U.S. Fish and Wildlife Service

Environmental Assessment

Ocotillo Wind Energy Facility Eagle Conservation Plan

California

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Acronyms and Abbreviations

ABDSP	Anza-Borrego Desert State Park
ABOCCC	Advanced Biological Observation Command and Control Center
ABPP	Avian and Bat Protection Plan
ACEC	Area of Critical Environmental Concern
ACP	advanced conservation practice
AMSL	above mean sea level
APP	Avian Protection Plan
Applicant	Ocotillo Express LLC
BCR	Bird Conservation Region
Eagle Act	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
C	Celsius
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
DRECP	Desert Renewable Energy Conservation Plan
EA	Environmental Assessment
ECP	Ocotillo Wind Energy Facility Eagle Conservation Plan
ECP Guidance	Eagle Conservation Plan Guidance Module 1: Land-based Wind Energy
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973, as amended
F	Fahrenheit
FAA	Federal Aviation Analysis
FEIR	Final Environmental Impact Report
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
FR	Federal Register
GHG	greenhouse gas
Holder	holder of the right-of-way grant
IPCC	Intergovernmental Panel on Climate Change
kV	kilovolt
MBTA	Migratory Bird Treaty Act

MW	megawatt(s)
NABCI	North American Bird Conservation Initiative
NEPA	National Environmental Policy Act of 1969
NFWF	National Fish and Wildlife Foundation
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PA	Plan Amendment
Permit	Eagle Take Permit
PG&E	Pacific Gas and Electric Company
Project	Ocotillo Wind Energy Facility
REA	resource equivalency analysis
Region 30	Sierras de Baja California
Region 32	Coastal California
Region 33	Sonoran and Mojave Desert
Region 40	Desierto de Baja California
PRBO	Point Reyes Observatory Conservatory Science
ROD	Record of Decision
ROW	right-of-way
SCE	Southern California Edison
Service	U.S. Fish and Wildlife Service
TAC	Technical Advisory Committee
TCP	Traditional Cultural Property
U.S.C.	United States Code
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
WEST	Western EcoSystems Technology, Inc.
WRA	Wind Resource Area
turbine	wind turbine generator

1 Purpose and Need

1.1 Introduction

We, the U.S. Fish and Wildlife Service (Service), have prepared this environmental assessment (EA) pursuant to the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 et seq. 1970). This EA evaluates the effects of issuing a 5-year eagle take permit (permit) under the Bald and Golden Eagle Protection Act (Eagle Act) (74 FR 46877, Sept. 11, 2009, as amended at 79 FR 73725, Dec. 9, 2013; 81 FR 8004, Feb. 17, 2016; 81 FR 91551, Dec. 16, 2016) for take that is incidental to otherwise lawful activities associated with operation of the Ocotillo Wind Energy Facility (Project) as described in the Ocotillo Wind Energy Facility Eagle Conservation Plan (ECP). Our *Eagle Conservation Plan Guidance Module 1: Land-based Wind Energy* Version 2 (Service 2013; ECP Guidance) recommends that eagle take permit applications include an ECP, or similar documentation, that details the impacts of the Project on affected eagle species and how these impacts would be avoided, minimized, and mitigated in order to maintain stable or increasing populations of eagles.

The Bureau of Land Management (BLM) is a cooperating agency in development of this EA. Regulations implementing the procedural provisions of NEPA call for agency cooperation in the NEPA process with the ultimate goal of "…decisions that are based on understanding of environmental consequences, and… actions that protect, restore, and enhance the environment" (40 Code of Federal Regulations [CFR] 1500.1 1978). The regulations specifically define a cooperating agency as "…any Federal agency other than the lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment" (40 CFR 1508.5).

The BLM El Centro Field Office has special expertise and responsibilities to manage their lands to conserve golden eagles in the course of siting, constructing, operating, and decommissioning wind energy facilities on public lands. Ocotillo Express LLC's (applicant) ECP for the Project was prepared in consultation with the Service, and BLM provided comments.

The applicant is requesting Eagle Act take coverage for operational activities associated with the Project. This company is a wholly owned subsidiary of Pattern Energy Group. The applicant has requested a 5-year take permit for golden eagles (*Aquila chrysaetos*) under the Eagle Act at the Project. The applicant's ECP (Appendix A) is the foundation of the permit application for the operational Project. The applicant worked closely with the Service and the BLM to develop and update the ECP to assure that it contains commitments to avoid, minimize, and mitigate adverse effects on eagles.

The applicant is also requesting an amendment to their BLM right-of-way (ROW) grant, to allow discontinuation of a system designed to minimize risk to eagles. The golden eagle risk minimization system includes a DeTect Merlin avian radar system, radar-controlled video tracking system, and a full time golden eagle biological monitor to observe any golden eagles flying within the wind facility and to curtail turbines when eagles are at risk of collision. This eagle risk minimization program was required as part of the ROW grant and associated Record of Decision (ROD) that was signed by the BLM on May 11, 2012.

Our consideration to issue an eagle take permit constitutes a discretionary Federal action that is subject to NEPA; the BLM's consideration to amend the ROW grant is also a discretionary action subject to NEPA. The applicant is requesting a permit for the take of up to two golden eagles over the 5-year duration of a permit, and to amend the ROW grant. This EA evaluates potential impacts that could result from the issuance of the eagle take permit based on the Project's ECP or alternatives to the proposed ECP. It is intended to assist us in evaluating effects on the human environment and in assessing the significance of the impacts that could result from the alternatives. "Significance" under NEPA is defined by regulation at 40 CFR 1508.27, and requires short-term and long-term consideration of both the context of a proposal and its intensity. As with

any NEPA process, if all components have undergone equal analysis, the final proposal may include all or some components of a single alternative. Or, it may include a combination of components from more than one alternative.

This EA partially tiers from the Service's Programmatic Environmental Impact Statement for the Eagle Rule Revision, December 2016 (PEIS; Service 2016). A programmatic NEPA review allows an agency to subsequently tier to the PEIS analysis, and focus analysis on narrower, site- or proposal-specific issues (CEQ 2014 from 40 CFR 1508.28). "Tiering has the advantage of not repeating information that has already been considered at the programmatic level so as to focus and expedite the preparation of the tiered NEPA review(s) (CEQ 2014 from 40 CFR 1508.28)." This EA incorporates by reference the analyses of the PEIS except for the eagle local-area population cumulative affects analysis. Due to known high impacts to eagles in this geographic region, this EA provides additional analysis beyond that conducted in the PEIS.

1.2 Background

In 2012, the BLM authorized the applicant to construct and operate a wind energy generation facility with up to 112 wind turbine generators (turbines), ancillary facilities, and supporting infrastructure that would generate up to approximately 315 megawatts (MW) of electricity on approximately 12,436 acres of public land in western Imperial County, California. The applicant installed 112 Siemens 2.37 MW turbines for a final installed capacity of 265 MW; commercial operations for 223 MW started in the fourth quarter of 2012, with the final 42 MW of the Project commencing in July 2013. The location of the Project is shown on Figure 1-1. Each turbine has a maximum blade tip height of approximately 428 feet above ground level.

The applicant received a Federal Land Policy and Management Act (FLPMA) Title V ROW Type 3 Grant and Plan Amendment (PA) on May 11, 2012, to construct, operate, maintain, and decommission the portion of the Project on BLM-administered lands. The BLM analyzed the environmental effects of its permit action to build and operate the Project in a Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FIER; BLM 2012a) and ROD (BLM 2012b) pursuant to FLPMA and NEPA. The analysis of the environmental effects of the Project on the human environment is referred to and incorporated by reference in this document. The BLM is a cooperating agency for this EA.

The BLM ROD authorized construction and operation of the Project to proceed without an eagle take permit because a February 29, 2012 memorandum issued by the Service stated that we had concluded our review of the Project's proposed conservation practices, monitoring protocol and mitigation measures described in the Avian and Bat Protection Plan (ABPP) and the Advanced Conservation Practice (ACP) as outlined in the 2012 ECP that was developed for the Project during the BLM permitting process. This ACP, including the use of a DeTect Merlin Radar avian radar system, video tracking system and a full time biological monitor to implement informed curtailment were designed to minimize or avoid risk of eagle take at the site; the ROD required that these ACPs be in use for the initial 10 years of Project operations. The ABPP and 2012 ECP provided the basis for a Technical Advisory Committee (TAC) made up of representatives of the BLM, the Service, and California Department of Fish and Wildlife (CDFW), to provide guidance to the applicant and the BLM based on the results of the post-construction monitoring studies conducted at the Project. Chapter 2 provides more information on the ACPs that have been implemented since operations started at the Project, as well as information on the potential changes to these ACPs as proposed by the applicant and alternatives to those proposed changes as analyzed in our NEPA review.

Our analysis in this EA addresses the expected impacts from our eagle take permitting decision on the human environment, with a focus on evaluating the Project's impacts to eagles and Native American cultural and religious practices. This EA also evaluates visual effects, impacts to migratory birds and protected plants and wildlife species. As a cooperating agency on this EA, the BLM is evaluating the potential impacts for removing the eagle risk minimization system, a combination of experimental ACPs that were evaluated in the FEIS/FEIR (BLM 2012a) and approved in the ROD (BLM 2012b). A list of permits and authorizations

relevant to this Project are provided in Table 1-1; all permits were required pre-construction and therefore were obtained by the applicant in 2012 or earlier.

TABLE 1-1
Summary of Permits and Authorizations Required for the Ocotillo Wind Energy Facility

Permit/Authorization	Responsible Agency
Federal Land Policy and Management Act (FLPMA) Title V Right-of-Way (ROW) Type 3 Grant and Plan Amendment (PA)	Bureau of Land Management (BLM)
Record of Decision	BLM
Jurisdictional Determination	U.S. Army Corps of Engineers
Determination of No Hazard	U.S. Department of Defense
National Pollutant Discharge Elimination System Permit/Stormwater Pollution Prevention Plan/Water Quality Certification	Colorado River Regional Water Quality Control Board Region 7
Streambed Alteration Agreement Notification No. 1600-2013-0002-R4	California Department of Fish and Wildlife
ROW Encroachment Permit/Transportation Permit	California Department of Transportation
National Historic Preservation Act (NHPA) Section 106 Consultation	State Historic Preservation Officer, Advisory Council on Historic Preservation
Consultation on Sacred Areas	Native American Heritage Commission, Indian Tribes
Power Purchase Agreement/Approval of SDG&E Switchyard and Loop-in	California Public Utilities Commission
Renewable Portfolio Standard Certification	California Energy Commission
Conditional Use Permit/ROW Encroachment Permit/Transportation Permit/Grading Permit	Imperial County

1.3 Purpose and Need for Action

The BLM and Imperial County comprehensively analyzed the impacts of the Project, including its construction and operation, in 2012, to comply with NEPA and the California Environmental Quality Act. The Service is now reviewing an application for a permit for take of eagles at the Project. Consistent with the Service's obligations under the Eagle Act and its implementing regulations, the Service has prepared this document to analyze the environmental impacts of issuing an eagle take permit, including by evaluating reasonable alternative mitigation measures to be incorporated into an eagle take permit, while incorporating by reference the previous environmental analyses by the BLM and Imperial County.

The need for this action is to make a permit decision in response to an eagle incidental take permit application from the applicant for the Project. The decision must comply with all applicable regulatory requirements, and be compatible with the preservation of eagles.

Issuance of a permit must comply with the Eagle Act and all related regulatory requirements. Denial of the permit must be based on the proposal not meeting issuance criteria under 50 CFR 22.26 and 50 CFR 13.21 (1974; general U.S. Fish and Wildlife Service permit issuance criteria) or because we have determined that the risk to eagles is so low that a permit is not necessary. In responding to the request for a permit, we must ensure: (1) that any take authorized under the Eagle Act is compatible with the Eagle Act's preservation goal of maintaining stable or increasing breeding populations of eagles; and (2) compliance with the Eagle Act and its implementing regulations and permit issuance criteria.

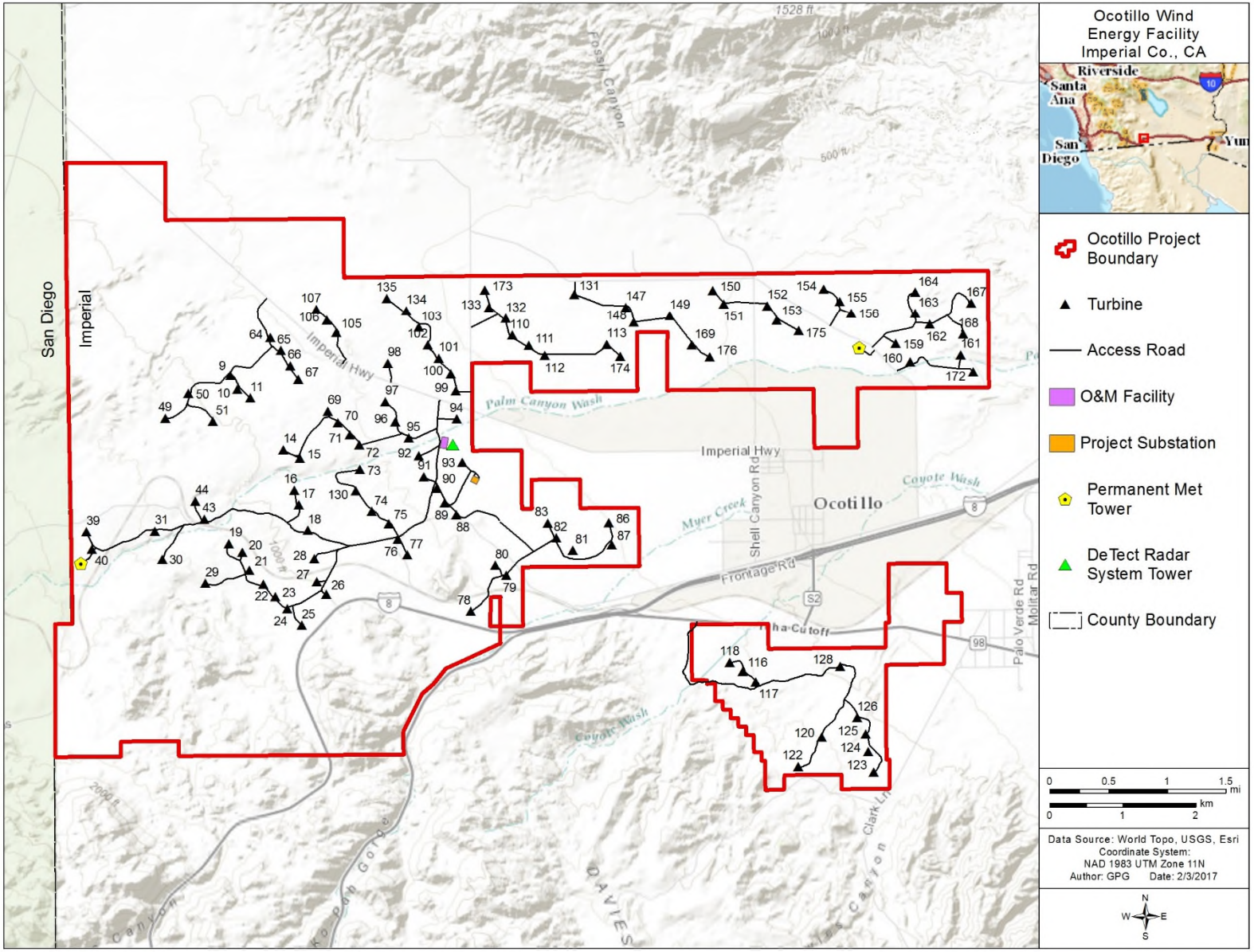

Figure 1-1 Project Location

The BLM's purpose and need for the Proposed Action is to respond to a FLPMA ROW grant amendment application submitted by the applicant which seeks to modify or eliminate certain eagle protection measures within its currently required ECP that was evaluated in the FEIS/FEIR (BLM 2012a) and approved in the ROD (BLM 2012b). The BLM would use this EA to decide whether to deny the proposed amendment, grant the amendment, or grant the amendment with modifications.

1.4 Regulatory Setting, Authorities, and Guidance

The Service has jurisdiction over a broad range of fish and wildlife resources. 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 USC 668–668d 1940) and its regulations (50 CFR Part 22). The PEIS (Service 2016) has a full list of authorities that apply to this action (PEIS Section 1.6, pages 7-12), which are incorporated by reference here.

The National Historic Preservation Act (NHPA) and associated regulations and guidance under the NHPA are described further below.

1.4.1 Coordination with Tribal Governments

Tribal participation is an integral part of the NEPA and the National Historic Preservation Act (NHPA) process, as well as a key component of determining whether to issue an eagle take permit. In accordance with Executive Order 13175 (2000) and our Native American Policy, we consult with Native American tribal governments whenever our actions taken under 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 NHPA and the American Indian Religious Freedom Act. To initiate consultation with Tribes regarding potential issuance of a eagle take permit, we sent letters to 41 Tribes located within 109 miles (the natal dispersal distance of golden eagles) of the Project. Comments are also encouraged and welcome during the 45-day comment period on the EA.

1.5 Scope of Analysis

This EA considers alternatives for issuance of a permit to take golden eagles at the Project. It analyzes the effects of our proposed issuance of a 5-year eagle take permit, as well as an alternative to issue a 30-year permit, on the human environment and evaluates impacts over the 30-year duration of the Project. The human environment as analyzed in this EA includes golden eagle populations, migratory bird populations, endangered and threatened species, visual resources, and Native American religious and cultural practices. Other aspects of the human environment, such as bat populations, climate change, human safety, the economy, and other cultural values have been addressed in the FEIS/FEIR (BLM 2012a), incorporated herein by reference.

As referenced in the Council on Environmental Quality's NEPA regulations regarding the contents of an EA (40 CFR 1508.9[b]), NEPA Section 102(2)(E) requires Federal agencies to develop, study, and briefly describe reasonable alternatives to any proposed action with the potential to result in unresolved resource conflicts. This EA evaluates the effects of the No-Action Alternative (Alternative 1), the applicant-proposed alternative (Alternative 2), and two other alternatives:

- Alternative 1: No Action - No Permit or ROW Grant Amendment for termination of bio-monitoring, Continued Bio-monitoring and Curtailment when Eagles are Detected
- Alternative 2: Issue 5-Year Permit for Applicant's Revised ECP; Issue ROW Grant Amendment
- Alternative 3: Continued Operation of the Project without an Eagle Take Permit; Issue ROW Grant Amendment

- Alternative 4: Issue a 30-Year Permit for Applicant's Revised ECP with Additional Mortality Monitoring and Mitigation; Issue ROW Grant Amendment

Each alternative's feasibility is evaluated for its ability to meet the Eagle Act permit issuance criteria as described in Section 1.5.2.

1.5.1 Geographic Extent

The geographic scale of the analyses for this EA is at the project level—the footprint of the Project and a 10-mile radius around it—and the local-area eagle population level. The local-area population for the species is defined by the dispersal distance of young—109 miles for golden eagles (Service 2016). The local-area population for golden eagles includes parts of two Federal Bird Conservation Regions (BCRs; North American Bird Conservation Initiative (NABCI) 2010) in the U.S.: BCR 32 (Coastal California) and BCR 33 (Sonoran and Mojave Deserts) as shown in Figure 1-2 and summarized in Table 4-1. In Mexico, the local-area population includes additional area in BCRs 32 and 33, as well as parts of BCR 39 (Sierras de Baja California) and 40 (Desierto de Baja California).

1.5.2 Permit Issuance Criteria

In the analysis of alternatives, we consider the degree to which each alternative would conform to the permit issuance criteria for take permits under the Eagle Act (50 CFR 22.26(f)(1–6) (2009 Eagle Rule) or required determinations under 50 CFR 22.26 (f)(1-7) (2016 Eagle Rule).

1.6 Previous Environmental Analysis

This proposal conforms with, and carries out, the management approach analyzed in, and adopted subsequent to, the Service's *Final Environmental Assessment Proposal to Permit Take as Provided Under the Bald and Golden Eagle Protection Act* (FEA, Service 2009) and the Service's *Programmatic Environmental Impact Statement for the Eagle Rule Revision, December 2016* (PEIS; Service 2016).

Previous environmental analyses were conducted for the Project; these analyses are available in the FEIS/FEIR (BLM 2012a) and ROD (BLM 2012b). These documents analyze most of the elements of the Project related to the human environment, and consequently allow the current analysis to focus on eagles. The analyses in the FEIS/FEIR (BLM 2012a) are hereby incorporated by reference into this EA.

1.7 Scoping and Public Participation

1.7.1 Internal Scoping

We engaged in an internal scoping process in the Pacific Southwest Region from January 2016 through March 2016. We worked with regional program leaders to determine the appropriate level of NEPA analysis for the Project's eagle take permit application and to develop a range of alternatives to the proposed action.

1.7.2 Public Scoping

This EA was made available to the public for a 30-day comment period. During the public scoping and comment period for the BLM's 2012 Draft EIS/Draft EIR (BLM 2012a) for the Project, numerous agencies, environmental advocacy organizations, Tribes and private citizens submitted recommendations that the Project have protective measures in place to protect golden eagles from potential fatalities. As a result, the project developed the 2012 ECP with our review and input. The 2012 ECP included BLM's requirement that the applicant implement eagle take minimization and monitoring measures as identified in the 2012 ECP. This substantially address the concerns that were raised during the scoping and BLM Draft EIS review period, and the revised ECP (Appendix A) as evaluated in this EA maintains the majority of the protective and monitoring measures committed to in the 2012 ECP.

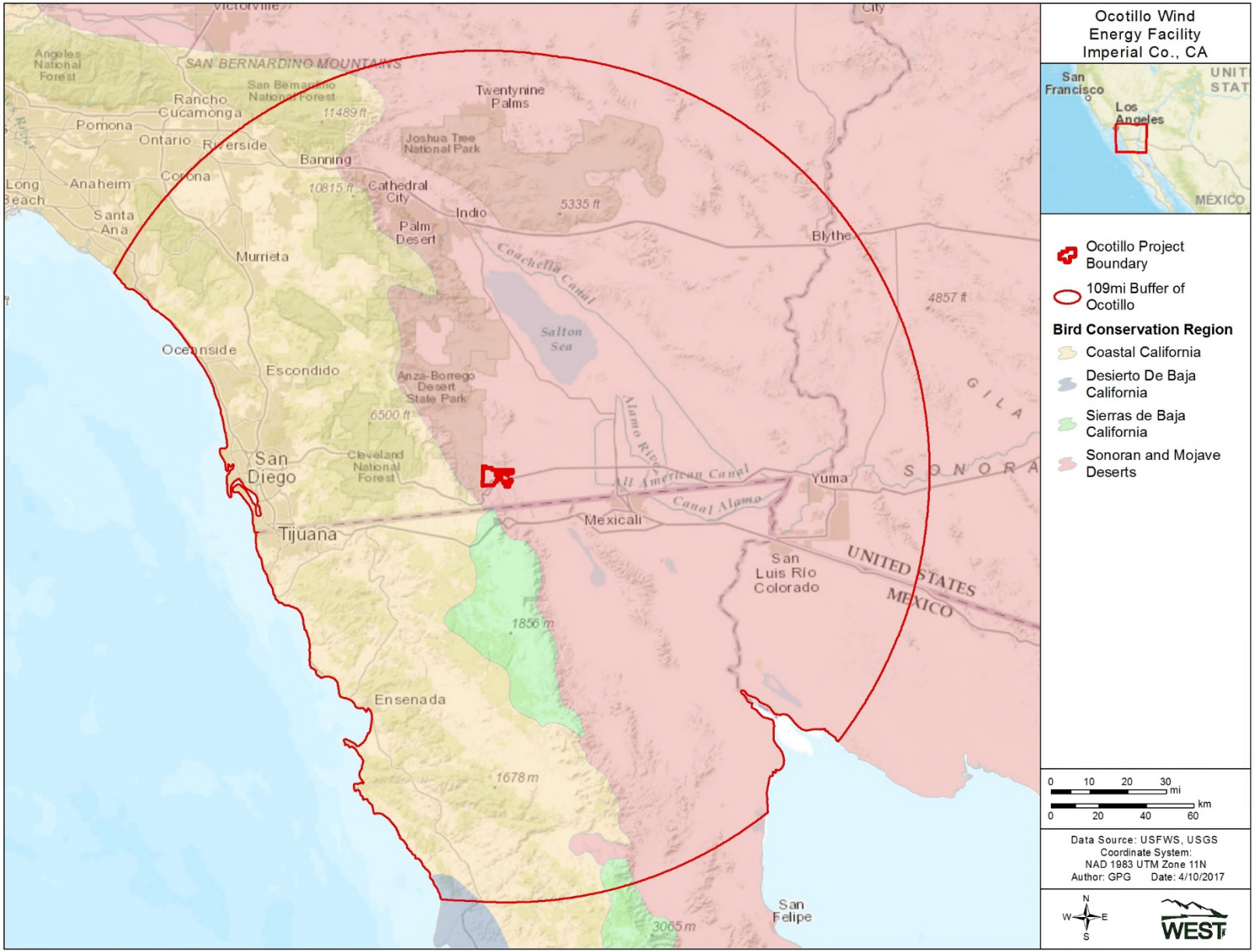

Figure 1-2 Geographic Scope of Analysis

1.8 Tribal Coordination

Tribal participation is an integral part of the NEPA process. In accordance with Executive Order 13175 and the Service's Native American Policy, we consult with Native American tribal governments whenever our actions may affect tribal lands, resources, or the ability to self-govern. In addition, we consult with Tribes in consideration of the unique traditional religious and cultural significance of eagles to Native American communities. Cultural and religious issues impacts were analyzed in our Eagle Rule Revision PEIS (Service 2016a). This EA incorporates by reference the analysis of the PEIS.

1.8.1 Service Tribal Coordination

We invited government to government consultation regarding the applicant's permit request through a letter sent on June 15, 2017 to the Federally Recognized Native American tribal governments located within a 109-mile radius of the Project and to tribal organizations consulted by the BLM. Our letter informed them of receipt of the eagle take permit application, the preparation of this EA, and requested assistance in identifying issues or concerns. Coordination and consultation with these tribal governments would be ongoing throughout the analysis and permitting process.

1.8.2 BLM Tribal Consultation

As described in detail in Chapter 5.2.3 of the original FEIS/FEIR for the Project and in summary in Section 3.2.2 of the ROD (BLM 2012b), the BLM conducted government-to-government consultation with federally recognized and other Native American Tribal groups in accordance with several authorities including, but not limited to, NEPA, the NHPA, the American Indian Religious Freedom Act, Executive Order 13175, and Executive Order 13007. As explained below, the BLM has engaged in extensive outreach in connection with the Project.

Initial tribal outreach by the BLM began in February 2010. Formal invitation letters were submitted to federally recognized Indian Tribes and one Tribal Organization (collectively referred to here as Tribes), informing them of the application submitted for a ROW to conduct wind testing and develop a wind energy generation facility at the site. The letters also requested assistance from the Tribes in identifying issues or concerns.

A second letter was sent to these Tribes in July 2010, providing an update on the environmental review process and cultural resources inventory, including a copy of the Class II & III Inventory Research Design and Work Plan, requested again their assistance in identifying concerns, issues or identification of sacred sites and places of traditional and cultural significance, and also notified the Tribes that the archaeological contractor would contact them to determine if they had tribal representatives who would participate in the inventory. Many Tribes responded to the BLM and the archaeological contractor, indicating they wanted to participate in the inventory of the area.

The BLM continued consultation with the Tribes throughout the NEPA process. Some Tribes commented as part of the comment period after the publication of the DEIS/DEIR (June 2011). Some identified the Project area as a Traditional Cultural Property (TCP), and other comments received during meetings and correspondence included concerns about potential effects to the recorded archeological sites including trails, geoglyphs, rock features, habitation areas, and sacred sites.

The BLM requested in writing and during in-person meetings additional information about the identified TCP, including information about the characteristics that would make the TCP eligible for inclusion in the National Register of Historic Places (NRHP) based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts or social institutions so the BLM could understand its significance to the Tribes and make the applicable determinations under Section 106. The BLM held multiple meetings and sent letters to Tribes in March and April 2012, including conducting field trips to visit requested archaeological sites within the Project area. Additionally, the BLM consulted with the Tribes on development of a Memorandum of Agreement, which documents the consultation and coordination that occurred under

Section 106 and reflected the measures identified to avoid, minimize or mitigate adverse effects of the Project on cultural resources.

As a result of the consultation with the Tribes, the BLM revised its original proposed determinations and expressly assumed the portion of the TCP within the Project is eligible for the NRHP, and acknowledged that the Project would result in adverse effects to the TCP that cannot be completely mitigated. In recognition of those effects, the Refined Project as approved eliminated 43 of the 155 turbines analyzed as part of the original proposed action in the EIS in order to respond to information from the Tribes regarding the spiritual and cultural significance of the Project site and surrounding area. Furthermore, the ROD stated that the BLM determined that the public lands outside of the Refined Project footprint (as defined and approved in the ROD) are unsuitable for wind energy development. Therefore, the BLM determined that, in consultation with the Tribes, it identified all practicable measures to avoid, minimize or mitigate the impacts of constructing and operating the Project on the cultural resources identified on the site, and that while adverse effects would remain, this did not require the BLM to deny the ROW application, and the BLM determined that approval of the Project is in the public interest.

1.9 ESA Consultation

The BLM requested formal consultation from the Service on its proposed issuance of a ROW grant for the Project pursuant to Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The BLM prepared a biological assessment in which it assessed the effects of its proposed action on federally listed species identified in the Project area (BLM 2012a). In our biological opinion, dated April 26, 2012, we analyzed the effects of the proposed action on the federally endangered peninsular bighorn sheep and federally endangered least Bell's vireo (Service 2012). In our Biological Opinion, we concluded that the proposed action (granting of ROW and subsequent construction and operation of the Project) was not likely to jeopardize the continued existence or significantly impair the recovery of these species, and the ROD required that all terms and conditions in the Biological Opinion be followed.

The Service would conduct an internal Section 7 consultation process prior to any eagle take permit issuance and would consult with the BLM on the potential effects of the amendment to the ROW grant on listed species.

The Service's action, the potential issuance of an eagle take permit to an operational wind farm, is not likely to impact species listed under the ESA within the wind farm itself. The required compensatory mitigation, retrofitting electric utility poles (see Section 2.3.2 below) may occur within the range of listed species. A Section 7 consultation would evaluate impacts and identify appropriate minimization, avoidance and other mitigation measures.

2 Alternatives

2.1 Introduction

The Council on Environmental Quality's NEPA regulations (40 CFR 1508.9[b]) require EAs to develop, study, and briefly describe a reasonable range of alternatives to a federal action and evaluate how those alternatives can resolve resource conflicts.

Since the Project has been operational, the applicant has been implementing an eagle risk minimization system, an ACP defined in the 2012 ECP. The golden eagle risk minimization system includes a DeTect Merlin avian radar system, radar-controlled video tracking system, and a full time golden eagle biological monitor (bio-monitor) to detect and observe any golden eagles flying within the Project and to curtail turbines (i.e., stop the blades from spinning) when eagles are at risk of collision. The radar system is mounted on top of an approximately 50-foot tall Advanced Biological Observation Command and Control Center (ABOCCC) that is in the central portion of the site. The ABOCCC has been manned by trained site biologists during all daylight hours of operations since December 2012 to specifically monitor movements of eagles using available tools including the radar system, video tracking system and the visual scans of trained biologists.

As documented in Section 5.1 of the ECP, the bio-monitors have documented relatively few golden eagles at the Project since it became operational. Over 19,867 hours of bio-monitoring conducted from early December 2012 through June 30, 2017, 41 observations of golden eagles have occurred (0.002 golden eagles/hour). Turbines were curtailed as a result of these operations 16 times between December 2012 and the end of June 2017, for a total of 8.49 hours of curtailment over the 4.5-year period. Furthermore, the DeTect Merlin radar system was found to regularly display "false positives" or non-bird detections such as spinning turbine blades, vehicles, motorcycles, rain, and the applicant has communicated to the Service that they have not found it useful in aiding the bio-monitoring in detecting golden eagles. The applicant has submitted an updated ECP and has provided the Service additional information on the results of the radar system and biological monitoring as well as the results of the post-construction fatality monitoring that have been conducted at the site, in order to apply for an eagle take permit for the site. The applicant has requested take coverage for golden eagles within a 5-year permit term and an amendment to the BLM ROW grant associated with their proposal to discontinue using the eagle risk minimization radar, video-tracking and bio-monitoring curtailment system.

This chapter describes the alternatives we considered during preparation of this EA, including a No Action Alternative and three action alternatives.

2.2 Alternatives Analyzed in this EA

2.2.1 Alternative 1: No Action – Continued Operation of the Project without an Eagle Take Permit or ROW Grant Amendment, Continued Bio-monitoring with Curtailment When Eagles Detected

Under the No Action Alternative, we would deny the permit application and would not issue an eagle take permit; the BLM would not amend the ROW grant. The Project would continue to operate without a take permit being issued. Under this scenario, the applicant would continue to implement the minimization, avoidance, and monitoring practices that are currently ongoing, as described in BLM's ROD and the 2012 ECP. This includes the ACPs as required by their BLM ROW grant including biological monitoring during daylight hours and associated curtailment when eagles are observed in risk of collision for the remaining period of the initial 10 years of operation. Additionally, because no take permit would be granted, no off-setting mitigation would be required under this alternative. The BLM ROD stipulates compliance with the Eagle Act, which would not be possible if an unanticipated eagle take occurred under this alternative because any such take would not be authorized pursuant to an eagle take permit.

Under the No Action Alternative, the Service would deny the permit application because it fails to meet one or more of several issuing criteria under 50 CFR 22.26 as described in Section 1.5.2, or because we have determined that the risk to eagles at the Project under the action alternatives is so low that a take permit is unnecessary. If we deny the permit application, and the BLM denies the ROW amendment to allow the termination of the bio-monitoring, then under this alternative the applicant would continue the eagle risk minimization system at the Project for the remainder of the 10-year post-operation interval, per the requirement of the ROW grant and ROD.

2.2.2 Alternative 2: Issue a 5-Year Permit for Applicant's Revised ECP and Issue ROW Grant Amendment

Under this alternative, we would issue a 5-year permit under the 2009 Eagle Rule to take up to two golden eagles based on the applicant's implementation of the revised ECP (Appendix A) with associated conditions, as allowed by regulation. As described further in Section 2.3.2, we have determined that two golden eagles is the predicted level of take at the site over a 5-year permit term. The permit would incorporate all conservation commitments and the implementation of ACPs outlined in the revised ECP. Additionally, this alternative would involve removal of the DeTect Merlin radar system and installation of an aviation radar system which would turn on the Federal Aviation Administration (FAA) -required flashing lights on the turbines only when aircraft are in the area. This would be a change from the existing lighting regime, which regularly flashes lights on the turbines regardless of whether aircraft are in the vicinity. The BLM would issue a ROW grant amendment lifting the requirement for the eagle risk minimization ACP which includes the DeTect Merlin radar system, radar-controlled video tracking system and full time daylight monitoring for the curtailment system. The amendment would also include any other additional terms and conditions of a take permit for the Project that are within the authority of the BLM (as determined by the authorized officer) to inspect and enforce, in accordance with 43 CFR 2805.12(a)(16). BLM would further include fatality monitoring using Service-approved standards in accordance with permit requirements and would require the grant be subject to future guidance the Service develops to address impacts to eagles. At the end of the 5-year permit term, the BLM would require coordination between the applicant, the Service, and the BLM to determine if a subsequent eagle take permit process would be initiated. Should the grant holder (holder) not reapply for a permit, BLM would coordinate with the Service and the applicant to consider resuming the requirement for a daytime biological monitoring and curtailment or to consider if alternate eagle take avoidance and minimization measures and/or additional mortality monitoring would be appropriate. Finally, the grant would also be amended with the following language:

> If an eagle is taken by the Project without a take permit, the holder shall immediately notify the BLM and the Service. After consultation with the BLM and the Service, the holder may be required to implement limitations or restrictions of operations on its entire Project or specific facilities, by season or time of day as appropriate, or other adaptive management measures deemed necessary by the BLM, in coordination with the Service, to avoid further unauthorized take of eagles. The Service retains sole authority to seek enforcement action against the Project and the holder under the Eagle Act. Regardless of whether the Service seeks enforcement action, the BLM would retain its authority to suspend, terminate, or modify the Project's right-of-way authorization in accordance with 43 CFR 2807.16 and 2807.17. These restrictions would be replaced by the terms and conditions of an Eagle Act take permit, should the holder obtain one. All such measures should be identified and, after appropriate environmental review, incorporated into the ROW grant.

Under this alternative, the radar system and observer-curtailment system would no longer occur at the Project for the 5-year permit term, unless take exceeds predicted levels, in which case reinstallation of the observer-curtailment measure could be an adaptive management measure. The applicant would provide compensatory mitigation by retrofitting between 32 to 74 power poles (depending on the retrofit utilized as explained in Section 2.3.2), which is a mitigation ratio of 1.2 to 1. Under this alternative, the applicant's proposed adaptive management process as presented in Table 2-1 and one year of additional mortality

monitoring would be conducted. Mortality monitoring was conducted in 2018. This data would be analyzed along with future mortality monitoring efforts to estimate take at the Project.

TABLE 2-1
Summary of Advanced Conservation Practices using a Step-wise Approach

Step	Threshold or Trigger	Advanced Conservation Practices
Step I	One eagle taken in five year permit period	• Assess eagle fatality to determine if cause or risk factor can be determined (e.g., season, time of day, weather, presence of prey/carrion, fire, or other event) and management response is warranted. • Consult with Service. • Take is within the permitted level and fully mitigated
Step II	Two eagles taken in five year permit period	• Assess eagle fatalities to determine if cause or risk factor can be determined (e.g., season, time of day, weather, presence of prey/carrion, fire, or other event) and management response is warranted. • Consult with Service to determine if: Immediate response or management action is needed to ensure take remains within permitted levels such as implementation of ACPs based on discussions with Service. • Take is within permitted levels and is fully mitigated. Any additional mitigation would be determined in consultation with Service.

2.2.3 Alternative 3: Continued Operation of the Project without an Eagle Take Permit; Issue ROW Grant Amendment

Under this alternative, we would deny the eagle take permit application and would not issue an eagle take permit; the BLM would amend the ROW grant to lift the requirement for the eagle risk minimization ACP which includes the DeTect Merlin radar system, and radar-controlled video tracking system and the aviation radar system would be installed. The wind Project would continue to operate without a take permit being issued. Under this alternative, the BLM would require that unless or until an eagle take permit is obtained, that the applicant would continue full time bio-monitoring and associated curtailment during daylight hours. Furthermore, the BLM would require that fatality monitoring occur at the Project using Service-approved standards. Finally, the grant would also be amended with the following language:

> If an eagle is taken by the Project without a take permit, the holder shall immediately notify the BLM and the Service. After consultation with the BLM and the Service, the holder may be required to implement limitations or restrictions of operations on its entire Project or specific facilities, by season or time of day as appropriate, or other adaptive management measures deemed necessary by the BLM, in coordination with the Service, to avoid further unauthorized take of eagles. The Service retains sole authority to seek enforcement action against the Project and the holder under the Eagle Act. Regardless of whether the Service seeks enforcement action, the BLM would retain its authority to suspend, terminate, or modify the Project's right-of-way authorization in accordance with 43 CFR 2807.16 and 2807.17. These restrictions would be replaced by the terms and conditions of an Eagle Act take permit, should the holder obtain one. All such measures should be identified and, after appropriate environmental review, incorporated into the ROW grant.

2.2.4 Alternative 4: Issue a 30-Year Permit for Applicant's Revised ECP with Additional Mortality Monitoring and Mitigation; Issue ROW Grant Amendment

Under Alternative 4, we would issue a 30-year permit under the 2016 Eagle Rule, to take up to nine golden eagles over the permit. The permit would be based on the applicant's implementation of the revised ECP (Appendix A) with associated conditions, as allowed by regulation.

The Service would evaluate the 30-year permit at 5-year intervals. These evaluations would reassess fatality rates, effectiveness of measures to reduce take, the appropriate level of compensatory mitigation, and eagle population status.

To offset the cumulative take from human activities to golden eagle populations, this alternative would also require a mitigation rate of 1.2 to 1. This equates to a range of 32 to 74 power pole retrofits.

The BLM ROW grant amendment would refer to the 30 year eagle take permit for eagle fatality monitoring requirements. All other aspects of the ECP and BLM ROW grant amendment associated with Alternative 4 would be the same as those described under Alternative 2. This is to ensure that in the event that an eagle take permit is not in place at some time in the future, the BLM could require avoidance and minimization measures and/or additional mortality monitoring to be applied to the project.

Under this alternative, the radar system and observer-curtailment system would no longer occur at the Project, unless take exceeds predicted levels, in which case reinstallation of the observer-curtailment measure could be an adaptive management measure. The applicant would provide compensatory mitigation by retrofitting between 32 to 74 power poles (depending on the retrofit utilized as explained in Section 2.3.2), at the required higher mitigation ratio of 1.2 to 1. Under this alternative, the adaptive management process as presented in Section 2.3.2.

2.3 Key Elements of Alternatives

2.3.1 Key Elements of All Alternatives

Under all alternatives under consideration, the measures committed to in the 2012 ECP (Appendix L of the FEIS/FEIR) would continue to be followed; these are described in below.

2.3.1.1 Project Macro-siting

Macro-siting project design modifications were made in part to minimize potential impacts to eagles. The Project layout initially proposed by the applicant consisted of up to 155 turbines. However, the Refined Project, which was defined and approved in the ROD (BLM 2012b) eliminated 43 turbines for a final reduced number of 112.

2.3.1.2 Micro-siting of Project Features

Micro-siting project design modifications were made by the applicant to minimize potential impacts to eagles. Structures were not sited near high avian or eagle use flight zones according to pre-construction eagle use data, turbines were located at least three miles from golden eagle nests (historic or active), and the turbines are not sited in any areas containing high concentrations of ponds, streams or wetlands.

2.3.1.3 Minimizing Impacts

The design measures implemented to minimize direct impacts and potential take of golden eagles include: buried collector lines, free-standing (unguyed) lattice meteorological towers, monopole design for turbines, and power line configurations that minimize electrocution risk.

Measures to be implemented during the operation of the plant are described in the revised ECP and include: environmental training, removal of remains, removal or avoidance of creating prey-attracting features such as rock piles, and formal and informal biological monitoring.

2.3.2 Key Elements of Eagle Permit Issuance Alternatives

Applicant-committed mitigation, monitoring and adaptive management measures included in the revised ECP (Appendix A) would be applied to action alternatives that involve issuance of an eagle take permit (Alternatives 2 and 4); these are described further below.

2.3.2.1 Predicted Take

In the ECP Guidance (Service 2013), we provided a mathematical model that estimates fatality risk at wind project sites. The model relies on a logical assumption that there is a positive relationship between the number of minutes eagles are present in the air near turbines, the amount of hazardous air space, and the risk of collisions by eagles. The results of the model predict the number of eagles taken per year at the project site. The eagle mortality estimate helps the Service and the applicant develop an ECP that includes avoidance and minimization measures, monitoring, adaptive management, and compensatory mitigation.

We use the take estimate and other information to determine if the level of predicted take, with the offsetting measures proposed in the ECP, is compatible with the Eagle Act (50 CFR 22.26) permitting standards; to manage for stable or increasing breeding eagle populations, or "no net loss" (Service 2009).

The applicant's revised ECP contains a risk assessment cooperatively developed and validated by the Service (ECP Appendix A) This risk assessment incorporates the anticipated impacts of the Project on eagles based on the results of site-specific surveys and other available data. The ECP presents a range of fatality estimates based on two different approaches. For evaluating this permit request, we only refer to the risk prediction that used the Service-recommended Bayesian Collision Risk Model (Service 2013), (ECP Appendix A). Risk factors such as eagle use, interaction with other birds, prey availability, topography, absence of perch structures, residency status, and flight style were used to support the take prediction. Using the Bayesian model and assumptions as outlined in the ECP (Appendix A), we predict that the Project would result in the mortality of approximately 0.3 golden eagles per year during operations—rounded up to two eagles over a 5-year period under Alternative 2. This is based on the 80th quantile, indicating that we expect the number of eagle fatalities would be less than or equal to the prediction 80 percent of the time. Our independent analysis of eagle risk from using the Bayesian Collision Risk Model (Service 2013; Appendix A) is similar to the estimate prepared by the applicant in the revised ECP (Appendix A).

2.3.2.2 Compensatory Mitigation

To calculate compensatory mitigation, we used a Resource Equivalency Analysis (REA) to quantify the number of power pole retrofits needed to offset the take of golden eagles at a wind project (see Appendix G of the ECP Guidance [Service 2013]). We used utility pole retrofits to eliminate electrocutions because:

- High-risk power poles cause quantifiable adverse impacts (mortality through electrocution) to eagles;
- Retrofitting high-risk poles reduces the risk of electrocution;
- The "per eagle" benefits from high-risk power pole retrofitting are quantifiable and verifiable through accepted practices; and
- Success of and subsequent maintenance of retrofitting can be monitored.

We use informed modeling to estimate the potential for eagle take, as described in Stage 3 of the ECP Guidance (see Appendix D of the ECP Guidance [Service 2013]). This fatality prediction is one of several fundamental variables that we use to populate the REA (see Appendix G of the ECP Guidance [Service 2013]).

To address known human caused impacts to populations of golden eagles (Service 2016), Alternative 2 and 4 considers a 1.2 to 1 compensatory mitigation rate. This equates to a range of 32 to 74 power poles proposed to be retrofitted under Alternative 2 and for the first five year term of the 30-year permit term under Alternative 4. Our REA indicates that a minimum of 32 utility pole retrofits will offset direct impacts to eagles resulting from Project operations, if the retrofits are installed and properly maintained for 30 years. In order to account for the possibility that the retrofit materials may not be maintained properly for 30 years, we also calculated how many poles would be required to offset the take assuming the retrofit poles would be maintained for only 10 years; this would require 74 poles (maintained for 10 years) to sufficiently offset direct impacts to golden eagles. The level of mitigation for the remaining 25 years of the permit term that would occur under Alternative 4 would be determined at the first five-year permit check in and may

change based on mortality monitoring results, but it is anticipated to be a level of power pole retrofits to offset the take of up to nine golden eagles over 30 years. The total amount of power pole retrofits under Alternative 4 would range from 97 to 221.

Under each action alternative, the applicant would either contract with an electric utility company or deposit compensatory mitigation funds, calculated using the REA as described in our ECP Guidance (Service 2013), into a Bald and Golden Eagle Mitigation Account that the Service's Pacific Southwest Region has set up with the National Fish and Wildlife Federation.

Under Alternatives 2 and 4, which involve issuance of an eagle take permit, the applicant would provide compensatory mitigation for eagles by retrofitting electric poles. The intent is to minimize the potential for electrocutions within the eagle management unit (EMU) (Service 2016) and ensure that the effects of take caused by the Project are offset. As illustrated in Table 2-1, up to a range of 32 – 74 poles are proposed to be retrofitted under Alternatives 2 and 4. The number of retrofits was derived using our REA (Service 2013), based on the anticipated annual eagle fatalities.

We are currently coordinating with two utility companies to identify a site with high-risk utility poles that may be appropriate for eagle compensatory mitigation. We would ultimately select the Project mitigation site based on an area identified as having higher than average electrocution rates. The retrofits would not be duplicative of the utility company's other obligations to retrofit poles within their system as explained below.

In accordance with our most recent analysis of golden eagle populations (Service 2016), compensatory mitigation would occur within the appropriate eagle management unit (EMU). For this area, the EMU is the Pacific Flyway. The applicant would be required to either deposit money into our National Fish and Wildlife Foundation (NFWF) Eagle Mitigation Account or purchase credits from a Service approved in lieu fee mitigation bank within 30 days of permit issuance.

2.3.2.2.1 Effectiveness of Power Pole Retrofits

Power line structures provide perching, roosting, and nesting substrates for raptors and other birds. Power line structures can present electrocution hazards to birds when less than adequate separation exists between energized parts. Eagle and other raptor electrocutions have been well documented and studied since the 1970's (Avian Power Line Interaction Committee (APLIC) 2006). The *Suggested Practices for Avian Protection on Power Lines* manual (APLIC 2006) includes a thorough review of scientific literature and summarizes other non-published information available at the time of publication. Research on the topic is ongoing. In Colorado, a study determined that raptor electrocution rates decreased by 47% within a few years of a utility company implementation of a retrofit program (Lehman et al. 2010). In Spain, researchers compared electrocution-related mortality rates at a set of retrofitted poles and a set of poles that were not retrofitted. Retrofitted poles experienced a significant reduction in avian mortality rates whereas poles not made bird safe lacked reduction in electrocution mortality rates (Tintó et al. 2010). A long term study in Spain determined that the combination of constructing new power poles to be avian safe and retrofitting existing poles resulted in significantly fewer Spanish Imperial Eagle electrocutions. The decline in eagle electrocution rates occurred while population of eagles increased and the number of electric utility lines also increased (Lopez-Lopez 2011). In the western U.S., an electric utility, PacifiCorp, has conducted avian risk assessment surveys throughout its service territory for 16 years. Initial results of these surveys in the early 2000s led to changes in retrofitting products and techniques to improve effectiveness. For example, the industry has learned that perch discouragers are not an effective tool to prevent electrocutions and can actually increase the electrocution risk to eagles and other raptors (Guyonne et al. 2009, PacifiCorp, unpubl. data, personal communication, Sherry Liguori). Likewise, differences between other after-market avian protection products can influence retrofitting effectiveness and longevity. PacifiCorp has used adaptive management to refine its Avian Protection Plan (APP) to increase the effectiveness and durability of avian protection retrofits. In a subset of poles with initial surveys, retrofitting, and follow-up surveys conducted between 2008-2015 in Utah, Wyoming, and California (n=12,975), there was a 100% reduction in eagle

mortalities and a 71% reduction in overall bird mortalities (mortalities included both electrocutions and power line collisions; PacifiCorp, unpubl. data, personal communication, Sherry Liguori). Retrofitting effectiveness for overall bird mortalities was less than that for eagles largely because of common raven nests on retrofitted transformer poles, which increased fire and subsequent raven mortality risks. The introduction of a recent publication, *Power Pole Density Informs Spatial Prioritization for Mitigating Avian Electrocution* (Dwyer et al. 2016) further summarizes some of the recent scientific literature on avian electrocutions. Scientific literature and other available data validate the effectiveness of retrofitting electric utility poles at reducing eagle mortalities.

2.3.2.2.2 Utility Company's Avian Protection & Retrofitting Policy

Eagle take is a known problem on utility power lines and utility companies have their own responsibilities to rectify eagle take caused by electrocution and line collision. Therefore, prior to proposing a final mitigation package for the Project, we evaluated multiple candidate utility companies' avian protection policies. We found Southern California Edison (SCE) and Pacific Gas & Electric Company (PG&E) to be the best candidates to receive the applicant's mitigation funds to retrofit lines for the proposed permit because of their current avian policies and the presence of utility lines within southern California.

Both PG&E and SCE followed the Avian Power Line Interaction Committee model to develop their company-wide Avian Protection Plans (APP). The primary focus of the APP is to reduce raptor mortality while also improving system reliability. Once we determine which utility we would coordinate with to select and implement the Project mitigation, we would work with that utility to develop a methodology within their system for selecting candidate power poles for retrofit with the intent of reducing golden eagle mortality on the highest risk poles on the landscape. Under Alternative 4, for eagle take permit terms beyond the first 5 years, the Service may consider retrofit packages with other entities, or alternate forms of compensatory mitigation could become reasonable options. Under either of those potential scenarios, the Service would conduct additional NEPA and internal Section 7 consultations as warranted.

2.3.2.2.3 High Risk Pole Identification

We would work with the utility (SCE or PG&E) to identify high electrocution risk utility poles for appropriate eagle compensatory mitigation. Both utilities collect information about golden eagle incidents to support their reporting commitments and requirements of their APP and Federal permits. In addition, the Federal Special Purpose Utility Permit requires reporting to the Service whenever an eagle electrocution or collision incident is discovered. We anticipate using the available golden eagle incident data to identify candidate poles for retrofit with the primary objective of reducing golden eagle mortality.

2.3.2.2.4 Project Mitigation Site

As stated above, a specific location for the Project mitigation site has not been identified at the time of this EA. Once it is identified, we would work with the utility (SCE or PG&E) to minimize and avoid impacts associated with the retrofit work as much as possible. No ground disturbance is anticipated at the mitigation sites. Where roads are available the utility crew performing the work would utilize a bucket truck with outriggers and also a secondary smaller bucket truck. Other support vehicles may consist of smaller trucks (F450, F350, and F150 or similar). Where no roads exist, no new roads would be created to access pole retrofit locations. In areas without vehicle access, the crew would walk to those poles and climb them to install the pole retrofits. Therefore, no new roads would be created to access the poles subject to retrofit.

2.3.2.2.5

2.3.2.2.6 NFWF Eagle Mitigation Account

We established an Eagle Mitigation Account with the NFWF to facilitate the eagle permit process in our Pacific Southwest Region. Deposits to this account would be used to accomplish specified conservation practices as identified in permits issued under the Eagle Act. Under the action alternatives that involve issuance of an eagle take permit (Alternatives 2 and 4), the applicant would deposit compensatory

mitigation funds into the NFWF Eagle Mitigation Account. Within 30 days of permit issuance, the applicant would make the initial deposit into our NFWF Eagle Mitigation Account. Further deposits would be required if the funds run out before the required retrofits are completed. Under Alternative 4, for eagle take permit terms beyond the first 5 years, the Service may consider compensatory mitigation options that do not include use of the NFWF account.

2.3.2.2.7 Retrofit Effectiveness Monitoring

As required by the California Public Utilities Commission (CPUC), both PG&E and SCE established inspection cycles and record-keeping protocols for their utility distribution equipment. These requirements are set forth in General Order 165 (CPUC 1997). In general, utilities must patrol (walk, drive, or fly by) their systems once a year (in urban areas) or once every 2 years (in rural areas). The utilities must conduct detailed inspections every three to five years, depending on the type of equipment. For detailed inspections, utilities' records must specify the condition of inspected equipment, any problems found, and a scheduled date for corrective action. The utility submits an annual report summarizing inspections made, equipment condition observed, and repairs made. The Service finds this inspection schedule to be acceptable for the purposes of the Project's compensatory mitigation effectiveness monitoring.

2.3.2.2.8 Conclusion

Once the utility and specific mitigation site for the Project have been selected, we would assess the data available in order to confirm that the proposed retrofit poles would satisfy the compensatory mitigation requirement for the incidental eagle take permit.

2.3.2.3 Post-Construction Monitoring

As part of the requirements to obtain an Eagle Act permit, mortality monitoring and reporting is required to determine whether the estimated amount of eagle fatalities is consistent with predicted operational outcomes at the Project. Post-construction monitoring enables the applicant to document eagle fatalities and allow the Service to identify factors associated with eagle fatalities that might warrant additional ACPs or adaptive management measures to specifically address the identified risk factor. This information would be used for any future take estimate in the event the applicant applies for additional eagle take coverage after the 5-year permit term expires (Alternative 2), or in the case of Alternative 4, to determine if any changes to the permitted level for the remaining 25 years of the permit term are appropriate.

2.3.2.3.1 Mortality Studies

This project went into operation in 2013. To date, the applicant has conducted two years of post-operation bird and bat mortality studies at the Project, per the requirements of the ROW grant and following the ABPP for the Project. A third year of mortality studies is currently underway. In coordination with the Service, the applicant also initiated an eagle mortality study that is being conducted simultaneously with the third year of the bird and bat mortality study. While the methodology differs for the two studies, it was economically and logistically efficient for the applicant to conduct both at the same time. Under the action alternatives that involve issuance of an eagle take permit (Alternatives 2 and 4), the eagle mortality study would serve as the first year of eagle mortality monitoring as required for the permit. Depending on the study results, an additional year of eagle monitoring may be required within the first five years of permit issuance. Under Alternative 4, any future eagle mortality studies would be conducted by a third party monitor as required by the revised regulations (Service 2016). The goal of the eagle monitoring study is to evaluate if the risk assessment was correct. The studies are designed to provide us with sufficient statistical confidence that the number of eagles taken at the Project would be accurately estimated for permit compliance purposes. Mortality study results also would be used as part of an adaptive management framework to implement increasingly rigorous measures as described in the Table (Table 2-1).

2.3.2.4 Adaptive Management

Under the action alternatives that involve issuance of an eagle take permit (Alternatives 2 and 4), the applicant would implement ACPs or adaptive management as appropriate as described in Table 2-1. Each action alternative has stepwise adaptive management steps that would be taken as eagle mortality occurs. The stepwise approach provides a framework in the event that additional conservation measures or compensatory mitigation prove necessary. The stepwise approach outlines the thresholds at which the applicant would implement ACPs or adaptive management and relies on coordination with our staff. The table elaborates the management actions that are to be taken when specific take thresholds are reached; it is not intended to limit or preclude other equivalent measures that are identified in coordination with us, or that may be developed as a result of new information, techniques, or science. If a take threshold is reached, we would evaluate the corresponding step and determine the approaches necessary to maintain the “no net loss” standard for eagle populations. If take were to exceed the authorized amount of 2 eagles under Alterative 2 or 9 eagles under Alternative 4, the Project would be out of compliance with the eagle take permit. The Service would consult with the Project and BLM to evaluate appropriate avoidance and minimization measures and to consider if a permit amendment would be necessary.

2.4 Summary of Alternatives

Table 2-2 provides a summary of the commitments for each of the alternatives considered.

TABLE 2-2
Summary of Key Components of Alternatives

	Alternative 1 – No Action – No Permit or ROW Grant Amendment, Continued Bio-monitoring, Curtailment when Eagles are Detected	**Alternative 2 – Issue 5-Year Permit for Applicant's Revised ECP; Issue ROW Grant Amendment**	**Alternative 3 – No Eagle Take Permit, Continued Bio-monitoring, Curtailment when Eagles are Detected; Issue ROW Grant Amendment**	**Alternative 4: Issue a 30-Year Permit for Applicant's Revised ECP with Additional Mortality Monitoring and Mitigation; Issue ROW Grant Amendment**
Predicted Take:				
Total Authorized	0	2	2	9
5 Years (rounded up)	2*	2	2*	2 (30-year permit would cover up to 9 eagles [0.3 per year x 30 years])
Eagle Mortality Monitoring:				
Number of Years Post-ETP	1 additional year of monitoring in non-drought year, not necessarily eagle-specific	1 additional year of eagle-specific monitoring	1 additional year of monitoring in non-drought year, not necessarily eagle-specific	1 additional year of eagle-specific monitoring during the first 4 years of the permit; 2 years eagle specific monitoring year 6- 10 of the permit; 1-2 years of eagle specific monitoring every following 5-year term as determined necessary by the Service
Compensatory Mitigation	0 poles	32 to 74 poles	0 poles	32 to 74 poles for first five-year term; additional mitigation dependent on monitoring results at first five-year review, 97 to 221 poles maximum over 30 years.
Curtailment				
Implementation	Bio-monitor-curtailment system would continue as currently conducted	Considered following second eagle take	Bio-monitor-curtailment system would continue but radar system and camera components would be discontinued	Considered following second eagle take in a 5-year period
BLM ROW Grant Amendment**				
Change from current eagle risk management ACP requirements	No amendment	Amended to allow installation of aviation radar system and lifting requirement for the eagle risk minimization ACP***	Amended to allow installation of aviation radar system. Bio-monitoring would continue	Amended to allow installation of aviation radar system and lifting requirement for the eagle risk minimization ACP***

* Although it is anticipated that the level of take is reduced significantly by monitoring and curtailment under Alternatives 1 and 3, the data and modeling available does not allow us to accurately predict the reduction in risk. We have therefore assumed up to two golden eagles over five years as potential take under this scenario.

** The amendment would also include any other additional terms and conditions of a take permit for the Project that are within the authority of the BLM (as determined by the authorized officer) to inspect and enforce, in accordance with 43 CFR 2805.12(a)(16). BLM would further include fatality monitoring using Service-approved standards, and would require the grant be subject to future guidance the Service develops to address impacts to eagles.

***At the end of the 5-year permit term, (or, in the case of Alternative 4, if the applicant decides at some point in the 30-year term to no longer follow the eagle take permit), the BLM would require coordination between the applicant, the Service, and the BLM to determine if a subsequent eagle take permit process would be initiated. Should the grant holder not reapply for a permit, daytime biological monitoring and curtailment would resume.

3 Affected Environment

3.1 Introduction

This chapter provides background on the environmental resources that are evaluated in the context of the Federal action and alternatives. Specifically, this chapter describes the physical environment, visual resources (focusing on lighting), migratory bird species, ESA-listed species, and eagle use and demographics.

3.2 Setting Discussions

3.2.1 Physical Environment

The Project site is located in the Yuha Desert, which is in the Colorado Desert region of the larger Sonoran Desert. The seven million-acre Colorado Desert region extends from the border of the higher-elevation Mojave Desert in the north to the Mexican border in the south, and from the Laguna Mountains of the Peninsular Ranges in the west to the Colorado River in the east. The Yuha portion extends from the Jacumba Mountains in the west to the historic West Side Main Canal near El Centro, and from Plaster City in the north to south of Mount Signal in Mexico.

The Colorado Desert is a desert of much lower elevation than the Mojave Desert to the north, and much of the land lies below 1,000 feet above mean sea level (AMSL). Common habitat includes sandy desert, scrub, palm oasis, and desert wash. Summers are hot and dry, and winters are cool and moist. Anza-Borrego Desert State Park (ABDSP), located mostly in eastern San Diego County, but jutting into Imperial County, is the bioregion's largest recreation area, covering 600,000 acres.

Most of the Project is a designated BLM Limited Use Area in which all motorized vehicles are restricted to the use of marked, designated routes only. BLM designated routes exist throughout the Project, and one occurs along the existing 500-kV transmission lines which traverse the middle of the Project southwest to northeast. Illegal off-highway vehicle trails crisscross portions of the Project, and some areas are regularly used for camping and firearm activities. This area is also regularly patrolled by the U.S. Border Patrol. Despite the above-mentioned usage, the majority of the Project is relatively undisturbed.

Surrounding land uses include ABDSP to the west and BLM land to the north, east, and west. The Coyote Mountains Wilderness Area is located to the north, the Jacumba Wilderness Area is located to the south, and the Ocotillo Area of Critical Environmental Concern (ACEC) occurs adjacent to the Project and the Yuha Basin ACEC occurs to the southeast. The town of Ocotillo and several scattered residences outside of the town are located between Sites 1 and 2.

Elevations in the Project range from approximately 1,490 feet AMSL in the southwest portion of the Ocotillo Wind site to 300 feet AMSL in the northeast portion of the Ocotillo Wind site. Elevation generally decreases from the west to the east, with the Coyote Mountains to the north, and the Jacumba Mountains to the west and south. To the west, the flanks of the Jacumba Mountains create rugged, rocky topographical features, low hills, and eroded badlands.

The majority of the Project is comprised of desert scrub communities such as brittle bush scrub, creosote bush scrub, teddy bear cholla scrub, white bursage scrub, and Wolf's cholla scrub. Smoke tree woodland is also present on the site; it typically occurs in washes. Unvegetated areas include sand dunes, streambeds, and badlands.

3.2.2 Visual Resources

The FEIS/FEIR (Sections 3.19 and 4.18, BLM 2012a) for the Project provides a thorough review of the Project's overall effects on visual resources and is incorporated by reference.

The federal action and associated alternatives do not affect the placement, size or number of turbines in the Project and therefore would not affect those visual aspects of the Project. However, the applicant has

requested that an aviation detection system be installed at the Project; this would result in changing how often the lights would be flashing on some of the turbines.

Under current operating conditions, the turbine arrays are lit per FAA requirements, with 56 of the 112 turbines lit with red flashing lights that all flash at the same time.

The possible impact of the alternatives under consideration on visual resources is addressed in Section 4.

3.3 Biological Environment

3.3.1 Bald Eagle

Bald eagles are not known in the Project vicinity, and no bald eagles were observed during pre-construction surveys conducted in 2009 – 2011, or during any of the post-construction monitoring conducted to date. Bald eagles in southern California are associated with reservoirs, lakes, and rivers, where they winter and where their breeding range is expanding. These Southern California areas include the Channel Islands and inland water bodies (Lakes Cachuma, Lake Casitas, Lake Hemet, and lakes within the San Bernardino Mountains, among others). Because they have not been documented in or near the Project vicinity, the risk of their take is considered to be very low. Consequently, the potential for their take was not analyzed in the ECP and they are not considered further in this document. However, we would consider the need for bald eagle monitoring, studies, and permitting if bald eagles are observed in the Project area. If a bald eagle injury or fatality were to occur, the stepwise approach to ACPs would be applied, and we would work with the applicant to determine if there is a need to amend the eagle take permit to include bald eagles.

3.3.2 Golden Eagle

Golden eagle habitat typically includes rolling foothills, mountain areas, sage-juniper flats, and desert. Golden eagles feed primarily on small to mid-sized mammals, most commonly rabbits (*Sylvilagus* spp.), hares (*Lepus* spp.), and ground squirrels (*Spermophilus* spp.), among others (Kochert et al. 2002). Golden eagles may travel great distances during dispersal and migration but usually return to within 30 miles of their natal area to breed (Millsap et al. 2015). Breeding golden eagles occupy discrete territories, which are typically used continuously for many years (Kochert et al. 2002; Kochert and Steenhof 2012). Golden eagle pairs establish and defend breeding territories that may contain multiple alternative nests, and nesting territories are often occupied for many decades (Millsap et al. 2015). Re-use of individual nests within a territory is frequent, but some individual 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 (Service 2016).

Golden eagles are known to nest and forage throughout the 10-mile-radius of the local project area. Golden eagles are known to be at risk of collision with wind turbines (Hunt 2002). Based on data collected during the preconstruction avian surveys for the Project, three golden eagles were observed flying at the site in September 2009 during the year of avian point count surveys in and around the Project area, and 33 golden eagles (two of which were incidentally documented outside of set survey hours) were recorded during fall and spring migration surveys conducted from fall 2009 through spring 2011 (see Appendix A). Golden eagle pre-construction use at the site was 0.01 golden eagle observations per hour, which is relatively low when compared to other projects in California where similar methods were used to document use, such as High Winds Wind Resource Area (Kerlinger et al. 2005, 2006) and the Diablo Winds Wind Resource Area (WEST 2008), each of which had documented use of 0.3 eagles/30 minute survey.

3.3.2.1 Project-specific Golden Eagle Nest Surveys

Surveys for nesting golden eagles were conducted within the Project and a 10-mile buffer both pre- and post-construction, consistent with the *Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols and other Recommendations in Support of Golden Eagle Management and Permit Issuance* (Pagel

et al. 2010). The methods and results for the surveys are briefly described below. Detailed information for each survey or set of surveys can be found in the ECP (Appendix A).

3.3.2.1.1 Pre-construction Nest Surveys

To evaluate the Project area eagle population and identify if any eagle concentration areas exist within the Project area, surveys were conducted in 2010 (within 10 miles of the Project following the Pagel et al 2010 protocol). The 2010 surveys identified five golden eagle nesting territories, which are described in Table 3-1. None of the nests were within three miles of turbines, and the closest active nest identified in the pre-construction surveys was located 4.1 miles from turbines (Appendix A). The ECP also summarizes the results of the golden eagle nest surveys associated with Tule Wind Project, which covered four of the five territories (Mountain Springs was excluded) associated with the Project's 10 mile survey area. The locations of all known active and inactive eagle nests within 10 miles of the Project are shown in Appendix A. The objective of the surveys was to locate golden eagle nests and breeding territories where eagles may be subject to injury, mortality, disturbance or displacement effects from Project construction or operation.

TABLE 3-1
List of Golden Eagle Territories Identified during Eagle Nest Surveys

Territories	Territory Status by Year	Notes on Nests
Carrizo Gorge	Unoccupied/Inactive – 2010, 2011, 2014; Occupied but inactive 2013 and 2015; Occupied and active - 2017	Four nests in territory; none active in 2013 or 2015. In 2017, one active nest with 1 chick was observed
Coyote Mountains East	Unoccupied/Inactive – 2010, 2011, 2013, 2014, 2015 and 2017	Two nests in territory; none active in surveyed years
Coyote Mountains West	Occupied/Active – 2010, Occupied but inactive – 2011, 2013, 2015; Unoccupied/Inactive – 2014 and 2017	Nine nests in territory; one active nest in 2010, rest inactive
Table Mountain	Occupied/Active – 2010, 2011, and 2017; Unoccupied/Inactive – 2013, 2014 and 2015	Six nests in territory; two possibly active in 2010; in 2017, one active nest observed, which failed
Mountain Springs	Unoccupied/Inactive – 2010	No nests in territory

References: Ocotillo ECP (Appendix A), Tule Wind LLC 2011, Bloom Biological, Inc. 2018

Five territories comprising a total of twenty-one golden eagle nests were observed during the 2010 nest surveys; two of the five territories were identified as active. The 2011 surveys for Tule showed that the same two territories that were active in 2010 were again occupied in 2011, although only one territory had an active nest (Tule Wind LLC 2011). No active eagle nests were located within the Project boundary during the 2010 and 2011 surveys (see ECP Figure 4 in Appendix A).

3.3.2.1.2 Post-construction Nest Surveys

The applicant conducted three years of post-construction raptor nest surveys at the site as part of their original 2012 ECP. The primary objective of the surveys was to determine activity status and productivity of all raptor nests within the Project, with a focus on golden eagle nests within 10 miles of the site. Surveys were conducted from the ground, due to concerns over potential effects of helicopter surveys on bighorn sheep lambing. Surveys were conducted in 2013, 2014 and 2015. For all three years, activities associated with twenty of the twenty-one golden eagle nests observed in the pre-construction surveys were observable from the ground; one historic nest location was inaccessible. No new or previously unidentified golden eagle nests were identified in any of the three years of monitoring. One territory was documented as occupied, but no in-use/active golden eagle nests were identified in 2013. In 2014, no golden eagles were observed during monitoring, and none of the territories in the 10-mile area around the Project appeared to be

occupied. In 2015, two of the territories showed golden eagle use, but no in-use/active golden eagle nests were identified. Additionally, data from the 2017 Sunrise Powerlink golden eagle survey results were reviewed; these surveys overlapped all but the Mountain Springs territory (Bloom Biological, Inc. 2018). In 2017, the Carrizo Gorge and Table Mountain territories were active, while the Coyote Mountains East and West territories were inactive (Bloom Biological, Inc. 2018).

3.3.2.2 Project-specific Avian Use Surveys

Section 2.2 of Appendix A provides information on the methodology and results of the avian use surveys that were conducted at the Project. During the year of avian point count surveys conducted from September 2009 through August 2010, only three golden eagles (two adults and one juvenile) were observed. These were observed on September 2, 2009, flying north over the western portion of the site at approximately 1,000 feet above ground level (above the rotor swept area). The avian point count surveys were conducted in what we considered a typical year for region. The 2009-2010 time period was considered an average rainfall year and the region did not experience abnormally long hot, cold, wet, or dry periods during the 2009-2010 timeframe.

3.3.2.3 Project-specific Raptor Migration Surveys

Section 2.3 of Appendix A provides information on the methodology and results of the raptor migration surveys that were conducted at the Project. The results of two years of raptor migration counts from fall 2009 through spring 2011 indicate that some golden eagles use the Project during the spring and fall migratory periods, but may not be part of a major migratory pathway for golden eagles (Appendix A). With the exception of Sugarloaf Mountain and the rocky terrain in the southwest portion of the site, the Project is generally flat and is located east of the Jacumba Mountains and south of the Coyote Mountains. The southwesterly prevailing wind direction would not appear to be conducive to creating updrafts in the Project that are often associated with high raptor migration areas. The site lacks a major ridgeline, water bodies, and large stands of mature trees. The closest major water body is the Salton Sea, which is 30 miles to the northeast of the site, and the irrigated agriculture fields near El Centro are approximately 15 miles to the west of Ocotillo. Therefore, the site does not appear contain the appropriate topography that has been observed to concentrate migrating raptors in other studies (Hoover and Morrison 2005).

3.3.3 Migratory Bird Species

The FEIS/FEIR (Sections 3.23 and 4.21, BLM 2012a) for the Project provides a thorough review of the Project's overall potential effects on migratory bird species and is incorporated by reference.

Additionally, the ABPP for the Project describes the pre-construction bird surveys that occurred prior to the Project (Appendix B). In the pre-construction surveys, 77 species and 6,387 individual observations were documented. House finches (*Haemorhous mexicanus*), black-throated sparrows (*Amphispiza bilineata*) and horned larks (*Eremophila alpestris*) were the most abundant species observed during the study. Sensitive species that were documented during the pre-construction surveys included the Swainson's hawk (*Buteo swainsoni*; state-listed as threatened), ferruginous hawk (*Buteo regalis*; watch list species), northern harrier (*Circus cyaneus*), loggerhead shrike (*Lanius ludovicianus*), yellow warbler (*Setophaga petechia*), Vaux's swift (*Chaetura vauxi*) and Le Conte's thrasher (*Toxostoma lecontei*), all of which are state Species of Special Concern.

During the two years of post-construction fatality monitoring that has occurred at the site as required by the ROD and ROW grant, 26 birds were found in the first year as documented fatalities and 37 birds were found as documented fatalities in the second year (WEST 2015, 2016). The most commonly documented species (five fatalities) in the first year was the white-throated swift (*Aeronautes saxatalis*; WEST 2015); in the second year, Townsend's warbler (*Setophaga townsendi*) was the most commonly documented fatality (four fatalities). Red-tailed hawks (*Buteo jamaicensis*) were the only raptors found as fatalities during the surveys (one in the first year and two in the second year). Two birds of conservation concern for BCR 33 were documented as fatalities at the Project: yellow warbler and Costa's hummingbird (*Setophaga petechia* and

Calypte costae, respectively; WEST 2015, 2016). The estimated overall bird fatality rate was 0.88 birds/MW/year (or approximately 233 birds per year at the entire 265 MW site) and 1.37 birds/MW/year (or approximately 363 birds per year at the site) in the first and second years' surveys, respectively. In the second year, the estimated raptor fatality rate was 0.04 raptors/MW/per year (approximately 10.6 raptors per year at the entire site). In the first year of the study, the only raptor fatality documented was a red-tailed hawk found incidentally, so no raptor fatality rate is available for the first year. These levels of bird and raptor fatalities are on the lower end of the range of those found at wind energy facilities in California (WEST 2015, 2016).

The possible impact of the alternatives under consideration on migratory bird species is addressed in Section 4.

3.3.4 Species Listed under ESA

The effects of authorizing incidental eagle take to the applicant is not expected to have affects to species protected by the ESA at the operational wind facility. The required eagle take permit compensatory mitigation, retrofitting electric utility poles, has the potential to affect species protected under the ESA. As discussed in Section 2.3.2 of this document, the compensatory mitigation site has not yet been identified. If the mitigation occurs on PG&E's system, the site would most likely be located within oak woodland savannah or agricultural habitats. If the mitigation occurs on SCE's system, affected species would likely be those found in the Mojave Desert. Tables C-1 and C-2 in Appendix C identifies likely species that might be present in areas where power poles may be identified for retrofitting in the oak woodland savannah and Mojave Desert habitats, respectively, according to the Service's Information for Planning and Consultation system. Aquatic species that may occur within the overall PG&E or SCE service areas are not included in these tables as it is assumed that poles that would be considered for retrofitting are in uplands. Note that these tables do not include aquatic animals or plants (such as fairy shrimp, fish, or aquatic plants), or flowering plants that are restricted to exposed dolomite bedrock outcrops in the San Bernardino Mountains (such as the Amargosa niterwort), since these species' habitats would not be anticipated to be affected by the retrofit work. Once the compensatory mitigation sites are selected, the Service would conduct an internal Section 7 Consultation and further analyze and address impacts and required compliance with the ESA. We anticipate that adverse effects to listed species will be avoidable by timing retrofits to avoid sensitive seasons, and/or through the use of other species-specific avoidance measures. However, if the determination of the Section 7 Consultation is that adverse effects were likely to occur to listed species, the Service would prepare additional NEPA documentation to supplement this EA.

4 Environmental Consequences

4.1 Introduction

The CEQ regulations implementing NEPA specify that agencies would examine whether a proposed action would have direct, indirect, or cumulative effects on the quality of the human environment. The regulations define "human environment" as including "the natural and physical environment and the relationship of people with that environment" (40 C.F.R. § 1508.14). "Effects" are defined generally as including ecological, aesthetic, historic, cultural, economic, social, or health effects (40 C.F.R. § 1508.8). Effects may be beneficial or adverse. More specifically, the CEQ regulations (40 C.F.R. § 1508.7, 1508.8) define the three types of effects as follows:

- "Direct effects" are defined as those effects "which are caused by the action and occur at the same time and place."
- "Indirect effects" are defined as those effects "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."
- "Cumulative impact" is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."

The discussion of effects for the permit program is provided in the PEIS (Service 2016) and is incorporated by reference here. This section would only analyze effects that may result from the issuance or denial of an eagle take permit for this project.

In this chapter, we describe the environmental consequences of the No Action Alternative and three action alternatives. The alternatives listed below are evaluated on the basis of the 30-year Project lifespan.

- Alternative 1: No Action - No Permit or ROW Grant Amendment for termination of bio-monitoring, Continued Bio-monitoring and Curtailment when Eagles are Detected for remainder of 10 year period
- Alternative 2: Issue 5-Year Permit for Applicant's Revised ECP; Issue ROW Grant Amendment
- Alternative 3: Continued Operation of the Project without an Eagle Take Permit; Issue ROW Grant Amendment
- Alternative 4: Issue a 30-Year Permit for Applicant's Revised ECP with Additional Mortality Monitoring and Mitigation; Issue ROW Grant Amendment

4.2 Impacts Analysis for Take of Golden Eagles

4.2.1 Approach and Methods

In determining how the issuance of a take permit would affect eagles, we screened permit issuance alternatives against the Eagle Act's Permit Issuance Criteria or Required Determinations (Chapter 1, Section 1.5.2). We used Service tools from the ECP Guidance (Service 2013), including: the Bayesian analysis (consistent with Appendix D, Stage 3—Predicting Eagle Fatalities); Resource Equivalency Analysis (consistent with Appendix G, Examples Using Resource Equivalency Analysis to Estimate the Compensatory Mitigation for the Take of Golden and Bald Eagles from Wind Energy Development); and Cumulative Effects Analysis (consistent with Appendix F, Assessing Project-Level Take and Cumulative Effects Analyses). We have also used some qualitative analysis based on our knowledge of the wind resource area, data available to the TAC, and studies of local eagle populations.

To address the effects of golden eagle take on cultural practices, we assessed whether the alternatives would substantially burden a Tribe's free exercise of its religion.

4.3 Effects Common to Alternatives

All alternatives have the potential to result in permitted or unpermitted take of eagles.

4.3.1 Direct and Indirect Effects

Under the eagle take permit issuance alternatives (Alternative 2 and 4), we estimate that two golden eagles may be taken within every 5 year period (Appendix A). We based this prediction on a conservative approach that is expected to overestimate annual and cumulative take at the outset of permit. We anticipate the prediction would decrease as we incorporate project-specific monitoring data into the prediction 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. As previously described, the applicant would provide compensatory mitigation (power pole retrofits) to fully offset the authorized take. The associated eagle fatality monitoring would allow the Service and applicant to estimate the total number of annual eagle fatalities. Monitoring is a critical component of adaptive management. Together, these conservation measures ensure there would be no significant impacts to golden eagles.

4.3.2 Local Effects

Up to three active nests were identified in 2010, and one active nest was identified in 2011 within 10 miles of the Project area: the nearest active nest was 4.1 miles to the north (Appendix A). No active nests were documented within 10 miles of the Project in post-construction nest monitoring conducted in 2013, 2014 or 2015. Inactive nests were also identified; the closest inactive nests were three miles to the north, with other inactive nests more than four miles to the southwest. Nesting survey results are detailed in the ECP (Appendix A). Although the surrounding territories appeared to be unoccupied in the latest nest survey (2015), it is possible that this is due to the drought conditions that were occurring in California at that time. Imperial County experienced severe drought conditions from 2013 through 2016, and is still experiencing moderate to severe drought as of April 2017 (Fuchs 2013, 2014, 2015, 2016; Bathke 2017). If drought or other conditions change and nests become active again in the vicinity of the Project during the 30 year operational life of the Project, nesting adults and juveniles from these nests are at risk of nest abandonment, injury, or mortality from Project operations. Migrating eagles, such as those documented during the two years of pre-construction migration surveys, would also be at risk of injury or mortality. Eagles generally hunt prey from favored perches near regular updrafts, which allow soaring to heights sufficient for them to efficiently scan their hunting areas (Johnsgard 1990). Prey studies were not conducted for the Project; however, eagles were observed relatively infrequently and no high use areas or concentration areas were identified at the site.

The specific fatality estimates for each alternative are described below in Section 4.6 under "Assessment of Alternatives."

Each action alternative that involves issuance of an eagle take permit (Alternatives 2 and 4) involves power pole retrofits as compensatory mitigation for take of eagles. Such retrofits are anticipated to protect eagles from electrocution. It is difficult to predict whether the birds saved would be breeding adults, juveniles, or floaters; however, our REA assumes that the losses to electrocution are proportional to the demographic distribution of the population. Avoided fatalities would help to offset Project-related fatalities (i.e., collisions with turbines or other facilities), thereby benefitting the eagle population as a whole. Pole retrofits associated with the action alternatives that involve issuance of an eagle take permit (Alternatives 2 and 4) are also expected to benefit other raptors that may be susceptible to electrocution.

4.3.3 Other Priority Uses

Other priority uses described in our regulations include safety emergencies, Native American use for rites and ceremonies, activities necessary to ensure public health and safety, renewal of nest-take permits, and

resource development or recovery operations (for inactive golden eagle nests only). Operation of the Project, including take of eagles, is not expected to interfere with other priority uses or permits because a no-net-loss standard is expected to be achieved under the action alternatives that involve issuance of an eagle take permit (Alternatives 2 and 4).

4.3.4 Cumulative Effects

This cumulative-effects section evaluates the cumulative effects on bald and golden eagles as required by NEPA (40 CFR 1508.8) and the Eagle Act's permitting regulations. As part of the permit application review process the Service also considers cumulative effects at the local area population (LAP) scale to evaluate whether the take to be authorized under the permit, together with other sources of permitted take and unpermitted eagle mortality may be incompatible with the persistence of the LAP. We incorporated data provided by the applicant, our own data on permitted take and other documented eagle mortalities, and additional available information on population-limiting effects, in determining cumulative impacts to the LAP. We do not anticipate the bald eagles will be affected, and so they are not considered further in this section. The scale of our analysis is a 109-mile radius around the project site (golden eagle natal dispersal distance). We conducted our cumulative effects analysis as described in ECP Guidance Appendix F (Service 2013). National estimates of golden eagle survival rates suggest that on average about 20% of golden eagles die each year, and about 56% of these mortalities are from anthropogenic causes. Thus, background levels of golden eagle anthropogenic mortality within an average LAP appear to be roughly 10% (Service 2016).

4.3.4.1 Local-Area Population Analysis

To assess cumulative impacts to the local-area population we followed methods outlined in Appendix F of the ECP Guidance (Service 2013) and as described in the 2016 Eagle Rule PEIS (Service 2016). We used our Cumulative Effects Tool to complete an analysis of the local area population. This analysis includes eagle mortality records available to us in the Service's eagle mortality database. A major caveat with our eagle mortality records is that they were obtained based on opportunistic or incidental reporting of eagle mortalities and they were not obtained from regular or systematic survey efforts to detect eagle mortalities using a statistically valid protocol or sampling methodology. Table 4-1 summarizes known unauthorized take within the LAP.

TABLE 4-1
Known Golden Eagle Mortalities within 109 Miles of the Ocotillo Wind Energy Facility, 1995 - 2017

Cause of Mortality	Reported Years	Reported Take Over Reported Period	Annual Take*
Electrocution	1995-2016	6	0.27
Shot	2004-2004	1	1.00
Collision with wind turbine	2002-2017	5	0.31
Poisoned	2014-2014	1	1.00
Collision with vehicle	2015-2015	1	1.00
Trauma	2016-2016	1	1.00
Trauma; Other	2016-2016	1	1.00
Starvation	2015-2016	2	1.00
Starvation; Other	2001-2014	2	0.14
Unknown	2005-2017	9	0.69
TOTAL		**29**	**7.42**

*Annual take for each reported cause of mortality is calculated by dividing the reported take by the number of reported years for each cause.

We conducted this analysis to determine if issuance of the permit would result in cumulative authorized take within the LAP exceeding 5% and to evaluate if background levels of unauthorized take exceed 10%. If issuance of this eagle take permit exceeded either of these benchmarks, we would consider requiring additional mitigation to offset to the local population (Service 2016). Our analysis determined that issuance of a permit to the applicant would result in 0.01% cumulative authorized take, and less than 5% cumulative unauthorized take of the LAP taken annually.

4.4 Effects Common to All Action Alternatives (Alternatives 2, 3, and 4)

4.4.1 Effects on Visual Resources

Under the action alternatives the applicant would install an aviation detection system that would result in the lit turbines flashing only when aircraft are in the area. All alternatives would therefore affect the visual resources in the Project vicinity by reducing the occurrence of flashing lights to the time only when aircraft are in the area.

4.5 Effects Common to Action Alternatives that Involve Issuance of an Eagle Take Permit (Alternatives 2 and 4)

4.5.1 Effects on Species Listed Under ESA

As stated above, the effects of authorizing incidental eagle take to the applicant is not expected to have effects to species protected by the ESA at the operational wind facility. The required compensatory mitigation, retrofitting electric utility poles, has the potential to affect protected species. As discussed in Section 2.3.2 of this EA, the compensatory mitigation sites have not yet been identified. If the mitigation occurs on SCE's system, affected species would likely be those found in the Mojave Desert. If the mitigation occurs on PG&E's system, the site would most likely be located within oak woodland savannah or agricultural habitats. Table C-3 in Appendix C identifies listed species that might be present and potential impacts that may occur.

Once the compensatory mitigation site is selected, the Service would conduct an internal Section 7 Consultation and further analyze and address what listed species may be affected, potential impacts and required compliance with the ESA. The following avoidance and minimization measures would likely be implemented for all retrofit work, regardless of the final location of the mitigation site:

- The retrofit work would be conducted during the dry season (July 1-October 31/or as long as dry season persists) to avoid potential impacts ESA species and breeding birds that may be in the area, including eagles. If wet weather patterns occur, work would not occur until 10 days after a rain event that resulted in 0.5 inches of rain or more.
- The retrofit work would not be conducted if poles are located in or adjacent to wetland or riparian areas. Alternate poles that are not located in or near these habitats would be selected for retrofits.
- The retrofit work would either not be conducted if poles are located on exposed bedrock areas in locations with known listed plant populations, or if high risk poles are identified on exposed bedrock, further evaluation would occur to identify any listed plants in the vicinity and develop plans to avoid impacts during the retrofit work.
- The retrofit work would not be conducted if poles are located in or adjacent to ponds or vernal pools.
- The retrofit work would not involve ground disturbing activities and vehicles would remain on existing public and private access roads to complete the work.
- Vehicles would maintain a speed limit of no more than 10 mph on roads within the ROW.

4.6 Assessment of Alternatives

In assessing whether there is a "significant" impact, we consider both the context and intensity of the action and its effects (40 CFR 1508.27). *Context* refers to the affected environment in which the proposed action takes place and may include the socioeconomic, legal, and political situation surrounding an action. *Intensity* refers to the severity of the proposed action's impact on the environment and may consider environmentally beneficial actions, public health, unique characteristics of the geographic area, controversy, uncertainty, precedent-setting elements, cumulative effects, cultural resource effects, effects on endangered species, and consistency with environmental laws (40 CFR 1508.27[b]). In the case of the Proposed Action—issuance of an eagle take permit—we have assumed that the context is operation of an approved wind energy facility, and that a certain amount of take of golden eagles already occurs in the local-area from wind energy projects. Consideration of intensity addresses the relative severity of effects on eagles, the possibility of the Federal action to establish a precedent for future eagle take permits, and the efficacy of the action in mitigating adverse cumulative effects.

4.6.1 Alternative 1: No Action

4.6.1.1 Effects on Eagles

Under the No Action Alternative, we would deny the permit application and would not issue a permit; the BLM would not issue an amendment to the ROW grant. Under the No Action Alternative, direct impacts of the Project on the golden eagle population would be minimized through continued use of the bio-monitoring and radar system for the remaining portion of the required initial 10 years of operation. After the initial 10 years of operation, the BLM would coordinate with the applicant and the Service to determine if an eagle take permit process should be reinvestigated, and/or if the eagle risk minimization system should be continued. The take estimate (likely conservative) for the 30 year life of the Project is up to nine golden eagles (0.3 golden eagles per year x 30 years). Because the revised ECP would not be implemented under this alternative, the proposed compensatory mitigation would not be provided. Therefore the beneficial impacts to eagles that would result from retrofitting power poles would not be realized under this alternative.

Under the No Action Alternative, the Project would continue to operate without a take permit, under the requirements of the 2012 ROW grant. Should take of eagles occur under the No-Action Alternative, the applicant would be in violation of the Eagle Act. Because no measures would be implemented to avoid or minimize risk to eagles under this No-Action Alternative, the risk to eagles is expected to be higher under this alternative as compared to the Proposed Action.

4.6.1.2 Effects on Migratory Birds

Under the No Action alternative, the eagle risk minimization program and curtailment system would continue, and the ABPP would continue to be implemented as required under the current ROW grant. Therefore no impact to migratory bird species compared to those that are currently occurring during operation of the Project would occur.

4.6.1.3 Effects on Visual Resources

Under the No Action alternative, the aviation detection system would not be installed, and the flashing lights would continue regular flashing per minimum FAA requirements regardless of whether planes are in the vicinity. Therefore no impact to visual resources compared to those that are currently occurring during operation of the Project would occur, and the beneficial effect of the aviation detection system would not be realized.

4.6.1.4 Effects on Species Listed under ESA

Under the No Action Alternative the Project would continue to operate as authorized under their current BLM ROW grant without an eagle take permit. The eagle risk minimization program would continue. No effects on listed species are anticipated.

4.6.2 Alternative 2: Issue a 5-Year Permit for Applicant's Revised ECP and Issue ROW Grant Amendment

4.6.2.1 Effects on Eagles

Under this alternative, we recognize that the Project is built, and that all applicant-committed measures, compensatory mitigation, and adaptive management requirements as outlined in the revised ECP (Appendix A) would be fulfilled; in addition we recognize that the original radar system would be removed, an aviation detection system would be installed and the eagle risk minimization program that includes full-time bio-monitoring and curtailment that is currently occurring would cease. We estimate that the Project would kill up to two eagles over the 5-year permit duration.

If the predicted eagle take threshold is reached within 4 or fewer years of permit issuance, the following experimental ACPs/adaptive management measures would be considered for implementation as described in Step II of the ECP's Step-wise table (Table 2-1) and summarized below:

- Studies to identify a risk factor (e.g., seasonality, time of day, weather, presence of attractants, etc.) and to determine if management response is warranted, and
- Other actions to minimize and compensate for effects

If unintended take were to reach or exceed our predicted or authorized levels, the Service would consider if curtailment, additional monitoring to inform ongoing curtailment schedules, focused eagle use and/or mortality monitoring, radar deployment and / or other measures deemed were appropriate.

At the end of the 5-year permit term, the BLM would require coordination between the applicant, the Service, and the BLM to determine if a subsequent eagle take permit would be sought, or if no subsequent permit would be sought and the eagle risk minimization system should be restarted. It is therefore likely that risk minimization measures and adaptive management approaches would continue at the Project past the 5-year permit term. Subsequent implementation of these measures could result in decreased eagle fatalities. Consequently, the fatalities that occur during the initial 5-year period (i.e., up to two fatalities, or an average annual rate of 0.3 eagles) cannot be extrapolated to determine a 30-year total because it is presumed that ACPs would reduce future fatalities should the ACPs continue to be implemented into the future after the 5-year permit term. This anticipated decline could reduce the 30-year take of eagles to something less than nine golden eagles. Up to 62 utility pole retrofits would be completed under this alternative.

The applicant's proposed approach would ensure no net loss to golden eagle populations. Based on the intensity and context of these effects and consideration of the elements associated with this alternative, Alternative 2 is not expected to result in significant adverse effects to the golden eagle population.

4.6.2.2 Effects on Migratory Birds

Under this alternative, the DeTect Merlin radar system would be removed and the observer based eagle risk minimization curtailment system would no longer be used. The power pole retrofits that would be required under this alternative may also serve to minimize electrocution risk to other large non-eagle raptors.

Potential adverse impacts would include possible increased risk to raptor species at the wind facility, as the current eagle risk minimization program uses a radar, camera and observer to curtail turbines if a large raptor or eagle is near a turbine. The eagle risk minimization system has primarily relied upon the biological observer as there were technological problems caused by interference from cactus with the radar system, and from heat waves with the cameras. The curtailment program has relied primarily upon biological observers. If this system is no longer in place, it is possible that raptor fatalities may increase over existing levels. Removal of the observer-curtailment system is not anticipated to result in adverse impacts to smaller migratory bird species compared to the existing conditions since there is no curtailment associated with non-raptor species.

Because the eagle risk minimization system has been in place since operations and during both years of post-construction mortality monitoring that have occurred to date, we do not have the data necessary to

determine if the relatively low raptor fatality rates are due to the curtailment system or simply a low level of baseline risk to raptors in this area. Mortality monitoring under this alternative would allow us to evaluate impacts to raptors in the absence of the curtailment program.

Potential beneficial impacts would include minimization of electrocution risk to other large raptors associated with the power pole retrofits that would be required as compensatory mitigation for eagle take under this alternative. While the potential benefit to non-eagle raptors may not necessarily offset the take at the Project, the power pole retrofits would likely have a beneficial impact on raptor populations.

There is some potential for beneficial impacts to nocturnal migrating birds by reducing the occurrence of flashing lights, which would only flash when aircraft are in the vicinity of the Project under this alternative. Nocturnal migrating birds are attracted to steady burning lights, and these types of lights have been associated with large-scale fatality events at lit communications towers as well as at wind farms when lighting associated with substations or operations buildings have been left on overnight. However, flashing lights have been shown to significantly decrease bird mortality rates compared to steady lights (up to 71% reduction; Gehring et al. 2009). Theoretically, unlit turbines are less attractive than turbines with flashing red lights (Evans et al. 2007); however, because mortalities at turbines with flashing red lights are generally low this difference may be difficult to demonstrate as was the case in the meta-analysis conducted by Kerlinger et al. (2010).

4.6.3 Alternative 3: Continued Operation of the Project without an Eagle Take Permit; Issue ROW Grant Amendment

4.6.3.1 Effects on Eagles

Under the this Alternative, we would deny the permit application and would not issue an eagle take permit; the BLM would issue an amendment to the ROW grant to allow the installation of the aviation radar system and lifting the requirement for the eagle risk minimization ACP which includes the DeTect Merlin radar system, and radar-controlled video tracking system. Under this Alternative, direct impacts of the Project on the golden eagle population would be minimized through continued use of the bio-monitoring and associated curtailment system for the remaining portion of the required initial 10 years of operation. After the initial 10 years of operation, the BLM would require that unless or until an eagle take permit is obtained, the applicant continue full time bio-monitoring and associated curtailment during daylight hours. Furthermore, the BLM would require that fatality monitoring occur at the Project using Service-approved standards. The take estimate (likely conservative) for the 30 year life of the Project is up to nine golden eagles (0.3 golden eagles per year x 30 years). Similar to the No Action Alternative, the revised ECP would not be implemented under this alternative, and the proposed mitigation would not be installed. Therefore the beneficial impacts to eagles that would result from retrofitting power poles would not be realized under this alternative.

Similar to the No Action Alternative, if the Project resulted in the take of eagles under this alternative, the applicant would be in violation of the Eagle Act and would thereby be subject to investigation and possible prosecution by our Office of Law Enforcement and the U.S. Department of Justice.

4.6.3.2 Effects on Migratory Birds

Under Alternative 3, the bio-monitoring program and curtailment system would continue, and the ABPP would continue to be implemented as required under the current ROW grant. Therefore no impact to migratory bird species compared to those that are currently occurring during operation of the Project would occur.

4.6.3.3 Effects on Listed Species

Under Alternative 3, the Project would continue to operate as authorized under their current BLM ROW grant without an eagle take permit. The bio-monitoring and curtailment program would continue, but power-pole retrofits would not be installed as mitigation. No effects on listed species are anticipated.

4.6.4 Alternative 4: Issue a 30-Year Permit for Applicant's Revised ECP with Additional Mortality Monitoring and Mitigation; Issue ROW Grant Amendment

4.6.4.1 Effects on Eagles

Under this alternative, we estimate that up to nine golden eagles would be killed over the 30-year permit duration (an average rate of 0.3 golden eagles per year over 30 years). The effects would be similar to those described in Alternative 2, across the 30 year permit term. The additional mortality monitoring would diminish the possibility of take occurring without being detected. Increased mortality monitoring associated with this alternative would help to ensure that fatalities are detected and would support validation of the take estimate. Increased monitoring also has the benefit of accelerating threshold-based ACPs and adaptive management (see ECP Table 15), thereby helping reduce future fatalities. Requiring additional compensatory mitigation under this alternative (up to 74 utility pole retrofits for the first five year period) would reduce the effects on golden eagles.

Risk minimization measures and adaptive management approaches would continue at the Project for the 30-year permit term. Implementation of these measures could reduce the 30-year total to something less than nine golden eagles. Alternative 4 is not expected to result in significant adverse effects on golden eagle populations because the compensatory mitigation would result in no net loss to the breeding population.

4.6.4.2 Effects on Migratory Birds

Similar to Alternative 2, this alternative would result in some potential minor adverse and potential beneficial effects on migratory birds.

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Appendix A
Eagle Conservation Plan

Appendix B
Avian and Bat Protection Plan

Appendix C
Listed Species and/or Their Critical Habitat Likely to Occur within Oak Woodland Savannah and Mojave Desert Habitats, and Potential Impacts