal ridges southwest of the City of Lompoc. The Project is a commercial wind farm

[1] This acreage is not the Project Area. The Project Area is defined in below.

developed by Strauss, and the first such project in Santa Barbara County and the central coast of California. As shown in Figure 2, the following are the major Project components:

- 27 wind turbine generators (WTGs)
- New access roads and road improvements
- An on-site communication system
- One meteorological (met) tower and one sonic detection and ranging (SODAR) unit
- Three IdentiFlight units
- On-site electrical collection lines
- An on-site substation, including an approximately 450-square-foot control building
- A new 7.3-mile, 115-kilovolt (kV) transmission line to interconnect with the Pacific Gas & Electric Company's (PG&E) electric grid
- A new switchyard
- Upgrades to existing PG&E facilities

Except for the transmission line facilities that connect the Project to the PG&E electrical system, the Project Area is located approximately 1.8 miles southwest of the City of Lompoc, 2.3 miles northwest of the coast, 3.5 miles north of Jalama Beach County Park, 3.6 miles southwest of Highway 1 (State Route 1), 4.1 miles southeast of the closest Vandenberg Space Force Base (VSFB), and 7.6 miles southeast of Ocean Beach Park. The Project Area is bounded by VSFB on the south and west sides, and private property on the north and east sides. The Project Area is accessed via San Miguelito Road, a public road that winds through the area and terminates at the VSFB property line at the northwest edge of the Project Area.

The Applicant has entered long-term leases and easements with the property owners where all Applicant-proposed activities would occur. All other work associated with the Project conducted by PG&E would occur within PG&E's right-of-way. The Project has an aggregate electrical generating capacity of approximately 95 megawatts (MW), which, on an annual basis, can generate

enough power to supply approximately 35,600 homes with electricity.[2,3,4] The Project can potentially generate up to approximately 260 gigawatt-hours of electricity annually.[5]

The Project is currently being constructed in one phase to achieve the full generating capacity of the Project. The Project is expected to have an operational life of approximately 30 years.

[2] The Project includes 23 General Electric 3.8 MW WTGs and 4 General Electric 1.79 MW WTGs, for a total of approximately 95 MW.

[3] The number of homes supplied with electricity per year is based on U.S. Energy Information Administration data from 2019 showing that the average annual electricity consumption in the United States was 11,880 kilowatt hours per year per home. Using the conversion calculator from Environmental Protection Agency (EPA; https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator), the average annual electricity consumption per home is equal to 5.139 metric tons of CO_2/home. The project built 27 WTGs equal to 95 MW and would generate approximately 260 gigawatt-hours (GWh) per year based on a 31% capacity factor. The proposed Project generation per year is equivalent to replacing 183,265 metric tons of CO_2 per the EPA calculator. 183,265 was then divided by the average 5.139 metric tons of CO2/home , resulting in the equivalent of approximately 35,600 homes' consumption being generated with electricity per year.

[4] EIA 2019.

[5] GWh per year anticipated was calculated based on 31% capacity factor of a 95 MW project.

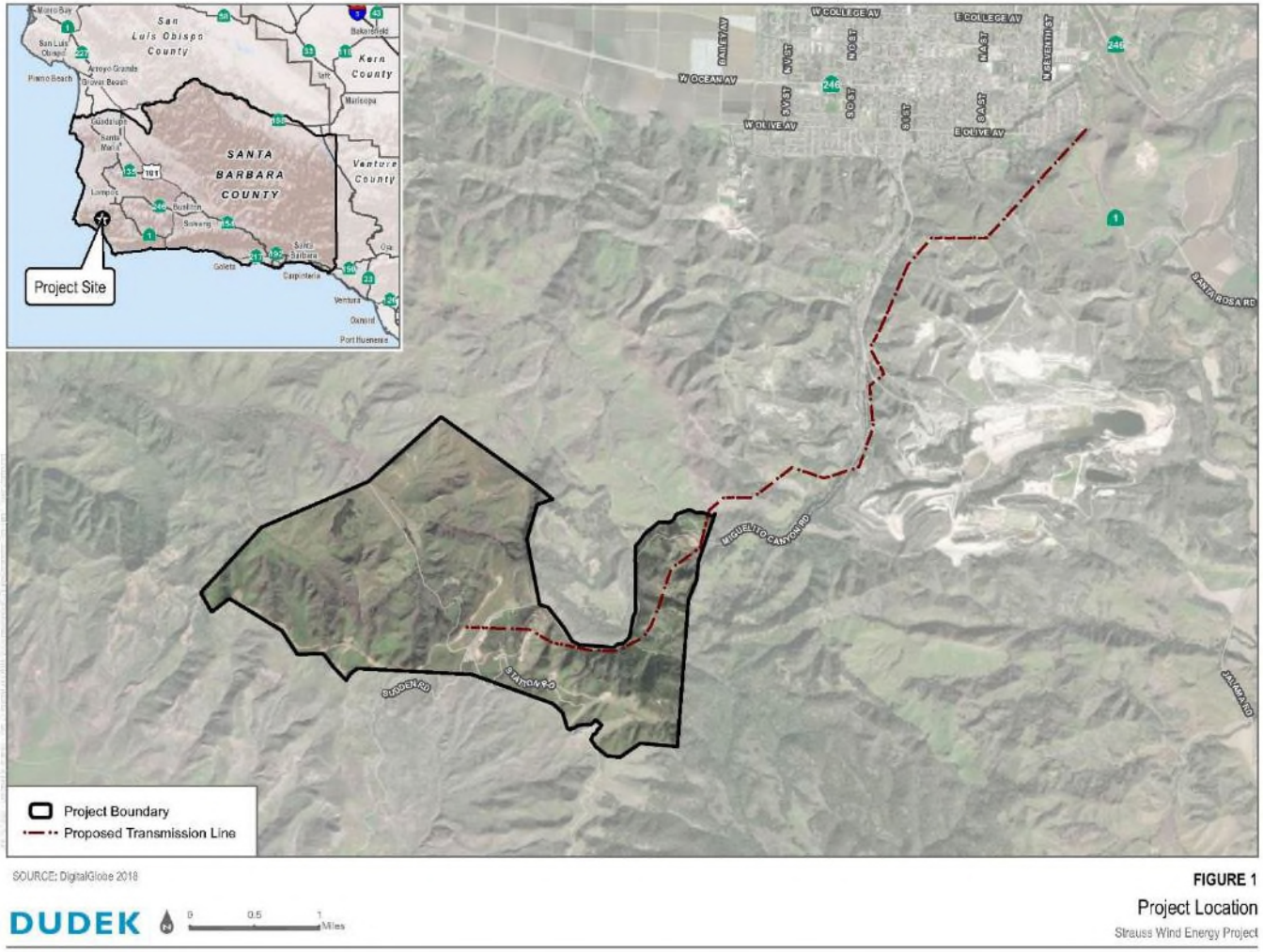


Figure 1. Location of the Strauss Wind Energy Project, Santa Barbara County, California.

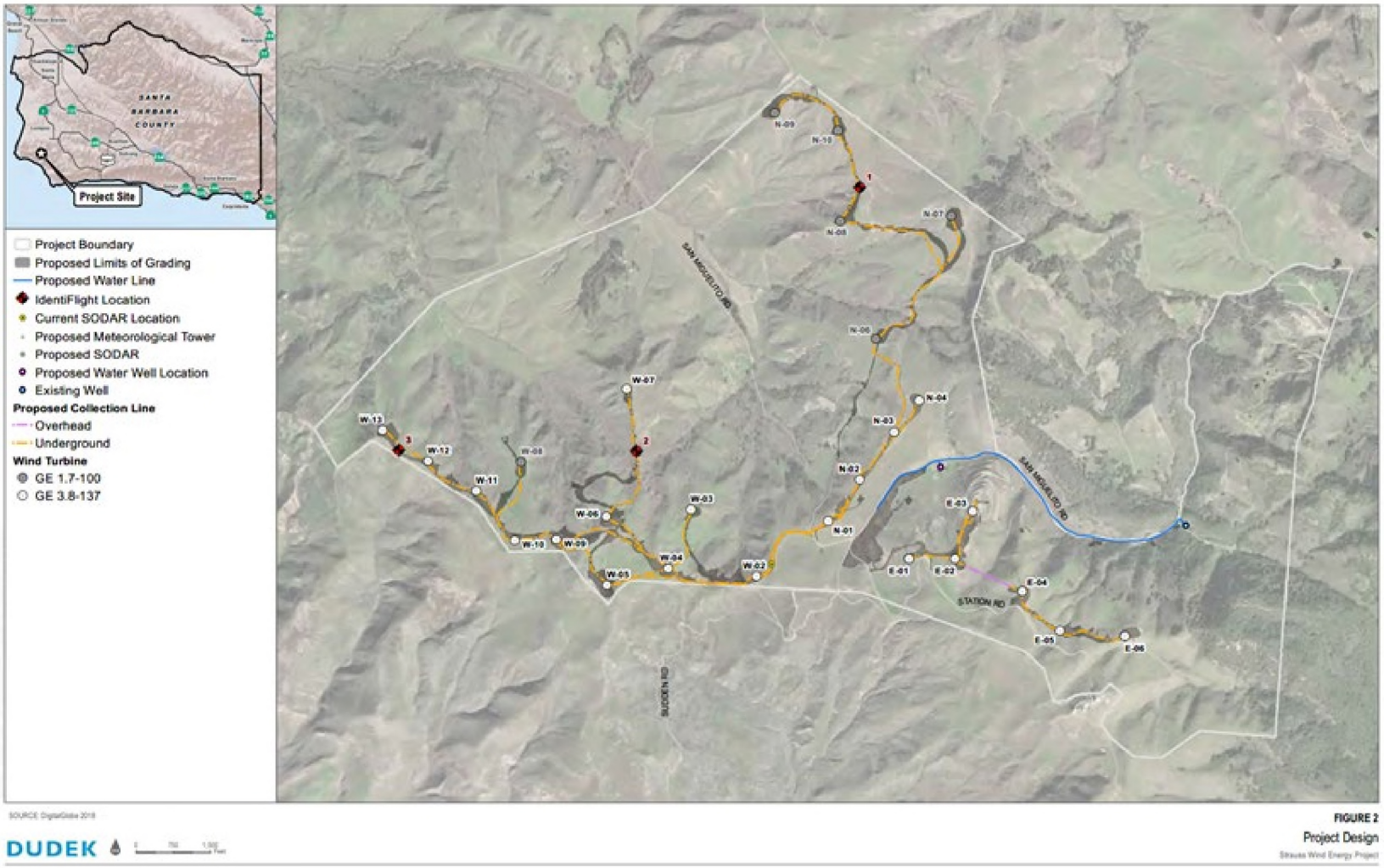


Figure 2. Infrastructure at the Strauss Wind Energy Project, Santa Barbara County, California.

1.2.1 Project Components

Wind Turbine Generators. 27 WTGs are located entirely within Santa Barbara County's Inland Zone (Figure 2). The Project includes two WTG models—a 1.79-MW WTG and a 3.8-MW WTG—which are 427 and 492 feet tall, respectively (Table 1).

Table 1
Wind Turbine Generator Model Component Specifications

WTG Model	Tower/Hub Height		Rotor Diameter		Blade Length*		Total Height Base to Tip	
	Meters	*Feet*	*Meters*	*Feet*	*Meters*	*Feet*	*Meters*	*Feet*
GE 1.79-100 MW	80.0	262.5	100.0	328.1	48.7	159.8	130.0	426.5
GE 3.8-137 MW	81.5	267.4	137.0	449.5	68.5	224.7	150.0	492.1

* Includes Hub. Blade length alone for GE 1.79-100 is 48.7 meters (159.9 feet) and for GE 3.8-137 is 67.2 meters (220.6 feet).

The WTGs are three-bladed, with a horizontal axis design, which is the type utilized in most modern, commercial wind farms. The blades are 224.7 (3.8 MW) to 159.8 feet (1.79 MW) long and are constructed in one piece of laminated fiberglass. Each turbine contains a rotor hub, to which the blades are bolted and covered by a composite nose-cone to streamline the airflow and protect the equipment.

The WTG hub height is between 262.5 and 267.4 feet above ground; and the towers are constructed of heavy-duty, epoxy-coated, welded steel, and form a conical shell. The towers taper from approximately 14 feet in diameter at the base to 10 feet at the nacelle (the enclosed part of the turbine in which the engine is housed). For all designs, the exposed concrete pad is approximately 15 feet in diameter and extends less than one foot above grade. All WTGs are set back from private property lines at the Project Area perimeter by a distance equal to the total system height, as required by the Santa Barbara County Land Use and Development Code Section 35.57.050, except where private property lines are within the Project parameters as per the requested variance.

The Federal Aviation Administration (FAA) recommended lights on the WTGs due to the height of the turbines. Twenty-three of the 27 turbines have synchronized, flashing, red lights mounted on the top of the nacelle of the WTG. The flashing is limited to the longest interval between flashes and the shortest flash allowable. Turbines W-09, W-12, N-01, and N-04 do not have FAA lighting.

Access Roads and Road Improvements. Numerous dirt roads are present throughout the Project Area and are maintained by the property owners for agricultural operations. To provide access during construction and operations, 2.6 miles of the existing roads have been improved and widened from their existing widths of 10 to 14 feet, to 22 feet. Some road sections are 16 feet wide with 10-foot compacted shoulders on each side to allow crane travel between WTG locations.

These shoulders will be reclaimed at the end of the Project. The width of construction access roads vary between 22 to 40 feet to accommodate roadway cut and fill, and necessary equipment turning radii and turn-outs. The roadways will be restored to a 16-foot width upon completion of WTG installation.

In addition, approximately 9.9 miles of new roads have been constructed. Short sections of roadway have also been built in other parts of the Project Area. The road work included trenching and installing underground electrical distribution lines and communication cables.

Electrical Collection Lines and Communication System. Each string of WTGs is interconnected via 34.5-kV electrically insulated cables. These cables generally run underground. The underground collector cables follow roads, where feasible. Due to steep terrain, one small section of aboveground collection line was installed, supported by single poles and H-frame structures. Another collector section uses transmission line structures and were under-built of the transmission line to connect this string to the substation. The overhead collection system was constructed in conformance with good utility practice, the National Electric Safety Code, American National Standards Institute, and the Avian Power Line Interaction Committee (APLIC). At the Project Substation, the voltage was increased from 34.5 kV to 115 kV to match the voltage of the PG&E grid at the Point of Interconnection (POI).

Operation of the Project is controlled by an integrated, automatic control system (SCADA), which is capable of monitoring all operational parameters, including starting and stopping each WTG. The SCADA system transmits operating parameters and other data from each WTG and the substation to the central computer. The system will allow remote control and monitoring of individual WTGs and the entire Project Area locally and remotely. Communication cables have been buried in the same trenches used for the electrical collector lines. Overhead communications lines are installed on the structures used for overhead lines.

Meteorological Towers or SODAR Units. Meteorological data was collected using mobile SODAR units and temporary met towers that recorded weather data necessary to determine the most efficient operational strategy for the WTGs. The data collected includes wind speed and direction, temperature, humidity, barometric pressure, and rainfall. As a result of their small footprint and mobility, and no permanent ground disturbance, SODAR units and temporary met towers can be transported easily with a pickup truck and small utility trailer. As the SODAR unit remains on the trailer, it can be easily parked in a specified location with minimal disturbance. A temporary 60-meter met tower was supported with three guy wires attached to ground anchors, resulting in no permanent ground disturbance.

One permanent met tower has been installed to measure the performance of the WTGs post installation. The met tower is a self-supporting (un-guyed) tower, approximately 262 feet in height.

Project Substation. All the power generated by the WTGs will be transmitted to the on-site Project Substation via the collection system. The Project Substation will step up the voltage from 34.5 kV to 115 kV and serve as the originating point of the proposed 7.3-mile 115-kV overhead transmission line that will interconnect the Project to the POI in the City of Lompoc at the Cabrillo Substation owned by PG&E. The Project Substation, 7.3-mile transmission line, and the circuit breaker station opposite the existing POI Cabrillo Substation in Lompoc will be under the ownership of the Applicant. The Point of Change of Ownership will occur on the Customer side of a PG&E transmission line disconnect switch at the POI location.

The Project installed and own one span of overhead line or approximately 200 feet of overhead cable from the POI into an Applicant-owned circuit breaker station with metering equipment. These lines incorporate APLIC compliant bird diverters. The Project will supply PG&E-approved high-voltage metering equipment and a metering cabinet in the control building. PG&E will install and own only a meter in the Applicant-provided cabinet. The height and bulk of required structures will not exceed those already within the Cabrillo Substation.

The on-site Project Substation is located entirely on the privately held land of a participating Project landowner within the Project boundary. The Project Substation footprint disturbed roughly 0.94 acres of land and is approximately 200 feet by 300 feet in dimension. Equipment was installed on top of structural concrete forms, which are roughly 18 inches above rough grade. The substation perimeter is entirely secured by a 7-foot chain-link fence topped with three-strand barbed wire, raked outward at a 45-degree angle. A locked, double-swing gate has been installed in the fencing to provide access to the Project Substation post-construction. No shrubbery, hedging, or landscaping around the perimeter of the substation is contemplated. The entire footprint of the substation will be finished with a graveled layer of clean, washed rock free of sands or organic material. This rocked layer will act as a fire barrier and as step protection. In addition, spatial separation of transformers and other design considerations are incorporated in the design to prevent the risk of fire. The substation meets or exceeds Institute of Electrical and Electronics Engineers (IEEE)-979 Substation Fire Protection standards. Detection and extinguishing equipment have been installed in accordance with all applicable code requirements. Project Substation signage, as required by the National Electric Safety Code, Occupational Safety and Health Administration, and other applicable organizations is provided. The substation includes standard low-illumination, motion-triggered lighting. The highest structure of the substation is the dead-end structure, which is a fully self-supporting structure where the conductors of the transmission line mechanically terminate to the substation. The Project Substation is fitted with static poles that will create a shield to protect all of the equipment inside the Project Substation from lightning. Static poles may or may not have overhead shield wires attached to enhance lightning protection. The static poles are approximately 60 feet above the substation grade. A control building is housed entirely within the Project Substation. The control building contains switchboard panels, batteries, battery chargers, supervisory

control, meters, and relays, and provides all weather protection and security for the control equipment. It is estimated that the control building would be 14 feet by 54 feet in dimension, pending release of the conceptual site plan by the Applicant. The control building is adequately ventilated to prevent the accumulation of hydrogen gases from battery operation.

Project Substation lighting is designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated, and so that backscatter to the nighttime sky is minimized.

The entire Project Substation is enclosed with a chain-link security fence. Following construction, an inspection and commissioning test plan will be executed prior to the Project Substation being energized.

Strauss Wind Energy Project Transmission Line. The 115-kV transmission line has been constructed by the Applicant and is permitted as part of the Project through the Santa Barbara County CUP entitlement process as a result of its direct connection to and interdependency with the Project. Minor upgrades to PG&E's Cabrillo Substation undertaken by PG&E are included in the environmental analysis for the Project but are expected to occur within the existing Cabrillo Substation. The transmission line will be managed by the Project through Balance of Plant contractors.

The Applicant has constructed the transmission line consistent with accepted industry standards, protective measures, and established industry guidelines. These include the recommended practices and procedures of the IEEE, standards for overhead line construction consistent with California Public Utilities Commission (CPUC) General Order 95 (GO95), avian protection measures consistent with the 2012 APLIC Guidelines, electric magnetic field design guidelines accepted for transmission design in California, and other applicable rules and standards. Where feasible and consistent with CPUC GO95, power lines follow existing distribution lines and/or are consolidated with existing facilities.

Operations and maintenance (O&M) activities for the transmission line would include frequent inspections to ensure that the system is in good condition and would not create hazards. Ongoing fire management and safety would include maintaining a 10-foot radial clearance of flammable fuels (vegetation) around the base of each wood pole structure during fire season. Under Public Resources Code Section 4292, a minimum 15-foot clearance between vegetation and conductors is required for safety and to minimize tree-related outages. Fast-growing trees may be removed, or vegetation trimmed back farther than the minimum required to achieve at least three to four years of clearance before the next trim. In addition, the maintenance program would also include removing dead, rotten, or diseased trees or vegetation that hang over or lean toward the system, creating a falling hazard.

The transmission line is constructed mostly of single wooden poles and a few double wooden poles. Single steel poles were used at a few engineered angle points; the number of steel poles were determined as part of final transmission line design. The poles are up to approximately 75 feet in height and are placed from 64 to 1,280 feet (380 feet average) apart based on the terrain and alignment. In some locations, engineered structures with concrete foundations were used to support the conductors. The Applicant acquired easements ranging from 50 to 100 feet wide, depending on design, span length, and terrain.

To ensure reliability, the Project transmission line uses new poles, and runs parallel to existing power lines.

Site Restoration and Landscape Plan

Site restoration and cleanup will include reseeding of specifically identified areas subject to temporary disturbance during the first suitable weather conditions after the heavy construction activities have been completed, or as per the Project's restoration and revegetation plan. Temporary disturbance areas around WTG sites will be reseeded with native grasses to allow the current use of the property to continue to the maximum extent practicable while maintaining adequate access to all WTGs. Temporary disturbance on the shoulder areas of access roads (new and improved) will also be reseeded. The 2-acre fenced substation area will be covered with crushed rock; no other landscaping is planned because of this area's interior location within the Project Area. All site restoration and landscaping activities within one mile of an active eagle nest will be conducted outside the breeding season (December 1 – July 31).

Operations Phase

During the operational phase of the Project, approximately five to seven staff would be employed. Monitoring of WTGs and system operation would occur at an O&M facility to be located in Lompoc. Staff on site would perform routine maintenance throughout the site, troubleshoot malfunctions, and shut down and restart WTGs when necessary. Operations would be continuously monitored through the SCADA system. Maintenance within one mile of an active eagle nest will be conducted outside breeding season (December 1 – July 31).

Larger equipment, supplies, and spare parts would be stored in a secured on-site yard, while normal sized equipment, supplies, and spare parts would be stored in the O&M facility. Spare parts might include large components, such as a spare blade set or gearbox. Specialized equipment not needed routinely would be brought on-site as needed. Maintenance of some components of on-site infrastructure (for example, roads and electrical lines) may be subcontracted to qualified firms.

Decommissioning Phase

The anticipated life of the Project is 30 years. At the end of its useful life, the Project could be "repowered," renovated or upgraded, or decommissioned. The decision to decommission or repower would depend on energy economics at the time, technological options, and other considerations.

If or when the Project is decommissioned, all structures and equipment at the site would be dismantled and removed, and the land surface would be restored to as close to the original condition as practical. Reclamation would be conducted on all disturbed areas to comply with Santa Barbara County reclamation policy. The short-term goal would be to stabilize disturbed areas as rapidly as possible, thereby protecting sites and adjacent undisturbed areas from degradation. Decommissioning or repowering within one mile of an active eagle nest will be conducted outside breeding season (December 1 – July 31).

1.3 Applicable Regulations

1.3.1 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take of any migratory bird or any part, nest, or eggs of any such bird. Under the MBTA, "take" is defined as pursuing, hunting, shooting, capturing, collecting, or killing, or attempting to do so (16 USC 703 et seq.). On October 4, 2021, the USFWS announced a final rule to revoke the January 7, 2021, final regulation that limited the scope of the MBTA. The effect of this final rule is to return to implementing the MBTA as prohibiting incidental take and applying enforcement discretion, consistent with judicial precedent and practice prior to 2017.

Additionally, Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, requires that any project with federal involvement address impacts of federal actions on migratory birds with the purpose of promoting conservation of migratory bird populations (66 Federal Registers [FR] 3853–3856). The Executive Order requires federal agencies to work with USFWS to develop a memorandum of understanding to promote the conservation of migratory bird populations. USFWS reviews actions that might affect these species.

1.3.2 Bald and Golden Eagle Protection Act

Bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are federally protected under the BGEPA, passed in 1940 to protect bald eagles and amended in 1962 to include golden eagles. The BGEPA (16 USC 668–668d) prohibits the take, possession, sale, purchase, barter, offering to sell or purchase, export or import, or transport of bald eagles and golden eagles and their parts, eggs, or nests without a permit issued by USFWS.

In November 2009, USFWS published the Final Eagle Permit Rule (74 FR 46836–46879) providing a mechanism to permit and allow for incidental (i.e., non-purposeful) take of bald and golden eagles pursuant to the BGEPA (16 USC 668 et seq.). These regulations may apply to projects such as wind turbines and transmission lines. They were followed by issuance of guidance documents for inventory and monitoring protocols and for avian protection plans (USFWS 2010a). On December 16, 2016, the USFWS released a final rule revising the regulations for permits for incidental take of eagles and take of eagle nests. The Service analyzed various alternative management options and rule revisions, including the final rule revisions, in a programmatic environmental impact statement. Among other revisions, the final rule addresses criteria for permit issuance, compensatory mitigation requirements, permit duration, and data standards for submitting permit applications. In September 2022, the USFWS released proposed revisions to the BGEPA take permit program. The proposed rule was open to public comment through late 2022 and a final ruling is expected in late 2023 or early 2024.

1.3.3 National Environmental Protection Act

The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970. With some limited exceptions, all Federal agencies in the executive branch have to comply with NEPA before they make final decisions about federal actions that could have environmental effects. Using the NEPA process, agencies evaluate the environmental and related social and economic effects of their proposed actions. Agencies also provide opportunities for public review and comment on those evaluations. NEPA applies to a very wide range of federal actions that include, but are not limited to, federal construction projects, plans to manage and develop federally owned lands, and federal approvals of non-federal activities such as grants, licenses, and permits.

After submittal of a formal application for eagle take, the USFWS is required to complete a NEPA analysis to determine if regulatory requirements for issuance of a permit have been met.

1.4 USFWS Guidance Documents

Two USFWS guidance documents were relied upon during the preparation of this ECP.

The WEG (USFWS 2012) are intended to provide a risk-based framework that would guide wind energy developers in addressing wildlife conservation concerns throughout the siting, development, and operation of wind energy developments. The WEG aim to accomplish several goals, including to promote compliance with wildlife laws and regulations; encourage scientifically rigorous surveys and assessments; produce comparable data across projects; avoid, mitigate and minimize potentially adverse effects; and improve the ability to predict and resolve effects. The WEG encourage developers to consider all potential effects to “species of concern,” which is defined as “any species which 1) is either a) listed as an endangered, threatened or

candidate species under the Endangered Species Act, subject to the MBTA or BGEPA; b) is designated by law, regulation, or other formal process for protection and/or management by the relevant agency or other authority; or c) has been shown to be significantly adversely affected by wind energy development, and 2) is determined to be possibly affected by the project."

The WEG are structured using a five-tiered approach for both pre-construction (Tiers 1 through 3) and post-construction (Tiers 4 and 5) phases of a project. Tiers are organized by increasing complexity and designed to guide the decision-making process using a rigorous but flexible risk-based framework. The WEG suggests a series of questions to consider for each Tier to assist in determining potential environmental risks or uncertainties in order to inform decisions. Tiers 1 and 2 involve a landscape-scale screening/preliminary site evaluation and site characterization. Tier 3 involves field studies to document wildlife and habitats and assess project impacts. Tier 4 involves post-construction studies to estimate impact. Tier 5 involves other post-construction studies and research in the case that Tier 4 analyses indicate potentially significant impacts.

The ECPG (USFWS 2013) also provides guidance for wind-facility projects and describes actions for compliance with the BGEPA (16 USC 668-668d) and application for an eagle ITP (50 CFR 22.26 and 22.27). The ECPG provides wind developers with a framework to assess the potential project effects on eagles and develop avoidance, mitigation, and compensation strategies for the preservation of eagle population while facilitating the expansion of wind energy development. The ECPG is compatible with the WEG described above and cross-references the five-tiered approach into five Stages, including: Stage 1 (site assessment), Stage 2 (site-specific surveys and assessments), Stage 3 (predicting eagle fatalities), Stage 4 (avoidance and minimization risk using Advanced Conservation Practices, and compensatory mitigation), and Stage 5 (calibration and updating of the fatality prediction and continued risk-assessment).

1.5 Agency Coordination

The following agency coordination refers to those recent discussions pertaining to eagle issues only.

On March 9, 2018, Dudek met with USFWS to review the Project, historical avian survey methods, and the currently proposed methods. As a result of that meeting, the USFWS requested that the following surveys be conducted: spring and fall 50-meter point count surveys, weekly 800-meter raptor point count surveys for one year (though this has been exceeded), aerial eagle nest surveys, and spring and fall bat surveys.

On December 10, 2018, Dudek provided the USFWS with an update regarding the survey efforts for 2018. This included the results of the aerial eagle nest surveys. No additional data were provided.

2 SITE ASSESSMENT (ECPG STAGE 1; WEG TIERS 1 AND 2)

This section provides a landscape level review of the Project Area (WEG Tier 1). In addition, this section characterizes the general biological resources in and surrounding the Project Area (WEG Tier 2) to evaluate the potential for eagles to occur. ECPG Stage 1 corresponds to WEG Tiers 1 and 2. The goal of the site assessment is to identify sites within a large geographic area that have a high potential for wind energy and low potential for negative impacts on eagles if a project is developed. Preliminary assessments (WEG Tier 1 and 2) to identify a suitable project wind site that has a high potential for wind energy and low potential for negative impacts on eagles began during the first project iteration in 2002 and continued through the early stage development of the current Project. Although the site assessment was performed prior to the publication of the WEG and ECPG, methods and results of that effort are described under the framework of these publications.

2.1 Environmental Setting

The Project Area region is in the southern extents of the Southern Coast Ranges (ranges running north to south and parallel to the Pacific Coast), near the intersection of the Southern Coast and Transverse Ranges (ranges running in an east-west orientation). The terrain includes rolling hills and rugged, steep slopes. The southern boundary of the Project Area, which is shared with VSFB, follows the ridgeline for much of its length. Prevailing winds from the north/northwest regularly flow over the ridges. Some of the prime wind sites in the southern portion of the Project Area are near the VSFB property line set below the primary ridges.

The region contains a distinctive climate and geological formations, which contribute to the diversity of habitats, topography, and species occurring in the region. The elevation within the Project Area ranges from approximately 200 feet above mean sea level in the northern end of the transmission line in Lompoc to 1,930 feet in the southwestern portion of the Project Area. The elevation range on site also contributes to a variety of wind patterns and localized climatic conditions that occur on site. The region contains a variety of habitat types including agricultural lands, scrub, shrublands, grasslands, woodlands, and riparian. In addition, the Project Area and biological resources within are influenced by a coastal marine layer (fog) that provides the region with a seasonal source of precipitation that supports a variety of plants, wildlife, and habitats. The marine layer is most prevalent during summer months and exhibits variability when it recedes. The majority of the Project Area is currently composed of rural, agricultural lands and grasslands.

2.2 Site Assessment

The Project Area and surrounding landscape support a variety of vegetation communities, including grasslands, woodlands, and scrub communities intersected by several creeks. Publicly

available information has documented the consistent presence of golden and bald eagles in the region (eBird 2023). In addition, although the Project Area supports some oak and deciduous woodlands, most of the Project Area is composed of grasslands that provide hunting opportunities for golden eagles, including populations of small mammals (e.g., squirrels). During Project surveys, eagles were documented foraging on the site, although no nests were documented within the Project Area. Recent studies between 2018 and 2020 have documented golden eagle nests proximate to the site, however, including a nest approximately 600 feet north, northeast of Turbine N-7, and two nests between 500 and 1,000 feet east of the transmission line and stock yard near San Miguel Road (see Sections 3.1.3 and 3.1.4). Although the Project Area is not known to be a critical area of wildlife congregation, per se, prior site studies (Thomas Olson Biological Consulting 2007, Sapphos 2017) indicate that the area supports the passage and use of a variety of California Species of Special Concern (for complete list see, County of Santa Barbara 2008, Sapphos 2018), including golden eagles.

Although a majority of the Project Area (except for mining operations in the northeastern portion of the site where turbines were not constructed) is composed of undeveloped, open, grazed grasslands, the existing lands are managed for livestock and crop production. Several fields are regularly plowed, planted and harvested throughout the Project Area. As a result, the site currently has several existing roads that serve to provide access to a VSFB tracking station, neighboring pastures, agricultural fields, and homes and farm structures within the Project Area. Development of the Project included additional roads, pads, and infrastructure, has not likely appreciably fragmented habitat from a wildlife use perspective. Of the 5,887 total acres of contiguous lands associated with this ownership, the Project will result in permanent impacts to 149.0 acres (3%) of the Project Area.

3 STUDIES, RESULTS, AND IMPACT ASSESSMENTS (ECPG STAGE 2; WEG TIER 3)

A variety of focused studies were completed to evaluate the proposed Project's potential for impacts to eagles (Table 2). The earliest studies (2002–2017) reflect evaluation of the earlier iterations of the Project. These studies were leveraged to the maximum degree they could as iterations of the Project evolved, but ultimately discussions with USFWS (Dietsch pers. comm. 2018) finalized a set of studies to address eagle considerations. Key conclusions regarding eagles from these early (2002–2017) studies are provided below, as well as more detailed survey methods and results from the most recent pre-construction avian use surveys conducted at the Project from April 6, 2018, through February 29, 2020.

Table 2
Avian Survey Efforts at the Strauss Wind Energy Project Area (All Project Iterations)

Survey Dates[1]	Relevant Surveys Conducted	Report Source, if applicable
Pre-Construction Studies		
May – September 2002 and April – August 2005	Raptor Surveys - Walking Line Transects	Olson and Rindlaub 2006 (BRTR Appendix A-1)
December 5–21, 2006	Point Count Surveys	Thomas Olson Biological Consulting 2007 (BRTR Appendix A-2)
February 4 – March 27, 2008	Area Search Counts (50meter), Supplemental Bird Counts, Incidental Bird Counts, Raptor Nest Surveys, Diurnal Raptor Transects	Sapphos 2008a (BRTR Appendix A-9)
April 8 – May 31, 2008[2]	Area Search Counts (50-meter), Line Transect Bird Counts, Recon Bird Counts, Single-Point Counts, Raptor Nest Surveys, Dusk Surveys	Sapphos 2008b (BRTR Appendix A-10)
April 8 – June 26, 2008[3]	Area Search Counts, Line Transect Bird Counts, Recon Bird Counts, Single-Point Counts, Raptor Nest Surveys, Dusk Surveys	Sapphos 2008c (BRTR Appendix A-12)
August 28 – November 8, 2008	Early Morning Flight Counts, Line Transects, Diurnal Raptor Transects, Single-Point Counts, Dusk Surveys, Recon Counts	Sapphos 2008d (BRTR Appendix A-14)
November 10 – December 14, 2016	Early Morning Flight Counts, Line Transects, Diurnal Raptor Transects, Single-Point Counts, Dusk Surveys, Recon Counts	Sapphos 2016a (BRTR Appendix A-17)
March 18–19, 2013 November 7, 2016	Aerial Raptor Surveys	Sapphos 2016b (BRTR Appendix A-18)
March 16 – April 19, 2017	Line Transects, Diurnal Raptor Transects, Area Search Counts, Single-Point Counts, Dusk Surveys, General Reconnaissance	Sapphos 2017 (BRTR Appendix A-20)
April 6, 2018 – February 29, 2020	Raptor Point Count Surveys (Weekly)[4]	Dudek 2020, eagle results also provided in this ECP.
April 20, 25, 26; May 23, 24, 30, 31; June 1, 2018	Spring Avian Point Count Surveys	Dudek 2020
September 25–28, 2018, and October 9–12, 2018	Fall Avian Point Count Surveys	Dudek 2020
June 11, 2018 – July 12, 2019 and February 6, 2019 – June 5, 2019	Pedestrian Eagle Nest Surveys	Dudek, eagle results provided in this ECP.
March 25 and May 30, 2018, and February 18, 2019	Aerial Eagle Nest Surveys	BRC 2018; Dudek, eagle results provided in this ECP.
Construction Studies		
March 1, 2022 – On-going	Raptor Point Count Surveys (Bi-Weekly)	Dudek, Nick Lethaby

Notes

1 Excludes desktop avian analyses reports (e.g., Geo-Marine, Inc. 2008; BRTR Appendix A-8).
2 Spring migration interim report. Dates overlap with Sapphos 2008c.
3 Final breeding season report. Dates overlap with Sapphos 2008b.
4 Surveys conducted bi-weekly from May 2019 to March 1, 2020.

3.1 Early Pre-Construction Studies (2006–2008)

2006 Thomas Olson Biological Consulting Avian Point Counts (February 2007)

Twenty-minute 800-meter avian point count surveys were performed in December 2006 at 18 stations. Surveys were performed during three passes in December. Fifty-six species were observed during the point counts, including a single golden eagle observed three times. The study concluded that golden eagle was detected in the rotor-swept zone (RSZ); and Sudden Bench/Quarry Ridge, Middle Ridge, North Ridge, and Signorelli Ridge/South Ridge are where all of the golden eagle observations were made.

2008 Sapphos Winter Bird Surveys (June 2008)

Sapphos performed several winter bird surveys in 2008. These included 50-meter area search counts at 54 locations, supplemental bird counts along 10 transects at three sites, incidental bird counts, raptor nest surveys, and diurnal raptor surveys along five ridges. These surveys were performed between February 4 and March 27, 2008. In total, 71 separate surveys were performed and included 208 hours of survey effort. The report summarized total numbers of individuals recorded, but did not document rate (e.g., number of individuals per hour or minutes observed within the RSZ). The study concluded that one immature golden eagle was detected during the studies along the north ridge but was evicted by red-tailed hawks (*Buteo jamaicensis*).

2008 Sapphos Spring Migration Bird Surveys (July 2008)

Sapphos performed several spring migration bird surveys in 2008. These included 50-meter area search counts at 54 locations; line transect bird counts at two sites, incidental bird counts, single 2.5-hour point count at one of the met towers for 14 days, raptor nest surveys, and dusk surveys. These surveys were performed between April 8 and May 31, 2008. In total, 80 separate surveys were performed and included 216 hours of survey effort. The report summarized total numbers of individuals recorded, but did not document rate (e.g., number of individuals per hour or minutes observed within the RSZ). The study concluded the following:

- Regarding golden eagle: Single birds (immature, sub-adult, age unknown) on three occasions were observed hunting on April 29, May 4, and May 9, 2008, over non-native grasslands and central coast scrub at generally low heights above ground (below 130 feet), although the immature bird also foraged higher within wind turbine blade heights (135 to 400 feet) before it was evicted from the LWEP property by a territorial red-tailed hawk. In addition, two golden eagles were observed by P.G. Rosso over non-native grasslands within the LWEP property on April 15, 2008. Golden eagles did not nest at the LWEP site during the Sapphos surveys, although it was reported but not confirmed that one pair may have nested nearby in the vicinity

of Tranquillon Peak on VSFB, approximately 0.5 miles west of the Project boundary; the VSFB checklist did not list golden eagle as a nesting species in 2008.[6]

- Raptor migration during spring was very low at the LWEP property. In addition to a pair of red-tailed hawks and a pair of great horned owls (*Bubo virginianus*) nesting at the LWEP property, one pair of Cooper's hawks (*Accipiter cooperii*) also nested at the proposed Project site. All these nests and probable nest sites were located outside proposed impact areas.

2008 Sapphos Spring Bird Surveys (August 2008)

Sapphos performed several additional spring bird surveys in 2008. These included 50-meter area search counts at 54 locations, line transect bird counts at two sites, incidental bird counts, single 2.5-hours point count at one of the met towers for 14 days, raptor nest surveys, and dusk surveys. These surveys were performed between June 11 and June 26, 2008, equating to 18 additional surveys and 34 additional hours. The report incorporates information from the April 8 and May 31, 2008, discussed above. Between April 8 and June 26, 2008, in total 98 separate surveys were performed and included 250 hours of survey effort. Like prior survey efforts, the report summarized numbers of individuals reported, but not rate (e.g., number of individuals per hour or minutes observed within the RSZ). No additional sightings of golden eagle were reported.

2008 Sapphos Fall Migration Surveys (December 2008)

Sapphos performed several fall migration bird surveys in 2008. These included early morning flight counts at one location, line transect bird counts at two sites, incidental bird counts, single 2.5-hours point count at one of the met towers for 14 days, raptor nest surveys, and dusk surveys. These surveys were performed between August 28 and November 8, 2008. In total, 124 separate surveys were performed and included 280 hours of survey effort. Like prior survey efforts, the report summarized numbers of individuals reported, but not rate (e.g., number of individuals per hour or minutes observed within the RSZ). Conclusions generally stayed the same with these additions:

- Single golden eagles, and once an adult pair, were observed hunting along ridgetops and slopes of ridges of non-native grasslands and central coast scrub within the LWEP property on 10 of 35 days during autumn 2008; all birds were observed during diurnal raptor surveys or single-point count surveys. At least four different individual birds were present (immature, sub-adult, two adults), but the adults were most frequently detected. Four eagle observations were of birds flying at 100 to 250 feet above ground level, whereas four other observations were of birds flying over 450 feet above ground level. Several eagles were flushed from the ground in non-native grasslands, once from a fresh calf carcass (less than

[6] Confirmed again on August 23, 2019, by reviewing the Checklist of Birds of Vandenberg Space Force Base, available at http://www.dodpif.org/checklists/vandenb.htm.

two days old) that was removed shortly thereafter. As recorded earlier, territorial red-tailed hawks evicted single golden eagles from the LWEP property on several occasions. Sapphos went on to conclude that while golden eagle are found on site, they occur in low numbers and are probably at lower risk. Sapphos, concluded the proposed Project would not pose a significant risk to golden eagles.

3.2 Recent Pre-Construction Avian Studies (2018–2020)

As described above in Sections 1.1 and 3.1, and shown in Table 2, Olson and Rindlaub, Thomas Olson Biological Consulting, Geo-Marine, and Sapphos conducted extensive avian surveys between May 2002 and April 2017. These surveys established baseline information on the avian activity in the area based on methods developed in consultation with resource agencies, local government, and local stakeholders. Figure 3 displays the pre-2018 survey design configurations. Survey details for previous surveys regarding eagles is provided in source documents listed in Table 4. Although reports of previous avian surveys are available and summarize the survey results, Dudek did not have access to raw survey data. To collect comparable data, between April 2018 and February 29, 2020, Dudek replicated select avian surveys (with some minor survey method and timing adjustments approved by USFWS) that were conducted by Sapphos previously.

Dudek surveys conducted between April 6, 2018, and February 29, 2020, are described below and include raptor point count surveys, avian point count surveys, and aerial and ground-based eagle nest surveys. While raptor point count surveys continued through the construction phase, the survey results presented in this ECP and used for analysis of predicted eagle take, include only data collected prior to the start of construction, from April 2018 through February 2020.

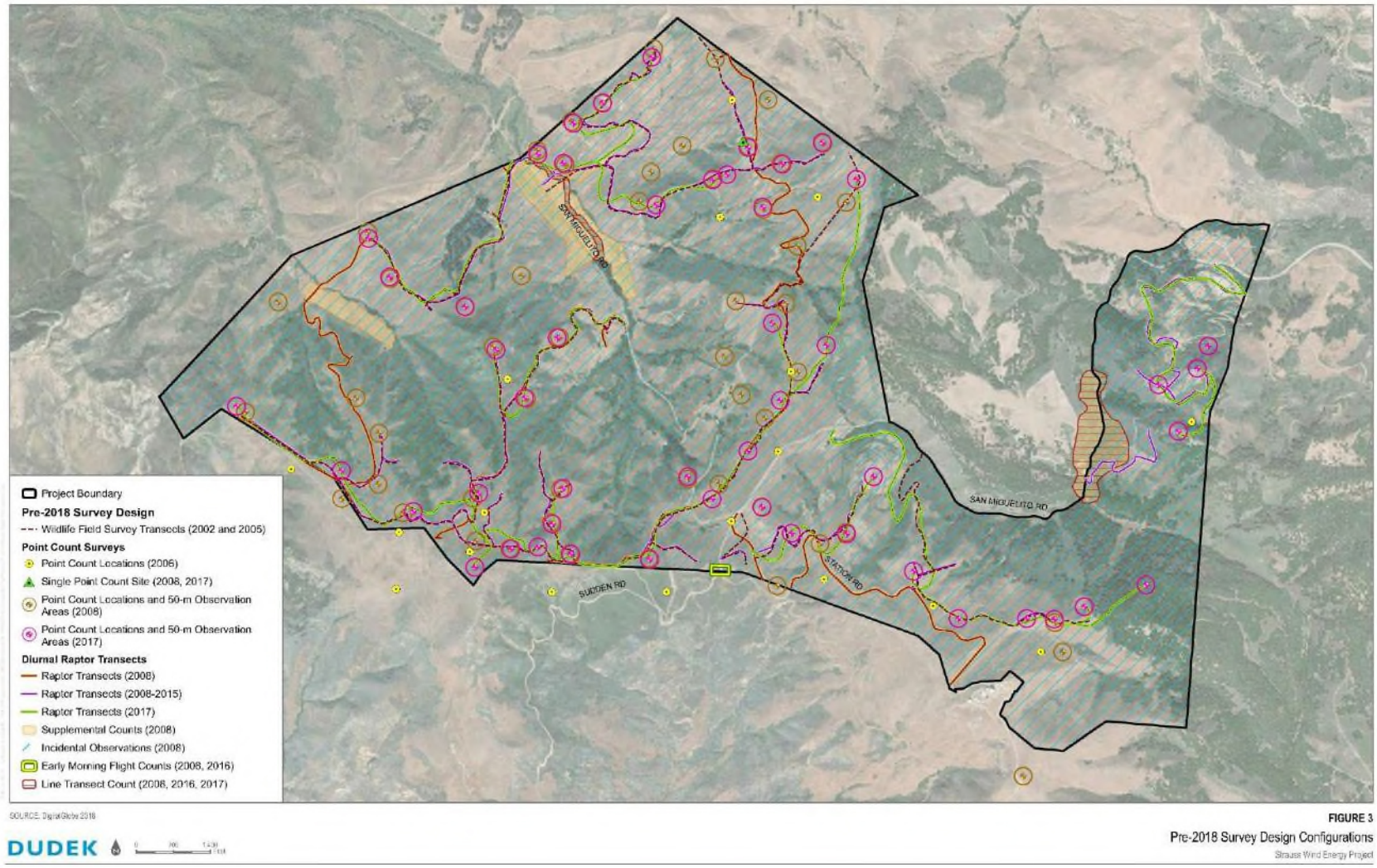


Figure 3. Pre-2018 Survey Design Configurations

3.2.1 Raptor Point Count Surveys (800-meter)

Methods: Field Surveys

Dudek conducted weekly ground surveys for golden eagle and other raptor species of concern from April 6, 2018, to April 25, 2019, and then biweekly surveys from May 9, 2019, through February 29, 2020, at five locations across the site (Figure 4, 800-m Raptor Point Count Locations). In accordance with the "2016 Eagle Rule" (81 FR 91494-91554), surveys consisted of point-based records of eagle flight activity within a three-dimensional sampling plot with a radius of 800 meters and height of 200 meters. The sampling design was spatially representative of the Project footprint, defined as the minimum convex polygon which encompasses the project wind area (project turbines). The number of point count stations was determined by applying a 1-kilometer buffer around the Project Area (8,539 acres), then determining how many 800-meter radius point count stations would provide a minimum 30% coverage of the primary wind site (2,970 acres), consistent with recommendations in the ECPG.

A total of five point count locations were established at vantage points throughout the site. Combined, the 800-meter coverage area for all point locations overlapped with 2,041 acres of the primary wind site resulting in a 67% coverage area (Figure 4). Each of the five locations were surveyed for a period of two hours for a total of 10 hours of survey time in each week. Survey hours occurred between dawn and dusk with the starting location rotated on a weekly basis from April 6, 2018, to February 29, 2020. Typically, all five locations were surveyed over two days and occasionally over three days due to weather conditions. Surveys were conducted under suitable weather conditions that provided visibility for detecting raptors within 800 meters of the survey location.

Using binoculars and spotting scopes, biologist moved around survey points to ensure observations in adjacent valleys and within 800 meters of the point were recorded. Although observers focused on areas within 800 meters of the observation point, and areas that could not be viewed from other observation points, biologists recorded eagle and other raptor activity visible anywhere on the Project Area. Flight paths, perch locations, and nests of any raptors, including golden eagles, were recorded on a mobile application displaying an aerial base map, point locations, 800-meter buffer, and Project Area boundary. Additional data recorded included, at least, date, surveying biologist, time, minutes of eagle flight (e.g., total flight time, time flying within the 800-meter buffer and RSZ, total time perching), number of individuals, activity/behaviors (e.g., circling, flapping, hunting, perching, soaring, territorial behavior, and height above ground [initial, maximum, and minimum]). The rotor swept height (RSH) is defined as the area between 13 and 150 meters above the ground at any location where the species was recorded. The RSZ is defined as the area between zero and 200 meters above the ground within a given 800-meter survey buffer for a given point location. For precise estimates, the time within RSH (13 to 150-meters) was recorded on-site along with minimum and maximum flight heights. Using field data height records, the eagle analysis presented here includes records for

zero to13 meters, 13 to 150 meters, and 150 to 200 meters (collectively, zero to 200 meters) within a given 800-meter survey buffer (i.e., RSZ).

Species excluded from data collection included small birds of prey, such as American kestrel (*Falco sparverius*) and turkey vultures (*Cathartes aura*). At the end of each survey day, biologists uploaded their data directly to the Dudek server. Dudek raptor biologists viewed the data periodically to identify any potential inconsistencies or errors and addressed these with the biologists recording the data.

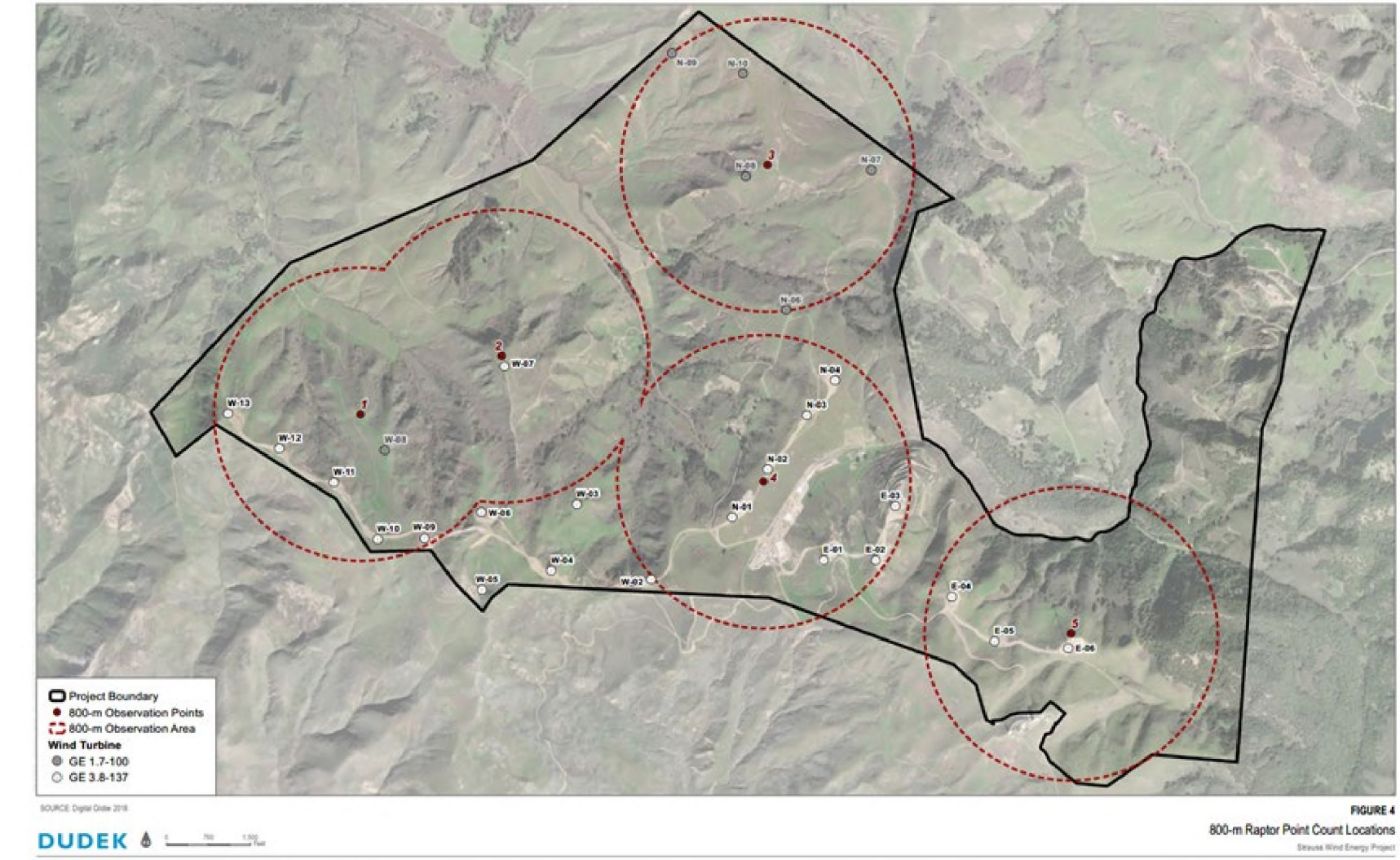


Figure 4. 800-meter Raptor Point Count Locations

Methods: Data Analysis

Data collected during raptor point count surveys were analyzed in order to establish baseline conditions (pre-construction); understand eagle use patterns, and exposure to wind turbines; and provide a basis for estimating eagle risk of collision with wind turbines as a result of construction and operation of the Project.

A description of the measurements examined, along with calculation methods, provided in this ECP is presented in Table 3. As described in Table 3, Mean Use describes the average level of eagle activity occurring during point count surveys. Exposure Index provides a relative measure of how often eagles are observed flying at heights proposed for the wind turbines (i.e., the RSH) and provides a measure for the relative risk that the Project may pose to eagles. The RSZ considered for this analysis is zero to 200 meters above the ground within a given 800-meter buffer per point count station. However, it should be noted that an Exposure Index alone does not provide the complete picture of a species level of risk of collision with wind turbines. Many factors affect a species risk of collision including, but not limited to; bird density, age, proximity to nests, residency status, season, weather, flight behavior, interaction with other birds, prey availability, topography, wind speed, and Project design (e.g., turbine height, rotor speed; USFWS 2013). Table 3 provides the empirical measurements and methods for components of risk assessed for this project.

Table 3
Measurements Descriptions and Calculation Methods

Measurement	Description	Calculation Methods
Number of Observation	Number of individuals observed	Tally of the number of individuals observed. This tally may include multiple observations of the same individual since most individuals were not identifiable by feather markings or other identifying traits.
Mean Use	Average number of individual observations recorded per survey per point count location	Calculated by (1) tallying the number of individuals observed at a given point location on a given survey day for all point locations and surveys, (2) summing the total number of individuals observed across all point locations and surveys, and (3) dividing by the total number of surveys performed across all locations.
Exposure Index	Provides a relative measure of how often birds are observed flying at heights proposed for the wind turbines and relates to the relative risk of collision with turbines	EI = A * P_f * P_t where *A* = individual mean use (average number of individuals observed per survey per point count location; see calculations above) P_f = proportion of species detections in flight. Calculated by dividing the number of individuals observed in flight by the total number of individuals observed for the species across all surveys. P_t = proportion of time spent by a species flying within the rotor swept zone. Calculated by dividing the number of individuals observed in flight within the rotor swept height by the total number of individuals observed in flight for the species across all surveys.

Results

Between April 6, 2018, and February 29, 2020, Dudek biologists and an independent biologist approved by Santa Barbara County performed 776 hours of raptor point count surveys across five point count locations. During these survey hours a total of two bald eagle observations were recorded and 535 golden eagle observations were recorded. It should be noted that of these 535 golden eagle observations, 283 were associated with the first detection of individuals during a 2-hour survey period and the remaining 202 were associated with a previously identified individual within a 2-hour survey. Although in the *Draft Bird and Bat Conservation Strategy* (Dudek 2020) these 202 observations were excluded, here they are included where appropriate (e.g., results related to time observed flying or other metrics not related to number of observations) and noted. While most of the golden eagle observations made across all surveys did not have identifying marks, identification bands, or other identifying features, survey data indicate that no more than a single family group of up to five individuals were observed in the Project Area Therefore, the results include numerous observations of the same individual(s) over multiple occasions and through multiple observation points. Appendix A provides the data collected during 800-meter point count survey and used in the summary of results provided below.

Bald Eagle

A single juvenile bald eagle was observed on September 28, 2018, and October 4, 2018, in the southern portion of the Project Area (Figure 5, Eagle Use Minutes, Flight Path, Perching, and Nest Location Results). On September 28, the individual was observed for 28 minutes circling, flapping, and soaring in this area at heights between 10 to 91 meters. On October 4 the presumed same individual was observed for six minutes circling and soaring in this same area at heights between zero to 91 meters before flying out of sight in a southeast direction.

Although suitable nesting trees are present in the Project Area, this species is rare in Santa Barbara County outside of Lake Cachuma (Lehman 2022). Aside from the 2018 sighting, the closest records to the Project Area include VSFB in 1976, the Santa Ynez River estuary in 1993–1994, and near Lompoc in 2013 (Lehman 2022). The nearest known nesting location is at Alisal Reservoir, approximately 24 miles east of the site. In addition, bald eagle breeding has been productive across the Channel Islands in recent years with 20 breeding pairs successfully rearing 19 chicks in 2018 (National Park Service [NPS] 2018) and 19 breeding pairs fledging 24 chicks in 2019 (NPS 2019). Although the islands are over 40 miles southeast of the Project site, the average natal dispersal distance for bald eagles is 86 miles (81 FR 91494-91554; “2016 Final Rule”). Therefore, over time there is some potential for dispersing juveniles to be observed in the region and possibly at risk.

Given the detection of only two bald eagle observations recorded during nearly 24 months of pre-construction surveys, the risk of exposure or collision with turbines is expected to be very small. Therefore, the majority of the remainder of this discussion focuses on golden eagles.

Golden Eagle – Project Area Activity

Golden eagles have been observed periodically during avian surveys since 2002 and regularly during pre-construction surveys between 2018 and 2020, with a maximum of five individuals observed on October 24, 2018 (two adults, two juveniles, and one subadult), and April 11, 2019 (two adults, two subadults, and one juvenile), flying, soaring, hunting, and perching on or over the Project Area. Golden eagles have also been regularly observed during construction between 2020 and 2022, as discussed above; however detailed results of surveys conducted during construction are not included in this ECP. Golden eagle observations recorded during the 2018–2020 per-construction surveys are summarized in Appendix B.

As shown on Table 4, a total of 535 golden eagle observations were made across all 776 hours of pre-construction surveying time. Of those 535 observations, 82% (441 observations) were observed in flight for approximately 48 hours (6% of total survey time). Of those 48 hours where eagles were observed in flight, approximately 24 hours (50%) occurred within the RSZ[7], for a total of 1,497 eagle minutes as defined in the ECPG.

Therefore, golden eagles were observed in the rotor swept zone for 3% of the total survey time and 50% of all flight time. As shown in Table 4, on average 43 hours were surveyed per month until May 2019 when bi-weekly (i.e., every other week) surveys commenced. Therefore, the fewer number of observations recorded after May 2019 reflects a reduction in eagle use and activity on-site proportionate to the number of hours surveyed. As shown in Table 4, the number of observations per survey hour fluctuates across all survey months with an average of 0.69 observations per hour.

Exposure index is related to the proportion of individuals observed in flight within the RSZ within a given 800-meter survey buffer. Exposure index ranged from zero to 1.74 with an average of 0.89. In addition, the average mean use value (i.e., average number of individuals per survey per point count location) was 1.53 eagles per 2-hour survey.

As shown on Figure 5, golden eagle flight paths were recorded throughout the site with concentrated activity occurring in the northern boundary and to a lesser extent in the west portion of the site. The golden eagle flight paths do not appear to coincide with topography or vegetation community or observer 800-meter survey area. They coincided instead with an off-site area to the north that

[7] Rotor swept zone is defined as the area within a given 800-m point station buffer between 0–13, 13–150, and 150-200 meters above the ground.

was favored by prospecting eagles starting in May 2018.[8] Golden eagle perching locations were scattered throughout the site with concentrated activity in the northern boundary of the site and to a lesser extent along the southern boundary of the site (Figure 5).

In addition, as shown in Table 4 and Exhibit A, the amount of time golden eagles were observed within an 800-meter RSZ fluctuated across months and years, generally with more observation time record from April through July 2018. It should be noted that survey effort was reduced from weekly observation surveys from April 2018 through April 2019 to bi-monthly (i.e., every other week) pre-construction surveys from May 2019 through February 29, 2020.

As described above, Figure 5 displays flight paths, the confirmed eagle nesting location, and perching locations up through March 1, 2020. In addition, Figure 5 provides a table showing the cumulative eagle flight minutes recorded for each of the five point count stations. As shown on Figure 5, the majority (55%; 1,580 minutes) of golden eagle flight activity was recorded at Site 3, which is situated southwest of the hill where golden eagles were known to nest and successfully fledge at least one young in 2019. Similarly, most minutes of eagles recorded within the 800-meter RSZ (72%; 1,059 minutes) was at Site 3.

[8] Dudek began surveys on April 6, 2018, and it was not until July 6, 2018, that the family group moved to the area and started using the site.

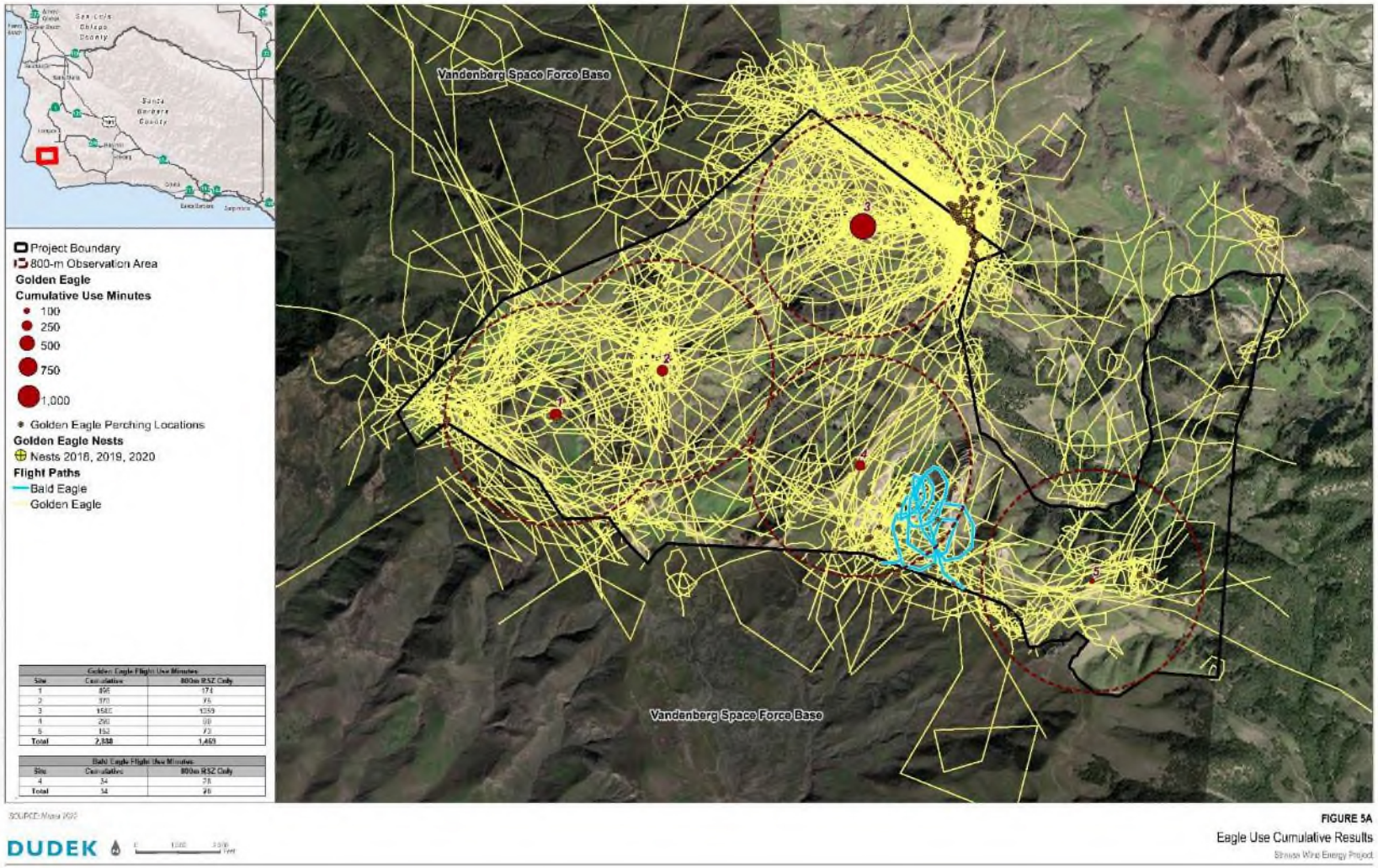


Figure 5. Eagle Use Minutes, Flight Path, Perching, and Nest Location Results

Table 4
Golden Eagle Use Survey Results, 2018–2020[1]

Year	Month	Total Survey Hours	Total # of Observ.	Observ. per Survey Hour	Mean Indiv. Use (A)[2]	Total # Observ. in Flight	Proportion in Flight (Pf)	Total # in Flight in 800m RSZ[3]	Proportion in Flight in 800m RSZ (Pt)	Exposure Index (A*Pf*Pt)	Total Hours in Flight	Total Hours in Flight in 800m RSZ[3]
2018	Apr	38	0	0.00	0.00	0	-	0	-	-	0.00	0.00
	May	46	6	0.13	0.39	6	1.00	4	0.67	0.26	3.13	2.29
	Jun	42	12	0.29	0.62	12	1.00	10	0.83	0.51	2.70	1.87
	Jul	42	29	0.69	1.95	21	0.72	20	0.69	0.97	3.47	2.31
	Aug	50	40	0.80	2.12	29	0.73	20	0.50	0.77	3.75	1.61
	Sept	40	46	1.15	2.55	31	0.67	27	0.59	1.01	3.08	1.10
	Oct	40	37	0.93	2.15	28	0.76	22	0.59	0.96	2.43	1.12
	Nov	50	37	0.74	1.64	29	0.78	24	0.65	0.83	2.37	0.88
	Dec	40	24	0.60	1.35	19	0.79	14	0.58	0.62	2.55	1.16
2019	Jan	48	47	0.98	1.96	45	0.96	38	0.81	1.52	3.70	1.78
	Feb	36	19	0.53	1.06	17	0.89	16	0.84	0.79	1.85	0.55
	Mar	44	42	0.95	2.00	40	0.95	25	0.60	1.14	2.95	1.02
	Apr	40	42	1.05	2.20	37	0.88	30	0.71	1.37	4.50	2.50
	May	20	12	0.60	1.20	11	0.92	8	0.67	0.74	0.82	0.30
	Jun	20	9	0.45	1.10	5	0.56	1	0.11	0.07	0.10	0.03
	Jul	24	20	0.83	2.00	18	0.90	14	0.70	1.26	1.10	0.53
	Aug	26	6	0.23	0.46	2	0.33	2	0.33	0.05	0.13	0.07
	Sept	20	4	0.20	1.10	4	1.00	4	1.00	1.10	2.83	2.05
	Oct	20	17	0.85	1.70	12	0.71	11	0.65	0.78	0.68	0.43
	Nov	20	16	0.80	1.60	15	0.94	12	0.75	1.13	0.70	0.40
	Dec	20	23	1.15	2.30	21	0.91	19	0.83	1.74	1.57	0.73
2020	Jan	30	27	0.90	1.80	24	0.89	21	0.78	1.25	1.85	1.17
	Feb[4]	20	20	1.00	2.00	15	0.75	10	0.50	0.75	1.87	0.58
Total	**-**	**776**	**535**	**1.45**	**1.54**	**441**	**0.82**	**312**	**0.66**	**0.83**	**48.13**	**24.48**

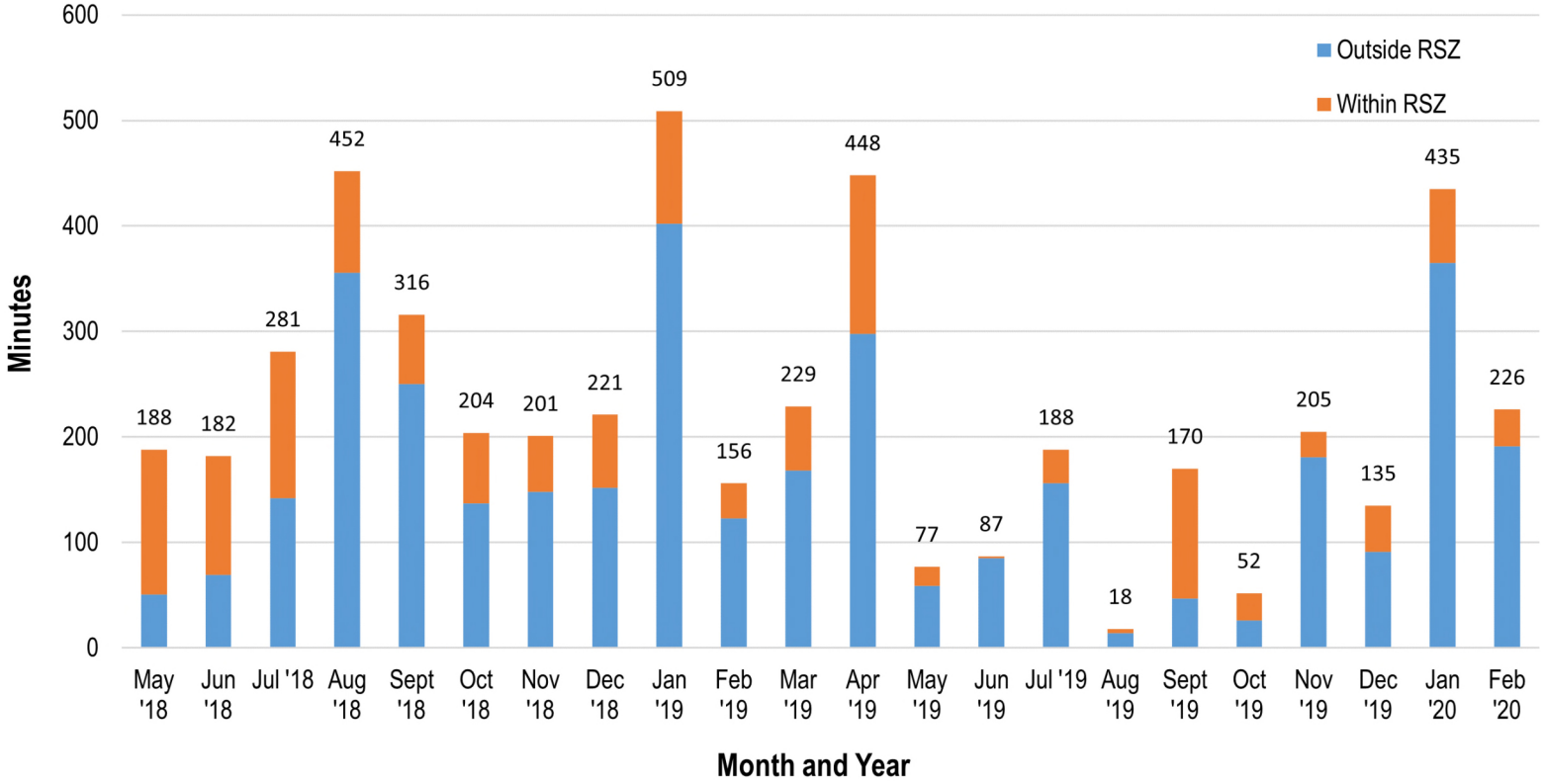
1 Includes 220 observations likely associated with previously identified individuals within a 2-hour survey period

2 Average number of individuals observed per survey per site

3 Only includes observations in flight within a given 800-m point station buffer within the RSZ (i.e., 0–13 meters, 13–150 meters, and 150–200 meters above the ground).

4 Last survey occurred on February 28, 2020.

Exhibit A
Golden Eagle Observation Minutes (Total[1] vs. Rotor Swept Zone[2]) by Month (2018–2020)



1 Total includes all observations recorded during 800-m point count surveys, including those outside of a given 800-m survey buffer
2 Observations in flight within a given 800m point station buffer within the RSZ (i.e., 0–13, 13–150, and 150–200 meters above the ground).

3.2.2 Avian Point Counts (50-meter)

Methods

Dudek conducted 2018 spring avian point counts at 50 point count locations (each 50 m in diameter), following the methodology of previous surveys (Area Search Counts, per Sapphos; see Table 2). The 50 point locations included all 30 initially considered turbine locations, eight locations outside of the turbine areas surveyed by Sapphos, and 12 points added to characterize the avian use in woodland, riparian, and scrub habitats, not previously examined by Sapphos (Figure 6, Historical and Current Avian Point Count Locations). Overall, 31 of the points visited in 2018 had overlapping 50-m buffer survey areas with the 50-m areas previously examined by Sapphos.

Two survey passes were conducted during the spring 2018 (April 20 to June 1) and two survey passes were conducted during the fall 2018 (September 25 to October 12). For each station, the surveying biologists recorded all avian species seen or heard within a 50-m radius plot for 15-minute survey period while remaining near the center of the survey plot. The 50-m radius plot was visualized as a cylinder and all species within this cylinder, including fly overs, were recorded. Data recorded included species, number of individuals, time of day, whether the bird was detected visually or aurally, behaviors observed, the bearing and distance of the bird from the center of the survey plot when initially observed, flight height (initial, maximum, and minimum), and flight direction. Sampling points were placed at a minimum of 160 m apart.

Results

Overall, one juvenile golden eagle was observed during 50-m point count surveys on in September 2018. Based on the length of each survey period (15-minutes) and the quantity of eagle data obtained through 800-m surveys, this individual golden eagle was likely part of the same family group observed previously. Because 800-m raptor point count surveys collected significantly more data regarding golden eagles than the 50-m point count surveys, this single eagle observation is noted here but not addressed elsewhere in this report.

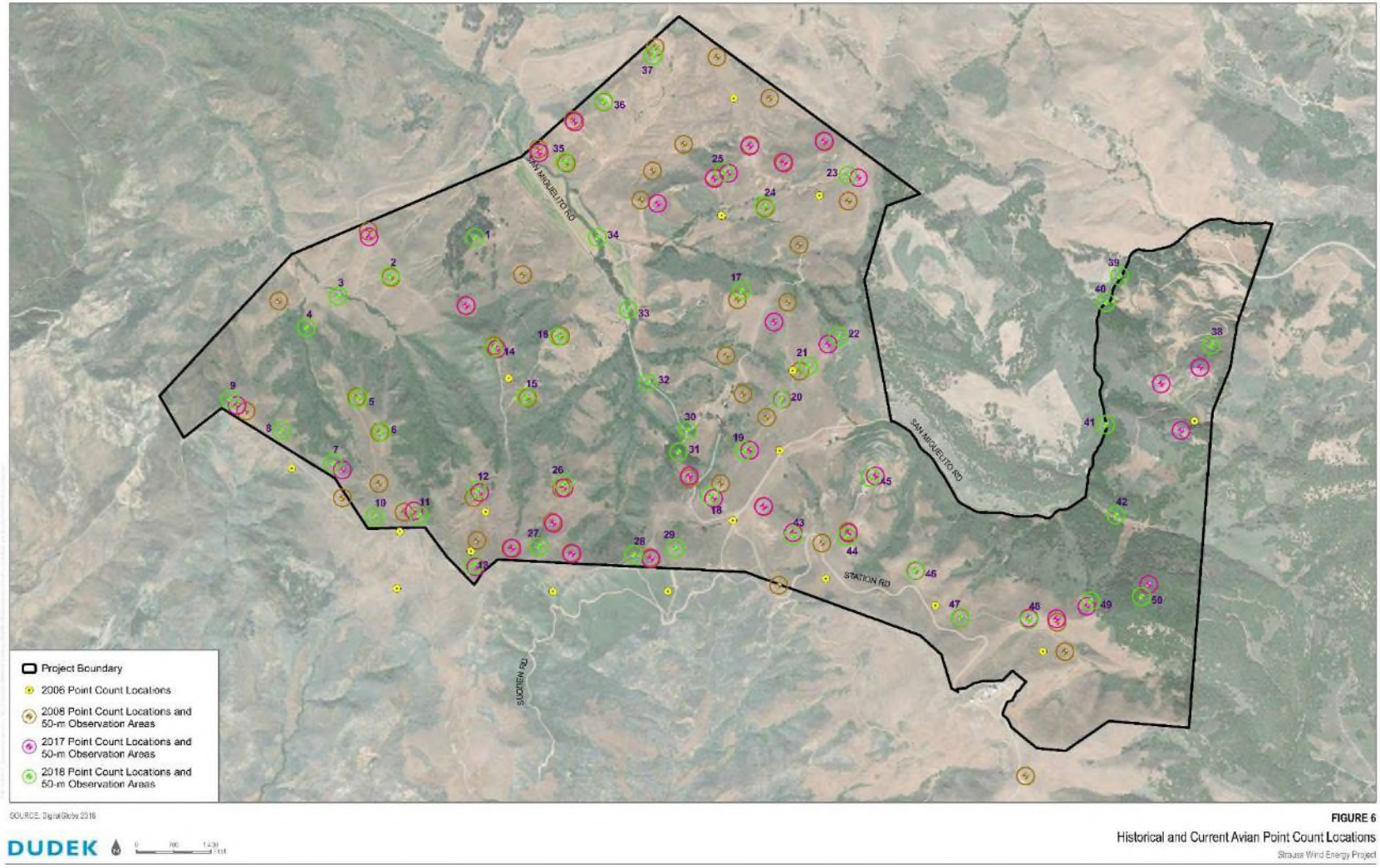


Figure 6. Historical and Current Avian Point Count Locations

3.2.3 Aerial Eagle Nest Survey (2018–2019)

Methods

Santa Barbara County-approved biologists performed aerial surveys on March 25 and May 30, 2018, and February 18, 2019. Surveys followed guidelines outlined in the USFWS monitoring protocol and ECPG (Discroll 2010, USFWS 2010b). Surveys were performed from a helicopter within a 10-mile radius of the Project Area (excluding non-flight zones and the Pacific Ocean; Figure 7, Golden Eagle Nest Survey Results within 10 miles; Figure 8, Golden Eagle Nest Survey Results within 2 miles). As shown on Figures 7 and 8, approximately 630 acres in the western half of the survey area was excluded from the survey due to VSFB flight restrictions. VSFB designates this area as prohibited airspace (Restricted Area: R-2517).

During each survey, two biologists were positioned on opposite sides of the helicopter. On the first survey of each year (March 25, 2018, and February 18, 2019) the biologists (via helicopter) surveyed multiple areas, including but not limited to coordinate locations of previously identified active or suspected eagle nest locations from USFWS or based on the previous year's survey efforts (BRC 2018), to re-survey the area while searching for signs of active nesting by golden eagles and other raptors. On the second survey (May 30) the biologists (via helicopter) followed up on any nest locations identified during the first survey and coursed around suitable golden eagle nesting habitat previously surveyed. For each survey, biologists determined the presence of young in nests and photographed nests using a Nikon DSLR camera (55–200 millimeter zoom vibration-reducing lens).

Additional details regarding 2018 and 2019 surveys are discussed in BRC (2018, 2019).

Results

Two probable golden eagle nesting locations were identified during 2018–2019 surveys within 10 miles of the site. Follow-up surveys were conducted in May 2019, and results to date are summarized below. Aerial survey results are depicted on Figures 7 and 8.

In 2018, one golden eagle was observed in flight approximately 7.9 miles southeast of the Project Area. In addition, an active golden eagle nest was observed approximately 4.0 miles northeast of the Project Area and situated on a cliff along the Santa Ynez River. This nest was determined to have successfully fledged one young based on the presence of two eggs on March 25, 2018, and subsequent adult behavior observed on May 30, suggesting adults were feeding a recent fledgling near the nest. In addition, on May 30 the nest conditions indicated young had recently fledged. This same nest was in disrepair and contained new vegetation growth within on February 18, 2019.

In 2019 surveys also focused on a potential nest location approximately 500 feet north of the Project Area within oak woodlands. Although surveyors detected a golden eagle flying in the immediate area, they were unable to confirm a nest. However, eagle behaviors indicative of breeding activity was detected on the ground by Dudek in March and April, and visual confirmation of a nest was made on May 2, 2019. At the beginning of June, both golden eagle adults were active in and around the nest site, and based on behavior, young were suspected as being present within the nest, but not observed. A family group (two adults and at least one fledgling) was confirmed on June 21. On this day, the biologist heard a fledgling calling from the nest on the hill off site to the northeast of the Project Area. The biologist then observed an adult flying over the nest and the fledgling then flew out of the nest. The fledgling was observed landing on the ground on the nesting hill and showed characteristics of attempting to fly (e.g., clumsy flight patterns, hopping on ground while flapping, and taking short flight bursts). The biologist observed this fledgling for over 30 minutes and observed both adults and one fledgling for an additional hour. Adults would land next to the young possibly bringing it food. It was possible there were two fledglings, but the biologist only observed three eagles (two adults and one fledgling) at any one time.

Similarly, on July 3, one fledgling and two adults were observed near or by the nest. The fledgling continued to show characteristics of learning to fly and was estimated to be close to two months old. On this day, the fledgling spent most of the time observed on the ground on the hillside with at least one adult staying relatively close by. In mid-July (July 18–19) two adults and fledgling/juvenile were observed flying together on site, mostly near the hillside where the nest is located. After completion of surveys, the biologist confirmed two juveniles flying together above the nesting site for approximately four minutes, after which both flew behind the trees to the north presumably into the nest. After this, throughout the day, both adults and a single juvenile were observed at a time, with one sighting of a juvenile flying farther away from the nest approximately 2,000 meters southeast of the nest location.

On July 31 an adult was observed flying around the nesting hill, and a juvenile was heard calling in the western portion of the Project Area on August 1. On August 2, adults continued to be active in and around the nesting hill.

3.2.4 Ground-Based Eagle Nest Surveys (2019–2022)

Based on golden eagle nesting behavior observed in early 2019, a pedestrian nest survey was performed on February 6, 2019, within the northeastern portion of the Project Area. For the pedestrian survey a biologist observed eagle activity at one or more locations with vantage points to the anticipated nest location. Eagle behavior and activities were documented during the entire survey. In addition, time spent observing eagles varied from one to 10 hours. During this survey and based on behavior, it was confirmed that golden eagles were likely nesting in oak woodlands outside of the northern boundary of the Project Area though the nest could not be observed due to

tree canopy. Follow-up nest surveys were performed in March, April, and June 2019 to document nesting behavior and acquire additional information on nesting activity and to try to visually see the nest. Pedestrian efforts were not able to visually confirm a nest. Subsequent remote photography was ultimately able to provide evidence of nesting activity on March 19, 2019. The nest was located approximately 500 feet northeast of the northern boundary of the site (Figure 8). In addition, a family group (two adults and one fledgling) was confirmed at this nest location on June 21, 2019. Although a fledgling was observed on July 6 and 11, 2018, in a similar area as the location of the 2019 active nest, active (or inactive) nests were not visually confirmed in 2018. During review of golden eagle flight paths mapped during raptor point count surveys, most adult eagle flights originated to the north of the Project Area through openings in the tree canopy.

In March and April 2020, a golden eagle adult was observed gathering nesting materials (branches, twigs) and carried it back to the previous nest location within the oak woodlands. As a result, construction monitoring nest surveys commenced. Adult golden eagles were regularly observed between June and November, juveniles (possible fledglings) were occasionally observed flying and perching in the area, including the grove of trees on the hill.

In January 2021 two adults were again observed gathering sticks and flying to the trees on the hill. However, in April 2021 observers detected a second nest approximately 162 meters south of San Miguelito Road (SMR) within a parcel that is not part of the Project. Based on a series of construction nest monitoring efforts, adult golden eagles were initially observed at this SMR nest in April (one adult observed sitting on the nest while the other soared above) but thereafter were also observed regularly around the trees on the hill. Although the adults were actively soaring around the SMR nest location and tree grove on the hill there was no direct evidence of an active nest at the SMR location. In May 2021 a juvenile was observed flying around the grove of trees on the hill. The SMR nest was actively monitored through July 2021 and appears to have been an alternate nest location.

In January and February 2022 two adults were observed by biological monitors at the SMR nest location with observed copulations and carrying nesting material. Based on focused monitoring activities, in April 2022 at least one eaglet was heard calling from the nest location and was directly observed in the nest. Between April and June, the eaglet was regularly observed at the nest and adults regularly present and observed feeding the eaglet. By the end of June, the eaglet had fledged the nest. On June 29, 2022, Santa Barbara County lifted a restricted 1-mile nest avoidance buffer requirement.

As of this writing, June 2023, no eagle nesting activity has been observed on or near the Project Area during the 2023 breeding season.

Figure 7. Golden eagle nest survey results within 10 miles.

Figure 8. Golden eagle nest survey results within 2 miles.

4 ASSESSING EAGLE RISK AND PREDICTING FATALITIES (ECPG STAGE 3)

The USFWS is required to evaluate and consider the effects of programmatic take permits on eagles at the eagle management unit, local area, and project area population scales, including cumulative effects, as part of its permit application review process (50 CFR 22.26 (f)(1) and USFWS 2009). Therefore, this section presents general information that is publicly available regarding threats to eagles and operating projects in the vicinity.

Factors that influence eagle vulnerability to collisions with wind turbines are poorly known. However, studies suggest that two main factors contribute to an increased risk of collision by eagles, including (1) eagle abundance, (2) features or circumstances that reduce the ability of an eagle to perceive and avoid collision (e.g., interaction of topographic features, season, wind currents that create conditions for high-risk flight behavior near turbines, behavior that distracts eagles and makes them less vigilant such as actively foraging or interactions).

The Project Area lacks water bodies and sources, such as lakes, rivers, streams, and other wetland systems that are typically used by bald eagles. Aside from the observation of one juvenile bald eagle on site, no additional observations of bald eagles have been made during 776 hours of survey time. As such, risk to bald eagles is minimal hence, the following discussion focuses on golden eagles.

The USFWS ECPG uses a three-category system in defining risk to eagles, and their definitions are provided below.

Category 1 – High risk to eagles, potential to avoid and mitigate impacts is low
A project is in this category if it:

(1) has an important eagle-use area or migration concentration site within the project footprint; or

(2) has an annual eagle fatality estimate (average number of eagles predicted to be taken annually) greater than 5% of the estimated local-area population size; or

(3) causes the cumulative annual take for the local-area population to exceed 5% of the estimated local-area population size.

Category 2 – High or moderate risk to eagles, opportunity to mitigate impacts.
A project is in this category if it:

(1) has an important eagle-use area or migration concentration site within the project area but not in the project footprint; or

(2) has an annual eagle fatality estimate between 0.03 eagles per year and 5% of the estimated local-area population size; or

(3) causes cumulative annual take of the local-area population of less than 5% of the estimated local-area population size.

Category 3 – Minimal risk to eagles.
A project is in this category if it:

(1) has no important eagle use areas or migration concentration sites within the project area; and

(2) has an eagle fatality rate estimate of less than 0.03 eagles per year; and

(3) causes cumulative annual take of the local-area population of less than 5% of the estimated local-area population size.

To assist in assessing the Project Area regarding these three criteria, the local area population for golden and bald eagles at the Project was assessed with respect to the 5% threshold identified by the USFWS (as per ECPG; Appendix F). In addition, fatality predictions per USFWS Collision Risk Model (CRM) are described below.

4.1 Cumulative Effects Analysis

The USFWS identifies take levels at two spatial scales to maintain stable or increasing eagle population: (1) the Eagle Management Unit (EMU) which, for the Project, is defined as the Pacific Flyway (Pacific EMU) and (2) the local area population. The local area population for golden eagles is defined in the "2016 Eagle Rule" (81 FR 91494-91554) as the total number of eagles estimated to occur within a 109-mile radius of the Project Area, based on the natal dispersal distance for golden eagles. For bald eagles the local area population is defined as the number of bald eagles within an 86-mile radius of the Project Area. The USFWS has identified take rates of between 1% and 5% of the estimated eagle population size at the local area population scale as sustainable; with 5% being at the upper end of what might be appropriate under the BGEPA preservation standard, whether offset by compensatory mitigation or not (USFWS 2016a).Because take for golden eagles would be mitigated to a no-net-loss standard, the Project will ultimately not contribute to the cumulative impacts at the EMU or local area population scale region. Compensatory mitigation for bald eagle take is generally not required under an eagle ITP.

As shown in Table 5, the Project Area is in the Coastal California Bird Conservation Region (BCR 32; NABCI 2019). The estimated golden eagle population size in this BCR is approximately 960 individuals within an area of approximately 63,919 square miles, for an estimated golden eagle density of is 0.015 eagles per square mile (USFWS 2013). Based on this regional golden eagle density, the Project's local area population of golden eagles is estimated to be 578 individuals. The

5% benchmark take rate for the Project's local area population is 29 golden eagles per year, which would include not only the Project's permitted eagle take but also all other forms of authorized golden eagle take within 109 miles of the Project.

Table 5
Local-Area Annual Golden Eagle Take Benchmarks

GOEA Management Unit[1]	BRC Number[1]	Estimated Population Size[1]	BRC Size (mi^2) [1]	Management Unit Eagle Density (GOEA per mi^2) [1]	Maximum Take Rate (% Local-Area Population Per Year)[2]	Local Area (mi^2)[3]	Local Area 5% Benchmark (eagles per year)[4]
Coastal California	32	960	63,919	0.015	5.0	38,504	29

1 Described in the ECPG, Appendix F.
2 A take rate of 5% is the USFWS's upper benchmark for take at the local-area population scale.
3 Local Area refers to the radius of the Project Area (1.70 miles for 5,887 acre area) plus an additional buffer of 109 miles, which is the average natal distance for the GOEA ("2016 Eagle Rule"; 81 FR 91494-91554) = 3.142 * 110.70^2 = 38,504
4 Local-Area 5% Benchmark = (Local Area * Regional Eagle Density) * 0.05 = (38,504*0.015)*0.05 = 28.9

The estimated bald eagle population size in the region is approximately 889 individuals in approximately 265,779 square miles, resulting in an estimated bald eagle density of 0.003 eagles per square mile (USFWS 2013). Using a maximum take rate of 5% per year, and the regional bald eagle density, the 5% benchmark take rate for bald eagles is approximately 18 individual per year (Table 6).

Table 6
Local-Area Annual Bald Eagle Take Benchmarks

BAEA Management Unit[1]	Estimated Population Size[1]	Region Size (mi^2) [1]	Management Unit Eagle Density (BAEA per mi^2) [1]	Maximum Take Rate (% Local-Area Population Per Year)[2]	Local Area (mi^2)[3]	Local Area 5% Benchmark (eagles per year)[4]
Region 8	889	265,779	0.003	5.0	24,166	18

1 Described in the ECPG, Appendix F.
2 A take rate of 5% is the USFWS's upper benchmark for take at the local-area population scale.
3 Local Area refers to the radius of the Project Area (1.70 miles for 5,887 acre area) plus an additional buffer of 86 miles, which is the average natal distance for the BAEA ("2016 Eagle Rule"; 81 FR 91494-91554) = 3.142 * 87.70^2 = 24,166
4 Local-Area 5% Benchmark = (Local Area * Regional Eagle Density) * 0.05 = (24,166*0.015)*0.05 = 18.1

The above analysis provides a preliminary estimate of the upper limit of golden and bald eagle take that might be appropriate under the BGEPA preservation standard for all sources of take permitted or authorized by the USFWS. The USFWS Region 8 will review all available internal records on known eagle mortalities within the local area population areas for both species from sources of known mortality such as electrocution, collisions, shootings, and poisonings, to inform the cumulative impacts analysis in the NEPA process and to inform the final permit conditions. There are no additional wind energy facilities within 109 miles of the Project.

4.2 Fatality Predictions

Annual fatality estimates for the Project Area were calculated following the baseline model description provided in Appendix D of the ECPG. The USFWS uses a Bayesian method to predict the annual fatality rates for a given wind-energy facility. Annual fatality estimates (F) resulting from collision with wind turbines are defined as: $F = \lambda C \varepsilon$, where λ is the rate of eagle exposure, C is the probability that eagle exposure will result in a collision with a turbine, and ε scales the resulting fatality rate to the project-specific area. The analysis used code prepared by the USFWS (USFWS 2018) in Program R (R Core Team 2022) and incorporated updated prior estimates described in 83 FR 23978 (published May 5, 2021) and New et al. (2018). A basic annual model was examined using the following input parameters described in Table 7 and Table 8 for data collected between April 6, 2018, and February 29, 2020[9].

Table 7
2018–2020 Variable and Input Values for Eagle Collision Model

Variable	Input	
Project Latitude and Longitude	34.580907°, -120.513949°	
Duration of point counts (minutes)	120 minutes	
Dates included in analysis	Year 1: 4/06/2018 through 04/04/2019 Year 2: 4/10/2019 through 2/29/2020 (last survey prior to construction) Year 1 + Year 2: 4/6/2018 through 2/29/2020	
Min height eagle observations recorded (m)	0 meters	
Max height eagle observations recorded (m)	200 meters	
Seasons/Annual?	Annual	
Total eagle minutes observed[1]	GOEA Year 1: 958 min Year 2: 511 min Year 1 + Year 2: 1,497 min	BAEA Year 1: 28 min Year 2: 0 min Year 1 + Year 2: 28 min
Number of point counts (120 minutes each)	Year 1: 263 stations Year 2: 125 stations Year 1 + Year 2: 388 stations	
Radius of survey area (m)	800 m	

[1] For 2018 data = sum of ([proportion of flight in a given 800-m plot for records within the rotor swept zone] * [flight time] * [number of individuals]); For 2019 data = sum of ([total time observed in a given 800-m plot within the rotor swept zone] * [number of individuals])

[9] It is understood that the USFWS will independently run the model using the provided data set.

Table 8
Collision Risk Model Results for Various Turbine Models[1]

Year	Golden Eagle CI80	Golden Eagle CI80 (Priors)	Bald Eagle CI60	Bald Eagle CI60 (Priors)
Turbine Model GE 3.8-137 (n = 23, rotor = 137m, ground clearance = 13m, tip height = 150m)				
Year 1	12	12	0.15	0.12
Year 2	14	12	< 0.01	0.12
Year 1 + Year 2	*13*	-	*0.10*	-
Turbine GE 1.79-100 (n = 4, rotor = 100m, ground clearance = 30m, tip height = 130m)				
Year 1	1.1	1.1	0.03	0.02
Year 2	1.3	1.1	< 0.01	0.02
Year 1 + Year 2	*1.2*	-	0.02	-
Total Year 1[2]	**13.1**	-	**0.18**	-
Total Year 2[2]	**14.3**	-	**< 0.01**	-
Total Year 1+ Year 2[2]	**14.2**	-	**0.18**	-

1 Take estimates based on updated priors (86 FR 23978 [2021], New et al. 2018 version 2);
2 Assumes take estimate values for each turbine model are additive.

Strict model outputs based on the data in Tables 7 and 8 should be interpreted cautiously as they are based on repeated observation of the same individual eagles over two years at the site. Based on the inputs to the model, approximately 1 bald eagle is predicted to be killed every 5.5 years (i.e., 0.18 bald eagles per year); and 14 golden eagles are predicted to be killed every year from collisions with turbines. This estimate is below the 5% local area benchmark values for golden and bald eagle (without considering the cumulative effects of other sources of authorized and unauthorized take in the region).

While the Project Area receives consistent year-round use by eagles, it is possible that most of that use is attributed to small number of eagles, including the family group associated with the breeding territory adjacent the Project. As such, the predicted estimate of 14 golden eagles taken per year may represent a greater number of eagle fatalities per year at the Project than may actually occur. However, the territorial pair may be excluding other eagles from the project site that will be at risk if the territorial pair suffers mortality. The fatality prediction derived from the USFWS CRM can be updated with site-specific, post-construction monitoring data which will provide a more accurate estimate of impacts. Baseline avian and bat fatality monitoring will be initiated at the Project following the start of Project operations and subsequent post-permit eagle fatality monitoring will be conducted during each administrative review period following permit issuance (Section 6.1). Site-specific mortality data can be incorporated into a posterior, site specific estimate of collision probability to further refine mortality predictions for the Project prior to permit issuance or to inform the level of take coverage that may be needed in subsequent review periods.

5 AVOIDANCE AND MINIMIZATION MEASURES AND COMPENSTORY MITIGATION (ECPG STAGE 4)

To reduce risk to eagle from the project, a variety of avoidance and minimization measures have been incorporated into the Project because of the California Environmental Quality Act review process and are described in Section 4.5, Biological Resources, of the EIR (County of Santa Barbara 2019). The measures described below are specific to eagles. Additional general wildlife/biological resource conservation measures are not included below but are described in the Project's *Draft Bird and Bat Conservation Strategy* (Dudek 2020) and may also be beneficial to eagles.

5.1 Conservation Measures during Pre-construction Planning and Design

- Utilizing existing roads and transmission corridors to the maximum extent possible
- Minimizing the extent of the road work required for development
- Following APLIC (2012) guidance for transmission line design and siting to minimize the potential for raptor electrocution and collision.
- Designing and micrositing WTGs to minimize collision potential, including use of WTGs with low rotational speed (approximately 10 to 23 revolutions per minute) and tubular towers. The Owner/Applicant conferred with a qualified wildlife biologist experienced in evaluating WTG bird and bat hazards to develop micrositing plans.
- Utilizing down-shielded, low-illumination, motion triggered lighting in the switchyard
- Siting turbines at least 500 feet away from active raptor nest sites

5.2 Conservation Measures during Construction

- **Avoidance Measures for Nesting Eagles.** Any construction activities or site restoration and landscaping activities should be conducted outside of the breeding season (December 1 – July 31) to the extent possible. If construction or restoration/landscaping activities during the breeding season cannot be avoided, annual surveys for golden eagle nests shall be conducted within one mile of the Project. A 1-mile no-disturbance buffer shall be implemented around each active nest within which no construction or restoration/landscaping activities are permitted while the nest is active. This buffer may be adjusted with concurrence from the USFWS.
- A speed limit of 15 miles per hour shall be established and enforced to reduce wildlife collisions and disturbance.

- At the start of construction, a carrion removal program will be implemented to promptly remove carrion from all areas in the Project site within a 500-foot radius of every WTG. The program shall include regular patrols of the Project site to locate and remove livestock carcasses or other carrion, to minimize attractants for avian carrion feeders such as vultures, condors, hawks, and eagles.

5.3 Conservation Measures during Operations

- **Avoidance Measures for Nesting Eagles.** Any O&M or decommissioning activities should be conducted outside of the breeding season (December 1 – July 31) to the extent possible. If O&M or decommissioning activities during the breeding season cannot be avoided, annual surveys for golden eagle nests shall be conducted within one mile of the Project. A 1-mile no-disturbance buffer shall be implemented around each active nest within which no maintenance or decommissioning activities are permitted while the nest is active. This buffer may be adjusted with concurrence from the USFWS.
- Three IdentiFlight units will be activated at the Project upon the start of operations (see Figure 2).
- Consistent with MM BIO-16a of the EIR and described in the Bird and Bat Conservation Strategy (BBCS), avian use surveys initiated at the Project during pre-construction and continued throughout the construction phase, will be further conducted throughout the operational life of the Project. The purpose of the surveys is to compare pre- and post-construction bird use on the site; to assess the effects of the Project on avian species; to assist in determining whether additional mitigation elements are necessary; and to collect research data to better understand wind power industry impacts and provide regulatory agencies with data for future Projects. Study reports shall include estimates of average bird usage on the site and information on the location of species within the site, flight elevations and patterns of activity, and WTG avoidance behavior.
- At the start of commercial operations, a bird and bat fatality monitoring study will be initiated at the Project, consistent with MM BIO-16b of the EIR and described in the BBCS (Dudek 2020; Section 6.1). The purpose of the study will be to estimate mortality rates for different species on the site attributable to collisions with WTGs and to identify individual WTGs or groups/strings of WTGs that cause unanticipated levels of mortality. The study will continue throughout the life of the Project.
- The carrion removal program initiated during construction will continue throughout the operational phase of the Project, consistent with MM BIO-16c and the Project's BBCS. The purpose of the program is to promptly remove carrion from all areas in the Project site within a 500-foot radius of every WTG. The program shall include regular patrols of the

Project site to locate and remove livestock carcasses or other carrion, to minimize attractants for avian carrion feeders such as vultures, condors, hawks, and eagles.

5.4 Upfront Compensatory Mitigation

Compensatory mitigation occurs in the eagle permitting process if the conservation measures do not remove the potential for take, and the projected take exceeds calculated thresholds for the species-specific eagle management unit in which the Project is located. To mitigate impacts, the USFWS uses a mitigation ratio for golden eagles of 1.2 eagles to one eagle taken (USFWS 2016b).

Strauss recognizes that mitigation is required for impacts to golden eagles resulting from Project operations and will work with the USFWS to develop a mitigation plan to offset the impacts of the predicted eagle take (USFWS 2013). The USFWS determines the final compensatory mitigation requirements for the Project using a resource equivalency analysis (USFWS 2013) based on the final predicted level of take for the Project. To fully offset the predicted take over the first three years of the ITP term, Strauss plans to retrofit high-risk power poles. USFWS will credit the excess mitigated take to Strauss for the subsequent 5-year period if take estimates are less than mitigated take after the initial review period. If estimated take is higher, the USFWS may require additional mitigation.

Strauss will develop a mitigation plan that will describe the approach to mitigation and, ultimately, provide documentation of all poles identified for retrofitting necessary to mitigate the initial three years of predicted take at the Project. Strauss anticipates the mitigation plan will focus on power pole retrofits by either working directly with local utilities to compensate them for retrofitting poles or placing the funds to retrofit power poles into a third-party mitigation account. Based upon communication with the USFWS, other potential mitigation options may become available soon, including support for lead abatement programs, carcass removal along highways, habitat restoration/prey enhancement programs, or funding for mitigation banking efforts. The USFWS would need to approve any alternative compensatory mitigation options to offset the amount of estimated eagle take from the Project by the alternative mitigation measures. Strauss will coordinate with the USFWS if additional mitigation options become available.

6 POST-CONSTRUCTION MONITORING

6.1 Bird and Bat Fatality Monitoring

Immediately following the start of operations, Strauss will implement a bird and bat fatality study to estimate mortality rates for different species or species groups on the site attributable to collisions with WTGs and to identify individual WTGs or groups/strings of WTGs that cause

unanticipated levels of mortality (Dudek 2021). The bird and bat fatality monitoring will be conducted for at least the first two years of Project operations.

The study design, provided in detail in the Project's BBCS (Dudek 2021) follows recommendations in the California Energy Commission (CEC) and California Department of Fish and Game (CDFG) Wind Energy Guidelines (CEC and CDFG 2007) and the WEG (USFWS 2012), and meets or exceeds current industry standards. The study will consist of three primary components: 1) standardized carcass searches beneath turbines and along the gen-tie, 2) searcher efficiency trials to estimate the probability searchers find a carcass, and 3) carcass persistence trials to estimate the average length of time a carcass remains in the search area for possible detection. In addition, a search area adjustment will be estimated to account for carcasses that may have fallen outside of search plots.

Standardized carcass searches will be conducted every week (approximately every 7 days) at one-third (nine) of the Project's 27 WGTs. Searches will be conducted within an 80-m radius plot centered on each sampled turbine with searchers walking linear transects spaced approximately 8-10 m apart (adjusted for vegetation types, visibility, and safety) throughout each plot. An initial clearing search will be conducted prior to the start of the study and any carcasses found during the clearing search will not be included in fatality estimation. In addition to searching turbines, 50% of the Project's gen-tie will be searched. The 7.3-mile gen-tie will be divided into 500-m segments, with every other segment searched out to 15 m on either side of the gen-tie line. Gen-tie searches will be conducted every seven days in spring and fall and every 21 days in summer and winter.

Searcher efficiency trials will be conducted multiple times throughout each season to account for seasonal differences and will include three difference size classes (large bird, small bird, and bat) with the goal of at least 80 trial carcasses placed at turbine and 80 placed along the gen-tie during each study year.

A minimum of two carcass persistence trials will be conducted in each of the four seasons for large and small birds, and during spring, summer, and fall for bats, with a goal of 120 trial carcasses at turbines and 80 carcasses along the gen-tie. All trial carcasses will be placed at random locations within the Project and monitored for 40 days. Any raptors used in persistence trials will be monitored for 90 days.

Following completion of each year of fatality searches, fatality estimates will be generated using GenEst (a generalized estimator of fatality; Dalthorp et al. 2018, Simonis et al. 2018). Per the BBCS, fatality estimates will be provided for the following groups, with separate estimates generated for turbines and the gen-tie:

- Non-listed sensitive bird species
- Non-listed sensitive bat species
- Raptors without designated conservation status
- Non-sensitive bird species, and
- Non-sensitive bat species

6.2 Raptor Point Counts

Immediately following that start of operations, Strauss will implement raptor point counts at the Project consistent with study design and survey protocols used in 2018 and 2019 (pre-construction) and in 2021-2022 (during construction). The objective of the avian use study is to compare pre- and post-construction raptor use of the Project site, as described in detail in the Project BBCS (Dudek 2021).

Raptor point counts will be conducted within 800-m radius plots surrounding five fixed locations within the Project boundary. Each raptor point count will be two hours in duration and will be conducted bi-weekly at all five points. Consistent with data collected in 2018-2019 and 2021-2022, during each raptor point count, the observer will record date, start time, end time, point count location, species (or best possible identification), number of individuals, sex, age class, distance from observer when first observed, closest distance, height above ground, behavior, and habitat. Specifically for eagles, the observer will record the flight altitude, distance to observer, and behavior of the bird once per minute for the entire portion of the survey during which the eagle is present, as detailed in Appendix C of the ECPG. Observations of large birds outside of the 800-m plot will be recorded, but these data will be analyzed separately from data collected on birds observed within the 800-m plot. The estimated distance to each bird observed to the nearest five meters, as well as the behavior (e.g., perched, soaring, flapping, flushed, circle soaring, hunting, gliding) and any comments or unusual observations will be recorded. Flight paths and perched locations for all raptor observations will be mapped so that raptor movement patterns can be evaluated relative to topography, vegetation, turbines and other Project infrastructure, and other landscape features.

Specific to eagles, the annual report will include total survey effort, number of eagle observations recorded, number of eagle minutes recorded, number of eagle minutes within a zone of risk (within 800 m of the observer and below 200 m in elevation), and details about eagle observations (e.g., age, behavior, landscape characteristics), consistent with the ECPG and 2016 Final Rule. Species composition, avian use metrics, and large bird flight paths will be compared with similar information collected at the Project before and during construction.

6.3 Post-Permit Eagle Fatality Monitoring (ECPG Stage 5)

The purpose of the post-permit eagle fatality monitoring is to estimate the level of take at the Project used to inform adaptive management decisions, ensuring that the level of estimated take of eagles remains within the level of take authorized by the eagle ITP. The current eagle permit regulations require review periods at no longer than 5-year periods for eagle ITPs that authorize take for a duration greater than 5-years. Based on the monitoring results, Strauss and USFWS will determine an evaluation schedule that could include a mixture of 2-year and 5-year review periods.

The post-permit monitoring plan could have two primary survey types: 1) systematic eagle fatality monitoring conducted by a qualified, independent, third party, and 2) systematic eagle fatality

monitoring by the Project's field personnel during years of Project operations when a third party is not conducting surveys. Strauss' eagle fatality monitoring plan will achieve the following:

- A cost-effective strategy that includes the metrics necessary to estimate eagle take during the monitoring period
- A monitoring plan designed to facilitate evaluation of thresholds that indicate whether an adaptive management response is needed to maintain permit compliance

The results of eagle fatality monitoring at other regional wind projects will inform the study design for systematic eagle mortality monitoring, which may be modified in future years to meet the objectives of the monitoring plan. Overall, the objective is to achieve an average overall g-value of at least 0.35 during an evaluation period. Post-construction monitoring methods are constantly improving as researchers develop new and more accurate methods of survey and analysis. Strauss will consider new techniques and protocols for inclusion in the Project's post-permit monitoring plan as they become available, which could include drone methods or application of other technology. Strauss and USFWS will agree upon the final monitoring plan prior to implementation.

6.4 Wildlife Incident Reporting System

As part of the post-construction monitoring, Strauss 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 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 birds or bats incidentally while conducting general wind facility or transmission line maintenance activities. The WIRS is designed to provide a means of recording and collecting fatalities to increase the understanding of wind turbine and wildlife interactions. Additionally, any native bird or bat found injured will be taken to the nearest appropriate wildlife rehabilitation facility as directed in the WIRS. As of this publication date, the nearest permitted wildlife rehabilitation center which accepts birds, including eagles, are:

- Santa Barbara Wildlife Care Network, 1460 N Fairview Ave, Goleta, CA 93117, (805) 681-1080 (https://www.sbwcn.org/)
- Ojai Raptor Center, P.O. Box 182, Oak View, CA 93022, (805) 649-6884 (https://www.ojairaptorcenter.org/)

Any incident involving a state- or federally listed threatened or endangered species or a bald or golden eagle must be reported to the USFWS and CDFW within 48 hours of identification. The Project 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 is the responsibility of employees and subcontractors to report all avian incidents to their immediate Supervisor.

6.5 Reporting

All eagle fatalities or injured eagles will be reported to USFWS within 48 hours of discovery and positive identification. Field forms and photographs of all eagle carcasses will be reported to USFWS (Office of Law Enforcement, Ecological Services Field Offices, and Regional Migratory Bird Management Office) for their direction on collection and/or sending carcasses to the National Eagle Repository.

7 ADAPTIVE MANAGEMENT PLAN

Adaptive management is an iterative process that will be implemented throughout the 30-year eagle ITP term, allowing for continuous improvement regarding efforts to avoid and minimize impacts to eagles. The purpose of this adaptive management plan is to prevent take levels from exceeding the permitted take over the 30-year permit term. Strauss will communicate with the USFWS regarding the need for or implementation of additional mitigation or conservation measures at the Project if concerns arise about the rate of eagle take relative to take authorized in the eagle ITP. As indicated in Section 4.2.2, fatality predictions from the USFWS CRM can be updated with site-specific, post-construction monitoring data. The site-specific mortality data can be incorporated into a posterior, site specific, estimate of collision probability to further refine mortality predictions for the Project and to inform the level of take coverage that may be needed in subsequent review periods. A stepwise process will guide the implementation of additional conservation measures, as needed.

Table 9a sets forth the adaptive management framework that would be implemented at the Project based on actual golden eagle remains found. In contrast, Table 9b describes the more limited opportunities available for adaptive management when the requested authorized take level is relatively low (i.e., fewer than one eagle over five years), such as is the case for bald eagles at the Project. For both golden and bald eagles, the metric of the threshold is based on the number of eagle remains found, not estimated. If the USFWS issues a permit, Strauss and the USFWS will revisit the adaptive management tables (Tables 9a and 9b) and revise as necessary during each administrative permit review period. Administrative reviews will occur at least every five years as required for all long-term eagle ITPs.

Table 9a.
Adaptive management framework for golden eagles take the Strauss Wind Energy Project in Santa Barbara County, California.

Step	Golden Eagle Threshold (number of remains)*	Adaptive Management Response
1	• ≥ 1 golden eagle found in any 5-year period	• Continue implementing the ECP. • Assess eagle fatalities to determine if cause or risk factor can be determined (e.g., season, weather, presence of prey/carrion, fire, or other event). Pay particular attention to any common elements among fatalities. • Provide eagle fatality data and other relevant data, with suspected cause of death, to the USFWS.
2	• ≥ 25 eagles found in first 5 years, or • ≥ 48 eagles found in first 10 years, or • ≥ 70 eagles found in first 15 years	• Implement Step 1 adaptive management response. • Consider additional studies (e.g., eagle use/nest surveys) to better understand risk factors. • If cause or risk factor can be identified, consider additional avoidance or minimization measures. • Coordinate with USFWS to determine if additional studies would provide useful information to better understand risk.

3	• ≥ 52 eagles found in first 10 years, or
	• ≥ 75 eagles found in first 15 years, or
	• ≥ 100 eagles found in first 20 years
		• Implement Step 1 and Step 2 adaptive management response.
		• If a specific risk factor has been identified under Step 1 or 2, consider one or more conservation measures designed to reduce the likelihood of future take, such as:
		  ○ Reducing eagle use near turbines (i.e., deterrent),
		  ○ Reducing the source of collision (i.e., curtailment), such as installment of additional automated eagle detection technology, or human biological monitors, or
		  ○ Other measure(s) agreed upon in consultation with the USFWS.
		• If avoidance and minimization measures have proven effective at reducing eagle fatalities in subsequent 5-year period, elimination or reduction of measures will be considered in consultation with the USFWS.
		• Consider if level of take authorization remains appropriate or if a permit amendment may be warranted (e.g., based on additional studies conducted under Step 2).

Step	Golden Eagle Threshold (number of remains)*	Adaptive Management Response
4	• ≥ 104 eagles found in first 20 years, or • ≥ 125 eagles found in first 25 years	• Immediately upon meeting this trigger, implement the following: ○ If technology, biological monitors, or other conservation measures have previously been implemented at the Project, alter the programming of implementation of those effort(s) to enhance effectiveness, or implement another conservation measure agreed upon in consultation with the USFWS. The effectiveness of any measure or enhanced measure much be studied with the study design approved by the USFWS. ○ Consult with USFWS to determine if the take limit should be adjusted and the permit amended (e.g. based on additional studies conducted under Step I or Step II).

* Golden eagle thresholds are based on the number of eagles found assuming a permitted take rate averaging 14.2 golden eagles/year and a minimum average detection probability (g) of 0.35 for each 5-year review period and using a 50% credible interval.

Table 9b.

Adaptive Management Framework for Bald Eagles at the Strauss Wind Energy Project, Santa Barbara County, California.

Step	Bald Eagle Threshold (number of remains)*	Adaptive Management Response*
1	1 found in a 15-year period	• Continue implementation of ECP • Investigate new potential risk factors. • Consider additional avoidance/minimization measures based on identified potential risk factors; for example: roadkill removal efforts or landowner outreach if roadkill or livestock carcasses are found to be attracting eagles or monitor flight movements at a newly constructed nest near turbines or install perch deterrents if frequent perch locations are identified near turbines.
2	> 1 found in a 15-year period	• Consult with USFWS to determine if the take limit for the Project should be adjusted and the permit amended.

* Bald eagle thresholds are based on the number of eagles found assuming a permitted take rate of 0.18 bald eagles/year and a minimum average detection probability (g) of 0.35 for each 5-year review period and using a 50% credible interval.

In addition to the adaptive management process described above which evaluates eagle take with respect to take authorized under the ITP, Strauss is also subject to mortality thresholds and subsequent management actions identified in the EIR. MM BIO-16d of the EIR required development of an Adaptive Management Plan (AMP; incorporated into the Project's BBCS [Dudek 2020]) to help guide Strauss' response to bird or bat mortality exceeding a specified threshold. Specific to eagles, the AMP identifies two mortality thresholds (Level 1 and Level 2; Table 10) that would potentially trigger adaptive management actions. For state or federal-listed or state fully-protected species (which includes both golden and bald eagles), the Level 1 threshold is one fatality found within any consecutive 12-month period. The Level 2 threshold would be triggered if a second eagle fatality is discovered within that same 12-month period. Table 10 outlines the adaptive management response as prescribed in the EIR and further described in the BBCS. Adherence to the EIR-established mitigation measures and adaptive management requirements will be evaluated by the TAC in a process separate from the ITP; however, it is anticipated that adaptive management actions for the two permits (ITP and CUP) may overlap.

Table 10.
Adaptive Management threshold criteria for eagles based on the Adaptive Management Plan described in Table 4.5-6 of the Bird and Bat Conservation Strategy

Level	Golden or Bald Eagle Threshold (based on fatalities found)	Adaptive Management Response
1	1 golden or bald eagle found in any consecutive 12-month period	• Report fatality to Santa Barbara County Planning & Development (P&D), US Fish and Wildlife (USFWS), and California Department of Fish and Wildlife (CDFW) within 24 hours of identification. • Carcass search frequency and patterns may be modified based on consultation with CDFW and USFWS.
2	2 golden or bald eagles found in any consecutive 12-month period	• Report fatality to P&D, USFWS, and CDFW within 24 hours of identification. • The following adaptive management actions may be considered, in consultation with P&D, CDFW, and USFWS, if determined to be feasible and likely to reduce future eagle fatalities: o Adjustments to IdentiFlight system currently deployed on site (e.g., fine-tuning or bolstering of system) o Selective curtailment of turbine operation, dependent on specific location of fatalities or on daily or seasonal eagle activity as determined from monitoring. o Habitat modifications to reduce prey base o Project modifications including blade painting, audible warnings, dummy towers, or other new or experimental technologies. Modifications may be implemented as a controlled experiment.

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Appendix B. Results of the bald eagle local area population (LAP) analysis for the Strauss Wind Energy Project

Focal Project: Strauss Wind Farm

Predicted eagle take (annual)	**0.4**

Local Area Population (LAP) Estimates by Local Area Density Unit (LADU):

Focal Project_Density Unit	Estimated Number of Eagles
StraussWindEnergyFacility_Pacific Flyway South EMU	9.52
StraussWindEnergyFacility LAP (total)	**9.52**

1% LAP Benchmark	**0.1**
5% LAP Benchmark	**0.48**

Permitted Projects with Overlapping LAPs:

Project ID	Estimated Annual Take	Percent Overlap with Focal Project	Overlapping Area (SqMi)	Overlapping Take
No overlapping 'Permitted' or 'Other' projects	-	-	-	-
All Projects (total)	0			0

Known Unpermitted Take Summary	
Cause of take	**20 eagles from 2013-2022**
Electrocution	7
Unknown	5
Collision with vehicle	1
Poisoned (lead)	1
Poisoned (pesticide)	1
Poisoned	1
Infection;Trauma	1
10-year total	17
10-year annual average	1.7

LAP Take Results	**Number of Eagles (Annual)**	**Percent of LAP**
Permitted Take		
Total Overlapping Take	0	0%
Focal Project Predicted Take	0.4	4.2%
Total Permitted Take (Focal Project + Total Overlapping Take)	0.4	4.2%
Unpermitted Take	1.7	18%

Appendix C. Results of the golden eagle local area population (LAP) analysis for the Strauss Wind Energy Project

Focal Project: Strauss Wind Farm

Predicted eagle take (annual)	**14.4**

Local Area Population (LAP) Estimates by Local Area Density Unit (LADU):

Focal Project_Density Unit	Estimated Number of Eagles
StraussWindEnergyFacility_COASTAL CALIFORNIA	122.7
StraussWindEnergyFacility_SONORAN AND MOJAVE DESERTS	0.06
StraussWindEnergyFacility LAP (total)	**122.83**

1% LAP Benchmark	**1.23**
5% LAP Benchmark	**6.14**

Permitted Projects with Overlapping LAPs:

Project ID	Estimated Annual Take	Percent Overlap with Focal Project	Overlapping Area (SqMi)	Overlapping Take
Project 23857D	1.18	41.92%	12187.02	0.49
Project 136064	0	9.91%	2357.04	0
PER0038885	0.59	2.47%	755.62	0.01
All Projects (total)	1.77			0.5

Known Unpermitted Take Summary	
Cause of take	**85 eagles from 2013-2022**
Collision with vehicle	2
Collision with wind turbine	12
Collision with wire	2
Collision/Electrocution	3
Collision with vehicle; Poisoned (pesticide)	3
Electrocution	19
Other	2
Other;Trauma	1
Poisoned (lead)	3
Poisoned (pesticide)	1
Trauma	3
Unknown	26
10-year total	77
10-year annual average	7.7

LAP Take Results	Number of Eagles (Annual)	Percent of LAP
Permitted Take		
Total Overlapping Take	1.77	1.4%
Focal Project Predicted Take	14.4	11.7%
Total Permitted Take (Focal Project + Total Overlapping Take)	14.9	12.1%
Unpermitted Take	7.7	6.3%