



— BUREAU OF —  
RECLAMATION

# Final Environmental Assessment

**CO Bar Solar Interconnection Project, Arizona**  
**Interior Region 8: Lower Colorado Basin**



**U.S. Department of the Interior**  
**Bureau of Reclamation**  
**Interior Region 8: Lower Colorado Basin**  
**Phoenix Area Office**  
**Glendale, Arizona**

**December 2023**

## **Mission Statements**

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

## Acronyms and Abbreviations

ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
amsl	above mean sea level
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
APS	Arizona Public Service
ARS	Arizona Revised Statutes
ASLD	Arizona State Land Department
ASM	Arizona State Museum
AZNST	Arizona National Scenic Trail
BMP	best management practice
BREC	Babbitt Ranch Energy Center
CEAA	cumulative effects analysis area
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COF	Coconino National Forest
CUP	Conditional Use Permit
dB	decibel(s)
dBA	A-weighted decibel(s)
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
Forest Plan	<i>Land and Resource Management Plan for the Coconino National Forest</i>
Forest Service	U.S. Forest Service
gen-tie	generation-tie
GHG	greenhouse gas
Interconnection Project	CO Bar Solar Interconnection Project
IPaC	Information for Planning and Consultation
kV	kilovolt(s)
Ldn	day-night average sound level
LGIA	Large Generator Interconnection Agreement
mph	miles per hour
MW	megawatt(s)
NEP	non-essential experimental population
NEPA	National Environmental Policy Act of 1969
NF	National Forest
NFS	National Forest System
NFSR	National Forest System Road
NHPA	National Historic Preservation Act of 1966
NRHP	National Register of Historic Places
NSTS	Navajo Southern Transmission System
PFYC	Potential Fossil Yield Classification

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Proponent	CO Bar Solar, LLC
Reclamation	U.S. Bureau of Reclamation
ROW	right-of-way
SHPO	State Historic Preservation Office
SIO	Scenic Integrity Objective
SUP	Special Use Permit
SWCA	SWCA Environmental Consultants
SWPPP	Stormwater Pollution Prevention Plan
SWReGAP	Southwest Regional GAP Analysis Project
US 180	U.S. Highway 180
USACE	U.S. Army Corps of Engineer
USFWS	U.S. Fish and Wildlife Service
WEAP	Worker Environmental Awareness Program

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# 1 INTRODUCTION, BACKGROUND, PURPOSE, AND NEED

## 1.1 Introduction

CO Bar Solar, LLC (the Proponent), a subsidiary of Clēnera, LLC, is proposing to interconnect the CO Bar Solar Complex to the Navajo Southern Transmission System (NSTS) at the Moenkopi to Cedar Mountain 500-kilovolt (kV) transmission line (referred to as the CO Bar Solar Interconnection Project, or Interconnection Project). The generation point of interconnection on the Moenkopi to Cedar Mountain 500-kV transmission line would be located on private lands approximately 30 miles northwest of Flagstaff in unincorporated Coconino County, Arizona (Figure 1). The CO Bar Solar Interconnection Project would be a component of the CO Bar Solar Complex, which is a large generator, renewable energy project located on nearby private land and lands managed by the Arizona State Land Department (ASLD) (see Section 1.2, Background). The CO Bar Solar Interconnection Project also includes the improvement of roads managed by the Coconino National Forest (COF).

The Moenkopi to Cedar Mountain 500-kV transmission line is part of the NSTS, of which the United States (U.S.) Bureau of Reclamation (Reclamation) is a part owner and Arizona Public Service (APS) is the operator. All interconnection requests for the NSTS that result in a Large Generator Interconnection Agreement (LGIA) must be submitted to APS and approved by the owners of the transmission line, including Reclamation via the Regional Director of Reclamation's Lower Colorado Basin Region. Prior to the Regional Director's approval, Reclamation must complete an environmental review of the proposed interconnection in compliance with the National Environmental Policy Act of 1969 (NEPA) (Public Law 91-190). Reclamation, as the lead federal agency, is preparing this environmental assessment (EA) for the proposed CO Bar Solar Interconnection Project to assess the environmental effects of the proposed interconnection.

The proposed CO Bar Solar Interconnection Project includes the improvement of approximately 4.5 miles of roads managed by the COF; therefore, the U.S. Forest Service (Forest Service) is participating as a cooperating agency in the NEPA process per 40 Code of Federal Regulations (CFR) 1501.8. The improvement of National Forest System Roads (NFSRs) 417<sup>☞</sup> and 9003 would require the Proponent to obtain a Special Use Permit (SUP) from the COF. The *Land and Resource Management Plan for the Coconino National Forest* (Forest Plan) (Forest Service 2018a, 2018b) guides Forest Service management in fulfilling its stewardship responsibilities to best meet the needs of the public for the present and into the future.

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☞ COF has administered maintenance responsibilities of NFSR 417 to Coconino County under a forest-wide agreement. Pending the outcome of county coordination, a permit through Coconino County (whether in place of or in addition to the COF SUP) may be required for improvements to NFSR 417.



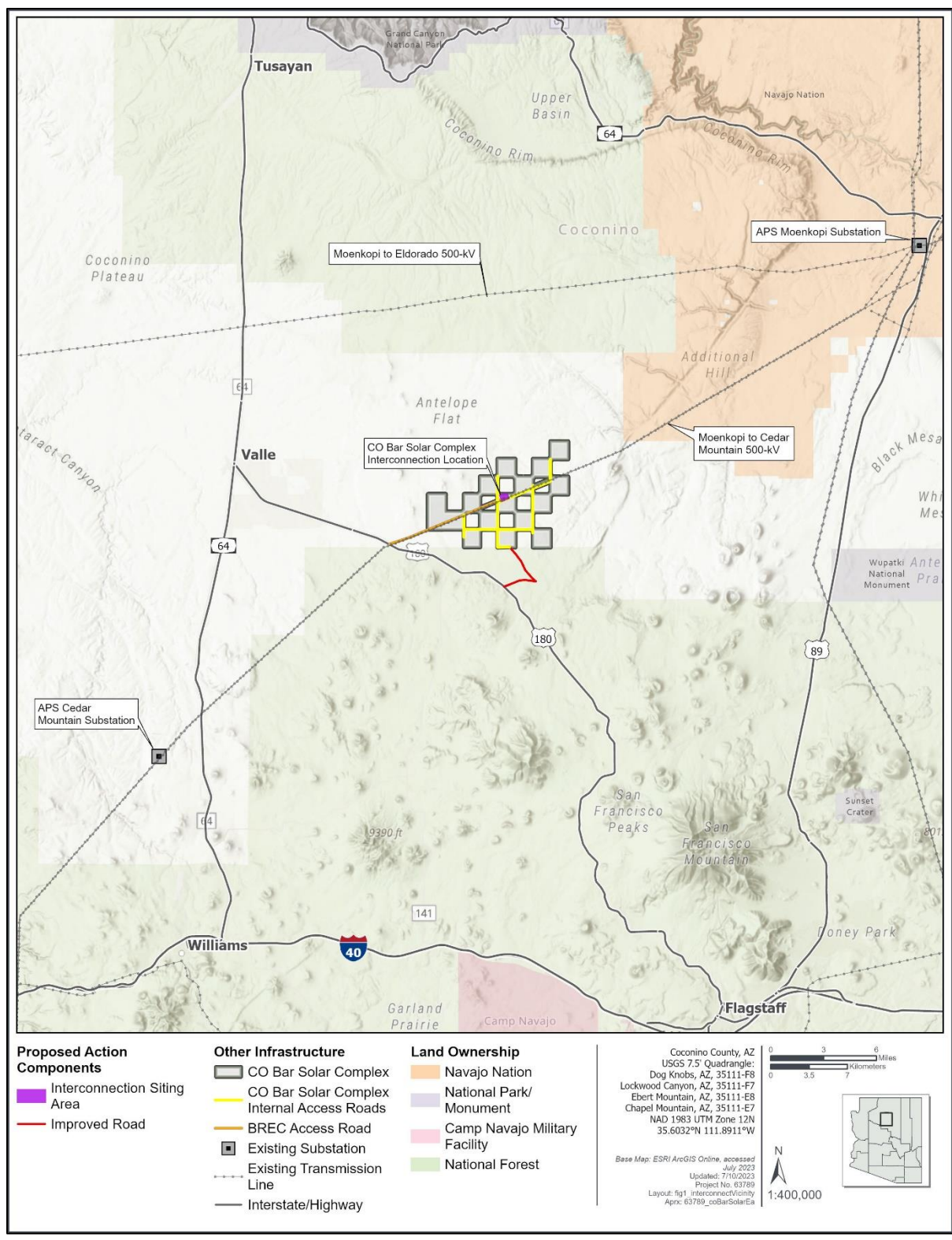


Figure 1. CO Bar Solar Interconnection Project vicinity.

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CO Bar Solar

Interconnection Project

The Forest Plan provides guidance for project and activity decision making, and the COF must ensure that its actions are in accordance with the Forest Plan. The proposed activities occurring on National Forest System (NFS) lands are a project implementing the COF's Forest Plan and are not authorized by the Healthy Forests Restoration Act. Given this, the activities occurring on NFS lands are subject to the pre-decision administrative review process outlined in subparts A and B of 36 CFR 218.

## 1.2 Background

The proposed CO Bar Solar Interconnection Project is part of the CO Bar Solar Complex, a renewable energy project that consists of multiple proposed photovoltaic solar energy facilities generating up to 1,000 megawatts (MW) located on private and ASLD lands (Figure 2). Total generation output of the CO Bar Solar Complex to the NSTS would not exceed 1,000 MW. The CO Bar Solar Interconnection Project would deliver renewable energy into the transmission grid in Arizona and the southwestern U.S. and meet several objectives on the local, State, and federal levels for additional clean, renewable energy supplies to serve the region.

The private lands in the CO Bar Solar Complex Project are in what is commonly known as the Babbitt Ranch, which is a checkerboard of private and ASLD lands used primarily for cattle ranching. All solar facilities would be built on private land. Lands to the southeast of the CO Bar Solar Complex are managed by the COF; land to the southwest and the north are managed by the Kaibab National Forest (NF) (see Figure 2). The Navajo Nation reservation is located approximately 7 miles to the east of the CO Bar Solar Complex.

## 1.3 Project Location

The primary components of the Interconnection Project would include the CO Bar Solar Complex substation, APS 500-kV switchyard improvements, collector lines, intertie line(s), and laydown areas, which would be located on private land in Section 21, Township 26 North, Range 5 East (Gila and Salt River Baseline and Meridian), north of the existing Moenkopi to Cedar Mountain 500-kV transmission line. The final location of the facilities within Section 21 will not be determined until the LGIA and associated engineering studies are completed, but the facilities are shown in their approximate location within the 153-acre interconnection siting area on private land north of the existing 500-kV transmission line (see Figure 3 and 4 in Chapter 2).

Access to the Interconnection Project would use NFSR 417, originating between U.S. Highway 180 (US 180) Mileposts 252 and 253, and then NFSR 9003 to the boundary between the COF and the private lands where the CO Bar Solar Complex would be constructed. NFSR 417 and 9003 are unmaintained graded gravel roads between 20 and 40 feet wide and would be improved as part of the Interconnection Project. The COF access roads are located in Sections 3, 4, 9, 10, 11, and 16 of Township 25 North, Range 5 East.

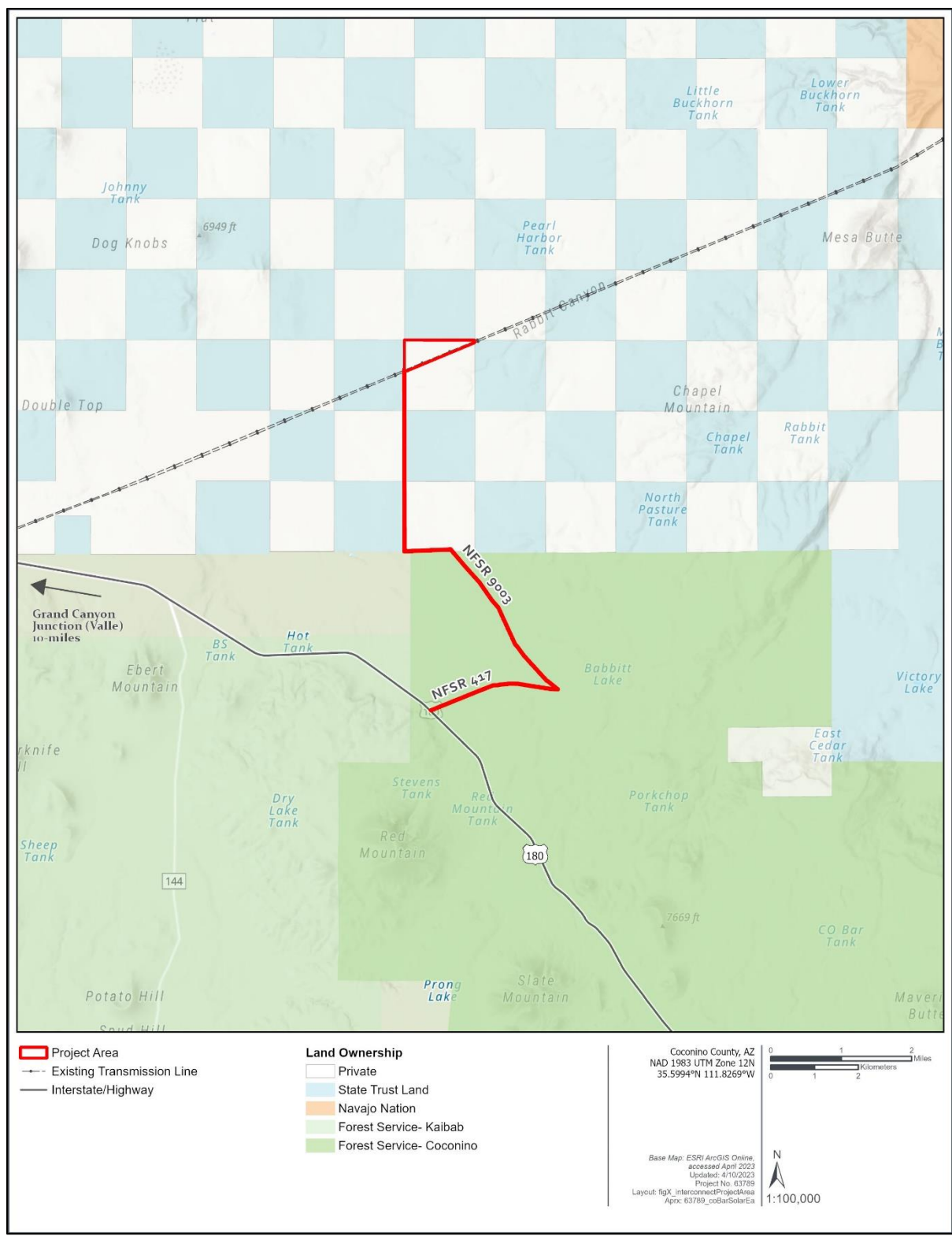


Figure 2. Project area.

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The project area evaluated in this EA includes the 153-acre interconnection siting area and a 100-foot-wide corridor along the COF access roads that would provide access to the interconnection siting area from US 180, as shown in Figure 2. The Interconnection Project would also be accessed from the west via the recently constructed Babbitt Ranch Energy Center (BREC) access road (see Figure 31). This access road is not included in the project area because it is not part of the Proposed Action evaluated in this EA.

## **1.4 Purpose and Need**

As owner of a share of the NSTS, Reclamation's purpose is to consider the large generator application for interconnection of the CO Bar Solar Complex to the NSTS at the Moenkopi to Cedar Mountain 500-kV transmission line and, if appropriate, approve the LGIA.

The need for Reclamation's review and approval of the LGIA request is based on the partial ownership of the NSTS by the U.S. government. The Navajo Generating Station and its associated transmission lines were authorized by the 1968 Colorado River Basin Project Act (Public Law 90-537, 82 Statute 885), and Reclamation manages the federal government's interests. Reclamation, along with the other owners, must approve the proposed interconnection into the NSTS.

The Proponent has applied to the operator (APS) of the Moenkopi to Cedar Mountain 500-kV transmission line to interconnect the CO Bar Solar Complex at the proposed interconnection location. The Proposed Action would deliver renewable energy from the CO Bar Solar Complex to the regional electrical grid via its interconnection to an APS line tap.

The Forest Service's purpose is to respond to CO Bar Solar, LLC's request for legal use and access across NFS lands by granting, if appropriate, an SUP and determining any measures needed to protect forest resources. The need for the COF to respond to an application for an SUP is established in 36 CFR Part 251, Subpart B.

## **1.5 Cooperating Agency**

The COF was invited to be a cooperating agency in preparation of the EA and accepted due to their jurisdiction by law and special expertise, in accordance with 40 CFR 1501.8.

## **1.6 Public Involvement and Agency Consultation**

### **1.6.1 PUBLIC SCOPING AND TRIBAL CONSULTATION**

Planning for the Interconnection Project began in December 2022. The Interconnection Project was published in the Forest Service Schedule of Proposed Actions in January 2023. Reclamation began a 30-day public scoping period on March 10, 2023. A legal announcement requesting public input was published in the *Arizona Daily Sun* on March 10, 2023. As part of the public scoping process, public

interest letters were sent to 96 interested parties including neighboring property owners; Native American tribes; local, State, and federal agencies; and non-governmental organizations. Section 5.2, Agency Coordination and Tribal Consultation, details the agencies and Native American tribes contacted for public scoping.

Reclamation and COF received five responses during the 30-day scoping period. The Arizona State Historic Preservation Office (SHPO) acknowledged receipt of the scoping notice but did not provide any comments. The Western Area Power Administration acknowledged receipt of the scoping notice and requested to be notified when the Draft EA is available but did not provide any comments. The White Mountain Apache Tribe, Western Watersheds Project, and Arizona Trail Association also provided responses, which are summarized in Table 1.

**Table 1. Summary of Public Scoping Comments**

Topic	Comment Summary
Tribal Cultural and Heritage Resources, Historic Properties	The White Mountain Apache Tribe Historic Preservation Office responded that the proposed Interconnection Project would have no adverse effect on the tribe's cultural heritage resources and/or historic properties.
Threatened, Endangered, and Sensitive Species	Western Watersheds Project requested that Reclamation and the COF confer with the U.S. Fish and Wildlife Service and provide an analysis of impacts to the endangered Mexican wolf ( <i>Canis lupus baileyi</i> ).
Livestock Grazing	Western Watersheds Project recommended the EA identify opportunities to reduce the amount of authorized livestock grazing in the project, such as voluntary grazing permit retirement, to mitigate the impacts of the solar facility and COF road improvements on wildlife.
Recreation	The Arizona Trail Association noted the benefits of the proposed Interconnection Project and recommended that impacts to the Arizona National Scenic Trail (AZNST) corridor, which extends 0.5 mile on either side of the trail's centerline, be minimized to the greatest extent feasible.

### 1.6.2 PUBLIC COMMENT PERIOD

Reclamation began a 30-day public comment period for the Draft EA on August 8, 2023. A legal announcement for the Notice of Availability was published in the *Arizona Daily Sun* on August 8, 2023. A Notice of Availability was sent to the same 96 interested parties (including neighboring property owners); Native American tribes; local, State, and federal agencies; and non-governmental organizations contacted during the public scoping process. Reclamation and COF received four responses during the 30-day public comment period, one each from the White Mountain Apache Tribe, the Yavapai-Prescott Indian Tribe, Western Area Power Administration, and the Sierra Club. These comments and Reclamation's responses are summarized in Appendix A.

## 1.7 Changes Between the Draft and Final EA

No changes were made to the EA based on public comment. However, Reclamation-initiated changes were made to the EA to improve the organization of the document, reduce redundancies,

remove irrelevant information, include “adverse” and “beneficial” impact determinations in the summary statements of the environmental consequences, and address all effects from the non-federal alternative under the No Action alternative instead of the cumulative effects analysis.

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## 2 PROPOSED ACTION AND ALTERNATIVES

### 2.1 Proposed Action

Under the Proposed Action, Reclamation would approve the LGIA for the interconnection of the CO Bar Solar Complex to the Moenkopi to Cedar Mountain 500-kV transmission line operated by APS. The associated interconnection facilities would include collection lines, intertie line(s), and substation, as well as improvements within the planned APS 500-kV switchyard. Construction of the facilities would also require temporary laydown yards and line pulling and tensioning sites, which would be reclaimed and revegetated immediately following construction.

The COF would issue an SUP to the Proponent for legal use and access across NFS lands needed for the NFSR access road improvements and maintenance. An SUP is a legal document such as a permit, term permit, lease, or easement that allows occupancy, use, rights, or privileges of NFS lands. The improved Forest Service access roads would be used and maintained for access to the Interconnection Project from US 180.

The major components of the Proposed Action are shown in Figure 3 and 4.

#### 2.1.1 INTERCONNECTION PROJECT COMPONENTS

A summary of the temporary and permanent disturbance associated with the Proposed Action is provided in **Error! Reference source not found.** Temporarily disturbed areas are those that would be reclaimed and revegetated immediately following construction. Permanently disturbed areas are those that would be occupied by project infrastructure and remain disturbed throughout the estimated 37-year operations period. These areas would be reclaimed and revegetated during decommissioning as described in Section 2.1.4. Detailed descriptions of each project component and the associated disturbance are provided in the following sections.

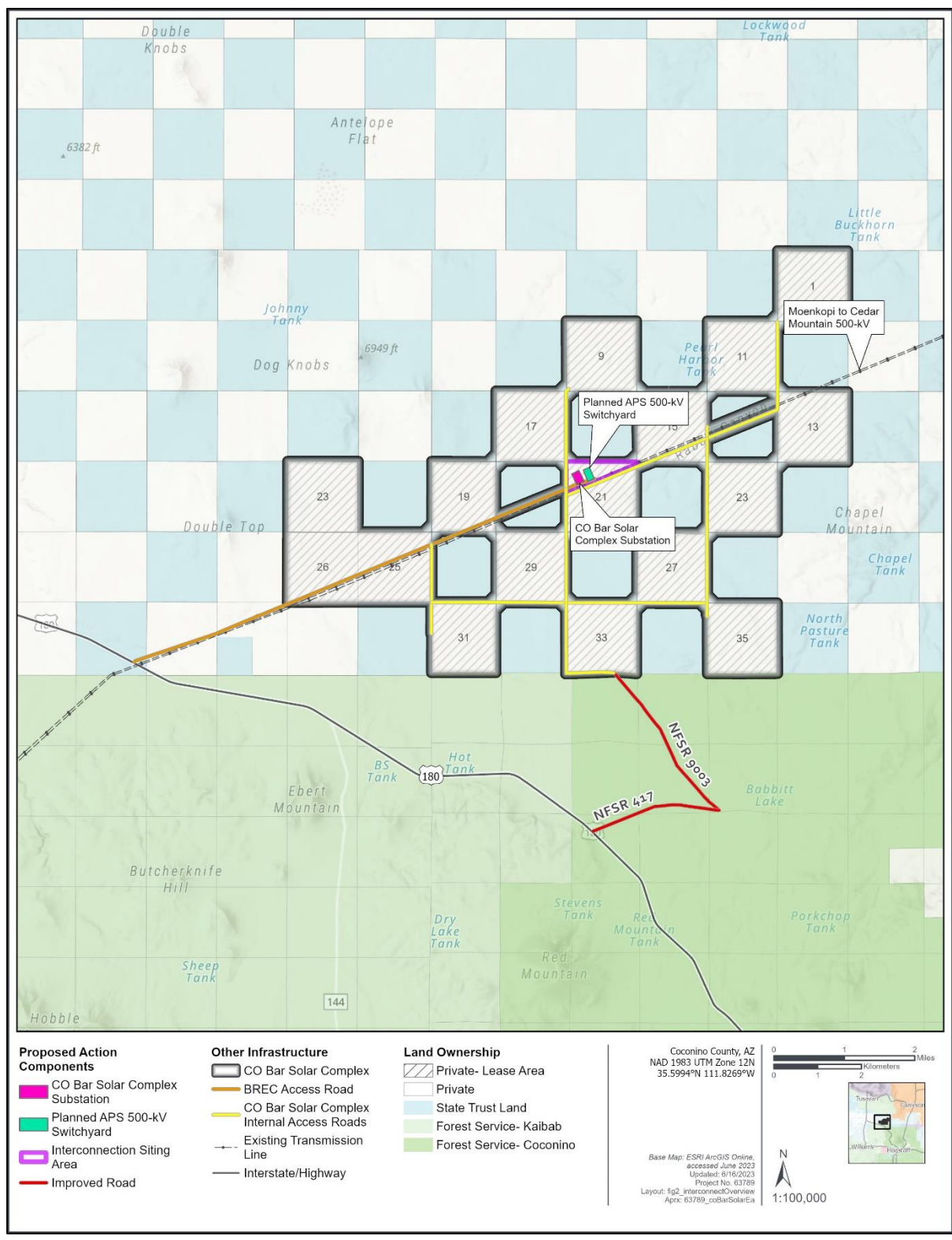


Figure 3. CO Bar Solar Interconnection Project overview.



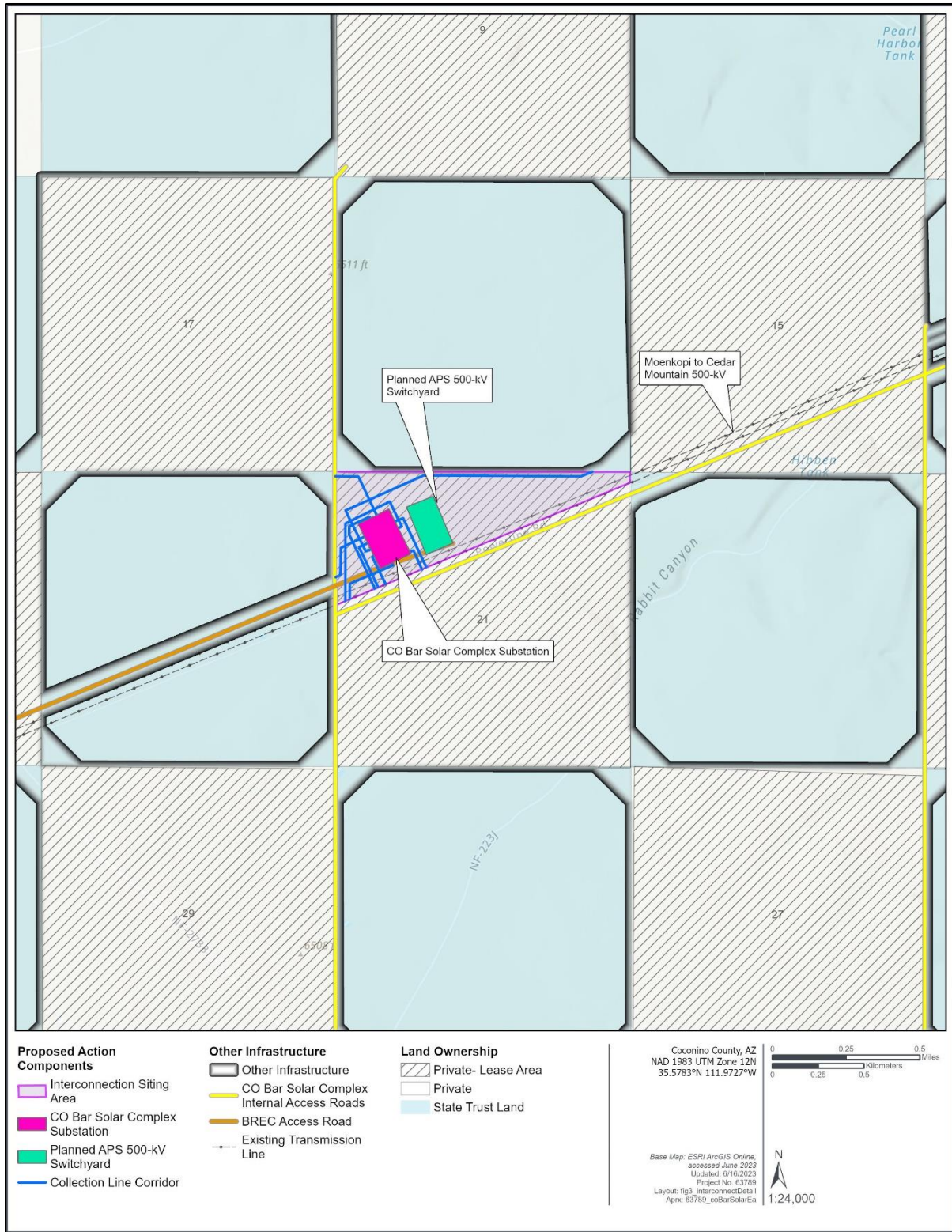


Figure 4. CO Bar Solar Interconnection Project detail.

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**Table 2. Estimated Acres of Temporary and Permanent Disturbance for the Proposed Action**

Project Component	Acres	
	Temporary Disturbance (to be reclaimed)	Permanent Disturbance
CO Bar Solar Complex substation	0.0	13.0
APS 500-kV switchyard improvements	0.0	5.0
Intertie line(s)*	18.8	2.4
Collector lines†	19.5	1.3
Laydown areas	15.8	0.0
NFSR improvements	37.1	17.5
<b>Total</b>	<b>91.2</b>	<b>39.2</b>

\* Disturbance acreages reflect the overhead intertie line option and include temporary disturbance associated with pulling and tensioning sites; if constructed underground, there would be up to 2.3 acres of temporary disturbance and no permanent disturbance (see Section 2.1.1.3 for details).

† Assumes entirety of the collector line corridors would be temporarily disturbed whether constructed underground or overhead; if constructed entirely underground, there would be no permanent disturbance (see Section 2.1.1.1 for details).

### **2.1.1.1 Collector Lines**

All collector lines from the CO Bar Solar Complex would terminate at the collection substation located within the interconnection siting area (see Figure 4). The exact locations of the collector lines may change during final design and engineering; however, the total length of collector lines within the interconnection siting area would be no more than 17,000 feet. Collector lines would be installed underground where soil conditions permit; collector lines would be constructed overhead where excavating trenches is not feasible.

Underground collector lines would be installed in trenches approximately 5 feet wide and up to 20 feet deep, which would be backfilled following installation. Temporary disturbance during underground collector line installation would be approximately 50 feet wide along the entire length of the collector lines (19.5 acres total; see **Error! Reference source not found.**). Where collector lines are buried, disturbed areas would be reclaimed and reseeded following construction, and there would be no permanent disturbance.

Where terrain or soil conditions are unfavorable, collector lines would be installed overhead on poles up to 50 feet tall with spans of approximately 100 to 200 feet. No more than 100 poles for overhead collector lines would be installed in the interconnection siting area. Multiple collector lines may be strung on each set of poles; pole types would be determined during final engineering but could include any combination of wooden or steel pole structures. Overhead collector line construction would consist of excavating holes up to 12 feet deep and 3 feet in diameter, installing the poles, and backfilling the holes with excavated soils. The conductors would then be strung along the poles using line pulling and tensioning trucks. As with underground collector lines, temporary disturbance during construction of overhead collector lines would be approximately 50 feet wide along the entire length of the collector lines. Where collector lines are installed overhead, the

permanent disturbance for each pole would be approximately 15 feet in diameter, which would result in up to 1.3 acres of permanent disturbance from overhead collector lines (see **Error! Reference source not found.**).

### **2.1.1.2 Collection Substation**

The purpose of the collection substation is to step up electricity generated by the CO Bar Solar Complex to the voltage (500-kV) necessary to transmit it across the transmission system.

The collection substation would permanently disturb a 13-acre area (see **Error! Reference source not found.** and Figure 4) and would include electrical equipment such as power transformers, circuit breakers, switchgear, voltage regulators, capacitors, switches, arresters, various monitoring instruments/equipment, and a small control building.

Construction of the substation would begin with site clearing and grading, following which a copper grounding grid would be installed in trenches 2 to 5 feet deep to protect equipment and personnel in the event of electrical malfunctions or lightning strikes. Next, concrete foundations for the control building and major electrical equipment would be poured; these foundations would typically be 5 to 8 feet deep. Once the control buildings and electrical equipment are erected, a final layer of crushed rock surfacing would be installed, possibly with a geotextile-type underlayment to help prevent weeds.

A permanent fence with a secure entrance gate would be installed around the collection substation for security. Permanent fencing would be chain-link fence, treated to minimize reflections off the metal, 6 feet in height, and topped with outward-facing 2-foot barbed-wire strands on top. An auger would be used to dig 9- to 12-inch-diameter holes to a depth of about 38 inches for fence posts, with the dirt excavated from the hole used to backfill the hole and secure the fence post. Security lights would be installed to provide adequate illumination around the substation.

### **2.1.1.3 Intertie Line(s)**

Up to two intertie lines would carry the power from the collection substation to the planned APS 500-kV switchyard where the power would be transferred to the electrical power grid. Since the collection substation would be constructed immediately adjacent to the planned APS 500-kV switchyard, it is expected that the intertie line(s) would only require two dead-end pole structures: one within the collection substation and the other within the planned APS 500-kV switchyard. Additional towers (up to six) may be required if the intertie lines need to be routed to avoid other structures or transmission lines. Each tower would be approximately 80–150 feet tall with spans of no more than 800–1,000 feet between towers. Tower type would be determined during final design and engineering but may include any combination of wooden or steel pole structures or steel lattice towers. Construction methods would be similar to those described for the collector lines in Section 2.1.1.1, but holes up to 20 feet deep may be necessary for the taller poles and concrete tower foundations.

The permanent disturbance area around each tower would be approximately 150 feet in diameter, with the temporary disturbance during construction approximately 250 feet in diameter. If all six

additional towers were constructed, this would disturb up to 6.8 acres, 4.4 acres of which would be temporary disturbance restored following construction, and 2.4 acres of which would remain permanently disturbed over the 37-year operation period. Although the actual disturbance is likely to be less, the maximum disturbance acreages are reported in **Error! Reference source not found.** The temporary disturbance for the intertie lines reported in **Error! Reference source not found.** includes up to 12 acres of additional temporary disturbance for line pulling and tensioning sites within the interconnection siting area.

#### **2.1.1.4 APS Switchyard Improvements**

APS plans to construct a 500-kV switchyard adjacent to the Moenkopi to Cedar Mountain transmission line on approximately 10 acres within the interconnection siting area as part of the BREC (Reclamation 2022) (see Figure 4). Construction of the APS switchyard will begin in 2023 separately from the Interconnection Project and is not evaluated in this EA because APS would construct the switchyard independently from the Interconnection Project and without federal involvement. For the Interconnection Project, APS would construct two new bays on approximately 5 acres within the existing 10-acre switchyard footprint. The Interconnection Project intertie line(s) would dead-end into these bays. No additional improvements are anticipated to the APS facilities outside of the previously evaluated 10-acre switchyard footprint.

Components of the new switchyard bays and construction methods would be similar to those described for the collection substation in Section 2.1.1.2 and would permanently disturb approximately 5 acres within the existing 10-acre switchyard footprint (see **Error! Reference source not found.**).

#### **2.1.1.5 Laydown Areas**

The proponent would establish a 10-acre temporary laydown area during construction near the collection substation; APS would also temporarily establish a 5.8-acre laydown yard during the improvements to their planned 500-kV switchyard. Both laydown yards would be located within the interconnection siting area.

#### **2.1.1.6 Access Roads**

No new access roads would be constructed under the Proposed Action. Access from the west would use an existing access road constructed for the BREC project, a 7.5-mile-long graded gravel road 16 to 30 feet wide (see Figure 3). Access from the south would be provided via an approximately 1.9-mile segment of NFSR 417 and 2.6-mile segment of NFSR 9003 between US 180 and the CO Bar Solar Complex boundary. From the solar complex boundary to the interconnection siting area, access would follow the internal access roads constructed for the CO Bar Solar Complex prior to the Interconnection Project (see Figure 3 and Section 4.1, Past, Present, and Reasonably Foreseeable Future Actions).

Under the Proposed Action, NFSR 417 and 9003 would be resurfaced and widened (where needed) to accommodate the delivery of equipment and materials. The existing subgrade would be bladed, scarified, moisture-conditioned, and recompacted to a minimum density of 95 percent. Then a layer of all-weather aggregate base would be installed at a thickness determined by the results of a geotechnical analysis and any jurisdictional requirements.

The improved road surface would consist of two 12-foot travel lanes with 4-foot shoulders (32 feet wide total), centered approximately on the existing road centerline, and would permanently impact an area of 17.5 acres. The existing road surface of NFSR 417 is approximately 30 to 40 feet wide, and the existing road surface of NFSR 9003 is approximately 20 feet wide. As such, most improvements to NFSR 417 would occur within the existing road prism, while NFSR 9003 would be physically widened by approximately 12 feet.

A 100-foot-wide corridor (50 feet on either side of the existing road centerlines) would be identified along both NFSRs 417 and 9003, which would allow for road widening and potential disturbance during ongoing road use and maintenance throughout the term of the permit. The EA assumes that the entire 100-foot-wide corridor—or approximately 54.6 acres—would include some level of disturbance during the 1-year construction period, 17.5 acres of which would remain disturbed throughout the life of the Interconnection Project (as described above) and 37.1 acres of which would be temporary disturbance restored following construction (see **Error! Reference source not found.**). However, it is expected that temporary disturbance would be unlikely to extend more than 20 feet beyond the 32-foot-wide improved road prism (i.e., up to 36 feet on either side of the existing road centerlines) during initial road widening, and long-term operation and maintenance.

The road surface would be maintained periodically throughout the 37-year operations period, as needed. Any temporary disturbance from road maintenance that extends beyond 32-foot improved road prism would be immediately restored following maintenance activities, adhering to the same procedures as interim reclamation following construction (see Section 2.1.2.4).

## **2.1.2 CONSTRUCTION METHODS**

### **2.1.2.1 Workforce**

Construction of the Interconnection Project would require approximately 30 to 50 workers over a 12-month period. The work force is expected to be drawn from surrounding communities, northern Arizona, the Phoenix metropolitan area, and from crews traveling with the contractor to various job sites.

### **2.1.2.2 Transportation and Equipment**

During construction, the Interconnection Project would be accessed from US 180 via the access roads shown on Figure 3 and described in Section 2.1.1.6. Equipment required for construction of the interconnection would include heavy civil equipment for site preparation, clearing, leveling, and foundation installation, as well as cranes to assemble and lift the structures into place (see Table 3

for further details). The BREC access road and COF access roads would also be used for construction, operation, and decommissioning of the CO Bar Solar Complex. This traffic would be in addition to the traffic related to the Interconnection Project, and is discussed in Chapter 4, Cumulative Effects. Table 4 provides daily traffic estimates for the Interconnection Project. Trips would likely be divided evenly between the two proposed access routes.

**Table 3. Construction Vehicles and Equipment**

Activity	Equipment
Road improvements, site preparation, and clearing	1 motor grader, 1 pickup truck, 1 bulldozer, 1 backhoe
Materials hauling	1 tractor trailer, 1 tractor-mounted crane, 1 pickup truck, 1 flatbed truck
Preparation of concrete foundations and transmission structures sites	1 bulldozer or motor grader, 1 pickup truck, 1 flatbed truck
Transmission structure excavation, hole augering, foundations	1 mounted auger truck, 1 backhoe, 1 pickup truck, 1 air compressor
Structure assembly	1 to 2 hydraulic cranes, 2 pickup trucks, 2 flatbed trucks, 1 air compressor
Wire stringing	1 puller, 1 tensioner, 2 reel-stringing trailers, 1 materials truck, 1 bulldozer, 2 to 3 pickup trucks
Revegetation and restoration	1 bulldozer with ripper, 1 grader, 1 front-end loader, 1 tractor with harrow/disk, 1 pickup truck

**Table 4. Estimated Traffic Volumes**

Phase (Year)	Interconnection Project Traffic
Construction (Year 1)	25 round trips per day (average) 50 round trips per day (maximum)
Operation (Years 2–38)	5 round trips per day
Decommissioning (Year 39)	25 round trips per day

### **2.1.2.3 Construction Power, Water, and Mineral Materials**

Power for construction would be provided by either an on-site diesel generator, station service power from the planned APS 500-kV switchyard, or the distribution line constructed for BREC. The diesel generator and any poles or other structures needed to provide station service power would be constructed within the disturbance footprint of other Interconnection Project facilities and would not result in any additional ground disturbance.

Construction water would be used for dust control, equipment washing, foundation construction, and other needs. Approximately 2 acre-feet of water (650,000 gallons) would be used during construction of the Interconnection Project, primarily for dust suppression. The water source options listed here are being evaluated for the CO Bar Solar Complex, and the same source would be used to provide water for the Interconnection Project:

- Drilling on-site well(s) on private or ASLD-administered land within the CO Bar Solar Complex prior to the start of construction, to fill temporary water bladders or aboveground tanks;
- Purchasing water from local ranches; and/or
- Purchasing water from nearby towns and/or water districts and trucking to the site.

Mineral materials such as sand and gravel for construction and road base would be sourced from sand and gravel deposits from an Arizona Department of Transportation (ADOT)-permitted external source located regionally. The materials source would be identified approximately 6 months prior to the start of construction.

#### **2.1.2.4 Reclamation and Revegetation**

Post-construction, the temporary disturbance areas (approximately 91.2 acres; see **Error! Reference source not found.**) would be reclaimed and revegetated in accordance with the County-approved Revegetation Plan prepared for the CO Bar Solar Complex. The Revegetation Plan will describe pre-construction conditions, methods for restoring temporary construction disturbance, and monitoring, treatment, and success standards. Reclamation of temporary construction disturbance typically consists of regrading areas to mimic surrounding natural contours and revegetating with an approved weed-free native seed mix. Weed-free mulch may be applied as required to provide additional erosion control. Ungraded areas disturbed by overland travel would be assessed to determine if reclamation is needed for recovery of the area.

On COF lands, Forest Service–approved weed-free material sources (seed, mulch, fill) would comply with *Guidelines for Weed-Free Seed, Forage, Mulch, and Fill Materials in Region 3* (Forest Service 2015), which recommends that local staff be involved with selecting, inspecting, and approving sources.

### **2.1.3 PROJECT OPERATION**

Once construction is complete, CO Bar Solar Complex on-site personnel would operate and maintain the Interconnection Project facilities. APS would be responsible for long-term operation and maintenance of their 500-kV switchyard. Routine preventative maintenance would occur on an approximately 6-month basis, and unplanned maintenance would occur as required. These activities would primarily consist of one to two technicians visiting the site and visually inspecting the facilities.

Operations and maintenance personnel and equipment accessing the site for the Interconnection Project would be minimal during operations. Up to five personnel would conduct routine maintenance, and equipment used would typically consist of passenger vehicles and light-duty

trucks. Other vehicles and equipment would be rented and brought to the site on an as-needed basis.

The BREC access road and COF access roads would continue to be used for access to the Interconnection Project during operations (see Table 4). Operations traffic for the CO Bar Solar Complex is discussed in Chapter 4, Cumulative Effects. Road maintenance activities would occur periodically, as needed, throughout the 37-year operations period.

Power for the interconnection facilities would be provided by station service power from the APS 500-kV switchyard or the distribution line constructed for BREC. Backup power would be provided by the diesel generator, which would only be used in the event of power outages from the primary power source or during emergencies. Water is not anticipated to be needed during operations and maintenance. If water is required for unplanned maintenance, it would be obtained from a permitted source within the CO Bar Solar Complex.

Monitoring and treatment of non-native plants and noxious weeds during operations would be conducted in accordance with the County-approved Noxious Weed Management Plan prepared for the CO Bar Solar Complex.

#### **2.1.4 PROJECT DECOMMISSIONING**

The Interconnection Project has an anticipated useful life of at least 37 years, coinciding with the operations period of the CO Bar Solar Complex. The goal of decommissioning would be to remove the collection substation, collector lines, and intertie line(s) and return the site to a condition as close to a pre-construction state as feasible. All decommissioning and reclamation would be completed in compliance with applicable federal, State, and local requirements. Decommissioning of the Interconnection Project would be conducted in accordance with the County-approved Revegetation Plan and Decommissioning Plan that will be prepared for the CO Bar Solar Complex, which will include a description of pre-construction conditions (including non-native plants and noxious weed populations), methods to be used to restore disturbed areas, and specific success standards for revegetation.

Shallow foundations (< 36 inches below ground), like that for the substation, would be removed in their entirety. Foundations deeper than 36 inches below the ground surface would be left in place as removal to greater depths would cause greater environmental impacts than leaving them in place. All excavated concrete and steel debris would be removed from the site. Voids left by the removed concrete foundations would be filled with native material and restored to original grade.

Areas disturbed during decommissioning would be restored as near as possible to their original condition and would be available for the same uses that existed prior to construction. Approximately 1 acre-foot of water would be used during decommissioning, primarily for dust suppression.

The APS 500-kV switchyard will be owned and operated by APS as part of their transmission system and would not be decommissioned.



The BREC access road and COF access roads would continue to be used for access to the Interconnection Project during decommissioning (see Table 4). Decommissioning traffic for the CO Bar Solar Complex is discussed in Chapter 4, Cumulative Effects. Road maintenance would continue to occur during the 1-year decommissioning period, if needed. At the end of decommissioning, NFSR 9003 would be reclaimed down to its pre-construction width (approximately 20 feet); no reclamation would be necessary for NFSR 417 as it would not require widening in most places.

### 2.1.5 BEST MANAGEMENT PRACTICES

The best management practices (BMPs) incorporated as part of the Proposed Action are listed in Table 5. The environmental effects analysis conducted for this EA considers environmental effects after these BMPs are implemented. Implementation of BMPs would be required.

**Table 5. Best Management Practices to Avoid, Minimize, and Mitigate Impacts**

Resource	Best Management Practice
Aesthetics and Scenery Resources	<ul style="list-style-type: none"> <li>The Interconnection Project will use the minimum amount of lighting necessary to meet safety and security needs. Low-intensity lighting (such as LEDs and low-pressure sodium lamps) and motion sensors will be used, and all lighting will be directed downward and fully shielded.</li> <li>Lighting will comply with the Coconino County Zoning Ordinance (Coconino County 2022a) and a lighting permit will be obtained prior to the installation of any outdoor lighting.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>Dust control measures approved by Coconino County, such as road watering, shall be implemented during construction.</li> <li>Vehicle speeds on access roads will be limited to 25 miles per hour.</li> </ul>
General Wildlife	<ul style="list-style-type: none"> <li>Site fencing will be designed to meet the Arizona Game and Fish Department's (AGFD's) standards for wildlife-compatible fencing as appropriate.</li> <li>The contractor will fill trenches in a reasonable time frame, cover them at night, and provide escape ramps for wildlife when not in use or covered. Trenches that have been left unattended for an extended period (such as overnight) will be inspected, and wildlife removed prior to backfilling.</li> <li>Notations summarizing permit conditions related to wildlife, such as timing restrictions and survey requirements, shall be included on construction documents.</li> <li>The Interconnection Project will be included in the County-approved Wildlife Protection Plan prepared for the CO Bar Solar Complex, which will include measures to avoid or minimize impacts to wildlife and their habitat and regular reporting to Coconino County through the operations period. If impacts occur that are greater than anticipated, the Proponent will work with the County to develop reasonable measures to address those impacts.</li> </ul>

Resource	Best Management Practice
Cultural Resources	<ul style="list-style-type: none"> <li>• The Interconnection Project will be included in the County-approved Cultural Resources Management Plan. This plan will describe any measures that will be implemented to avoid or minimize impacts to cultural resources, including specific avoidance and/or monitoring measures for known cultural sites, as well as procedures that will be implemented in the event of an unanticipated discovery of previously unidentified cultural resources.</li> <li>• Imported earthen material, if needed, would come from ADOT-approved borrow sources.</li> <li>• Cultural resources awareness training will be implemented for project personnel prior to construction.</li> </ul>
Land Use and Access	<ul style="list-style-type: none"> <li>• Access for residents, recreational users, and emergency vehicles on public roads to be used by the Interconnection Project will be maintained.</li> </ul>
Migratory Birds	<ul style="list-style-type: none"> <li>• Active nest surveys will be conducted by a qualified biologist prior to any clearing, grubbing, or tree/limb removal during the bird breeding season (February 1 to August 31). Such surveys will be conducted no more than 7 days prior to vegetation removal or ground disturbance. If active nests are discovered, an avoidance buffer would be established in coordination with the Reclamation or Forest Service biologist, as appropriate.</li> <li>• Aboveground power lines shall comply with the Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006) and Reducing Avian Collisions with Power Lines (APLIC 2012).</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Operational noise impacts from the project shall not exceed 50 A-weighted decibels at the property line. Compliance testing shall be conducted to ensure the facility meets the required audible noise limit.</li> </ul>
Soils	<ul style="list-style-type: none"> <li>• Impacts to soils from erosion and stormwater runoff will be minimized or avoided by following the measures in the Stormwater Pollution Prevention Plan (SWPPP).</li> </ul>
Special-Status Species	<ul style="list-style-type: none"> <li>• A Worker Environmental Awareness Program (WEAP) will be prepared. All on-site personnel will participate in WEAP training prior to starting work on the project site. The WEAP training will include a review of the special-status species and other sensitive resources that could exist in the project area, the locations of sensitive biological resources and their legal status and protections, and measures to be implemented for avoidance of these sensitive resources.</li> <li>• To minimize the potential for direct and indirect impacts to COF sensitive plants, the Proponent will be required to survey the road corridor for the COF access road improvements prior to any vegetation-clearing or ground-disturbing activities. Any COF sensitive plants identified will be marked for avoidance; if avoidance is not possible, the Proponent will coordinate with the COF botanist to salvage and relocate the individuals.</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>• The Interconnection Project will be included in the County Engineer–approved Traffic Control Plan, which will include measures to minimize impacts to travelers on US 180.</li> <li>• A Traffic Impact Analysis shall be submitted meeting the scope determined by ADOT. All improvements identified or required by ADOT shall be completed by the Proponent. Encroachment permits shall be obtained from ADOT for all access to, or work completed in the right-of-way for US 180.</li> </ul>

Resource	Best Management Practice
Vegetation	<ul style="list-style-type: none"> <li>• Grading will be kept to a minimum to preserve existing vegetation, landforms, and topography. Where grading is necessary, topsoil shall be removed, stockpiled, and used for site reclamation and revegetation during decommissioning.</li> <li>• All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities.</li> <li>• The Interconnection Project will be included in the County-approved Revegetation Plan that will be prepared for the CO Bar Solar Complex, which will describe specific procedures for minimizing ground disturbance during construction and for reclamation and revegetation of temporarily disturbed areas following construction.</li> </ul>
Non-native Plants and Noxious Weeds	<ul style="list-style-type: none"> <li>• The Interconnection Project will be included in the County-approved Noxious Weed Management Plan that will be prepared for the CO Bar Solar Complex, which will describe preventative measures to minimize or avoid the introduction or spread of non-native plants and noxious weeds as well as specific mechanical and chemical control measures and monitoring procedures.</li> </ul>
Waste and Hazardous Materials Management	<ul style="list-style-type: none"> <li>• Clearing and disposing of trash, debris, and vegetation on those portions of the site where construction will occur will be performed at the end of each workday through all stages of construction. Disposal of non-hazardous cuttings and debris will be in an approved facility designed to handle such waste. Any wastewater will be disposed of in accordance with federal, State, and county regulations.</li> <li>• A Spill Prevention, Control, and Countermeasures Plan will be developed for the proposed facility and will have information about training, equipment inspection and maintenance, and refueling for construction vehicles, with an emphasis on minimizing spills.</li> <li>• During operations, potentially hazardous materials will be stored in approved, aboveground containers with appropriate spill containment features.</li> </ul>
Water Resources	<ul style="list-style-type: none"> <li>• The Proponent shall submit one of the following: (1) A U.S. Army Corps of Engineers (USACE) 404 Permit; or (2) a letter from a qualified third-party consultant stating the project is exempt from a USACE 404 Permit along with documentation supporting this claim (e.g., letter from USACE).</li> <li>• Final grading and drainage plans will be completed and submitted to Coconino County for approval prior to construction. The final drainage and grading plans will demonstrate that downstream flows would not be adversely impacted due to any proposed changes to natural washes resulting from proposed grading, drainage management measures, or the addition of retention ponds.</li> <li>• A SWPPP would be submitted to the Arizona Department of Environmental Quality to obtain a Notice of Intent prior to construction. The SWPPP will identify measures to control erosion and off-site migration of sediment.</li> </ul>
Wildfire Risk	<ul style="list-style-type: none"> <li>• The Interconnection Project will be included in the County-approved Public Safety, Fire Protection, and Emergency Management plan that will be prepared for the CO Bar Solar Complex.</li> <li>• The subject properties shall annex into any nearby newly established fire districts unless this is determined to be unfeasible by the Coconino County Community Development Director.</li> </ul>

## 2.2 No Action Alternative

Under the No Action alternative, Reclamation would not approve the proponent's LGIA request, and the CO Bar Solar Complex would not interconnect with the NSTS. The COF would not approve the proponent's SUP application, there would be no improvements to NFSR 417 or NFSR 9003, and these roads would not be used to access the Interconnection Project.

Without Reclamation's approval of the LGIA, the Proponent would submit an LGIA request for interconnection to the Moenkopi to Eldorado 500-kV transmission line to the north of the CO Bar Solar Complex, which is owned and operated by Southern California Edison and has available capacity. The interconnection request would enter the Southern California Edison queue and require feasibility and system impact studies.

All facilities for this interconnection option would be built on private and/or ASLD lands. The CO Bar Solar Complex substation and associated collection lines would still be constructed in the interconnection siting area; however, a 19-mile-long generation-tie (gen-tie) line and access road across private and ASLD lands would be necessary to deliver power to the alternative point of interconnection on the Moenkopi to Eldorado 500-kV line (Figure 5). This would also require construction of a new line tap and 500-kV switchyard since there are no existing or planned interconnection facilities at this point of interconnection. Additional temporary laydown yards and line pulling and tensioning sites would be needed due to the increased length of the gen-tie. The planned APS 500-kV switchyard would not be improved to accommodate the Interconnection Project, and the associated temporary laydown yard would not be needed.

Under the No Action alternative, the CO Bar Solar Complex substation and associated collection lines would be accessed using the existing BREC access road. There would be no traffic from the alternative interconnection project on NFSRs 417 and 9003. The CO Bar Solar Complex internal access roads (see Figure 3), which will consist of graded gravel travel surface up to 32 feet wide, would still be constructed under the No Action alternative but would not be accessed to the south from NFSR 9003.

Temporary and permanent disturbance associated with the No Action alternative are shown in Table 6. Approximately 14.3 acres of the 87.3 acres of permanent disturbance and 29.5 acres of the 426.5 acres of temporary disturbance would occur within the interconnection siting area on private land within Section 21.

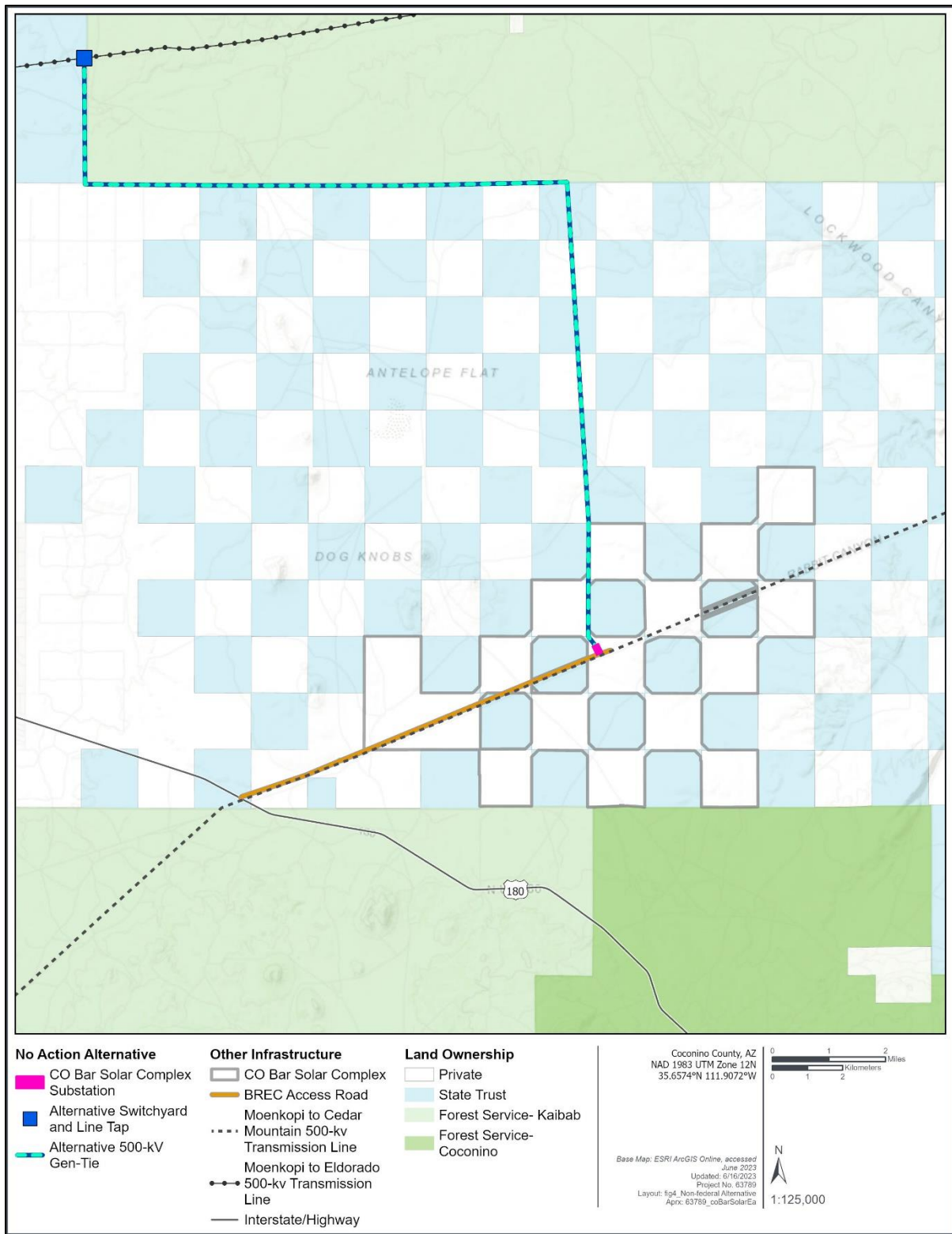


Figure 5. Alternative interconnection for the CO Bar Solar Interconnection Project.

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**Table 6. Estimated Acres of Temporary and Permanent Disturbance for the No Action Alternative**

Project Component	Acres	
	Temporary Disturbance (to be reclaimed)	Permanent Disturbance
CO Bar Solar Complex substation	0.0	13.0
New 500-kV switchyard	0.0	5.0
Collector lines <sup>†</sup>	19.5	1.3
Laydown areas	10.0	0.0
500-kV gen-tie line and access road	397.0	87.3
<b>Total</b>	<b>426.5</b>	<b>87.3</b>

Since the CO Bar Solar Complex has a feasible interconnection option that does not include federal land or federal approvals, the energy center retains independent utility under NEPA. The CO Bar Solar Complex would not depend on Reclamation authorization of the requested interconnection and would not be a connected action under NEPA. Access to the interconnection site would only occur via the BREC access road, and the NFSR improvements and an SUP from the Forest Service would no longer be required. Therefore, the scope of analysis under review in the EA is limited to the CO Bar Solar Interconnection Project. The CO Bar Solar Complex is discussed in Chapter 4, Cumulative Effects.

## 2.3 Alternatives Considered but Eliminated from Further Study

Council on Environmental Quality (CEQ) regulations define reasonable alternatives as those “...that are technically and economically feasible, and meet the purpose and need for the proposed action” (40 CFR 1508.1(z)). Alternatives eliminated from further study include those that are infeasible or purely conjectural possibilities whose implementation is remote and speculative. Reclamation’s purpose is to respond to the Proponent’s application for an LGIA for the interconnection of the 1,000 MW CO Bar Solar Complex to the NSTS. The Forest Service’s purpose is to respond to the Proponent’s request for legal use and access across NFS lands by granting, if appropriate, an SUP and determining any measures needed to protect forest resources (see Section 1.4, Purpose and Need).

Alternatives to the proposed interconnection considered but eliminated from further study include alternative points of interconnection on the Moenkopi to Cedar Mountain 500-kV transmission line. While there are several other feasible points of interconnection within and adjacent to the project area, the planned APS 500-kV switchyard would be able to accommodate the CO Bar Solar Interconnection Project. Therefore, alternative interconnection locations on the Moenkopi to Cedar Mountain 500-kV transmission line would result in increased costs and environmental impacts due to the need for an additional line tap and switchyard, as well as a 500-kV gen-tie line from the CO Bar Solar Complex substation. Any changes to the proposed point of interconnection would require modifications to the interconnection request as well as additional technical and feasibility studies from APS.

Alternatives to the proposed COF SUP considered but eliminated from further study include construction of a new access road across Kaibab NF lands. While this would provide a more direct route of access from the south and would minimize conflicts with users of NFSRs 417 and 9003, construction of a new access road would result in increased costs and greater environmental impacts than improving the existing COF access roads. Further, the guidelines in the Forest Plan indicate that access to private parcels should be managed to reduce the proliferation of roads while meeting legal obligations for access (Forest Service 2018a: p. 106). Therefore, this alternative was not carried forward for detailed analysis in this EA.

None of the comments received during the public scoping period or Draft EA comment period suggested additional alternatives for analysis in the EA (see Section 1.6.1, Public Scoping and Tribal Consultation, and Appendix A). Reclamation is not aware of other available alternatives that would involve a discretionary decision by Reclamation or the COF.

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## 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter presents the existing conditions and the resources in the project area that have the potential to be affected and discloses the potential environmental effects that would be reasonably expected from implementing the Proposed Action and alternatives.

Environmental consequences are analyzed based on direct and indirect effects on resources under consideration within the analysis area. The analysis areas for each resource are shown in Figure 6; the analysis time frame for all resources is the life of the Interconnection Project, which coincides with that of the CO Bar Solar Complex (39 years). Cumulative effects are discussed in Chapter 4.

The CEQ defines direct effects as those that are caused by the action and occur at the same time and place, and it defines indirect effects as those that are caused by the action and occur later in time or farther removed in distance. BMPs or other mitigative or protective measures described in the following sections are considered part of the Proposed Action and are taken into consideration when predicting environmental consequences.

### 3.1 Impact Analysis Methods and Terminology

The impact analysis for each resource is focused only on areas where the applicable resource is likely to be impacted by the Proposed Action and alternatives. However, not all resources would experience impacts within the project area, and not all impacts from the Proposed Action or alternatives would extend across the entire analysis area.

For each resource, this chapter describes the current conditions, followed by an analysis of the impacts of the Proposed Action and alternatives using the following impact type descriptors:

- **Direct**—A direct impact is an impact to a resource that is caused by the action and occurs at a particular time and place.
- **Indirect**—An indirect impact is an impact to a resource that is caused by the action later in time or farther away and is still reasonably foreseeable (e.g., increased likelihood of non-native, invasive species moving into the area after disturbance).
- **Short-term**—A short-term impact is an impact to a resource that would be less than 5 years in duration, including temporary disturbance during construction and decommissioning.
- **Long-term**—A long-term impact is an impact to a resource that would be greater than 5 years in duration.



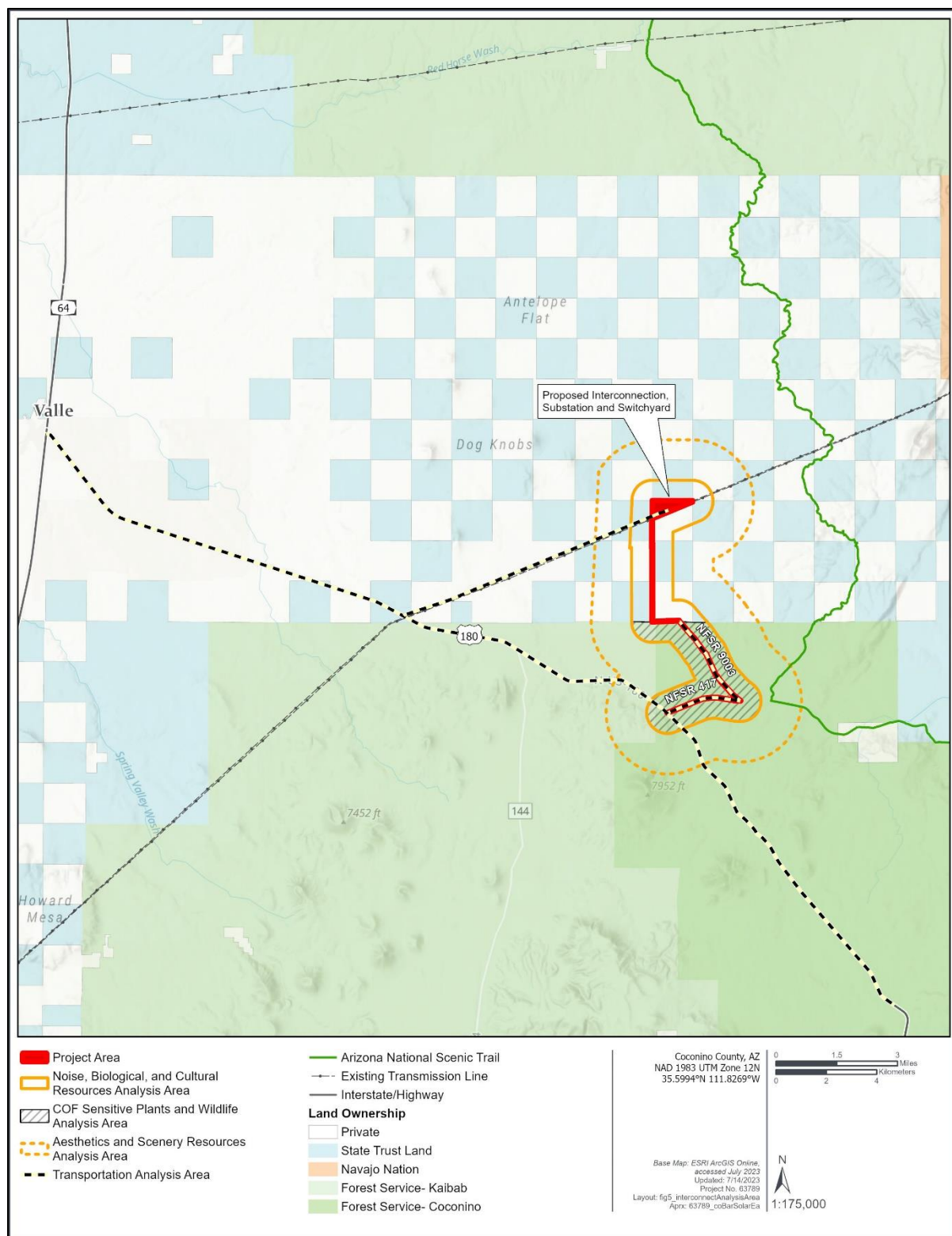


Figure 6. Project area and resource analysis areas.

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- Negligible—This indicates no measurable or observable change from current conditions: The impact to the resource would be at or below the levels of detection.
  - Minor or minimal—This indicates a small, detectable, or measurable change. The impact could be
    - outside the range of natural or typical variability but occur for a very brief duration; or
    - within the natural or typical range of variability but occur for a longer period of time. Mitigation, if implemented, would be easily applied and successful with a high degree of certainty.
  - Moderate—This indicates an easily discernible or measurable change. The effects would either
    - be readily apparent or would result in measurable impacts to the resource; these impacts would affect the availability or natural recovery of those environmental elements over the long-term; or
    - could be substantial but of a short duration with no permanent impact to the resource. It is anticipated that mitigation, if implemented, would be successful with a high degree of certainty, based on prior examples with similar effects and documented mitigation outcomes.
  - Major—This indicates a large observable or measurable change. The effects would result in substantial impacts to the resource that would be readily apparent, consequential, and outside the natural or typical range of variability. Mitigation, if implemented, would be uncertain in its success, or ineffective with consequent long-term and permanent changes in the availability or natural recovery of the resource.
  - Beneficial—This indicates a positive change in the condition, appearance, or function of the resource.
  - Adverse—This indicates a negative change that moves the resource away from or detracts from its condition, appearance, or function.

The analysis captures effects to the extent reasonably possible, based on the best available information.

## 3.2 Resource Considerations

Reclamation and COF developed a list of preliminary resources to address in the EA using comments from the public, agencies, tribes, and the internal interdisciplinary teams. Resources carried forward for detailed analysis in Chapter 3 and the effect indicators used to assess the effects of each alternative are listed in Table 7. Resources that do not require detailed analysis to address potential environmental effects and the rationale for that determination are listed in Table 8 **Error! Reference source not found.** The resources in Table 8 were evaluated and determined to be either not affected or minimally affected with implementation of BMPs, which are summarized in Table 5. **Error! Reference source not found.**

**Table 7. Resources Carried Forward for Detailed Analysis in the EA**

Resource	Analysis Issue	Effect Indicator
<b>Biological Resources</b>		
<i>Vegetation</i>	How would the Proposed Action affect native vegetation?	Acres of temporary and permanent disturbance to vegetation.
<i>General Wildlife</i>	How would the Proposed Action affect general wildlife species?	Acres of temporary and permanent disturbance to habitat for general wildlife; timing and length of human disturbances.
<i>Migratory Birds</i>	How would the Proposed Action affect nesting migratory birds?	Acres of temporary and permanent disturbance to habitat for migratory birds; timing and length of human disturbances.
<b>Special-Status Species</b>		
<i>Monarch Butterfly</i>	How would the Proposed Action affect the monarch butterfly and its habitat?	Acres of temporary and permanent disturbance in suitable breeding or foraging (nectar-producing) vegetation.
<i>Mexican Wolf</i>	How would the Proposed Action affect the Mexican wolf and its habitat?	Acres of temporary and permanent disturbance in habitat for Mexican wolf; timing and length of human disturbances.
<i>Special-Status Plants</i>	Would the Proposed Action result in special-status plant species population declines?	Acres of impact to known populations of special-status plant species and acres of temporary and permanent disturbance in habitat for species with the potential to occur in the project area.
<i>Other Special-Status Wildlife</i>	Would the Proposed Action result in special-status wildlife species population declines?	Acres of temporary and permanent disturbance in habitat for species with the potential to occur in project area; timing of and length of human disturbances.
<b>Cultural Resources</b>	How would ground-disturbing activities associated with the Proposed Action affect the integrity of historic properties and those cultural resources treated as eligible for the National Register of Historic Places (NRHP)?	Physical destruction/damage to all or part of a historic property that results in the loss or degradation of the property's integrity (i.e., physical character-defining features) that qualify it for the NRHP or Arizona Register of Historic Places, including the number of historic properties that would be impacted by ground-disturbing activities associated with construction, operation, and decommissioning.

Resource	Analysis Issue	Effect Indicator
Noise	Would the project affect sensitive noise receptors?	Project-related noise levels (in decibels).
Transportation	How would traffic associated with the Proposed Action impact existing traffic patterns on US 180, NFSR 417, and NFSR 9003?	Number of vehicle trips associated with construction, operation, and decommissioning.
Aesthetics and Scenery Resources	How would the Proposed Action impact landscape character?	Change in visual contrast from sensitive viewing locations.

**Table 8. Resources Not Analyzed in Detail in the EA**

Resource	Dismissal Rationale and Findings
Air Quality	Coconino County, where the project area is located, is in an attainment area for all criteria pollutants regulated under the National Ambient Air Quality Standards. The small amounts of criteria pollutants that would be generated by the Proposed Action, primarily during the construction and decommissioning phases, would not be expected to cause a detectable increase in the ambient concentrations of these pollutants or cause a trend toward non-attainment. The nearest designated Class I airshed is associated with Grand Canyon National Park, more than 20 miles north of the Interconnection Project. With the implementation of design features and BMPs (see Table 5) to reduce exhaust emissions and fugitive dust generation, it is unlikely that the Interconnection Project would deteriorate visibility or air quality within this airshed. Therefore, no further analysis is necessary.
Climate Change	<p>In light of the global scope of greenhouse gas (GHG) emissions, and the incremental contribution of each single action to global concentrations, the CEQ recommends that agencies consider GHG emissions associated with proposed actions in relevant context, including how they relate to climate action commitments and goals (CEQ 2023).</p> <p>GHG emissions associated with the Proposed Action, primarily from vehicle and equipment use during the construction and decommissioning periods, would be small in comparison to the GHG emissions that would be avoided by the delivery of renewably generated solar energy to the regional transmission grid during the 37-year operation period. The delivery of up to 1,000 MW of renewably generated solar energy would benefit local, State, and federal goals to address climate change through renewable energy production.</p> <p>Over the approximately 39-year life of the Interconnection Project, climate change is likely to impact many of the same resources that would be affected by the Interconnection Project. These effects are addressed in Chapter 4, Cumulative Effects. CEQ (2023) guidance also directs federal agencies to consider the reasonably foreseeable impacts of climate change on the Proposed Action and its environmental impacts. Climate change is expected to increase the frequency of severe weather events such as droughts, floods, and wildfires (CEQ 2023). This may impact construction by causing schedule delays and a need for more sustainable construction materials, which may in turn increase construction costs. During operation, climate change effects would progressively worsen and may lead to damage of project infrastructure, increasing the frequency of maintenance and repair activities and the associated environmental effects. Increased maintenance costs or reduced power generation could limit the economic benefits of the Proposed Action. No further analysis of climate change is necessary.</p>

Resource	Dismissal Rationale and Findings
Environmental Justice	No environmental justice populations, as defined by Executive Order 12898 (59 Federal Register 7629), would be affected by the Proposed Action. Potential environmental justice populations can be indicated by high proportions of minority populations (>50 percent of the population) or residents living in poverty. The project area is in a rural area approximately 18 miles from Grand Canyon Junction (Valle), Arizona, which has a total population of 101. The minority population makes up about 2 percent of the population of Grand Canyon Junction (Valle), and 1 percent of all residents were living in poverty (U.S. Census Bureau 2021a, 2021b). Because of the lack of environmental justice populations, no further analysis is necessary.
Floodplains/Flood zones	According to the Federal Emergency Management Agency, the entire project area falls within an area of minimal flood hazard (Zone X) (Federal Emergency Management Agency 2021). Based on the lack of floodplains and other flood zones in the project area, no further analysis is necessary.
Indian Trust Assets	Indian Trust Assets are legal assets associated with rights or property held in trust by the U.S. for the benefit of federally recognized tribes or individuals by treaties or individual tribal members. The U.S., as trustee, protects and maintains the specific rights reserved by, or granted to, Indian tribes or individuals by treaties, statutes, and executive orders. There are no known Indian Trust Assets within the project area; therefore, the Proposed Action would result in no adverse effects to any Indian Trust Assets, and no further analysis is necessary.
Non-native Plants and Noxious Weeds	<p>One Arizona Class C noxious weed, field bindweed (<i>Convolvulus arvensis</i>), was recorded in the project area during biological site visits. Other non-native species recorded during the site visits include cheatgrass (<i>Bromus tectorum</i>) and Russian thistle (<i>Salsola tragus</i>). Temporary disturbance during construction would be limited to 75.1 acres and would be immediately reclaimed and revegetated following construction. Permanently disturbed areas (up to 39.2 acres) would be occupied by infrastructure during operation and would be reclaimed and revegetated during decommissioning. Ground disturbance during construction and decommissioning could create conditions that are favorable for the establishment or spread of non-native plants and noxious weeds. Seeds or propagules of non-native plants and noxious weeds could be carried to the project area on vehicles, equipment, and worker clothing during construction, operations, and decommissioning. BMPs would be implemented to minimize the introduction or spread of non-native plants and noxious weeds (see Table 5).</p> <p>With the implementation of these BMPs, the potential for non-native plants and noxious weeds to be introduced or spread by the Proposed Action would be minimal. Because noxious weed monitoring and treatment would occur throughout construction, operations, and decommissioning, and reestablishment of native vegetation would be required followed decommissioning, there would be no long-term effects on non-native plant and noxious weed populations. Therefore, no further analysis is necessary.</p>

Resource	Dismissal Rationale and Findings
Land Use and Livestock Grazing	<p>The project area is composed of approximately 53 acres (21 percent) of COF-managed lands, 18 acres (7 percent) of ASLD-managed lands, and 181 acres (72 percent) of privately owned lands. Livestock grazing is the primary land use in the project area. Approximately 53 acres (or 0.1 percent) of the COF-managed Slate Mountain grazing allotment fall within the proposed corridor for access road improvements. Approximately 198 acres (or 0.1 percent) of the ASLD-managed Antelope Flat grazing allotment fall within the private and ASLD lands in the project area. A small portion (&lt;1 percent) of the project area overlaps ASLD rights-of-way (ROWs), including the ROW for the NSTS and adjacent underground gas pipelines. Other land uses occurring in the project area include dispersed recreation, fuelwood cutting, and hunting (Coconino County 1999).</p> <p>The Proposed Action would be consistent with Coconino County land use plans and policies per the Coconino County–approved Conditional Use Permits (CUPs) for the CO Bar Solar Complex (Coconino County 2022b). The Proposed Action would not result in changes to land ownership as the Proponent would enter into lease agreements with private landowners and obtain a special use authorization from the Forest Service as described in Section 1.4, Purpose and Need. The Proponent would also obtain use authorization from the ASLD for the portions of the Proposed Action occurring on ASLD lands. The Proponent would coordinate with APS regarding access within its existing ROW.</p> <p>Approximately 75.8 acres (&lt;0.1 percent) of the Antelope Flat grazing allotment would be temporarily unavailable during project construction. Of these, 54.1 acres would be reclaimed and revegetated following construction and would be available for livestock grazing once vegetation reestablishes. The remaining 21.7 acres would be occupied by project infrastructure and would be unavailable for livestock grazing throughout operations and decommissioning. Although there would be 37.1 acres of temporary disturbance and 17.5 acres of permanent disturbance within the Slate Mountain grazing allotment, much of the area that would be disturbed is occupied by the existing road and is currently unavailable to grazing. As part of the Proposed Action, fencing and signage would be posted prior to construction to inform the public and ranch users of construction activities. Grazing exclusion would be accomplished according to the terms of the private land lease agreements and through coordination with grazing permittees.</p> <p>The Proposed Action was designed to minimize land use impacts by co-locating facilities with existing and planned utility and road infrastructure. Because the Proposed Action is consistent with existing land use plans and regulations, would not change land ownership, and would only impact a very small portion of either the Slate Mountain or Antelope Flat grazing allotments, the impacts to land use and livestock grazing would be negligible and no further analysis is necessary.</p>

Resource	Dismissal Rationale and Findings
Paleontology	<p>According to previous geologic mapping and current Potential Fossil Yield Classification (PFYC) designations, the project area crosses 30 acres of PFYC 1 (very low), 161 acres of PFYC 3 (moderate), and 60 acres of PFYC U (unknown) (Billingsley et al. 2007; Bonde and Slaughter 2020; Bureau of Land Management 2023). There are no known previously recorded paleontological localities within the proposed Interconnection Project. Based on information provided by the Forest Service and Reclamation (Reclamation 2022), the areas designated as PFYC U include Quaternary alluvial, eolian, valley-fill, and ponded sediments that are considered locally to have low potential for paleontological resources.</p> <p>Impacts to paleontological resources, known and unknown, could occur during ground disturbance if fossils are uncovered, moved, broken, or crushed. Ground disturbance in the interconnection siting area, which is mapped as PFYC 3 (Permian Kaibab Formation), would be limited to 75.8 acres. Ground disturbance during construction would include grading, trenching, and excavation for foundations and pole structures. However, due to the low topographic relief, grading is anticipated to be minimal.</p> <p>NFSR 417 and NFSR 9003 would be improved, and portions of these roads cross areas of PFYC 3, Kaibab Formation. Improvements, including creating a wider road surface, would require ground disturbance of up to 54.6 acres, most of which would occur in areas disturbed by the existing access roads and their construction. Due to this previous surficial disturbance in the areas mapped as PFYC 3, the natural cover of recent sediment or sand and vegetation across most of the project area, and limited disturbance planned within previously undisturbed PFYC 3 areas, the potential for paleontological resources to be disturbed by the Proposed Action is low. Therefore, no further analysis is necessary.</p>

Resource	Dismissal Rationale and Findings
Public Health and Safety	<p>The Proposed Action would not include the use of hazardous materials, except for chemical constituents contained in fuels (gasoline and diesel fuel) and lubricants (oil and grease). The Proponent and its contractors would comply with all hazard communication and hazardous material laws and regulations regarding these chemicals and would implement a Spill Prevention, Control, and Countermeasures Plan to minimize the leaks of motor oils, hydraulic fluids, and fuels. In addition, the Proponent and its contractors would comply with all applicable federal and State regulations regarding notices to federal and local emergency response authorities and would develop a Public Safety, Fire Protection, and Emergency Management Plan as required by the Coconino County CUPs for the CO Bar Solar Complex (Coconino County 2022b). With these measures and implementation of Project BMPs (see Table 5), no impacts from hazardous materials are anticipated.</p> <p>During construction and decommissioning, the risk of fire ignition would increase due to potential tailpipe fires, sparks generated by construction equipment, cigarette smoking, and similar human-caused incidents. The Public Safety, Fire Protection, and Emergency Management Plan would include BMPs to minimize such risks during construction.</p> <p>The Interconnection Project would have a minimal risk of fire ignition during operations due to the limited activities occurring during this phase and, in the event of a fire, would be protected by the water systems, portable water tanks (buffalos), and portable fire extinguishers in place at the CO Bar Solar Complex (Coconino County 2022b).</p> <p>Additional emergency response would be provided externally by local service providers, if required. The local fire department will participate in the development of the Public Safety, Fire Protection, and Emergency Management Plan, and the Proponent would continue to coordinate with the local fire department throughout construction, operations, and decommissioning.</p> <p>With the implementation of these design features and BMPs, the Interconnection Project would have negligible impacts to public health and safety; therefore, no further analysis is necessary.</p>



Resource	Dismissal Rationale and Findings
Recreation and Access	<p>Dispersed recreation opportunities for hiking, hunting, off-highway vehicle riding, and wildlife viewing exist on Forest Service, ASLD, and private lands in and around the project area. All activities on private land in the project area require a valid Ranch Access Pass from AGFD, and activities on ASLD lands require a valid ASLD recreation permit (AGFD 2023a). Permits are not required for access to Forest Service lands. The nearest developed recreation opportunity is the AZNST, located approximately 0.7 mile east of the intersection of NFSR 417 and NFSR 9003 (see Figure 6). NFSR 417 provides access to the trail from US 180.</p> <p>As described in Table 5, public and private access would be maintained throughout construction, operations, and decommissioning, and fencing and signage would be posted prior to construction to inform the public and ranch users of construction activities. With the implementation of these BMPs, the impacts to access from the proposed Interconnection Project would be negligible. Effects to recreational users from increased traffic on access roads are described in Section 3.8, Transportation.</p> <p>Recreational users within 0.5 mile of active work sites may also experience impacts from increased noise during construction, but these impacts are expected to be negligible due to the lack of developed recreation sites within 0.5 mile of the project area and the availability of other dispersed recreation opportunities in the surrounding area. Noise from construction activities or vehicle traffic would be unlikely to be audible from the AZNST because it is more than 0.5 mile from the project area (refer to Section 3.7, Noise, for additional detail).</p> <p>Given the temporary and localized nature of noise impacts and potential traffic delays during construction and decommissioning, the negligible impacts during operations, and the implementation of BMPs to maintain public and private access, the Proposed Action would have negligible impacts to recreation and access. Therefore, no further analysis is necessary.</p>
Socioeconomics	<p>Construction and decommissioning of the Interconnection Project would require approximately 30 to 50 workers over the 1-year construction and decommissioning periods. The workforce would be drawn from surrounding communities, northern Arizona, the Phoenix metropolitan area, and from crews traveling with the contractor to various job sites. This small number of construction jobs would be temporary and would not affect the overall employment of Coconino County, although there would be a small increase in local spending as a result of these jobs.</p> <p>During the 37-year operations period, employment would be limited to approximately five workers for inspections and maintenance activities. The workforce is expected to be drawn from the same communities as construction and decommissioning. Given the short-term nature of the construction and decommissioning employment and the small operations workforce, the Proposed Action would have a negligible impact to employment and spending in Coconino County; therefore, no further analysis is necessary.</p>

Resource	Dismissal Rationale and Findings
Soils	According to the Natural Resources Conservation Service (2022a, 2022b) and Forest Service (1991), the project area contains 19 mapped soil types. None of these soils are hydric, and there are no prime farmlands, unique farmlands, or other protected farmlands present. Impacts to soils from vegetation clearing and ground disturbance would be limited to 114.3 acres and would primarily occur during the construction and decommissioning periods. Ground-disturbing activities have the potential to cause soil erosion and compaction. However, BMPs (see Table 5) would be implemented to reduce these impacts, including minimizing surface disturbances, implementing a Stormwater Pollution Prevention Plan (SWPPP), and reclaiming the land during decommissioning. With the implementation of these BMPs, impacts to soils would be negligible; therefore, no further analysis is necessary.
U.S. Army Corps of Engineers Jurisdictional Waters, including Wetlands	The aquatic resources assessment (SWCA Environmental Consultants 2023a) identified 13 ephemeral surface water features in the project area. None of these features were found to exhibit clear ordinary high-water mark indicators and were subsequently determined to be non-jurisdictional erosional features or swales. Therefore, the Proposed Action would not affect wetlands or other waters of the U.S., and no further analysis is necessary.
Water Quality	Ephemeral surface water features in the project area have the ability to transport stormwater flows from localized precipitation events. Transportation of stormwater flows and subsequent impacts to surface water quality are not likely due to the implementation of the erosion control and stormwater drainage BMPs, including the SWPPP (see Table 5). These BMPs would be implemented to effectively control soil erosion and mitigate potential impacts to downstream water quality that could potentially be affected by runoff from soil erosion and sedimentation (or fuel spills) into drainages. Impacts to water quality would be negligible with the implementation of these BMPs; therefore, no further analysis is necessary.
Water Quantity	During construction, approximately 2 acre-feet of water (approximately 650,000 gallons) would be used for fugitive dust control and for the concrete required for the foundations in the proposed substation, switchyard improvements, and intertie line(s). Water may be trucked in from private, permitted groundwater sources in Williams and/or Grand Canyon Junction (Valle) or from a new Arizona Department of Water Resources–permitted well constructed for the CO Bar Solar Complex prior to the Interconnection Project and would be used to fill temporary water bladders or aboveground tanks. Permanent water use would not be necessary for operations. Water use during decommissioning would be similar to that of construction. This would represent a negligible impact to groundwater quantity; therefore, no further analysis is necessary.

### 3.3 Vegetation

#### 3.3.1 AFFECTED ENVIRONMENT

The analysis area for vegetation (see Figure 6) is the project area plus a 0.5-mile buffer to account for indirect impacts that may extend beyond the disturbance footprint (e.g., fugitive dust). COF sensitive plant species are discussed in Section 3.5.

The vegetation analysis area is in the Great Basin Conifer Woodland biotic community (Brown 1994) and, according to the Southwest Regional Gap Analysis Project (SWReGAP) data, is dominated by Colorado Plateau Pinyon-Juniper Woodland (6,683 acres or 64 percent) and Intermountain Basins Semi-Desert Shrub Steppe (2,897 acres, or 28 percent) (U.S. Geological Survey 2016) (Table 9). The analysis area is located on the Coconino Plateau within portions of the San Francisco Volcanic Field; elevations range from approximately 6,350 to 6,500 feet above mean sea level (amsl).

Private and ASLD land are subject to the Arizona Native Plant Law (Arizona Revised Statutes [ARS] 3-904), which prohibits taking, transporting, or possessing protected native plants without permission and a permit issued by the Arizona Department of Agriculture. The Proponent has completed a native plant inventory for all State lands within the CO Bar Solar Complex and Interconnection Project and will comply with all State laws prior to construction.

Biological site visits, consisting of pedestrian surveys to evaluate vegetation and landscape features considered important to the potential occurrence of special-status plant and animal species, were conducted on July 1, 2021, and May 10, 2022. Surveys for the CO Bar Solar Complex ASLD Native Plant Inventory were conducted in the project area and surrounding vicinity on August 22–25, 2022, and on December 9, 2022.

**Table 9. SWReGAP Vegetation Communities in the Analysis Area**

Vegetation Community	Acres in Analysis Area	Percent of Analysis Area
Colorado Plateau Pinyon-Juniper Woodland	6,683.4	63.8
Inter-Mountain Basins Semi-Desert Shrub Steppe	2,897.4	27.7
Inter-Mountain Basins Juniper Savanna	378.7	3.6
Inter-Mountain Basins Semi-Desert Grassland	202.1	1.9
Inter-Mountain Basins Big Sagebrush Shrubland	181.5	1.7
Rocky Mountain Ponderosa Pine Woodland	116.7	1.1
Southern Rocky Mountain Montane-Subalpine Grassland	9.3	0.1
Inter-Mountain Basins Mixed Salt Desert Scrub	6.7	0.1
<b>Total</b>	<b>10,475.8</b>	<b>100.0</b>

Source: U.S. Geological Survey (2016)

Dominant native plant species observed during these surveys include rubber rabbitbrush (*Ericameria nauseosa*), longflower rabbitbrush (*Chrysothamnus depressus*), broom snakeweed (*Gutierrezia sarothrae*), oneseed juniper (*Juniperus monosperma*), twoneedle pinyon (*Pinus edulis*), Fremont's mahonia (*Mahonia fremontii*), blue grama (*Bouteloua gracilis*), sideoats grama (*Bouteloua curtipendula*), and squirreltail (*Elymus elymoides*). Other species observed include pale desert-thorn (*Lycium pallidum*), Rocky Mountain beeplant (*Cleome serrulata*), coyote tobacco (*Nicotiana attenuata*), Indian ricegrass (*Achnatherum hymenoides*), spinystar (*Escobaria vivipara*), Whipple cholla (*Cylindropuntia whipplei*), tulip pricklypear (*Opuntia phaeacantha*), and globemallow (*Sphaeralcea* spp.). No broadleaf deciduous riparian vegetation communities (i.e., communities containing cottonwood [*Populus* spp.], willow [*Salix* spp.], ash

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[*Fraxinus* spp.], etc.) were observed in the project area. Non-native plants and noxious weeds are discussed in Table 8. **Error! Reference source not found.**

### **3.3.2 ENVIRONMENTAL CONSEQUENCES**

#### **3.3.2.1 Proposed Action**

Direct impacts to vegetation under the Proposed Action would include 91.2 acres of temporary disturbance (37.1 acres on COF land) and 39.2 acres of permanent disturbance (17.5 acres on COF land) from vegetation clearing, grading, and installation of Interconnection Project infrastructure during construction. Approximately 91.5 percent of vegetation disturbance would occur in the pinyon-juniper woodlands and semi-desert shrub steppe vegetation communities that dominate the analysis area (see Table 9). Impacts on COF land would occur primarily in areas already disturbed by the existing road prism. BMPs, such as minimizing grading and ground disturbance by designating areas for equipment staging and materials storage and conspicuously staking or flagging work area limits, would be implemented during construction to minimize impacts to vegetation (see Table 5). Following construction, temporarily disturbed areas would be reclaimed and revegetated using landowner-approved certified weed-free native seed mixes. Vegetation in these reclaimed areas would gradually return to pre-construction conditions over the 37-year operations period. Permanent disturbance would be limited to the footprint of the structures installed during construction, which would remain disturbed throughout the 37-year operations period.

Fugitive dust generated by ground disturbance and vehicle traffic can repeatedly blanket the foliage of vegetation adjacent to disturbed areas and unpaved access roads, which can interfere with photosynthesis and reduce plant productivity. However, the amount of dust that must accumulate to result in a measurable effect on plant productivity is far greater than what is typically observed under normal conditions (Thompson et al. 1984). Under the Proposed Action BMPs (see Table 5), including road watering and a speed limit of 25 miles per hour (mph), would be implemented to reduce fugitive dust generation, which would minimize the potential for adverse impacts to vegetation. Any effects from fugitive dust that were to occur would primarily be limited to the 1-year construction period and 1-year decommissioning period. Most routine inspections and maintenance activities would involve little to no ground disturbance, and vehicle traffic during operations would be limited to five round trips per day on average (see Table 4); therefore, the impacts to vegetation from fugitive dust during operations would be negligible.

Direct effects on general vegetation during operations under the Proposed Action would be minimal, consisting primarily of trimming, pruning, or removing trees and shrubs within areas previously disturbed during construction to maintain clearances for access roads and the interconnection facilities.

During decommissioning, infrastructure would be removed, and disturbed areas would be restored and revegetated with landowner-approved weed-free seed mixes. Grasses, shrubs, and forbs would be expected to recover within a few years of reclamation and revegetation, though it may take many decades to replace any mature trees adversely impacted as a result of the Proposed Action. The APS 500-kV switchyard would not be decommissioned, and habitat would not be restored in the 5 acres

of switchyard improvements. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed to its pre-construction width of approximately 20 feet; NFSR 417 would not require reclamation.

In summary, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term impacts to vegetation during construction and decommissioning. Adverse long-term impacts to vegetation during operations would be negligible.

### **3.3.2.2 No Action Alternative**

Under the No Action alternative, the non-federal interconnection would be constructed, which would result in 426.5 acres of temporary disturbance and 87.3 acres of permanent disturbance, most of which would fall outside the interconnection siting area (see Table 6). The BREC access road would be used to access the alternative interconnection project. No COF lands would be impacted under the No Action alternative, as NFSRs 417 and 9003 would not be improved, and these roads would not be used to access the alternative interconnection project. Therefore, there would be no impacts to vegetation within the COF under the No Action alternative. BMPs implemented to avoid or minimize effects on vegetation would be similar to those under the Proposed Action. Operations and decommissioning under the No Action alternative would also be similar to the Proposed Action. Therefore, under the No Action alternative, impacts to vegetation on the private and ASLD lands within the analysis area would be similar to those described for the Proposed Action, but impacts to private and ASLD lands beyond the analysis area would be increased.

## **3.4 Wildlife**

### **3.4.1 GENERAL WILDLIFE**

#### **3.4.1.1 Affected Environment**

The analysis area for wildlife is the project area plus a 0.5-mile buffer (see Figure 6). A 0.5-mile buffer is considered sufficient to account for effects to wildlife that extend beyond the disturbance footprint, such as noise from construction equipment and vehicle traffic (Wrigley 2018).

Rock squirrel (*Otospermophilus variegatus*) was the only mammal observed during the site visits. Several burrows were observed within the project area that were consistent with American badger (*Taxidea taxus*) and fox, such as gray fox (*Urocyon cinereoargenteus*) and kit fox (*Vulpes macrotis*). Pocket gopher (*Thomomys* spp.) mounds were observed in the project area, as well as desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*) sign. Although prairie dogs (*Cynomys* spp.) occur in the region, no colonies were observed within the project area. Other mammalian species commonly associated with habitats in the analysis area include pinyon mouse (*Peromyscus truei*), bushy-tailed woodrat (*Neotoma cinerea arizonae*), and coyote (*Canis latrans*) (Brown 1994).

The analysis area provides open grassland habitat for American pronghorn (*Antilocapra americana*), which are known to migrate through the area (Arizona Game and Fish Department [AGFD] 2011; Western Migrations 2022). Migratory corridors for mule deer (*Odocoileus hemionus*) are also present in the analysis area, and this region has been identified as a priority big game corridor in the Arizona State Action Plan (AGFD 2022a). Elk (*Cervus canadensis*), American pronghorn, and coyote sign was observed during the site visits. Other game species that may be found in the analysis area include mountain lion (*Puma concolor*) and American black bear (*Ursus americanus*) (AGFD 2022b).

Reptilian species associated with the habitat in the project area include striped whipsnake (*Coluber taeniatus*), eastern collared lizard (*Crotaphytus collaris*), tiger whiptail (*Aspidoscelis tigris*), and western skink (*Plestiodon skiltonianus*) (Brown 1994). Suitable aquatic habitats for frogs, amphibians, fish, or other aquatic or semi-aquatic species are not present in the analysis area. Avian species that use the analysis area are described in Section 3.4.2, Migratory Birds. Special-status wildlife are addressed in Section 3.5.2.1.2, COF Sensitive Wildlife, and Section 3.5.1, Threatened and Endangered Species.

### **3.4.1.2 Environmental Consequences**

#### **3.4.1.2.1 PROPOSED ACTION**

Under the Proposed Action, impacts to general wildlife could occur from construction, operations, and decommissioning through habitat loss, alteration, or fragmentation; direct mortality or injury; and disturbance or displacement from noise and increased human presence in the analysis area.

Vegetation clearing and ground disturbance during construction would temporarily disturb up to 91.2 acres of habitat for general wildlife, including 37.1 acres within the COF. These areas would be reclaimed and revegetated immediately following construction of the Proposed Action.

An additional 39.2 acres of habitat for general wildlife would be permanently disturbed by the placement of interconnection infrastructure and would remain unavailable to wildlife throughout the 37-year operations period. This includes 17.5 acres of permanent disturbance within the COF associated with improvements to NFSRs 417 and 9003, most of which overlaps with the area currently disturbed by these roads. In addition to direct habitat loss, this disturbance would fragment the remaining habitat in the analysis area and create barriers to movement for big game and other wildlife. Fencing installed for the Interconnection Project would also be a barrier to movement, increasing the effects of fragmentation. Designing fencing to meet AGFD's standards for wildlife-compatible fencing (see Table 5) would reduce these effects, and the only permanent fencing for the Interconnection Project would enclose the relatively small area (13 acres) occupied by the collector substation. Additionally, the pinyon-juniper woodland and shrub steppe habitats present in the analysis area (see Section 3.3) are common in the region and the 39.2 acres of long-term habitat disturbance that would occur under the Proposed Action would be expected to have a minimal impact on general wildlife.

During construction, smaller, less-mobile wildlife could be crushed by vehicles and construction equipment. Injury or mortality could also occur if wildlife become trapped in trenches or other excavated areas. Increased vehicle traffic on access routes (including NFSRs 417 and 9003) could also lead to increased risk of injury or mortality from vehicle strikes. BMPs (see Table 5) including

escape ramps and covers for trenches and a 25-mph speed limit on access roads would be implemented to minimize the risk of wildlife injury or mortality.

Increased human presence and noise from construction activities can disturb wildlife, leading to disruption of breeding, foraging, sheltering, or migratory activities or displacement of individual animals from the analysis area. Large amounts of similar habitat would remain available to individuals displaced from the analysis area during construction, but displaced individuals may experience increased competition for habitat and resources. These effects would be localized and short-term in nature, and wildlife would be expected to return to the analysis area following construction.

Impacts to general wildlife during the 37-year operations period would be negligible because there would be minimal traffic on access roads (refer to Table 4 for traffic estimates) and because most maintenance activities would involve little to no ground disturbance or vegetation removal. BMPs (see Table 5), including the 25-mph speed limit, would continue to be implemented during operations to further minimize potential impacts to general wildlife. The Interconnection Project would also be included in the wildlife protection plan prepared for the CO Bar Solar Complex, which would require regular reporting to Coconino County and the development of additional measures to reduce impacts to wildlife if impacts are greater than expected.

Effects to general wildlife from ground-disturbance and increased vehicle traffic during decommissioning would be similar to those described for construction. Following removal of project infrastructure, permanently disturbed areas would be reclaimed and revegetated with weed-free native seed mixes, leading to the gradual recovery of wildlife habitat in the project area. The APS 500-kV switchyard would not be decommissioned, and habitat would not be restored in the 5 acres of switchyard improvements. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed to its pre-construction width of approximately 20 feet; NFSR 417 would not require reclamation.

In summary, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term impacts on general wildlife during construction and decommissioning. Adverse long-term impacts to general wildlife during operations would be negligible.

#### **3.4.1.2.2 NO ACTION ALTERNATIVE**

Under the No Action alternative, the non-federal interconnection would be constructed, which would result in 426.5 acres of temporary disturbance and 87.3 acres of permanent disturbance, most of which would fall outside the interconnection siting area (see Table 6). The BREC access road would be used to access the alternative interconnection project. Under the No Action alternative, there would be no improvements to NFSRs 417 and 9003, and these roads would not be used to access the alternative interconnection project. Therefore, there would be no impact to general wildlife within the COF under the No Action alternative.

BMPs implemented to avoid or minimize effects on general wildlife would be similar to those under the Proposed Action. Operations and decommissioning under the No Action alternative would also

be similar to the Proposed Action. Therefore, under the No Action alternative, impacts to general wildlife on the private and ASLD lands within the analysis area would be similar to those described for the Proposed Action, but impacts on private and ASLD lands beyond the analysis area would be increased.

## **3.4.2 MIGRATORY BIRDS**

### **3.4.2.1 Affected Environment**

The analysis area for migratory birds is the project area plus a 0.5-mile buffer (see Figure 6), as described for general wildlife (see Section 3.4.1). Migratory birds are protected under the Migratory Bird Treaty Act, which prohibits take of any migratory bird or active nest, except as permitted by regulation.

During the site visits, nine avian species were documented within the project area: horned lark (*Eremophila alpestris*), mountain bluebird (*Sialia currucoides*), northern mockingbird (*Mimus polyglottos*), chipping sparrow (*Spizella passerina*), black-throated sparrow (*Amphispiza bilineata*), lark sparrow (*Chondestes grammacus*), Cassin's kingbird (*Tyrannus vociferans*), rock wren (*Salpinctes obsoletus*), and common raven (*Corvus corax*). Other bird species commonly associated with habitat in the analysis area include pinyon jay (*Gymnorhinus cyanocephalus*), gray flycatcher (*Empidonax wrightii*), gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), juniper titmouse (*Baeolophus ridgwayi*), Scott's oriole (*Icterus parisorum*), and red-tailed hawk (*Buteo jamaicensis*) (Brown 1994).

### **3.4.2.2 Environmental Consequences**

#### **3.4.2.2.1 PROPOSED ACTION**

Potential impacts from the Proposed Action on migratory birds would be similar to those described for general wildlife in Section 3.4.1.2.1. The pinyon-juniper woodland and arid grassland habitats in the analysis area provide nest substrates and foraging resources for migratory birds. Approximately 91.2 acres (including 37.1 acres within the COF) of nesting and foraging habitat for migratory birds would be temporarily disturbed during construction, and approximately 39.2 acres (including 17.5 acres within the COF) would remain disturbed throughout the operations period until the facility is decommissioned and those areas are reclaimed and revegetated. The impacts to migratory birds from this habitat loss would be minimal considering the abundance of similar habitat in the analysis area and surrounding region.

During construction and decommissioning, as well as intermittently during operations and maintenance, noise and human presence may disrupt bird behaviors, including foraging, roosting, nesting, or breeding, or may temporarily displace individual birds near the activity area. This disturbance would be short-term and localized, and the large areas of habitat available adjacent to the analysis area would allow individual birds to use nearby habitats. Increased vehicle traffic (see Table 4) and equipment usage, particularly during construction and decommissioning, could lead to direct mortality or injury of migratory birds through collisions and crushing of ground-nesting birds,



but these impacts would be minimized or avoided through implementation of a 25-mph speed limit on project access roads and pre-construction nest clearance surveys during the migratory bird breeding season (see Table 5).

The potential effects to migratory birds from collisions with or electrocution by the intertie line(s) and overhead collector lines during operations would be minimized by designing these lines in accordance with Avian Power Line Interaction Committee (APLIC) guidelines (APLIC 2006, 2012) (see Table 5).

Noise, human presence, traffic (see Table 4), and ground disturbance during decommissioning would have short-term effects on migratory birds similar to those described for construction. After structures and foundations are removed, these areas would be recontoured and seeded with a weed-free native seed mix, which would have long-term beneficial effects from the restoration of habitat for migratory birds. The APS 500-kV switchyard would not be decommissioned, and habitat would not be restored in the 5 acres of switchyard improvements. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed to its pre-construction width of approximately 20 feet, and NFSR 417 would not require reclamation.

In summary, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term effects on migratory birds during construction and decommissioning. Adverse long-term impacts during operations would be negligible.

#### **3.4.2.2.2 NO ACTION ALTERNATIVE**

Under the No Action alternative, the non-federal interconnection would be constructed, which would result in 426.5 acres of temporary disturbance and 87.3 acres of permanent disturbance, most of which would fall outside the interconnection siting area (see Table 6). The BREC access road would be used to access the alternative interconnection project. Under the No Action alternative, there would be no improvements to NFSRs 417 and 9003, and these roads would not be used to access the alternative interconnection project. Therefore, there would be no impact to migratory birds within the COF under the No Action alternative.

BMPs implemented to avoid or minimize effects on migratory birds would be similar to those under the Proposed Action. Operations and decommissioning under the No Action alternative would also be similar to the Proposed Action. Therefore, under the No Action alternative, impacts to migratory birds on the private and ASLD land within the analysis area would be unlikely to substantially differ from those described for the Proposed Action, but impacts on private and ASLD lands beyond the analysis area would be increased.

## 3.5 Special-Status Species

### 3.5.1 THREATENED AND ENDANGERED SPECIES

The U.S. Fish and Wildlife (USFWS) Information for Planning and Consultation (IPaC) database (USFWS 2023a) was queried to generate a list of federally threatened and endangered species with potential to occur in the project area. The results included Fickeisen plains cactus (*Pediocactus peeblesianus* var. *fickeiseniae*), Mexican spotted owl (*Strix occidentalis lucida*), Mexican wolf (*Canis lupus baileyi*), northern Mexican gartersnake (*Thamnophis eques megalops*), and yellow-billed cuckoo (*Coccyzus americanus*). The results of the IPaC query also included monarch butterfly (*Danaus plexippus*), a candidate for Endangered Species Act (ESA) listing. According to the IPaC report, there is no designated or proposed critical habitat for federally listed species in the project area (USFWS 2023a).

SWCA Environmental Consultants (SWCA) conducted site visits in the project area and prepared a biological resources report (SWCA 2023b) that assessed the potential for the threatened, endangered, and candidate species listed above to occur in the project area. The assessment determined that one candidate species, the monarch butterfly, and one endangered species, the Mexican wolf, may occur in the project area.

The biological resources report (SWCA 2023b) concluded that the project area is outside the known geographic and elevational ranges and/or does not contain habitat for the remaining four threatened and endangered species listed above. Therefore, it is anticipated that there would be no effect on these species, and no further analysis is necessary.

#### 3.5.1.1 Affected Environment

##### 3.5.1.1.1 MONARCH BUTTERFLY

The analysis area for the monarch butterfly is the project area plus a 0.5-mile buffer, as described for general wildlife (see Section 3.4.1). The monarch butterfly is listed as a candidate species under consideration for official listing under the ESA but is not currently afforded federal protection (USFWS 2023a). Monarchs are found in a variety of habitats; during fall migration in Arizona, monarchs favor nectar from native plants including sunflowers (*Helianthus* spp.), rabbitbrush (*Ericameria* spp.), thistles (Family Asteraceae), milkweeds (*Asclepias* spp.), and a variety of other native and garden plants (Morris et al. 2015). Populations in Arizona can migrate to either California or Mexico for the winter (USFWS 2020) or may overwinter in the low deserts in California or Arizona (Morris et al. 2015). In the southwestern U.S., migrating monarchs often occur near water sources, such as rivers, creeks, riparian corridors, roadside ditches, or irrigated gardens (USFWS 2020).

The analysis area contains suitable plant species for foraging monarchs, such as rabbitbrush and thistles. Milkweed species may occur but were not observed during the site visits (SWCA 2023b); the nearest recent records of monarch and milkweed are approximately 8 miles south of the analysis area (Western Monarch Milkweed Mapper 2023). There are no perennial water sources within the

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analysis area favored by migrating monarchs, such as creeks or riparian corridors, and no roadside ditches that retain water for extended periods.

### **3.5.1.1.2 MEXICAN WOLF**

The analysis area for the Mexican wolf is the project area plus a 0.5-mile buffer, as described for general wildlife (see Section 3.4.1). Wolves south of Interstate 40 in Arizona and New Mexico are treated as part of the non-essential experimental population (NEP) under the ESA; any wolves occurring in the analysis area would be treated as endangered since the analysis area falls outside the NEP boundary.

In Arizona, Mexican wolves inhabit pine-oak woodlands, pinyon-juniper woodlands, and mixed conifer forest. In Arizona, they show a strong preference for elk, compared with other ungulates, although deer and small animals are also preyed upon (USFWS 2015). Forest cover, high native ungulate density, and low livestock density are the most important habitat attributes needed for wolves to persist in an area. Habitats with low forest cover and high human density and use are considered unsuitable. Riparian corridors are important sources of water and cover and provide a means of movement in more arid regions within the subspecies' range. Wolves are social animals born into a family unit referred to as a pack, which can include anywhere from two to 12 individuals. Each pack establishes and defends a territory within which the pack hunts and shelters. Territory size varies based on prey density and pack size, and wolf movements within a territory vary in response to the distribution and abundance of prey and care of young. Individual wolves (or rarely, a group) may disperse from their natal pack in search of vacant habitat or a mate. Dispersal to neighboring territories may occur over relatively short distances, but some dispersal events can be a long-distance journey over hundreds of miles (USFWS 2017).

The analysis area is approximately 21 miles north of the Mexican wolf NEP area and the occupied range for the subspecies. The only recent record of a Mexican wolf north of Interstate 40 was a lone juvenile male dispersing from a home territory in New Mexico that was detected north of Flagstaff, Arizona, in 2021, within 30 miles of the analysis area. This individual was subsequently relocated to the White Mountains, within the NEP area, by the AGFD and USFWS (Botts 2022). The nearest recent record of a wolf was on March 28, 2023, east of Munds Park, Arizona (USFWS 2023b), approximately 55 miles to the southeast of the analysis area.

The analysis area contains pinyon-juniper woodlands, and prey items such as elk and deer are present (see Section 3.4.1, General Wildlife). However, the pinyon-juniper woodlands in the analysis area are patchy and disturbed by human developments such as the large, existing utility corridor, which is maintained clear of large woody vegetation. Further, the analysis area is part of active grazing allotments and a private ranch, and livestock density and human use is relatively high. Development of other renewable energy projects is currently occurring in the analysis area, and human use will increase in the future (see cumulative effects in Section 4.1.1.8). Therefore, it is unlikely the analysis area could support a Mexican wolf pack. Although dispersing wolves prefer to use wooded riparian corridors, which are not present in the analysis area, the possibility for transient individuals to pass through the analysis area cannot be ruled out.

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### **3.5.1.2 Environmental Consequences**

#### **3.5.1.2.1 PROPOSED ACTION**

##### *MONARCH BUTTERFLY*

Approximately 91.2 acres (including 37.1 acres within the COF) of migratory stopover habitat for the monarch would be temporarily disturbed during construction, and approximately 39.2 acres (including 17.5 acres within the COF) would remain disturbed throughout the operations period until the facility is decommissioned and those areas are reclaimed and revegetated. Mortality of monarch eggs or larvae during vegetation removal is unlikely given the lack of milkweed in the project area. Vehicles and equipment traveling on access roads present a collision and crushing risk to individual monarch butterflies, though these impacts would primarily be limited to the construction and decommissioning periods and would only occur during the fall migratory period when monarchs may be present in the analysis area. Occasional vegetation or trimming during operations to maintain access road clearance and the low volume of project-related traffic during this time would have negligible effects on the monarch.

Short-term effects to the monarch during decommissioning would be similar to those for construction, but the reclamation and revegetation of permanently disturbed areas would benefit the monarch in the long term by restoring foraging and migratory stopover habitat for the species. The APS 500-kV switchyard would not be decommissioned, and habitat would not be restored in the 5 acres of switchyard improvements. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed to its pre-construction width of approximately 20 feet, and NFSR 417 would not require reclamation.

In summary, the Proposed Action would have minor, adverse, short-term impacts on the monarch during construction and decommissioning. Adverse, long-term impacts to the monarch during operations would be negligible.

##### *MEXICAN WOLF*

The Proposed Action would disturb up to 130.4 acres of habitat for dispersing Mexican wolves, 91.2 acres of which would be reclaimed and restored immediately following construction. The remaining 39.2 acres would be occupied by Interconnection Project infrastructure and would remain disturbed throughout the 37-year operations period. Because this habitat is not currently occupied by the Mexican wolf and large amounts of similar habitat would remain in the surrounding area, this would have negligible effects on the wolf. Although they are likely to avoid active work sites, Mexican wolves could be injured or killed by collisions with vehicles on access roads; this risk would be further minimized with the implementation of a 25-mph speed limit (see Table 5).

Impacts to the Mexican wolf during the 37-year operations period would be negligible because there would be very little traffic on access roads (see Table 4) and because most maintenance activities would involve little to no ground disturbance or vegetation removal. BMPs (see Table 5), including the 25-mph speed limit, would continue to be implemented during operations to further minimize

potential impacts to the Mexican wolf. The Interconnection Project would also be included in the Wildlife Protection Plan prepared for the CO Bar Solar Complex, which would require regular reporting to Coconino County and the development of additional measures to reduce impacts to wildlife if impacts are greater than expected.

Effects to the Mexican wolf from ground disturbance and increased vehicle traffic during decommissioning would be similar to those described for construction. Following removal of project infrastructure, permanently disturbed areas would be reclaimed and revegetated with weed-free native seed mixes, leading to the gradual recovery of habitat in the analysis area. The APS 500-kV switchyard would not be decommissioned, and habitat would not be restored in the 5 acres of switchyard improvements. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed to its pre-construction width of approximately 20 feet, and NFSR 417 would not require reclamation.

In summary, with the implementation of BMPs (see Table 5), the Proposed Action would have negligible, adverse, short- and long-term effects on the Mexican wolf.

### **3.5.1.2.2 NO ACTION ALTERNATIVE**

#### *MONARCH BUTTERFLY*

Under the No Action alternative, the non-federal interconnection would be constructed, which would result in 426.5 acres of temporary disturbance and 87.3 acres of permanent disturbance, most of which would fall outside the interconnection siting area (see Table 6). The BREC access road would be used to access the alternative interconnection project. No COF lands would be impacted under the No Action alternative, as NFSRs 417 and 9003 would not be improved, and these roads would not be used to access the alternative interconnection project. Therefore, there would be no impact to monarchs within the COF under the No Action alternative. While this would require all traffic for both projects to use the BREC access road, the overall traffic volume and the corresponding impacts to monarchs would be similar to that for the Proposed Action. Thus, under the No Action alternative, impacts to monarchs on the private and ASLD land within the analysis area would be similar to those described for the Proposed Action, but impacts on private and ASLD lands beyond the analysis area would be increased.

#### *MEXICAN WOLF*

Under the No Action alternative, the non-federal interconnection would be constructed which would result in 426.5 acres of temporary disturbance and 87.3 acres of permanent disturbance, most of which would fall outside the interconnection siting area (see Table 6). The BREC access road would be used to access the alternative interconnection project. Under the No Action alternative, there would be no improvements to NFSRs 417 and 9003, and these roads would not be used to access the alternative interconnection project. Therefore, there would be no impact to the Mexican wolf within the COF under the No Action alternative.

BMPs implemented to avoid or minimize effects on Mexican wolf would be similar to those under the Proposed Action. Operations and decommissioning under the No Action alternative would also be similar to that of the Proposed Action. Therefore, under the No Action alternative, impacts to the Mexican wolf on the private and ASLD land within the analysis area would be similar to those described for the Proposed Action, but impacts on private and ASLD lands beyond the analysis area would be increased.

### **3.5.2 OTHER SPECIAL-STATUS SPECIES**

#### **3.5.2.1 Affected Environment**

##### **3.5.2.1.1 COF SENSITIVE PLANTS**

Forest Service sensitive species (both plants and wildlife) are defined in Forest Service Manual 2670.5 (Forest Service 2005) as “those plant and animal species identified by [the] regional forester for which population viability is a concern, as evidenced by: (a) significant current or predicted downward trends in population numbers or density; or (b) significant current or predicted downward trends in habitat capability that would reduce a species’ existing distribution (USFS 2005).” Actions approved by the Forest Service must not result in a loss of viability or a trend towards federal listing under the ESA (Forest Service 2005). The Region 3 Foresters sensitive plant list (Forest Service 2013a) identifies Forest Service sensitive plant species that may occur on the COF (i.e., COF sensitive plants).

The analysis area for COF sensitive plants is the project area plus a 0.5-mile buffer (as described in Section 3.3, Vegetation) but is limited to COF lands (see Figure 6). A biological resources report (SWCA 2023b), including a field-based habitat assessment, was prepared to evaluate the potential for COF sensitive plant species to occur in the analysis area. The COF sensitive plant species list (Forest Service 2013a) was reviewed and compared with the known habitat parameters and ranges of the species to determine the potential for each species to occur in the analysis area.

The biological resources report concluded that two COF sensitive plant species, Mt. Dellenbaugh sandwort (*Arenaria aberrans*) and Tusayan rabbitbrush (*Chrysothamnus molestus*), have the potential to occur in the analysis area (AGFD 2022b). The analysis area provides the appropriate open woodland characteristics, including pinyon and junipers, with sandy soils suitable for Mt. Dellenbaugh sandwort. The analysis area also provides the appropriate substrate and open pinyon-juniper grassland suitable for Tusayan rabbitbrush. Both species have been documented within 3 miles of the analysis area (AGFD 2022b). Neither species was observed during the site visits (SWCA 2023b), but the site visits did not include species-specific surveys and did not occur during the appropriate detection window for either species.

##### **3.5.2.1.2 COF SENSITIVE WILDLIFE**

The Region 3 Foresters sensitive wildlife list (Forest Service 2013b) identifies Forest Service sensitive wildlife species that may occur on the COF (i.e., COF sensitive wildlife).

The analysis area for COF sensitive wildlife is the project area plus a 0.5-mile buffer (for the same reasons described in Section 3.4.1, General Wildlife) but is limited to COF lands (see Figure 6). As described in Section 3.3.1, the analysis area consists primarily of pinyon-juniper woodland and shrub steppe habitats. The biological resources report (SWCA 2023b) assessed the potential for all 25 COF sensitive wildlife species to occur within the analysis area based on publicly available information on their geographic ranges and habitat requirements.

The biological resources report concluded that six of the 25 COF sensitive wildlife species on the Region 3 Foresters sensitive wildlife list (Forest Service 2013b) may occur in the analysis area: American peregrine falcon (*Falco peregrinus anatum*), western burrowing owl (*Athene cunicularia hypugaea*), Allen's lappet-browed bat (*Idionycteris phyllotis*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), spotted bat (*Euderma maculatum*), and golden eagle (*Aquila chrysaetos*) (see Section 3.5.2.1.3). The remaining 19 COF sensitive wildlife species are unlikely to occur in the analysis area because it is outside the known geographic range for the species, does not contain habitat for the species, or both (SWCA 2023b).

#### AMERICAN PEREGRINE FALCON

Peregrines can be found across North America, either as full-time residents or seasonal visitors. In Arizona, peregrines are commonly year-round residents. The species nests near cliffs overlooking open habitats that support large numbers of birds, at elevations ranging from 400 to 9,000 feet amsl. Peregrines typically feed on birds, which they ambush from above by diving (AGFD 2022c).

The analysis area contains open habitats, but there are no cliffs, permanent water sources, or other habitat features that would attract a large avian population to serve as a prey base for peregrines. However, the species has been recorded within 3 miles of the analysis area (AGFD 2022b), and it is possible peregrines may occasionally pass through or forage in the analysis area.

#### WESTERN BURROWING OWL

The western burrowing owl can be found year-round in Arizona in a wide variety of open habitats, including well-drained grasslands, steppes, shrublands, deserts, and agricultural lands, often in association with burrowing mammals (AGFD 2022d). The subspecies can also be found in open areas or vacant lots near golf courses, airports, and other developed areas. There are sparse winter records of the subspecies from the Colorado Plateau in northern Arizona, and it is believed that populations in northern Arizona are migratory (AGFD 2022d). Western burrowing owls nest in underground burrows, often using abandoned small mammal burrows (such as prairie dog colonies). Unlike their non-migratory counterparts, migratory burrowing owls do not use and maintain burrows year-round. The western burrowing owl feeds primarily on large insects and small mammals but will opportunistically feed on fish, reptiles, amphibians, and cactus seeds. The subspecies hunts both during the day and at night, typically in mowed or overgrazed pastures or other areas with short grass.

The analysis area is within the predicted range for western burrowing owl in Arizona, but there are no records of the species within 3 miles of the analysis area (AGFD 2022b; eBird 2022). The analysis

area provides limited open shrub-steppe habitat for foraging western burrowing owls. However, modeling indicates that habitat in the analysis area is not suitable for breeding western burrowing owls (AGFD 2023b), and no evidence of prairie dog colonies, which are favored by nesting western burrowing owls in this region, was observed during the site visits (SWCA 2023b).

#### *ALLEN'S LAPPET-BROWED BAT*

In Arizona, Allen's lappet-browed bats are typically found in ponderosa pine, pinyon-juniper, and Madrean oak woodlands, as well as riparian woodlands, at elevations from 1,320 to 9,800 feet amsl. The species is commonly associated with boulder piles, cliffs, rocky outcrops, and lava flows. Allen's lappet-browed bats feed primarily on small moths, but also beetles, roaches, and flying ants, which it gleans from the ground or catches in flight. Like many bat species, foraging appears to be concentrated over water bodies such as small streams and ponds. Allen's lappet-browed bats roost in caves and abandoned mineshafts. The species can be found at higher elevations in mountainous areas throughout Arizona (AGFD 2001). Although not well studied, it appears that females form small maternity colonies under the bark of large ponderosa pine snags or in the cracks of large cliffs after mating in the early summer (Siders and Jolley 2009; Slovesky and Chambers 2009). In Arizona, young are born in mid- to late June and begin to fly by late July. Maternity colonies have been documented from the Kingman area (120 miles west of the project area) and the Galiuro Mountains (230 miles southeast of the project area). Lactating females have been captured near Flagstaff, suggesting the species may breed in the area. Little is known about the species' seasonal movements or winter habitat; there is only one record of the species from Arizona in the winter, in the vicinity of Kingman (AGFD 2001).

The analysis area is within the known geographical range of the species and provides pinyon-juniper habitat for the species; however, the analysis area lacks caves, abandoned mines, and large trees or cliffs for roosting and water sources for foraging. There are no records of the species within 3 miles of the analysis area (AGFD 2022b). It is unlikely that Allen's lappet-browed bats use the analysis area for breeding or roosting, but the species may pass through the area while foraging or moving between roost sites.

#### *PALE TOWNSEND'S BIG-EARED BAT*

The pale Townsend's big-eared bat uses a wide variety of desert scrub and woodland habitats throughout Arizona at elevations from approximately 550 to 7,500 feet amsl, though most records are from over 3,000 feet amsl. Summer roosts consist of caves and mines with open ceilings (not cracks or crevices) from desert scrub lowlands up through pinyon-juniper woodlands and coniferous forests at higher elevations. Night roosts are often in abandoned buildings, and winter hibernacula are typically cool caves, mines, and lava tubes in the uplands near the Grand Canyon and in the Sky Islands region in southeastern Arizona. In Arizona, females form maternity colonies of several dozen to several hundred bats in late April and give birth in June. Most young can fly by the end of July. The pale Townsend's big-eared bat feeds primarily on small moths but will take other flying insects as well, which it catches in flight along forested edges or gleans from foliage (AGFD 2003a).



The analysis area is within the known geographical range of the species and provides pinyon-juniper woodland habitat for foraging pale Townsend's big-eared bats, but caves or mines with open ceilings for roosting are not present. There are no records of the species within 3 miles of the analysis area (AGFD 2022b). It is unlikely that pale Townsend's big-eared bats use the analysis area for breeding or roosting, but the species may forage in the area during the summer or pass through during migration.

#### *SPOTTED BAT*

In Arizona, the spotted bat has been found from low deserts in the southwest, to high desert and riparian habitats in the northwest, and conifer forests in the north, at elevations ranging from 110 to 8,670 feet amsl. They are considered by some biologists to be an elevational migrant. Roost site characteristics and site localities are poorly known, but limited observations suggest that they prefer to roost singly in crevices and cracks in cliff faces (AGFD 2003b).

The analysis area is within the predicted range for the spotted bat and provides pinyon-juniper woodland habitat for foraging spotted bats, but crevices or cliffs for roosting are not present. There are no records of the species within 3 miles of the analysis area (AGFD 2022b). It is unlikely that spotted bats use the analysis area for breeding or roosting, but the species may forage in the area during the summer or pass through during migration.

#### **3.5.2.1.3 BALD AND GOLDEN EAGLES**

In addition to protection under the Migratory Bird Treaty Act, bald eagles (*Haliaeetus leucocephalus*) and golden eagles are protected under the Bald and Golden Eagle Protection Act. The golden eagle is also a COF sensitive species.

The analysis area is within the limited breeding and non-breeding ranges of the bald eagle and may provide foraging resources. Secondary bald eagle prey items on-site may include carrion, especially in winter, birds (e.g., waterfowl), and terrestrial mammals (e.g., rabbits) (Buehler 2000); however, the species seeks out aquatic foraging habitats and prefers fish. There is no nesting or roosting habitat (high cliffs or tall trees) or preferred foraging habitat (fish-bearing waters) within the analysis area.

The analysis area is within the golden eagle's year-round range and contains appropriate foraging habitat (i.e., open grassland and steppe-like vegetation communities [Katzner et al. 2020]) and limited, marginal nesting habitat, primarily consisting of existing transmission towers. The species has been documented within 3 miles of the analysis area (AGFD 2022b), and there is a known breeding area approximately 1.5 miles east of the analysis area (McCarty et al. 2021).

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### **3.5.2.2 Environmental Consequences**

#### **3.5.2.2.1 PROPOSED ACTION**

##### *COF SENSITIVE PLANTS*

Under the Proposed Action, the only construction activities that would occur on COF land would be the improvements to NFSRs 417 and 9003. Potential impacts to COF sensitive plant species would be similar to those described for vegetation in Section 3.3.2, namely direct injury or mortality from ground disturbance during construction and decommissioning and vegetation maintenance during operations, and reduced productivity from fugitive dust accumulation. To minimize the potential for direct and indirect impacts to COF sensitive plants, the Proponent would be required to survey the road corridor for the COF access road improvements prior to any vegetation clearing or ground-disturbing activities. Any COF sensitive plants identified would be marked for avoidance; if avoidance were not possible, the Proponent would coordinate with the COF botanist to salvage and relocate the individuals (see Table 5). Since there would only be 17.5 acres of permanent disturbance associated with the COF access road improvements, most of which would occur within the area disturbed by the existing road prism, the impacts to habitat for COF sensitive plants would be negligible.

New populations of COF sensitive plants could develop near NFSR 417 and 9003 during the 37-year operations period, where they could be impacted by fugitive dust from vehicle traffic. However, as described in Section 3.3.2, fugitive dust generated by the Proposed Action would have negligible effects on vegetation. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed during decommissioning to its pre-construction width of approximately 20 feet, and NFSR 417 would not require reclamation. Reclaiming NFSR 9003 to its pre-construction width could be accomplished without disturbing vegetation beyond the road shoulder and would not impact COF sensitive plants, should new populations develop near the road during operations.

In summary, due to limited habitat disturbance for COF sensitive plants and the implementation of pre-construction clearance surveys (see Table 5), the Proposed Action would have negligible, adverse, short- and long-term impacts on COF sensitive plants. The Proposed Action may impact individuals, but impacts are not likely to result in a trend towards federal listing or loss of population viability.

##### *COF SENSITIVE WILDLIFE*

Under the Proposed Action, the only construction activities that would occur on COF land would be the improvements to NFSRs 417 and 9003. These improvements would disturb approximately 54.6 acres, 37.1 acres of which would be temporary disturbance restored immediately following construction. The remaining 17.5 acres of permanent disturbance would primarily occur in areas disturbed by the existing road prism. This small amount of long-term habitat loss would have a negligible effect on COF sensitive wildlife. NFSR 9003 would be reclaimed during decommissioning to its pre-construction width of approximately 20 feet. NFSR 417 would not require reclamation.

The potential impacts to COF sensitive wildlife from noise and human disturbance during construction and decommissioning would be similar to those described for general wildlife in Section 3.4.1 and would be minimized through the implementation of BMPs (see Table 5). These BMPs also include a 25-mph speed limit on access roads, which would minimize the risk of direct injury or mortality of COF sensitive wildlife due to increased traffic on NFSRs 417 and 9003.

Additional species-specific analysis for COF sensitive wildlife species that may occur in the analysis area are provided in the following sections; based on these analyses, the Proposed Action may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for any COF sensitive wildlife species.

#### *AMERICAN PEREGRINE FALCON*

Ground disturbance and vegetation clearance is not anticipated to directly impact peregrine falcons since their use of the analysis area is limited to occasional foraging or migratory flyovers, but traffic and noise during all phases of the Proposed Action may result in short-term avoidance of the area. These effects would mostly be limited to the construction and decommissioning periods. The risk of vehicle collisions would be minimized through the implementation of a 25-mph speed limit (see Table 5). Vegetation clearance during construction would result in a negligible reduction of habitat for prey species. Therefore, adverse short- and long-term effects to the American peregrine falcon under the Proposed Action would be negligible.

#### *WESTERN BURROWING OWL*

Ground disturbance and vegetation clearance during construction would not directly impact nesting burrowing owls because pre-construction nest clearance surveys would be required during the migratory bird breeding season (see Table 5). Habitat along NFSRs 417 and 9003 is more heavily wooded than the private and ASLD lands in the interconnection siting area (which is beyond the analysis area for COF sensitive wildlife) and is unlikely to be important for foraging or breeding burrowing owls. Thus, ground disturbance associated with the COF access road improvements would have negligible impacts on the burrowing owl and its prey base. As with the peregrine, avoidance due to increased noise and human presence would primarily occur during construction and decommissioning, and the 25-mph speed limit (see Table 5) would minimize the risk for direct mortality or injury from vehicle collisions. Therefore, adverse short- and long-term effects to the western burrowing owl under the Proposed Action would be negligible.

#### *ALLEN'S LAPPET-BROWED BAT*

It is unlikely that Allen's lappet-browed bats use the analysis area regularly, and construction activities would not occur at night when Allen's lappet-browed bats may be passing through the analysis area. Therefore, the Proposed Action would have no effect on Allen's lappet-browed bat.

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### *PALE TOWNSEND'S BIG-EARED BAT*

The pale Townsend's big-eared bat may forage in the analysis area, but impacts to foraging bats are not anticipated because construction activities would not occur at night. While the improvements to NFSRs 417 and 9003 would disturb a small amount of foraging habitat for the species, pinyon-juniper woodlands are abundant in the surrounding region, and the adverse impacts to pale Townsend's big-eared bats and their prey would be negligible.

### *SPOTTED BAT*

The spotted bat may forage in the analysis area, but impacts to foraging bats are not anticipated because construction activities would not occur at night. While the improvements to NFSRs 417 and 9003 would disturb a small amount of foraging habitat for the species, pinyon-juniper woodlands are abundant in the surrounding region, and the adverse impacts to spotted bats and their prey would be negligible.

### *BALD AND GOLDEN EAGLES*

During construction, increased noise from and visual presence of vehicles, equipment, and humans may cause individual bald and golden eagles to avoid the analysis area. Construction activity noise and human presence may also result in disturbance to prey species, which may then disperse to nearby habitat. Although they are likely to avoid active work sites, bald and golden eagles could be injured or killed by collisions with vehicles on access roads, but this risk would be minimized with the implementation of a 25-mph speed limit (see Table 5).

Approximately 91.2 acres (including 37.1 acres within the COF) of foraging habitat for the golden eagle and foraging or migratory stopover habitat for the bald eagle would be temporarily disturbed during construction. Approximately 39.2 acres (including 17.5 acres within the COF) would remain disturbed throughout the operations period until final reclamation after decommissioning. The APS 500-kV switchyard would not be decommissioned, and habitat would not be restored in the 5 acres of switchyard improvements. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed to its pre-construction width of approximately 20 feet, and NFSR 417 would not require reclamation. This would reduce the amount of habitat available for prey species in the analysis area, which may reduce foraging opportunities for golden eagles. Given the abundance of similar foraging habitat in the region, this would have a negligible effect on the golden eagle. Primary prey for the bald eagle (i.e., fish) would not be affected, but habitat for secondary bald eagle prey resources would be reduced. As with golden eagles, the effect on bald eagle foraging would be negligible.

The nearest known golden eagle breeding area is more than 1.5 miles east of the analysis area and is unlikely to be impacted by noise or human presence during the construction period. However, the existing transmission towers provide suitable nesting habitat for golden eagles, and golden eagles could nest in the analysis area in the future. New pole structures for the intertie line(s) and overhead collector lines would be designed in accordance with APLIC guidelines (APLIC 2006, 2012), which would discourage eagles and other raptors from perching or nesting on these structures

(see Table 5). This would also minimize the potential for direct impacts to golden eagles during operations from collision with or electrocution by these lines. Due to the brief and infrequent nature of inspection and maintenance activities, effects to golden eagles during operations would be negligible.

Since suitable nesting habitat for bald eagles is not present in the analysis area, there is no potential for the Proposed Action to directly impact nesting bald eagles or their young. As with golden eagles, impacts to bald eagles during operations would be negligible due to the brief and infrequent nature of inspection and maintenance activities and the implementation of APLIC guidelines (APLIC 2006, 2012) (see Table 5) in intertie line and overhead collector line designs.

Therefore, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term effects on bald and golden eagles during construction and decommissioning. Adverse long-term impacts during operations would be negligible.

### **3.5.2.2.2 NO ACTION ALTERNATIVE**

#### *COF SENSITIVE PLANTS*

Under the No Action alternative, no construction would take place on COF lands and the COF access roads would not be used to access the alternative interconnection project. Therefore, there would be no direct or indirect impacts to COF sensitive plant species or habitat.

#### *COF SENSITIVE WILDLIFE*

Under the No Action alternative, NFSRs 417 and 9003 would not be improved and these roads would not be used to access the alternative interconnection project. Therefore, the No Action alternative would have no effect on COF sensitive wildlife.

#### *BALD AND GOLDEN EAGLES*

Under the No Action alternative, the impacts to bald and golden eagles on the private and ASLD land within the analysis area would be similar to those described for bald and golden eagles under the Proposed Action, but impacts on private and ASLD lands beyond the analysis area would be increased. The BREC access road would be used to access the alternative interconnection project. There would be no impacts to bald and golden eagles within the COF because there would be no improvements to NFSRs 417 and 9003, and these roads would not be used to access the alternative interconnection project.

## **3.6 Cultural Resources**

Cultural resources are generally defined as the physical manifestations of past human activities, including prehistoric and historic-era archaeological sites, historic-era buildings and structures, and the locations of important events in prehistory/history. Cultural resources may also refer to places

of traditional religious and spiritual importance, including archaeological sites, landscapes, natural landforms, and sacred places, as well as gathering or use areas important to the continuity of indigenous practices and necessary for maintaining a community's cultural identity.

### 3.6.1 AFFECTED ENVIRONMENT

The area of potential effects (APE) is the geographic area or areas within which impacts from an undertaking (that is, a federal action) may directly or indirectly affect cultural resources that are listed, or eligible for listing, in the National Register of Historic Places (NRHP) (i.e., historic properties). As the lead federal agency, Reclamation determines the APE by considering potential direct and indirect impacts to historic properties from the construction, operation, and decommissioning of the Interconnection Project. The APE consists of approximately 253 acres of land, including 18 acres administered by the ASLD, 55 acres managed by the COF, and 180 acres of private land. The analysis area for cultural resources is defined as a 0.5-mile buffer extending from the project APE (see Figure 6). The analysis area provides important context for the identification and evaluation of cultural resources within the APE and it provides a wider scale for the consideration of potential cumulative impacts (see Section 4.1.2) from implementation of the Interconnection Project.

The analysis area was used by many indigenous groups, including archaeological cultures defined as the Paleoindian, Archaic, and Formative traditions, spanning several thousands of years. Considered a frontier zone, the analysis area represents a place of cultural overlap between contemporary cultural traditions such as the Cohonina, Sinagua, and Ancestral Pueblo. Ethnographically speaking, the analysis area incorporates the ancestral lands and traditional territories of many modern tribal groups, including the Diné (Navajo), Havasupai, Hopi, Hualapai, Zuni, San Carlos Apache, Yavapai-Apache, Fort Mojave, Mescalero Apache, and others (Arizona SHPO and Salt River Pima-Maricopa Indian Community 2023). Additionally, the boundaries of the Navajo Nation lie approximately 5 miles to the northeast of the analysis area.

Pursuant to Section 106 of the National Historic Preservation Act of 1966 (NHPA), Reclamation must make a “reasonable and good faith effort” to identify and inventory historic properties that may be affected by a proposed federal undertaking (36 CFR 800.4(b)(1)). As part of the inventory for this undertaking, the results of previously completed cultural resources surveys were examined and a new Class III pedestrian cultural resources survey was conducted where necessary to encompass the entire APE. The results are summarized in *Cultural Resources Survey for the CO Bar Solar Interconnection Project in Coconino County, Arizona* (Barr 2023).

The inventory conducted for the Interconnection Project identified one archaeological site within the APE. AZ I:5:81(Arizona State Museum [ASM]) is a Cohonina artifact scatter, which was determined eligible for inclusion in the NRHP under Criterion D for its potential to yield important information about the transition from reliance on hunting and gathering to agriculture and Cohonina occupation of the Coconino Plateau. One previously recorded site within the APE, described as a sweat lodge, could not be relocated. The inventory also recorded four isolated occurrences within the APE, which are not eligible for inclusion in the NRHP.

An additional 27 previously recorded cultural resources were identified in the analysis area beyond the APE, including 22 Cohonina archaeological sites, four historic-era artifact scatters, and one Navajo sweat lodge. Of these 27 cultural resources, two are eligible for inclusion in the NRHP; the remaining 25 cultural resources are not eligible or have not been evaluated for eligibility for inclusion in the NRHP.

### **3.6.2 ENVIRONMENTAL CONSEQUENCES**

Impacts to cultural resources are discussed in terms of direct, indirect, and cumulative impacts from the Proposed Action and the No Action alternative that could result in an adverse effect on historic properties. As defined under 36 CFR 800.5(a)(1) (Criteria of Adverse Effect), an adverse effect occurs when a federal action directly or indirectly alters any characteristics (integrity) of a historic property that qualify it for the NRHP. An adverse effect on a historic property is not limited to physical destruction or damage, but also includes relocation of the property, changes in character of the setting of the property, and the introduction of visual, atmospheric, or audible intrusions. Impacts from federal actions that result in an adverse effect on a historic property may also include reasonably foreseeable effects caused by the action that may occur later in time. Reclamation must determine whether the alteration of character-defining features (of a historic property) would result in the degradation of the aspects of integrity (i.e., location, design, setting, materials, workmanship, feeling, and association [National Park Service 1997]) to the extent that the degree of alteration would constitute an adverse effect under Section 106 of the NHPA. Cultural resources that are ineligible for the NRHP cannot be adversely affected as defined under Section 106 because they do not qualify as historic properties.

#### **3.6.2.1 Proposed Action**

The Proposed Action would disturb approximately 130.4 acres (including 91.2 acres of temporary disturbance that will be reclaimed following construction and 39.2 acres of permanent disturbance). The Proponent has committed to avoiding all historic properties during construction, operations, and decommissioning of the Proposed Action (see Table 5); therefore, there would be no impacts to the only historic property within the APE.

Implementation of the Proposed Action would introduce temporary, non-physical changes to the analysis area in the form of increased noise from heavy equipment and machinery operation in the interconnection siting area and from increased traffic on access roads (see Table 4). These auditory changes to the setting within the analysis area would primarily be limited to the construction and decommissioning periods, and given their short-term nature, would not diminish the integrity of setting for these cultural resources. Long-term auditory impacts to setting during operations would be negligible because inspections and maintenance activities would be intermittent in nature and would generate limited noise. Noise from traffic on access roads would also be limited because there would only be five round trips per day on average (see Table 4).

During operations, the Proposed Action would introduce long-term visual intrusions into the landscape that are not currently present in the analysis area. However, because of the distance of

these cultural resources from the interconnection infrastructure and the intervening topography and vegetation, the degree of visual changes to the landscape and historic setting as viewed from these cultural resources would be very small. Any changes to setting that do occur would not be permanent since the landscape in the analysis area would be restored to its pre-construction conditions during decommissioning. Therefore, under the Proposed Action, changes to the historic setting of these cultural resources would not constitute an adverse effect under the NHPA.

With the implementation of BMPs (see Table 5), the Proposed Action would have no adverse effects on any historic properties and would have adverse, negligible cumulative impacts on cultural resources in the analysis area.

### **3.6.2.2 No Action Alternative**

Under the No Action alternative, Reclamation and the Forest Service would not have a federal undertaking that would trigger Section 106 of the NHPA. However, the Proponent would still be subject to the applicable provisions of the State Historic Preservation Act and the Arizona Antiquities Act on State and private land (including historic properties that would be avoided by ground-disturbing activities). Therefore, adverse effects to historic properties within the APE would be avoided under the No Action alternative. Adverse effects to cultural resources in the analysis area are also unlikely under the No Action alternative because the non-federal gen-tie and associated infrastructure would be designed to avoid adverse effects on historic properties.

## **3.7 Error! Reference source not found.Error! Reference source not found.Error! Reference source not found.Error! Reference source not found. Figure 5 Noise**

### **3.7.1 AFFECTED ENVIRONMENT**

The analysis area for noise is the project area plus a 0.5-mile buffer (see Figure 6) which is based on the distance at which construction equipment and vehicle traffic is typically audible (Wrigley 2018). In this context, noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

The general human response to changes in noise levels can be characterized as follows:

- A 3-decibel (dB) change in sound level is considered a barely noticeable difference.
- A 5-dB change in sound level typically is noticeable.



- A 10-dB increase is considered a doubling in loudness (California Department of Transportation 2013).

When evaluating human response to noise, sound levels are generally presented in terms of A-weighted decibels (dBA), which measures sound in a fashion similar to how a person perceives or hears sound, thus achieving a strong correlation with how people perceive acceptable and unacceptable sound levels.

As a result of the Noise Control Act of 1972, the U.S. Environmental Protection Agency (EPA) developed standards for noise levels under various conditions that would protect public health and welfare with an adequate margin of safety. The EPA determined that outdoor day-night average sound levels (Ldn) less than or equal to 55 dBA are sufficient to protect public health and welfare in residential areas and other places where quiet is a basis for use; and this level (Ldn of 55 dBA) as the level below which no adverse impact occurs. An Ldn of 65 dBA represents a compromise between community impact and the need for construction. As such, that level is commonly used for noise planning purposes (EPA 1974).

Sound propagation, or how sound travels, is affected by terrain and the elevation of the receptor relative to the noise source. From level ground, noise travels in a straight path between the source and receptor. Breaking the line-of-sight between the receptor and the noise source can affect noise levels; examples include a traffic noise source at a certain elevation and a receptor at a higher elevation and vice versa. Each doubling of the distance from the source of a noise decreases the sound pressure level by 6 dBA at distances of more than 50 feet (New York Department of Environmental Conservation 2001).

Coconino County zoning classifies the project area as a residential land use category intended to accommodate rural lifestyles, including ranches and agricultural land uses (Coconino County 2022a). The Coconino County Comprehensive Plan (Coconino County 2015) notes goals and policies to consider noise impacts when reviewing development projects (Community Character Policies 41, 42 and 44), including the siting of utility-scale projects and transmission lines, which should consider the potential for noise disturbances to adjacent residential areas (Energy Policy 14) (Coconino County 2015). Noise standards for renewable energy projects in Coconino County are determined through the Conditional Use Permit (CUP) process as described in the Coconino County Zoning Ordinance (Coconino County 2022a).

The project area is in a rural unincorporated region in Coconino County. In rural areas, typical outdoor Ldn values range between 35 and 50 dB (EPA 1974), from very quiet to moderately quiet. Ambient noise surrounding the project area consists predominantly of rural or natural sounds and vehicle traffic on US 180 and, to a lesser extent, on Forest Service roads and private ranch roads. There are no noise-sensitive receptors such as residences, schools, churches, hospitals, or parks within the analysis area. The nearest noise-sensitive receptors are hikers on the Arizona National Scenic Trail (AZNST), located approximately 0.7 mile east of the intersection of NFSR 417 and NFSR 9003 at its closest point, and approximately 2.8 miles east of the interconnection siting area (see Figure 6).

## 3.7.2 ENVIRONMENTAL CONSEQUENCES

### 3.7.2.1 *Proposed Action*

During construction, noise levels generated by equipment would vary daily and hourly, depending on the construction activity and the type, age, and number of equipment in operation. Table 10 lists typical noise levels for equipment and vehicles commonly used during construction and decommissioning. Noise impacts from construction would vary with the type of work being done, the distance between the work and the receptor, and meteorological conditions. Most equipment produces noise in the 80- to 90-dBA range at distances of 50 feet (American National Standards Institute 2018). As noise levels dissipate with distance, impacts would be greatest in the immediate vicinity of active work sites and would decrease at greater distances. Noise impacts would typically occur during daylight hours and the normal workweek, when construction activities are occurring. All construction vehicles and equipment would be maintained in proper operating conditions and would be equipped with manufacturers' standard noise control devices or better (e.g., mufflers, engine enclosures). Traffic on access roads during construction (see Table 4) would also result in increased noise.

Long-term noise during operations would primarily be associated with the transformers and other electrical equipment within the collector substation and adjacent switchyard. As required by the Coconino County Zoning Ordinance, noise would not exceed 50 dBA at the private property line (see Table 5). Occasional noise would also be produced by vehicle traffic (see Table 4) and equipment use associated with inspections and maintenance activities during operations; however, these activities would be brief, infrequent, and localized in nature.

**Table 10. Noise Levels from Common Construction Equipment**

Construction Equipment	Typical Sound Pressure Level (dBA)				
	50 feet	100 feet	500 feet	1,500 feet	3,000 feet
Bulldozer (250–700 horsepower)	88	82	68	58	52
Front-end loader (6–15 cubic yards)	88	82	68	58	52
Trucks (200–400 horsepower)	86	80	66	56	50
Grader (13–16 feet blade)	85	79	65	55	49
Shovels (2–5 cubic yards)	84	78	64	54	48
Portable generators (50–200 kilowatts)	84	78	64	54	48
Derrick crane (11–20 tons)	83	77	63	53	47
Mobile crane (11–20 tons)	83	77	63	53	47
Concrete pumps (30–150 cubic yards)	81	75	61	51	25

Source: Adapted from Table 4.53. Noise Levels from Common Construction Equipment in Bureau of Land Management 2011).

Notes: These typical noise levels at distances away from the pieces of equipment (beyond 50 feet) are conservative because the only attenuating mechanism considered was divergence of the sound waves in open air. In general, this mechanism results in a 6-dBA decrease in the sound level with every doubling of distance from the source. For example, the 84-dBA average sound level associated with generators would be attenuated to 78 dBA at 100 feet, 72 dBA at 200 feet, 66 dBA at 400 feet, and so forth. Attenuation from air absorption, ground effects, and shielding from intervening topography or structures are not included in determining these nominal values. Further, use of this data is considered to be conservative because construction equipment producers have striven to produce quieter models to protect operators from exposure to high noise levels and the community from undue noise intrusion.

Noise impacts during decommissioning of the Proposed Action would be similar to those during construction since similar equipment would be used; traffic volumes and associated noise would also be similar to those for construction.

In summary, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term impacts from noise during construction and decommissioning. Adverse, long-term noise impacts during operations would be negligible.

### **3.7.2.2 No Action Alternative**

Under the No Action alternative, the non-federal interconnection would be constructed (see Table 6), which would involve an amount of construction within the interconnection siting area similar to the Proposed Action (see Figure 5). The BREC access road would be used to access the alternative interconnection project. NFSRs 417 and 9003 would not be improved, and these roads would not be used to access the alternative interconnection project; therefore, there would be no noise impacts within the COF under the No Action alternative. BMPs implemented to avoid or minimize effects from noise would be similar to those under the Proposed Action. Operations and decommissioning under the No Action alternative would also be similar to the Proposed Action. Therefore, under the No Action alternative, noise impacts on the private and ASLD land within the analysis area would be similar to those described for the Proposed Action.

## **3.8 Error! Reference source not found. Error! Reference source not found. Transportation**

### **3.8.1 AFFECTED ENVIRONMENT**

The analysis area for transportation is US 180 between Mileposts 239 (Curley Seep Spring) and 266 (State Route 64 in Grand Canyon Junction [Valle], AZ), NFSRs 417 and 9003, and the BREC access road (see Figure 6). US 180 is a paved, two-lane roadway classified as a rural major collector (ADOT 2022a) connecting the communities of Grand Canyon Junction (Valle) and Flagstaff, Arizona. In 2021, average annual daily traffic on US 180 in the analysis area was 1,279 vehicles per day (ADOT 2022b).

From US 180 (between Mileposts 252 and 253), NFSRs 417 and 9003 are unpaved dirt roads that extend west and north towards the Interconnection Project. Traffic data is not collected on NFSRs 417 and 9003; however, the number of daily trips on the roads is assumed to be very limited since they are primarily used for dispersed recreation, COF administrative activities, and access to grazing allotments and private ranch lands (Forest Service 2018a).

A 7.5-mile unpaved access road was recently constructed as part of the BREC project, originating from US 180 at approximately Milepost 255 and terminating at the planned APS 500-kV switchyard (Reclamation 2022) (see Figure 3). The primary purpose of this road is to provide access to the BREC and CO Bar Solar Complex, but it may also be used to access private and ASLD lands in the

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analysis area (for landowners and members of the public with valid permits [see Recreation and Access in Table 8]).

## **3.8.2 ENVIRONMENTAL CONSEQUENCES**

### **3.8.2.1 *Proposed Action***

Under the Proposed Action, construction traffic would vary from 25 to 50 round trips per day over a 1-year period (see traffic estimates in Table 4). This would represent a 3.9 percent to 7.8 percent increase in average annual daily traffic on US 180 in the analysis area. The Proposed Action would provide a second access point from US 180, which would help minimize congestion or delays on the highway. This would also allow construction traffic to be split evenly between the BREC access road and the COF access roads, reducing the potential for motorists to experience delays on these roads during construction.

Traffic during operations would be minimal and limited to the occasional use of pick-ups and other light-duty trucks during inspections and maintenance activities. This would result in an average of 5 round trips per day over the 37-year operations period (see Table 4), which would not notably impact traffic patterns on roads in the analysis area. The volume of traffic on access roads in the analysis area during decommissioning would be similar to that during construction.

Traffic impacts throughout all phases would be minimized through the implementation of BMPs (see Table 5) including a County-approved Traffic Control Plan, coordination with ADOT, and scheduling of deliveries during off-peak hours. Motorists on NFSRs 417 and 9003 could experience minor delays during the access road improvements, but there would be no road closures and access would be maintained throughout all phases of the Proposed Action.

In summary, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term impacts on transportation during the construction and decommissioning periods. Adverse, long-term impacts to transportation during operations would be negligible.

### **3.8.2.2 *No Action Alternative***

Under the No Action alternative, the non-federal interconnection would be constructed (see Section 2.2), which would lead to increased traffic during construction due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities. While some of the construction traffic for these facilities may use other means of access outside the analysis area, there would still be more traffic on US 180 in the analysis area than under the Proposed Action. There would be no direct impacts to transportation within the COF under the No Action alternative because NFSRs 417 and 9003 would not be improved, nor would they be used to access the alternative interconnection project. However, this would require traffic for both projects to use the BREC access roads as the sole means of access from US 180. Not only would this double the anticipated traffic volume on the BREC access road, but it may lead to increased congestion and delays on US 180 since all traffic would enter and exit at a single location. This could also cause

delays for motorists accessing NFSRs 417 and 9003 from US 180. Operations traffic would be slightly increased under the No Action alternative because of the additional inspections and maintenance required for the 19-mile gen-tie line but, overall, would still be expected to cause a negligible increase in traffic volumes on US 180 and the BREC access road. As with construction, decommissioning traffic on US 180 and the BREC access road would also be increased under the No Action alternative. BMPs implemented to avoid or minimize effects from noise would be similar to those under the Proposed Action.

Therefore, under the No Action alternative, there would be moderate short-term impacts to traffic and transportation on the BREC access road and US 180 in the analysis area during construction and decommissioning. Long-term effects to transportation during operations would be negligible.

## **3.9 Aesthetics and Scenery Resources**

Scenery resources are the visible physical features of a landscape including landforms, vegetation patterns, water, wildlife, structures, and other features. Combined, these physical feature values create an image and make the landscape identifiable and unique, creating landscape character, which provides a baseline for scenery management and assessing a landscape's scenic integrity.

### **3.9.1 AFFECTED ENVIRONMENT**

The analysis area for aesthetics and scenery resources is based on the potential visibility of Proposed Action components, in consideration of the surrounding topography and landscape setting. Based on the forms, lines, colors, and textures that would be introduced by the interconnection infrastructure, it was determined that visual impacts could occur in the foreground (0 to 1.5 miles), but that interconnection infrastructure is unlikely to be discernible from the existing landscape in the middle ground (1.5 to 5 miles) and background (beyond 5 miles). Therefore, the analysis area for aesthetics and scenery resources includes the project area plus a 1.5-mile buffer (see Figure 6).

The visual analysis area falls within unincorporated Coconino County. While the Coconino County Plan does not prescribe specific visual resource management objectives for development on the private and ASLD lands in the analysis area, it emphasizes the importance of incorporating measures to minimize impacts to aesthetics and scenic quality into development projects (Coconino County 2015). The Coconino County Zoning Ordinance (Coconino County 2022a) prescribes specific visual performance standards for renewable energy projects to limit impacts to scenic quality and night skies, such as using existing infrastructure to minimize the need for new facilities and transmission lines, and utilizing exterior lighting fixtures that comply with County guidelines. These measures have been incorporated into the Proposed Action as BMPs (see Table 5).

COF land in the analysis area is subject to the Forest Plan (Forest Service 2018a), which requires that management decisions that are unable to maintain or move toward the desired Scenic Integrity Objectives (SIOs) and whose effects persist in the long term shall not occur unless the Forest Plan

is amended to change the SIO. SIOs are objectives for maintaining the scenic integrity of the landscape and identify the maximum level of deviation allowed to the described landscape character. The Forest Service uses the Scenery Management System to divide the COF into four SIO categories: very high, high, moderate, and low. The highest scenic integrity ratings are given to those landscapes that have little or no deviation from the described landscape character. COF lands within the analysis area have a moderate or high SIO rating. A moderate SIO rating means that the landscape can appear slightly altered and noticeable deviations are to be visually subordinate to the landscape character. A high SIO rating means the landscape character appears intact and deviations should not be evident. Although 5,084 acres of Kaibab NF land are present within the analysis area, the only components of the Proposed Action within 1.5 miles of Kaibab NF land are the COF access roads. Because these roads do not provide access to the Kaibab NF and the road improvements and traffic on these roads are unlikely to be visible from Kaibab NF land in the analysis area, Kaibab NF land is not described further in this section.

As described in Section 3.3, Vegetation, the analysis area is located within the Great Basin Conifer Woodland biotic community and consists primarily of pinyon-juniper woodlands and semi-desert shrub steppe. Soil colors include light khaki to rust red soils with vegetation colors ranging from light tans to deep greens. Sensitive viewers or viewing locations in the analysis area are limited and primarily transitory (i.e., recreational users or vehicular travelers), rather than permanent in nature (e.g., residences, developed recreation sites). Sensitive viewers and viewing locations within the analysis area include the following:

- Recreational users including hunters, 4×4 recreationalists, off-highway vehicle riders, and hikers. Approximately 1.9 miles of the AZNST fall within the analysis area.
- Vehicular travelers on COF access roads and US 180. Approximately 7.3 miles of US 180 fall within the analysis area; 5.3 miles are part of the portion of US 180 designated by ADOT as the San Francisco Peaks Scenic Road.

### **3.9.2 ENVIRONMENTAL CONSEQUENCES**

#### **3.9.2.1 Methodology**

Impacts to aesthetics and scenery resources were analyzed for each alternative by assessing the potential change to existing scenery experiences, setting, and deviation from the surrounding landscape character, as well as compliance with relative visual and scenery management objectives applicable to the analysis area. For COF land in the analysis area, the analysis evaluates whether the impacts to scenery resources are consistent with the SIOs in the analysis area.

#### **3.9.2.2 Proposed Action**

Construction, operations, and decommissioning could impact aesthetics and scenery resources if scenic quality is degraded or views from sensitive viewpoints are adversely modified. Temporary

impacts during construction would include the presence of construction vehicles, equipment, and workforce, as well as fugitive dust generated by ground-disturbing activities and vehicle traffic (see Table 4) on unpaved access roads. Visual resource analyses conducted in support of the Coconino County CUP process for the CO Bar Solar Complex indicated that interconnection infrastructure would not be visible to travelers on US 180 (SWCA 2020). Construction activities would be visible from US 180 during the COF access road improvements. However, because of the intervening topography and vegetation, these activities would only be visible from a short stretch of the highway. These impacts would be short-term in nature (less than 3 months) because most of the road improvement activities would be obscured from view by the intervening topography and vegetation. ADOT would evaluate any improvements needed at the intersection of US 180 and NFSR 417 during their review of the required encroachment permit (see Table 5) and would identify any measures necessary to minimize visual impacts to the scenic byway. Any work within the US 180 right-of-way (ROW) would follow ADOT's guidelines and rules for scenic roadway construction and maintenance (ADOT 2023).

The AZNST is approximately 0.7 mile from the proposed COF road improvements at its closest point and approximately 2.8 miles from the interconnection siting area, and therefore, most construction activities would not be visible to trail users. BMPs (see Table 5) such as dust control measures and a 25-mph speed limit on unpaved roads would minimize the temporary impacts from fugitive dust. Grading for project components would be kept to a minimum, and designated areas for equipment, materials, and parking would be established to minimize the area of ground disturbance. Temporarily disturbed areas (91.2 acres, including 37.1 acres within the COF) would be reclaimed and revegetated immediately following construction, which would reduce long-term impacts to aesthetics and scenic resources during operations. Temporary impacts to scenic quality within the COF during construction would be consistent with the moderate to high SIO designation in the analysis area because these impacts would be limited in extent and short-term in nature.

The primary source of long-term impacts to aesthetics and scenery resources during the 37-year operations period would be the presence of interconnection infrastructure (i.e., the substation, switchyard expansion, collector lines, and intertie line[s]) introduced to the landscape during construction. These components would add new forms, lines, and textures—including the repeating, vertical features of the collector lines and intertie line(s)—to the existing landscape in the analysis area; these effects would be greatest on the private and ASLD land in the immediate vicinity of the interconnection siting area. However, due to the similar line, color, and texture of existing and planned transmission infrastructure in the interconnection siting area (see Cumulative Effects in Section 4.1.5), the degree of visual contrast to the landscape in the analysis area would be reduced. The Proposed Action has been designed to comply with the visual performance standards for renewable energy projects set out in the Coconino County Zoning Ordinance (Coconino County 2022a) and specific measures included in the terms and conditions of the CUPs for the CO Bar Solar Complex (Coconino County 2022b).

The interconnection components are more than 2.5 miles north of the COF boundary and would begin to fade into the background when viewed from this distance; the visual impacts of the interconnection components on COF land are further reduced by the intervening landscape, which would mostly obscure them from view. The relatively small amount of traffic that would occur on

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COF access roads during operations (see Table 4) would have negligible long-term effects on aesthetics and scenery resources. The only visual changes that would be evident within the COF during the 37-year operations period would be the improvements to NFSRs 417 and 9003. This change would be compatible with the moderate to high SIO designation in the analysis area since smoothing of the travel surface and minor widening in some locations would not introduce new lines, forms, colors, or textures. The intersection of NFSR 417 and US 180 would not need to be enlarged or substantially changed, and thus would be consistent with the high SIO designation in this area.

As described above, the interconnection infrastructure would not be visible to motorists traveling on US 180 (SWCA 2020) and, therefore, there would be no long-term impacts to aesthetics and scenery resources for travelers on US 180 (including the portion designated as a scenic byway). Similarly, views from the AZNST would not be notably impacted since the trail is approximately 2.8 miles from the interconnection siting area at its closest point.

Temporary impacts associated with decommissioning would be similar to those described for construction. During decommissioning, the landscape character in the analysis area would be restored to pre-construction conditions through the removal of interconnection infrastructure reclamation and revegetation of disturbed areas. The APS 500-kV switchyard would not be decommissioned, and habitat would not be restored in the 5 acres of switchyard improvements. NFSR 417 and NFSR 9003 would not be decommissioned; NFSR 9003 would be reclaimed to its pre-construction width of approximately 20 feet, and NFSR 417 would not require reclamation. This would not negatively affect aesthetics and scenery resources because the widened COF access roads would appear similar to their pre-construction state and because the switchyard is located in an area where transmission infrastructure was present prior to construction of the Proposed Action.

In summary, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term impacts to aesthetics and scenery resources during the construction and decommissioning. Adverse long-term impacts during operations would be minor on the private and ASLD lands in the immediate vicinity of the interconnection siting area and negligible at distances greater than 1.5 miles from the interconnection siting area. There would be negligible, adverse, long-term impacts within the COF from the improvements to NFSRs 417 and 9003, which would be consistent with the moderate to high SIO designation in the analysis area.

### **3.9.2.3 No Action Alternative**

Under the No Action alternative, the non-federal interconnection would be constructed, which would result in 426.5 acres of temporary disturbance and 87.3 acres of permanent disturbance, most of which would fall outside the interconnection siting area as construction of the Proposed Action (see Table 6). The interconnection infrastructure installed within the analysis area would also be similar to the Proposed Action, but the need for a 500-kV gen-tie line would lead to greater impacts to aesthetics and scenery resources beyond the interconnection siting area. Thus, under the No Action alternative, impacts to aesthetics and scenery resources on the private and ASLD lands



within the analysis area would be similar to but greater than those described for the Proposed Action.

Under the No Action alternative, the BREC access road would be used to access the alternative interconnection project. NFSRs 417 and 9003 would not be improved, and these roads would not be used to access the alternative interconnection project. None of the alternative interconnection components would be visible from COF lands because they would be located more than 2.5 miles north of the COF. Therefore, there would be no impact to aesthetics and scenery resources within the COF under the No Action alternative.

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## 4 CUMULATIVE EFFECTS

A cumulative effect is defined under NEPA as

“effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR Part 1508.1(g)(3)).

Past, present, and reasonably foreseeable future actions that incrementally add to the potential cumulative impacts of the Proposed Action and No Action alternatives are considered in this EA. The intent of this analysis is to capture the total effects of several actions over time that would be missed by evaluating each action individually.

### 4.1 Past, Present, and Reasonably Foreseeable Future Actions

For each resource topic, the cumulative effects analysis area (CEAA) is the same as the analysis area for direct and indirect environmental effects. The temporal scale for the cumulative effects analysis is the life of the Interconnection Project (39 years), which coincides with that of the CO Bar Solar Complex.

The cumulative effects of past actions contributed to and are accounted for in the baseline conditions of the affected environment for each resource in Chapter 3. For this analysis, “reasonably foreseeable” actions are considered where there is a proposed action or existing decision (e.g., draft NEPA document, record of decision, or issued permit), a commitment of resources or funding, or a formal proposal (e.g., a permit request). Actions that are highly probable based on known opportunities or trends (e.g., residential development in urban areas) are also considered. Speculative future developments (such as those that are not formally proposed or do not have sufficient project details to inform analysis) are not considered. SWCA conducted a desktop review of potential present and future actions in the vicinity of the Interconnection Project. Resources examined include local news sources, Forest Service data available in the Schedule of Proposed Actions for the COF (Forest Service 2023a) and Kaibab NF (Forest Service 2023b), and Coconino County information (Coconino County 2023).

The cumulative effects analysis includes actions that meet the following criteria:

- The action impacts a resource potentially affected by the Proposed Action.
- The action causes impacts within all or parts of the same geographic scope of the Proposed Action.

- The action causes impacts within all or part of the temporal scope for the potential impacts from the Proposed Action.

Reasonably foreseeable future projects and actions considered in the cumulative effects analysis are listed in Table 11 and shown in Figure 7.

Impacts to the resources analyzed in Chapter 3 would mostly be localized to the project area, with most of the impacts occurring during the construction period. Apart from the CO Bar Solar Complex, BREC, Forged Ethic Wind Energy Project and Interconnection Project (Forged Ethic), grazing allotments, and Christmas tree sales, the projects identified in Table 11 do not directly overlap the project area, but they may contribute to indirect cumulative impacts that extend beyond the project area. The impacts of projects that comprise the cumulative scenario combined with the Proposed Action could contribute to cumulative effects on certain resources, as discussed below.

**Table 11. Past, Present, and Reasonably Foreseeable Future Projects**

Project Name	Description	Status/Schedule	Project Location
Utility ROWs	Utility ROWs are subject to ongoing vegetation management and routine maintenance activities.	Ongoing	The NSTS and adjacent utility ROWs are present immediately south of the interconnection siting area.
Highway maintenance	US 180 is a two-lane paved highway maintained by ADOT. Ongoing maintenance activities may include herbicide treatments and other vegetation management, as well as routine repairs and resurfacing.	Ongoing	The proposed access points for the CO Bar Solar Interconnection Project are located on US 180.
BREC	The BREC is a 161-MW renewable energy project that will consist of a 160-MW wind energy facility, a 60-MW photovoltaic solar energy facility, and up to 60 MW of energy (battery) storage located on private and ASLD lands. APS is constructing a line tap and 500-kV switchyard on 10 acres to accommodate the BREC interconnection; this switchyard would be improved to accommodate the CO Bar Solar Interconnection Project. The BREC includes construction of a 25-mile communications line from the BREC to the Cedar Mountain Substation. The BREC also includes construction of an 8.8-mile-long access road from US 180 to the APS 500-kV switchyard (i.e., the BREC access road). The BREC has a 40-year operational life (Reclamation 2022).	The BREC construction commenced in early 2023 with the access road. The target completion date for construction is December 2023.	The BREC shares the same point of interconnection as the CO Bar Solar Interconnection Project and extends approximately 5 miles north and west of the interconnection siting area.

Project Name	Description	Status/Schedule	Project Location
CO Bar Solar Complex	The CO Bar Solar Complex will consist of up to 14 utility-scale photovoltaic solar energy facilities with a combined generation capacity of up to 1,000 MW. The CO Bar Solar Complex will be constructed on approximately 12,000 acres of private and ASLD lands. The CO Bar Solar Complex will have a 35-year operational life.	The CO Bar Solar Complex will be constructed in several phases over 2–3 years with construction expected to begin in late 2023.	The CO Bar Solar Interconnection Project would be located within the CO Bar Solar Complex, which extends approximately 3–5 miles from the interconnection siting area in all directions.
Forged Ethic	Forged Ethic is a proposed 323-MW wind project with up to 95 turbines on 29,106 acres of private and ASLD lands. Forged Ethic would interconnect to the regional transmission grid via the same APS 500-kV switchyard as the BREC and CO Bar Solar Complex. Forged Ethic includes a 5-mile gen-tie line paralleling the existing Moenkopi to Cedar Mountain 500-kV transmission line. Forged Ethic would be accessed from State Route 89 via East Tub Ranch Road. Forged Ethic has an estimated 35-year operational lifespan (Coconino County 2023).	Forged Ethic is in the preliminary planning stage with an unknown operation timeline.	The Forged Ethic point of interconnection and a portion of the gen-tie line overlap with the interconnection siting area. The Wind Project would be located approximately 4 miles to the east of the CO Bar Solar Interconnection Project.
Livestock grazing	Livestock grazing occurs on private, ASLD, and COF lands throughout the analysis area.	Ongoing	Throughout the analysis area and surrounding vicinity.
South Zone Grassland Restoration Project	Grassland restoration, primarily through prescribed burning and mechanical thinning of pinyon-juniper stands (Forest Service 2017).	Approved in 2017; restoration activities are ongoing and are expected to continue over the next 25–35 years.	Kaibab NF lands outside of, but to the west of, the CO Bar Solar Interconnection Project.
North Forest Grassland Restoration Project	COF project to reduce pinyon and juniper encroachment on grasslands within the northern boundaries of COF. Treatments would focus on thinning the encroaching trees followed by broadcast burns over the next 30 to 40 years (Forest Service 2019).	Approved in 2019; restoration activities are ongoing and are expected to continue over the next 30 to 40 years.	COF lands to the south and east of the CO Bar Solar Interconnection Project, including COF land within and adjacent to the access road improvements.
Flagstaff and Williams Ranger District (Coconino and Kaibab NFs) Christmas Tree Sales	Each District sells permits for Christmas tree cuttings for those with a valid permit in permitted areas.	Ongoing and likely to continue.	Forest Service lands to the north and south of the CO Bar Solar Interconnection Project, including COF land within and adjacent to the access road improvements.

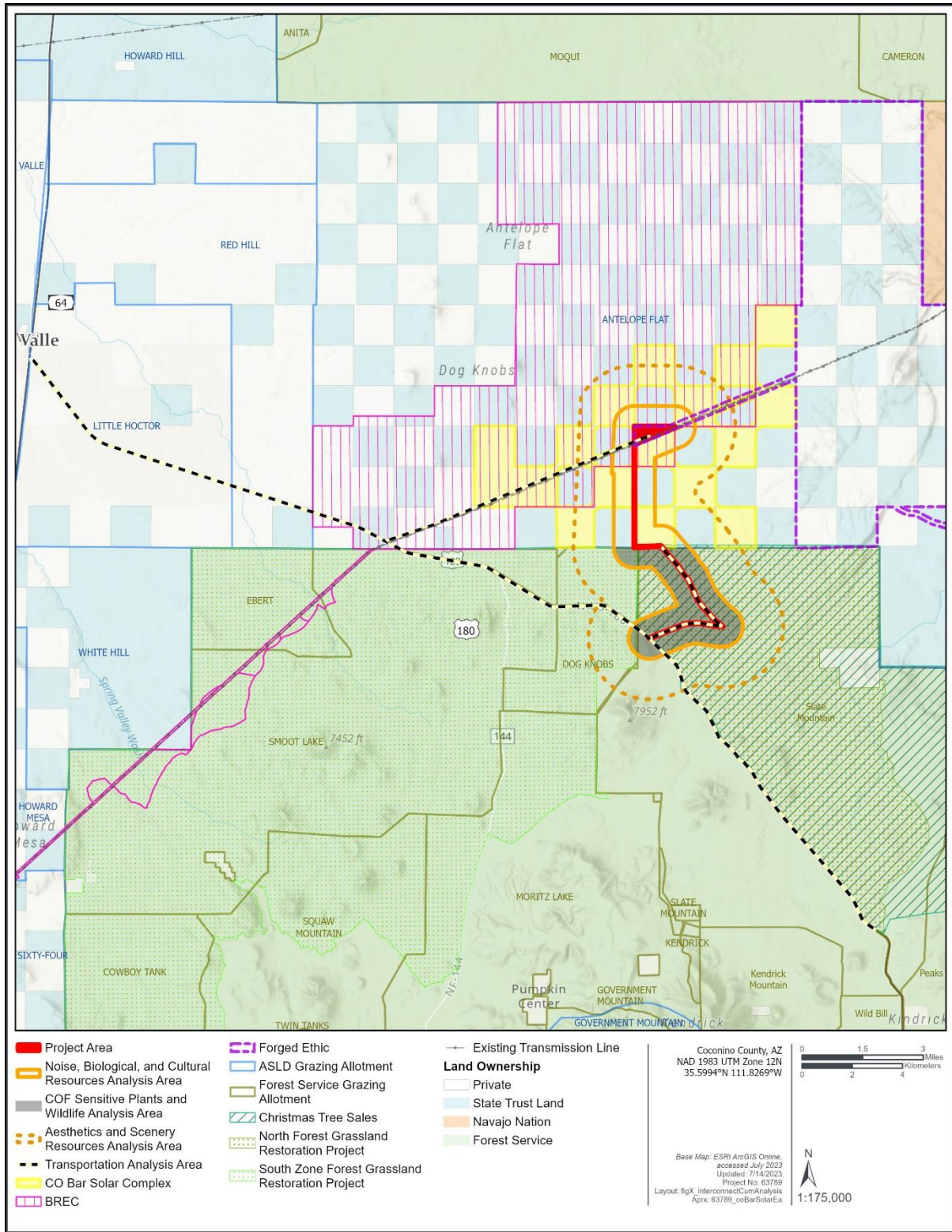


Figure 7. Reasonably foreseeable projects within the CEAs.

Final Environmental Assessment

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## **4.1.1 BIOLOGICAL RESOURCES**

### **4.1.1.1 *Vegetation***

As described in Section 3.3.2, the Proposed Action would have minor short-term impacts to vegetation in the analysis area during construction and decommissioning, and negligible long-term effects during operations. Reasonably foreseeable future actions that may contribute to cumulative effects to vegetation are listed in Table 11. As shown in Figure 7, the majority of the analysis area will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). The construction schedules for these projects are likely to overlap with the construction of the Proposed Action, which would lead to increased impacts to vegetation from clearing, grading, and installation of project infrastructure; increased fugitive dust from vehicle traffic; and increased potential for the introduction and spread of non-native plants and noxious weeds. Most of these effects would be short-term in nature, ceasing after the construction of the facilities, though effects would persist in the long term where there is permanent disturbance from the placement of project infrastructure. Christmas tree sales, livestock grazing, and ongoing ROW and highway maintenance activities may also cause short-term, adverse impacts to vegetation but, due to the localized and intermittent nature of these activities, would have negligible long-term impacts on vegetation. Some of the adverse effects to vegetation would be offset by restoration projects planned in the analysis area (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project).

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have moderate, short-term impacts on vegetation in the analysis area, primarily during the construction phases for planned renewable energy facilities. Over the long term, cumulative impacts to vegetation in the analysis area would be minor because temporarily disturbed areas would be restored following construction and because several restoration projects would be implemented in the analysis area. The Proposed Action would have a minor contribution to cumulative impacts on vegetation because most impacts would be limited to the construction and decommissioning periods, and because the amount of habitat that would be disturbed is small in comparison to the habitat disturbed by the reasonably foreseeable future actions described above.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on vegetation due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

### **4.1.1.2 *General Wildlife***

As described in Section 3.4.1, the Proposed Action would have minor short-term impacts to general wildlife in the analysis area during construction and decommissioning, and negligible long-term effects during operations. Reasonably foreseeable future actions that may contribute to cumulative effects to general wildlife are listed in Table 11. As shown in Figure 7, the majority of the analysis area will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). The construction schedules for these projects are likely to overlap with the

construction of the Interconnection Project, which would lead to increased impacts to general wildlife from habitat loss, alteration, and fragmentation; direct mortality from ground-disturbing activities and project-related vehicle traffic; and disturbance and displacement from increased noise and human presence. Most of these effects would be short-term in nature, ceasing after the construction of the facilities, though effects to habitat would persist in the long term where there is permanent disturbance from the placement of project infrastructure. Christmas tree sales, livestock grazing, and ongoing ROW and highway maintenance activities may also cause short-term, adverse impacts to general wildlife but, due to the localized and intermittent nature of these activities, would have negligible long-term impacts on general wildlife. Some of the adverse effects to general wildlife would be offset by habitat restoration projects planned in the analysis area (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project).

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have moderate, short-term impacts on general wildlife analysis in the area, primarily during the construction phases for planned renewable energy facilities. Over the long term, cumulative impacts to general wildlife in the analysis area would be minor because temporarily disturbed areas would be restored following construction and because several habitat restoration projects would be implemented in the analysis area. The Proposed Action would have a minor contribution to cumulative impacts on general wildlife because most impacts would be limited to the construction and decommissioning periods, and because the amount of habitat that would be disturbed is small in comparison to the habitat disturbed by the reasonably foreseeable future actions described above.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on general wildlife due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

#### **4.1.1.3 Migratory Birds**

As described in Section 3.4.2.2.1, the Proposed Action would have minor short-term impacts to migratory birds in the analysis area during construction and decommissioning, and negligible long-term effects during operations. Reasonably foreseeable future actions that may contribute to cumulative effects to migratory birds are listed in Table 11. As shown in Figure 7, the majority of the analysis area will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). The construction schedules for these projects are likely to overlap with the construction of the Proposed Action, which would lead to increased impacts to migratory birds from habitat loss; direct mortality from ground-disturbing activities and project-related vehicle traffic; and disturbance and displacement from increased noise and human presence. Most of these effects would be short-term in nature, ceasing after the construction of the facilities, though effects to habitat would persist in the long term where there is permanent disturbance from the placement of project infrastructure. Christmas tree sales, livestock grazing, and ongoing ROW and highway maintenance activities may also cause short-term, adverse impacts to migratory birds but, due to the localized and intermittent nature of these activities, would have negligible long-term impacts on migratory bird species. Some impacts would be offset by habitat restoration projects planned in the

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analysis area (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project).

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have minor short-term impacts on migratory birds in the analysis area, primarily during the construction phases for planned renewable energy facilities. Long-term cumulative impacts to migratory birds in the analysis area would be minor because temporarily disturbed areas would be restored following construction and because several habitat restoration projects would be implemented in the analysis area. The Proposed Action would have a minor contribution to cumulative impacts on migratory birds because most impacts would be limited to the construction and decommissioning periods, and because the amount of habitat that would be disturbed is small in comparison to the habitat disturbed by the reasonably foreseeable future actions described above.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on migratory birds due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

#### **4.1.1.4 Bald and Golden Eagles**

As described in Section 3.5.2.2, the Proposed Action would have minor short-term impacts to bald and golden eagles in the analysis area during construction and decommissioning, and negligible long-term effects during operations. Reasonably foreseeable future actions that may contribute to cumulative effects to bald and golden eagles are listed in Table 11. As shown in Figure 7, the majority of the analysis area will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). The construction schedules for these projects are likely to overlap with the construction of the Proposed Action, which would lead to increased impacts to bald and golden eagles from foraging habitat loss and alternation; direct mortality from project-related vehicle traffic; and disturbance and displacement from increased noise and human presence. Most of these effects would be short-term in nature, ceasing after the construction of the facilities, though effects to habitat would persist in the long term where there is permanent disturbance from the placement of project infrastructure. Ongoing ROW and highway maintenance activities may also cause short-term, adverse impacts (disturbance) to bald and golden eagles but, due to the localized and intermittent nature of these activities, impacts would have negligible long-term impacts. Some of the adverse effects would be offset by habitat restoration projects planned in the analysis area, which would improve potential foraging habitat for eagles (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project).

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have minor short-term impacts on bald and golden eagles in the analysis area, primarily during the construction phases for planned renewable energy facilities. Over the long term, cumulative impacts in the analysis area would be negligible because temporarily disturbed areas would be restored following construction and because several habitat restoration projects would be implemented in the analysis area. The Proposed Action would have a minor contribution to cumulative impacts on bald golden eagles because most impacts would be limited to the



construction and decommissioning periods, and because the amount of habitat that would be disturbed is small in comparison to the habitat disturbed by the reasonably foreseeable future actions described above.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on bald and golden eagles due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

#### **4.1.1.5 COF Sensitive Plants**

As described in Section 3.5.2.1.1, the Proposed Action would have negligible short- and long-term impacts to COF sensitive plants. Reasonably foreseeable future actions that may contribute to cumulative effects to COF sensitive plants are described above in Table 11; the planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex) do not fall within the CEAA for COF sensitive plants (see Figure 7) and would not contribute to cumulative impacts to COF sensitive plants. Minor impacts to COF sensitive plants may occur from continued livestock grazing and Christmas tree sales. Some impacts may be offset by habitat restoration projects planned in the analysis area (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project).

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have minor long-term impacts on COF sensitive plants in the analysis area. The Proposed Action would have a negligible contribution to cumulative impacts to COF sensitive plant species because implementation of BMPs would avoid impacts to COF sensitive plants.

#### **4.1.1.6 COF Sensitive Wildlife**

As described in Section 3.5.2.1.2, the Proposed Action would have negligible short- and long-term impacts to COF sensitive wildlife. Reasonably foreseeable future actions that may contribute to cumulative effects to COF sensitive wildlife are described above in Table 11; the planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex) do not fall within the CEAA for COF sensitive wildlife (see Figure 7) and would not contribute to cumulative impacts to COF sensitive wildlife. As shown in Figure 7, ongoing livestock grazing and Christmas tree sales occur within the CEAA, which may cause minor, short-term, localized impacts to COF sensitive wildlife. Some impacts would be offset by habitat restoration projects planned in the analysis area (i.e., North Forest Grassland Restoration Project).

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have minor short-term impacts to COF sensitive wildlife in the analysis area. Long-term cumulative impacts to COF sensitive wildlife would be negligible because of the lack of prolonged disturbances and because several habitat restoration projects would be implemented in the analysis area. The Proposed Action would have a negligible contribution to cumulative impacts to COF sensitive wildlife because of the minimal amount of disturbance associated with the access road

improvements and temporary nature of construction and decommissioning traffic on COF access roads.

#### **4.1.1.7 Monarch Butterfly**

As described in Section 3.5.1.2.1, the Proposed Action would have minor short-term impacts to monarchs in the analysis area during construction and decommissioning, and negligible long-term effects during operations. Reasonably foreseeable future actions that may contribute to cumulative effects to monarch butterfly are listed in Table 11. As shown in Figure 7, the majority of the analysis area will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). The construction schedules for these projects are likely to overlap with the construction of the Proposed Action, which would lead to increased impacts to monarch butterfly from habitat loss and alteration; direct mortality from ground-disturbing activities and project-related vehicle traffic; potential increase in noxious weeds; and indirect effects from project-related dust. Most of these effects would be short-term in nature, ceasing after the construction of the facilities, though effects to habitat would persist in the long term where there is permanent disturbance from the placement of project infrastructure. Livestock grazing and ongoing ROW and highway maintenance activities may also cause short-term, adverse impacts to monarch butterfly but, due to the localized and intermittent nature of these activities, would have negligible long-term impacts. Some of the adverse effects to monarch butterfly would be offset by habitat restoration projects planned in the analysis area (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project).

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have minor short-term cumulative impacts on monarch butterfly in the analysis area, primarily during the construction phases for planned renewable energy facilities. Long-term cumulative impacts to monarch butterfly in the analysis area would be negligible because temporarily disturbed areas would be restored following construction and because several habitat restoration projects would be implemented in the analysis area. The Proposed Action would have a minor contribution to cumulative effects to monarch butterfly because the amount of habitat that would be disturbed is small in comparison to the habitat disturbed by the reasonably foreseeable future actions described above.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on monarch butterfly due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

#### **4.1.1.8 Mexican Wolf**

As described in Section 3.5.1.2.1, the Proposed Action would have negligible short- and long-term impacts to the Mexican wolf. Reasonably foreseeable future actions that may contribute to cumulative effects to the Mexican wolf are listed in Table 11. As shown in Figure 7, the majority of the analysis area will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). The construction schedules for these projects are likely to overlap

with the construction of the Proposed Action, which increases the likelihood that transient wolves would avoid the analysis area. Construction traffic for the BREC project would contribute to the increased risk of mortality from vehicle collisions on the BREC access road, but the 25-mph speed limit would also be implemented for this project (Reclamation 2022), which would minimize this risk (the Forged Ethic project would use different access roads from the east). By disturbing habitat and increasing human presence, the construction of these projects would decrease the suitability of habitat in the analysis area for Mexican wolves; ongoing livestock operations in the analysis area will also continue to degrade habitat quality. While other wildlife may benefit from habitat restoration projects planned in the analysis area (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project), these projects would reduce the quality of habitat for Mexican wolves by removing the forest cover they depend on. Christmas tree sales and ongoing ROW and highway maintenance activities may cause short-term, adverse impacts to the Mexican wolf (if present) but, due to the localized and intermittent nature of these activities, would have negligible long-term impacts on the subspecies.

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have moderate long-term cumulative impacts on Mexican wolf dispersal habitat in the analysis area, primarily due to ongoing livestock operations and the increase in human presence and development associated with the planned renewable energy projects. Mexican wolves do not currently inhabit the CEAA; thus, the potential for cumulative effects would be limited to transient wolves passing through the analysis area. Because dispersing Mexican wolves would likely avoid the analysis area due to the increased noise and human presence, the potential for transient wolves to be directly impacted by the reasonably foreseeable future actions (e.g., through vehicle collisions) is low. The Proposed Action would have a negligible contribution to cumulative impacts on the Mexican wolf because the amount of habitat that would be disturbed is small in comparison to the habitat disturbed by the reasonably foreseeable future actions described above and because ongoing livestock grazing precludes long-term use of the analysis area by Mexican wolves.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on Mexican wolf due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

#### **4.1.2 CULTURAL RESOURCES**

As described in Section 3.6, Cultural Resources, the Proposed Action would have negligible short- and long-term impacts on cultural resources because there would be no adverse effects to historic properties in the analysis area. Reasonably foreseeable future actions that may contribute to cumulative effects to cultural resources are listed in Table 11. As shown in Figure 7, the majority of the CEAA will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex); however, it is anticipated that impacts to cultural resources from these projects would be minimized through the NHPA Section 106 compliance process, as well as preservation and protection obligations under the Arizona Antiquities Act (ARS 41-841 et seq.) and the Arizona State Historic Preservation Act (ARS 41-861 through 41-864). Therefore, these

projects are also anticipated to have negligible cumulative impacts on cultural resources in the CEAA.

These reasonably foreseeable actions, when combined with the impacts of the Proposed Action, would have negligible short- and long-term cumulative impacts on cultural resources in the CEAA. The Proposed Action would have a negligible contribution to cumulative impacts on cultural resources because it would not adversely affect any historic properties.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on cultural resources that are considered sensitive to changes in their prehistoric/historic setting due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

### **4.1.3 NOISE**

As described in Section 3.7.2.1, the Proposed Action would have minor to moderate short-term noise impacts in the analysis area during construction and decommissioning, and negligible long-term impacts during operations. Reasonably foreseeable future actions that may contribute to cumulative effects to the noise environment and noise-sensitive receptors are listed in Table 11. As shown in Figure 7, most of the analysis area will be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). The construction schedules for these projects are likely to overlap with the construction of the Proposed Action, which would lead to increased noise impacts from construction activities and vehicle traffic. Most of these effects would be short-term in nature, ceasing after the construction of the facilities, though noise impacts would persist near the interconnection facilities and along gen-tie lines. Grassland and landscape restoration projects, as well as Christmas tree sales, would have negligible to minor, short-term noise impacts that would be limited to the immediate vicinity of these activities.

These reasonably foreseeable future actions, when combined with the impacts of the Proposed Action, would have minor to moderate, short-term noise impacts, primarily during the construction phases for planned renewable energy facilities. Long-term cumulative impacts to the noise environment and noise-sensitive receptors in the analysis area would be negligible to minor because operations and maintenance of the facilities would generate low levels of periodic noise. The Proposed Action would have a minor contribution to cumulative impacts on noise because most impacts would be limited to the construction and decommissioning periods, and because of the minimal number of noise-sensitive receptors nearby in comparison to other reasonably foreseeable future actions described above.

Under the No Action alternative, the project would have a greater contribution to cumulative noise impacts due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2). However, other than the increase in traffic noise on the BREC access road, most of these effects would occur outside the CEAA.

#### **4.1.4 TRANSPORTATION**

As described in Section 3.8.2.1, the Proposed Action would have minor to moderate short-term impacts on transportation in the analysis area during construction and decommissioning; long-term impacts during operations would be negligible. Reasonably foreseeable future actions that may contribute to cumulative effects to transportation are listed in Table 11 and shown in Figure 7. The BREC is the only planned renewable energy facility that would use roads within the transportation analysis area (traffic for the CO Bar Solar Complex is accounted for under the Proposed Action). The construction schedule for BREC is likely to partially overlap with the construction of the Proposed Action, which would lead to increased impacts to the transportation network in the analysis area. Ongoing livestock grazing and Christmas tree sales, as well as planned restoration projects (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project), would be expected to lead to negligible short-term increases in traffic when these activities are occurring within the analysis area.

These reasonably foreseeable future actions, when combined with the impacts of the Proposed Action, would have minor to moderate, short-term impacts on transportation in the analysis area, primarily during the construction phases for planned renewable energy facilities. Long-term cumulative effects to transportation in the analysis area would be negligible to minor because operations and maintenance of the facilities would generate minimal traffic and no other increases in traffic are anticipated. The Proposed Action would have a minor contribution to cumulative effects on transportation because most impacts would be limited to the construction and decommissioning periods, and because congestion and delays would be minimized by dividing traffic for the Proposed Action between two access roads.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on transportation due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2). It is likely that much of the traffic for construction, operations, and decommissioning of these facilities would use US 180 and the BREC access roads, which would lead to increased cumulative effects in the CEAA. However, impacts to transportation on COF access roads would be reduced since they would not be used for access under the No Action alternative.

#### **4.1.5 AESTHETICS AND SCENERY RESOURCES**

As described in Section 3.9.2.2, the Proposed Action would have minor short-term impacts to aesthetics and scenery resources in the analysis area during construction and decommissioning; long-term effects during operations would be negligible to minor. Reasonably foreseeable future actions that would result in modification of the landscape, as detailed in Table 11, would contribute to the cumulative adverse impacts to landscape character and scenery resources. As shown in Figure 7, much of the analysis area would be disturbed by planned renewable energy facilities (i.e., BREC, Forged Ethic, and the CO Bar Solar Complex). Construction of the BREC and CO Bar Solar Complex would considerably change the landscape character of the analysis area through the long-term presence of utility-scale wind and solar facilities and associated transmission infrastructure (only the gen-tie for Forged Ethic falls within the analysis area). Construction schedules for these

projects are likely to overlap with the construction of the Proposed Action, which would lead to increased short-term visual impacts from construction activities, traffic, and fugitive dust. Ongoing livestock grazing and Christmas tree sales, as well as planned restoration projects (i.e., North Forest Grassland Restoration Project and South Zone Grassland Restoration Project), would be expected to lead to negligible short-term impacts to aesthetics and scenery resources when these activities are occurring within the analysis area. These restoration projects, ongoing livestock grazing, and Christmas tree sales all have the potential to affect vegetation communities in the analysis area, leading to long-term changes in scenic quality that would be expected to have minor impacts on aesthetics and scenery resources.

These reasonably foreseeable future actions, when combined with the effects of the Proposed Action, would have minor to moderate short- and long-term impacts on aesthetics and scenery resources in the analysis area. Impacts would be greatest near the interconnection siting area where infrastructure from multiple renewable energy projects would be introduced. The Proposed Action would have a minor contribution to cumulative effects because the most visually prominent proposed projects in the analysis area (i.e., BREC, CO Bar Solar Complex, and Forged Ethic gen-tie) would introduce the majority of the visual contrast felt by observers.

Under the No Action alternative, the project would have a greater contribution to cumulative effects on aesthetics and scenery resources due to the need for a 19-mile gen-tie, new 500-kV switchyard, and additional line-tap facilities (see Section 2.2); however, most of these effects would occur outside the CEAA.

## 5 CONSULTATION AND COORDINATION

### 5.1 List of Preparers

Members of the Reclamation, Forest Service, and SWCA teams that contributed to the preparation of this EA are listed in Table 12.

**Table 12. List of Preparers**

Name	Position / Role
<b>Reclamation Team</b>	
Dominic Graziani	Environmental Protection Specialist/NEPA Team Project Manager
Carol Evans	Wildlife Biologist
Sean Heath	Deputy Area Manager
Dr. Lauren Jelinek	Archaeologist
<b>Forest Service Team</b>	
Michael Dechter	NEPA Specialist
Deirdre Marx	Realty Specialist
Andy Pigg	Botanist
Peter Pilles	Archaeologist
Kate Day	Hydrologist
<b>SWCA Team</b>	
Nicholas Brasier	Project Manager/Sr. Biology Specialist
Erica Fraley	Assistant Project Manager/Vegetation Specialist
Eleanor Gladding	Sr. Vegetation Specialist
Kristin Miller	Noise and Transportation Specialist
Annie Lutes	Cultural Resources Specialist
Jerome Hesse	Sr. Cultural Resources Specialist
Garet Openshaw	Aesthetics and Scenery Resources Specialist
Spenser Branch	Aesthetics and Scenery Resources Specialist
Matthew Robinson	Sr. Aesthetics and Scenery Resources Specialist
Jenn Katalinich	Biology Specialist
Shelby Oliphant	Water Resources Specialist
Jeremy Casteel	Sr. Soils and Water Resources Specialist
Brad Sohm	Sr. Air Quality and Noise Specialist
Georgia Knauss	Paleontology Specialist
Alex Shin	Sr. NEPA Specialist

### 5.2 Agency Coordination and Tribal Consultation

#### 5.2.1 TRIBAL CONSULTATION

On March 10, 2023, Reclamation sent scoping letters to 15 tribes: Fort Mojave Indian Tribe, Fort McDowell Yavapai Nation, Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Mescalero Apache,

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Navajo Nation, Pueblo of Acoma, Pueblo of Zuni, San Carlos Apache Tribe, San Juan Southern Paiute Tribe, Tonto Apache Tribe, White Mountain Apache Tribe, Yavapai Apache Nation, and the Yavapai-Prescott Indian Tribe.

Pursuant to Section 106 of the NHPA (54 United States Code 306108), which requires federal agencies to consider the effects of their actions on historic properties, a cultural resources inventory was conducted for the proposed Project, which constitutes a federal undertaking. In compliance with Section 106 of the NHPA, Reclamation has consulted on NRHP eligibility and effects with the Arizona SHPO, interested Native American tribes, COF, and ASLD.

On April 7, 2023, Reclamation initiated the Section 106 consultation process with each of the tribes. The consultation initiation included a letter along with physical copies of the Cultural Resources Inventory Report for review. Five responses were received during the Section 106 consultation period.

The Arizona SHPO concurred with the finding of *no adverse effect* to historic properties on April 19, 2023; ASM, APS, the San Carlos Apache Tribe, and the Yavapai-Prescott Indian Tribe also concurred with the finding of *no adverse effect* to historic properties.

The White Mountain Apache Tribe also provided responses to the scoping letter (see Section 1.6.1) and Draft EA Notice of Availability (see Section 1.6.2); both responses stated that the White Mountain Apache Tribe concurred with the finding of *no adverse effect* to the tribe's traditional cultural properties or historic properties. The Yavapai-Prescott Indian Tribe also provided a response to the Draft EA Notice of Availability stating they understand the Proponent will avoid historic properties.

## **5.2.2 LIST OF AGENCIES CONSULTED**

The following agencies were sent public scoping letters and a Notice of Availability of the Draft EA for public comment: Arizona Corporation Commission, Arizona Department of Environmental Quality, Arizona Department of Forestry and Fire Management, ADOT, AGFD, Arizona SHPO, ASLD, Arizona State Parks and Trails, Coconino County Board of Supervisors, Federal Aviation Administration, Kaibab NF, National Park Service – Grand Canyon National Park, U.S. Army Corps of Engineers, U.S. Bureau of Indian Affairs, U.S. Department of Agriculture Rural Utilities Service, EPA, U.S. Federal Highway Administration, USFWS, U.S. Naval Observatory – Flagstaff Station, and Western Area Power Administration.

Reclamation requested technical assistance from USFWS for monarch butterfly and informal consultation for the Mexican wolf under Section 7 of the ESA on August 7, 2023. USFWS concurred with Reclamation's finding that the Proposed Action "may affect but is not likely to adversely affect" the Mexican wolf and "would not jeopardize" the monarch butterfly on September 28, 2023.



## 6 LITERATURE CITED

- American National Standards Institute. 2018. How Loud is Construction Site Noise? Available at: <https://blog.ansi.org/2018/10/how-loud-is-construction-site-noise/#gref>. Accessed December 7, 2022.
- Arizona Department of Transportation (ADOT). 2022a. Federal Functional Classification. Available at: <https://adot.maps.arcgis.com/apps/webappviewer/index.html?id=7910e9ddd68b43f3a5b86aaf19119081>. Accessed December 8, 2022.
- . 2022b. Average Daily Traffic Report 2021. Available at: <https://azdot.gov/planning/transportation-analysis/traffic-monitoring>. Accessed December 8, 2022.
- . 2023. Designating a State Scenic Road. Available at: <https://azdot.gov/about/historic-and-scenic-roads/designating-state-scenic-road>. Accessed April 5, 2023.
- Arizona Game and Fish Department (AGFD). 2001. *Idionycteris phyllotis*. Unpublished abstract compiled and edited by the Heritage Data Management System. AGFD, Phoenix, Arizona. 4 pp.
- . 2003a. *Corynorhinus townsendii pallescens*. Unpublished abstract compiled and edited by the Heritage Data Management System. AGFD, Phoenix, Arizona. 5 pp.
- . 2003b. *Euderma maculatum*. Unpublished abstract compiled and edited by the Heritage Data Management System. AGFD, Phoenix, Arizona. 9 pp.
- . 2011. The Coconino County Wildlife Connectivity Assessment: Report on Stakeholder Input. Available at: [https://www.flagstaff.az.gov/DocumentCenter/View/13448/CoconinoCounty-WildlifeLinkagesReport\\_March2011?bidId=](https://www.flagstaff.az.gov/DocumentCenter/View/13448/CoconinoCounty-WildlifeLinkagesReport_March2011?bidId=). Accessed May 31, 2022.
- . 2022a. Arizona State Action Plan for Implementation of Department of the Interior Secretarial Order 3362: “Improving Habitat Quality in Western Big Game Winter Range and Migratory Corridors”. Updated September 2022. AGFD, Phoenix, Arizona. Available at: <https://wafwa.org/wp-content/uploads/2022/10/Arizona2022SAP.pdf>. Accessed April 13, 2023.
- . 2022b. Arizona Heritage Geographic Information System (AZHGIS) Arizona Game and Fish Department online environmental review tool. Available at: <https://azhgis2.esri.com/>. Accessed November 15, 2022.
- . 2022c. *Falco peregrinus anatum*. Unpublished abstract compiled and edited by the Heritage Data Management System. AGFD, Phoenix, Arizona. 6 pp.

- 
- . 2022d. *Athene cunicularia hypugaea*. Unpublished abstract compiled and edited by the Heritage Data Management System. AGFD, Phoenix, Arizona. 7 pp.
- . 2023a. CO Bar Ranch Access. Available at: <https://www.azgfd.com/landowner-compact/co-bar-ranch-access>. Accessed February 14, 2023.
- . 2023b. *Athene cunicularia hypugaea* Habitat Suitability Model in *Arizona Wildlife Conservation Strategy* [web application]. Available at: <https://awcs.azgfd.com/species/birds/athene-cunicularia-hypugaea>. Accessed April 4, 2023.
- Arizona State Historic Preservation Office (SHPO) and Salt River Pima-Maricopa Indian Community. 2023. Government-to-Government Consultation Toolkit Consultation Map. Available at: <https://sites.google.com/view/az-consultation-toolkit/consultation-map?authuser=0&pli=1>. Accessed January 25, 2023.
- Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, California.
- . 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, California.
- Barr, D.M.R. 2023. *Cultural Resources Survey for the CO Bar Solar Interconnection Project in Coconino County, Arizona*. Cultural Resources Report No. 23-37. SWCA Environmental Consultants, Tucson, Arizona.
- Billingsley, G.H., S.S. Priest, and T.J. Felger. 2007. Geologic map of the Cameron 30' x 60' quadrangle, Coconino County, northern Arizona. Scale 1:100,000. Scientific Investigations Map 2977. U.S. Geological Survey.
- Bonde, A., and M. Slaughter. 2020. *Paleontological Resources Inventory of the Lower Colorado Region*. Task Agreement No. P18AC00286, Cooperative Agreement No. P15AC00050. Boulder City, Nevada: U.S. Department of the Interior, U.S. Bureau of Reclamation, Lower Colorado Region, Regional Headquarters.
- Botts, L. 2022. Anubis, the wandering Mexican gray wolf, is shot and killed near Flagstaff. Available at: <https://www.azcentral.com/story/news/local/arizona-environment/2022/01/07/anubis-mexican-gray-wolf-shot-and-killed-near-flagstaff/9138025002/>. Accessed April 4, 2023.
- Brown, D.E. (editor). 1994. *Biotic Communities: Southwestern United States and Northwestern Mexico*. Salt Lake City: University of Utah Press.
- Buehler, D.A. 2000. Bald eagle (*Haliaeetus leucocephalus*) in *Birds of the World*, edited by A.F. Poole and F.B. Gill. Ithaca, New York: Cornell Lab of Ornithology. Available at: <https://doi.org/10.2173/bow.baleag.01>. Accessed July 28, 2022.

- 
- Bureau of Land Management. 2011. *Sonoran Solar Energy Project Final Environmental Impact Statement*. DOI-BLM-AZ-P020-2009-0002-EIS. Phoenix, Arizona: Bureau of Land Management, Lower Sonoran Field Office. Available at: <https://eplanning.blm.gov/eplanning-ui/project/77400/570>. Accessed December 11, 2022.
- . 2023. BLM National PFYC Potential Fossil Yield Classification Geologic Formation 2022 Polygons. Available at: [https://gis.blm.gov/EGISDownload/LayerPackages/BLM\\_National\\_2022\\_PFYC.zip](https://gis.blm.gov/EGISDownload/LayerPackages/BLM_National_2022_PFYC.zip). Accessed February 17, 2023.
- California Department of Transportation. 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. Available at: [https://www.dtsc-ssfl.com/files/lib\\_ceqa/ref\\_draft\\_peir/Chap4\\_10-Noise/Caltrans\\_2013a\\_Tech\\_Noise\\_Supplement.pdf](https://www.dtsc-ssfl.com/files/lib_ceqa/ref_draft_peir/Chap4_10-Noise/Caltrans_2013a_Tech_Noise_Supplement.pdf). Accessed January 11, 2023.
- Coconino County. 1999. *Valle Area Plan*. Adopted October 18, 1999. Available at: <https://coconino.az.gov/DocumentCenter/View/91/Valle-Area-Plan?bidId=>. Accessed December 6, 2022.
- . 2015. *Coconino County Comprehensive Plan*. Adopted December 15, 2015. Available at: <https://www.coconino.az.gov/DocumentCenter/View/10608/Coconino-County-Comprehensive-Plan---2017-Approval?bidId=>. Accessed December 6, 2022.
- . 2022a. Coconino County Zoning Ordinance. Approved November 12, 2019, Amended May 10, 2022. Available at: <https://www.coconino.az.gov/DocumentCenter/View/31215/Coconino-County-Zoning-Ordinance---Final-Approved-June-9-2022?bidId=>. Accessed December 6, 2022.
- . 2022b. Planning and Zoning Commission Staff Report, CUP-22-11 to 019 and 021 to 034. In project record.
- . 2023. Agenda Center for Planning and Zoning Commission, Board of Adjustment, Code Compliance Hearings. Available at: <https://coconino.az.gov/AgendaCenter/Planning-and-Zoning-Commission-4>. Accessed April 14, 2023.
- Council on Environmental Quality (CEQ). 2023. National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. Notice of Interim Guidance. *Federal Register* 88(5):1196–1212.
- eBird. 2022. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available at: <http://www.ebird.org>. Accessed November 14, 2022.
- Federal Emergency Management Agency. 2021. FEMA Flood Map Service Center. FIRM Panel nos. 04005C4950G, 04005C5450G, and 04005C5475G. Available at: <https://msc.fema.gov/portal/home>. Accessed January 11, 2023.

- Katzner, T.E., M.N. Kochert, K. Steenhof, C.L. McIntyre, E.H. Craig, and T.A. Miller. 2020. Golden eagle (*Aquila chrysaetos*), version 2.0. in *Birds of the World*. Cornell Lab of Ornithology. Available at: <https://doi.org/10.2173/bow.goleag.02>. Accessed September 23, 2022.
- McCarty, K.M., J.K. Presler, and K.V. Jacobson. 2021. Arizona Golden Eagle Productivity Assessment 2021. Nongame and Endangered Wildlife Program Technical Report 342. Phoenix: Arizona Game and Fish Department.
- Morris, G.M., C. Kline, and S.M. Morris. 2015. Status of *Danaus plexippus* Population in Arizona. *Journal of the Lepidopterists' Society* 69(2):91–107 (1 June 2015).
- National Park Service. 1997. National Register Bulletin 15—How to Apply the National Register Criteria for Evaluation. U.S. Department of the Interior, National Park Service, Cultural Resources, National Register, History and Education, Washington, D.C.
- Natural Resources Conservation Service. 2022a. Web Soil Survey. Available at: <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed December 8, 2022.
- . 2022b. Hydric Soils. Available at: <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soil/hydric-soils>. Accessed December 8, 2022.
- . 2023. FY 2022 Joint Chiefs' Landscape Restoration Project Summaries. Available at: <https://www.nrcs.usda.gov/fy-2022-joint-chiefs-landscape-restoration-project-summaries>. Accessed February 15, 2023.
- New York Department of Environmental Conservation. 2001. *Assessing and Mitigating Noise Impacts. February 2001*. Available at: [https://www.dec.ny.gov/docs/permits\\_ej\\_operations\\_pdf/noise2000.pdf](https://www.dec.ny.gov/docs/permits_ej_operations_pdf/noise2000.pdf). Accessed April 9, 2022.
- Siders, M.S., and W. Jolley. 2009. Roost sites of Allen's lappet-browed bats (*Idionycteris phyllotis*). *The Southwestern Naturalist* 54(2): 201–203.
- Slovesky, B.G., and C.L. Chambers. 2009. Roosts of Allen's lappet-browed bat in Northern Arizona. *Journal of Wildlife Management* 73(5): 677–682.
- SWCA Environmental Consultants (SWCA). 2020. *Visual Resource Assessment for the Proposed CO Bar Solar Project*. Flagstaff, Arizona: SWCA Environmental Consultants. May 2020.
- . 2023a. *Aquatic Resources Assessment for the CO Bar Solar Energy Project*. Phoenix, Arizona: SWCA Environmental Consultants. Revised March 2023.
- . 2023b. *Biological Resources Survey Report for the CO Bar Solar Interconnection Project in Coconino County, Arizona*. Phoenix, Arizona: SWCA Environmental Consultants.

- Thompson, J.R., P.W. Mueller, W. Fluckiger, and A.J. Rutter. 1984. The effect of dust on photosynthesis and its significance for roadside plants. *Environmental Pollution Series A, Ecological and Biological* 34(2):171–190.
- U.S. Bureau of Reclamation (Reclamation). 2022. *Final Environmental Assessment for the Babbitt Ranch Energy Center Interconnection Project*. Glendale, Arizona: U.S. Department of the Interior, Bureau of Reclamation, Phoenix Area Office. December 2022. Available at: [https://www.usbr.gov/lc/phoenix/reports/BREC/FinalEA\\_BREC\\_Interconnection Project.pdf](https://www.usbr.gov/lc/phoenix/reports/BREC/FinalEA_BREC_Interconnection_Project.pdf). Accessed February 11, 2023.
- U.S. Census Bureau. 2021a. American Community Survey (ACS) 5-Year Estimate Data Profiles, 2016-2021. DP03 - Selected Economic Characteristics. Available at: <https://data.census.gov/cedsci/>. Accessed December 8, 2022.
- . 2021b. American Community Survey (ACS) 5-Year Estimate Data Profiles, 2016-2021. DP05 - Demographic and Housing Estimates. Available at: <https://data.census.gov/cedsci/>. Accessed December 8, 2022.
- U.S. Environmental Protection Agency (EPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. 550/9-74-004. Washington, D.C.: U.S. Environmental Protection Agency, Office of Abatement and Control.
- U.S. Fish and Wildlife Service (USFWS). 2015. Endangered and threatened wildlife and plants; revision to the regulations for the nonessential experimental population of the Mexican wolf. *Federal Register* 80:2512–2567.
- . 2017. Biological Report for the Mexican Wolf (*Canis lupus baileyi*). Albuquerque, New Mexico: USFWS Southwest Region.
- . 2020. Monarch (*Danaus plexippus*) Species Status Assessment Report, version 2.1. September. Available at: <https://ecos.fws.gov/ServCat/DownloadFile/191345>. Accessed December 8, 2022.
- . 2023a. Information for Planning and Consultation (IPaC). Environmental Conservation Online System (ECOS) online environmental review tool. Available at: <https://ipac.ecosphere.fws.gov/>. Accessed May 2022.
- . 2023b. FWS R2 ES Collared Mexican Wolf Project Public Location Map [web application]. Available at: <https://www.arcgis.com/home/webmap/viewer.html?webmap=dbcc9960867948aea225fc53c50d0ed0&extent=-110.6313,32.9752,-106.5746,34.932>. Accessed April 4, 2023.
- U.S. Forest Service (Forest Service). 1991. *Terrestrial Ecosystem Survey of the Kaibab National Forest: Coconino County and Part of Yavapai County, Arizona*. Albuquerque, New Mexico: U.S. Forest Service, Southwestern Region.

- 
- . 2005. Forest Service Manual 2600- Wildlife, Fish, and Sensitive Plant Habitat Management, Chapter 2670- Threatened, Endangered, and Sensitive Plants and Animals. U.S. Forest Service. Available at: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd940040.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd940040.pdf) Accessed May 11, 2022.
- . 2013a. *Region 3 Sensitive Plant List*. Available at: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprd3806395.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3806395.pdf). Accessed October 23, 2022.
- . 2013b. *Region 3 Sensitive Animals List*. Available at: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsbdev3\\_021328.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_021328.pdf). Accessed October 23, 2022.
- . 2015. Guidelines for Weed-Free Seed, Forage, Mulch, and Fill Materials in Region 3. Available at: [https://ecowattle.com/wp-content/uploads/2018/04/Weed-Free-Guidelines-for-Mulch.pdf#:~:text=To%20ensure%20that%20invasive%20weed%20species%20are%20not,Invasive%20Species%20Management%20in%20the%20Southwestern%20Region%20%28http%3A%2F%2Fwww.fs.usda.gov%2FInternet%2FFSE\\_DOCUMENTS%2Fstelprd3801891.pdf%29](https://ecowattle.com/wp-content/uploads/2018/04/Weed-Free-Guidelines-for-Mulch.pdf#:~:text=To%20ensure%20that%20invasive%20weed%20species%20are%20not,Invasive%20Species%20Management%20in%20the%20Southwestern%20Region%20%28http%3A%2F%2Fwww.fs.usda.gov%2FInternet%2FFSE_DOCUMENTS%2Fstelprd3801891.pdf%29). Accessed July 15, 2022.
- . 2017. South Zone Grassland Restoration Project Final Decision Notice and Finding of No Significant Impact. USDA Forest Service, Kaibab National Forest, Williams, Arizona.
- . 2018a. Land and Resource Management Plan for the Coconino National Forest: Coconino, Gila, and Yavapai Counties, Arizona. MB-R3-04-31. U.S. Forest Service, Southwestern Region. Available at: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd606737.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd606737.pdf). Accessed November 14, 2022.
- . 2018b. Record of Decision for the Coconino National Forest Land and Resource Management Plan: Coconino, Gila, and Yavapai Counties, Arizona. MB-R3-04-33. U.S. Forest Service, Southwestern Region. Available at: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd606746.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd606746.pdf). Accessed December 8, 2022.
- . 2019. North Forest Grassland Restoration Project. Available at: <https://www.fs.usda.gov/project/?project=52629>. Accessed December 8, 2022.
- . 2023a. Schedule of Proposed Action (SOPA), 01/01/2023 to 03/31/2023, Coconino National Forest. Available at: <https://www.fs.usda.gov/sopa/components/reports/sopa-110304-2023-01.html>. Accessed March 10, 2023.

- . 2023b. Schedule of Proposed Action (SOPA), 01/01/2023 to 03/31/2023, Kaibab National Forest. Available at: <https://www.fs.usda.gov/sopa/components/reports/sopa-110307-2023-01.html>. Accessed March 10, 2023.
- U.S. Geological Survey. 2016. Survey Gap Analysis Program, GAP/LANDFIRE National Terrestrial Ecosystems 2011. Available at: <https://doi.org/10.5066/F7ZS2TM0>. Accessed March 3, 2023.
- Western Migrations. 2022. Wildlife Corridors and Route Viewer. Available at: <https://www.westernmigrations.net>. Accessed May 31, 2022.
- Western Monarch Milkweed Mapper. 2023. Sightings Map [web application]. A project by the Xerces Society, U.S. Fish and Wildlife Service, Idaho Department of Fish and Game, and Washington Department of Fish and Wildlife. Available at: [www.monarchmilkweedmapper.org](http://www.monarchmilkweedmapper.org). Accessed April 5, 2023.
- Wrigley, M.J. 2018. Biological Assessment Guidebook, v. 3.1. National Park Service Intermountain Region, Lakewood, Colorado. Available at: [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd639466.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd639466.pdf). Accessed November 9, 2022.

## APPENDIX A – RESPONSES TO COMMENTS ON THE DRAFT EA

This appendix provides responses to the public comments received during the 30-day public comment period on the Draft EA published on August 8, 2023. Within the comment period, four letters or emails were submitted to Reclamation. All comment letters were reviewed, and individual comments within each letter were identified and categorized for analysis. **Table A-1** provides a list of the commenters, the organization they represent, and the letter number assigned to their comment. Responses to the comments are provided in **Table A-2**. Not all letters provided substantive comments (that is, it was a statement acknowledging the project with no further information included in the comment); responses were not provided in those instances. Where appropriate, additional information was incorporated into the Final EA.

**Table A-1. List of Commenters on the Draft EA**

Letter Number	Name	Organization/Title	Date	Responses Provided
1	Mark Altaha	White Mountain Apache Tribe Tribal Historic Preservation Officer	08/10/23	Yes
2	Greg Glassco	Yavapai-Prescott Indian Tribe Compliance Officer	08/10/23	Yes
3	Becky Hopkins	Western Area Power Administration Environmental Project Manager	08/11/23	No
4	Sandy Bahr	Sierra Club – Grand Canyon Chapter Director	09/07/23	Yes



**Table A-2. Responses to Comments**

Commenter	Organization	Comment Number	Comment	Response
Mark Altaha	White Mountain Apache Tribe	1-1	Please be advised, we have reviewed the consultation letter and the information provided, we have reviewed the information provided and determined the proposed road improvement projects will have a " <b>No Adverse Effect</b> " to the tribe's traditional cultural properties and/or historic properties. We have no further issues and/or concerns with the draft Environmental Assessment.	Thank you for your comment. Consultation with the White Mountain Apache Tribe is summarized in Section 5.2.1.
Greg Glassco	Yavapai-Prescott Indian Tribe	2-2	We did notice one possible typo you probably already fixed, I think it should be Peter Pilles...	This typo has been corrected in the final EA (see Table 11).
Rebecca Hopkins	Western Area Power Administration	3-1	Confirming receipt of the Notice of Availability for the CO Bar Solar Interconnection Project Draft EA. Western Area Power Administration (WAPA) appreciates being consulted on projects in the vicinity of WAPA's transmission lines.	Thank you for your comment.

Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-1	As described in the DEA, the solar project would be on private land with the interconnection site partially on state trust land. The total solar project would cover 17 square miles and produce up to 1,000 MW of power with the interconnection site tying into the existing Moenkopi to Cedar Mountain 500KV transmission line. Interestingly, the DEA confines itself to analyzing the impacts of widening of a few miles of Forest Service Road to the interconnection site and to the 153-acre site itself, and does only a cursory analysis of cumulative effects of some of the adjacent proposed renewable energy projects. (i.e., DEA Table 10 at pp.70-71).	The scope of analysis under review in the EA is limited to the CO Bar Solar Interconnection Project because the CO Bar Solar Complex has a feasible, non-federal interconnection option and is not dependent on Reclamation’s approval of the LGIA. This non-federal interconnection option and components associated with the CO Bar Solar Complex are discussed in the No Action alternative (Section 2.2). Table 11 provides a brief description of the past, present, and reasonably foreseeable future projects that are addressed in the detailed cumulative effects analysis in Section 4.1.1 through Section 4.1.5.
Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-2	It is puzzling that the DEA is limited in scope as the interconnection project will make possible other nearby projects. As described in the document, in addition to CO Bar Solar, both the Babbitt Ranch Energy Center that will host a 160 MW wind and 60 MW battery project and the nearby 323 MW Forged Ethic Wind Project will tie in to this same interconnection site. Without the interconnection site, these projects would not be viable unless the power was routed north a considerable distance to a second transmission line.	The APS 500-kV switchyard was previously analyzed and approved in the BREC EA (Reclamation 2022). The Proposed Action only includes improvements to the APS 500-kV switchyard, within the previously approved footprint (see Section 2.1.1.4). The cumulative effects analysis in Section 4.1.1 through Section 4.1.5 discloses the increased impacts from the construction of a new 19-mile gen-tie, new 500-kV switchyard, and new line tap (i.e., the No Action alternative). The BREC interconnection has already been approved (Reclamation 2022), and a discussion of alternate interconnection options for Forged Ethic and other planned renewable energy projects in the CEAs is beyond the scope of the analysis in this EA.

Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-3	<p>In addition, other renewable projects might occur in the area with Forged Ethic in a previous incarnation being called Zeus Wind that extended east to H89. We note that MET towers (research wind towers) are also planned further west that could result in additional wind projects in that area. The Interconnection Project will have reasonably foreseeable cumulative impacts with more than 41,000 acres of solar and wind projects, plus a 5-mile gen-tie line, 25 miles of communications line, and 8.8 miles of access road, and more, as well as the impacts associated with staging and construction of all of these facilities. (Table 10 in DEA at pp. 70-71)</p>	<p>Forged Ethic would be accessed from State Route 89 via East Tub Ranch Road, but the wind project boundary is more than 9 miles from State Route 89 at its closest point. There are no known proposals to install meteorological towers within the analysis area or immediate vicinity. The cumulative impacts described in the comment are the result of the BREC, CO Bar Solar Complex, Forged Ethic, and other planned renewable energy projects and would occur regardless of the alternative selected. Additionally, most of these impacts would occur outside the CEAs and are beyond the scope of analysis in this EA. As described in Section 4.1.1 through Section 4.1.5, the Proposed Action would have a minor contribution to these cumulative effects because the amount of disturbance associated with the Interconnection Project would be small in comparison with the disturbance from these renewable energy projects and other reasonably foreseeable future actions.</p>
Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-4	<p>In any event, the DEA, in just 11 pages, dutifully lists the sensitive species, cultural resources, and aesthetics and scenery resources that might be affected, concluding that impacts will be limited to the construction period of the interconnection site and offers no opinion as to impacts from all the projects that the interconnection site will service.</p>	<p>See responses to comments 4-2 and 4-3; the APS 500-kV switchyard was previously approved as part of the BREC (Reclamation 2022) and is not included in the Proposed Action. Impacts from planned renewable energy projects are disclosed in the cumulative effects analysis in Section 4.1.1 through Section 4.1.5.</p>

Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-5	<p>This is important as the general area is listed as being in a major wildlife corridor as designated by the Arizona Game and Fish Department. Called the Grand Canyon to Prescott Corridor (AZ State Action Plan, Sept. 2022), the corridor is crucial for movement of mule deer, elk and pronghorn, and other species. Despite numerous wildlife studies, including the considerable information on migratory and avian species in Forged Ethic’s recent application for its Certificate of Environmental Compatibility from the Arizona Corporation Commission’s Line Siting Committee, we see no real conclusionary assessment of effects of multiple energy projects that unfortunately are located in a wildlife corridor.</p> <p>We recognize the difficulty of siting renewable energy projects given the constraints involved in requiring a lot of land and access to transmission lines but encourage agencies to provide as complete a picture as possible of the effects on wildlife and natural resources so that mitigation measures can be implemented to reduce impacts. As always, we encourage agencies and developers alike to look towards already disturbed lands such as the built environment, abandoned mine sites and retired agricultural lands for the next generation of renewable energy projects once our transmission lines reach load capacity and new infrastructure needs to be built.</p>	<p>Wildlife corridors in the analysis area, including the Grand Canyon to Prescott Corridor, are described in Section 3.3.1. Impacts to general wildlife, including impacts to big game and migratory corridors, are disclosed in Section 3.4.1. As described in this section, with the implementation of BMPs (see Table 5), the Proposed Action would have minor, adverse, short-term impacts to general wildlife during construction and decommissioning. Adverse long-term impacts to general wildlife during operations would be negligible. Cumulative impacts from Forged Ethic that fall within the CEAAAs (i.e., the gen-tie and interconnection) are disclosed in Section 4.1.1 through Section 4.1.5; cumulative impacts from Forged Ethic that fall outside the CEAAAs (i.e., the wind project) are beyond the scope of the analysis in this EA.</p>
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Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-6	<p>Because of the vast scale of these past, present, and reasonably foreseeable projects, mitigation should be required. We realize that regulations under the National Environmental Policy Act (NEPA) are currently being revised, but that does not negate the need for mitigation. In the current regulations, mitigation should be undertaken for federal actions that have a “nexus” to effects that need to be avoided or compensated, and is defined as:</p> <p>§ 1508.1 Definitions.  (s) Mitigation means measures that avoid, minimize, or compensate for effects caused by a proposed action or alternatives as described in an environmental document or record of decision and that have a nexus to those effects. While NEPA requires consideration of mitigation, it does not mandate the form or adoption of any mitigation. Mitigation includes:</p> <ol style="list-style-type: none"> <li>(1) Avoiding the impact altogether by not taking a certain action or parts of an action.</li> <li>(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.</li> <li>(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.</li> <li>(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.</li> <li>(5) Compensating for the impact by replacing or providing substitute resources or environments.</li> </ol>	<p>See responses to comments 4-1 and 4-2; the CO Bar Solar Complex has a feasible, non-federal interconnection option and is not dependent on Reclamation’s approval of the LGIA. As stated in the current definition of mitigation provided in the comment, mitigation is intended to minimize, avoid, or compensate for the effects caused by a proposed action or alternatives. Mitigation for cumulative impacts related to planned renewable energy facilities is beyond the scope of analysis in the EA. Measures to minimize or avoid impacts from the Proposed Action are listed in Table 5 and were considered in the analysis of impacts presented in Chapter 3.</p>
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Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-7	<p>Because this project will enable and/or create cumulative impacts with more than 41,000 acres of solar and wind projects, plus a 5-mile gen-tie line, 25 miles of communications line, and 8.8 miles of access road, and more (as well as the impacts associated with staging and construction of all of these facilities) in the heart of mule deer and pronghorn habitat and migration corridors, mitigation measures should be implemented during the construction of the interconnection project and at the associated energy facilities. (Table 10 in DEA at pp. 70-71, Figure 2 in AGFD 2022). The impacts on private land that this project enables cannot be ignored. Considering the cumulative impacts with these past, present, and reasonably foreseeable projects will enable the Bureau of Reclamation and U.S. Forest Service to take these actions while creating the most positive outcome possible.</p>	<p>See responses to comments 4-1, 4-2, 4-3, and 4-6; the APS 500-kV switchyard was previously approved as part of the BREC (Reclamation 2022), and the renewable energy projects listed in Table 11 are not dependent on the Proposed Action. Cumulative impacts from these projects that fall within the CEAs are disclosed in Section 4.1.1 through 4.1.5; cumulative impacts that fall outside the CEAs are beyond the scope of the analysis in this EA. BMPs for the Interconnection Project are listed in Table 5.</p>
Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-8	<p>We suggest the following mitigation measures:  <b>Migration corridors:</b> Encourage unimpeded wildlife movement by leaving solar facilities unfenced or using pronghorn-safe fencing. Concentrate solar facilities into the smallest area possible and cluster facilities into subsections with wide swaths of undisturbed vegetation between the subsections to allow wildlife movement, cover, and foraging. Pronghorn movement could be decreased 2-3 km or more from the site, so movement pathways should be appropriately sized. If fencing must be used, angle the fence corners and leave buffers along roads. Avoid blocking access to water or other essential resources. Avoid damage to winter range, birthing areas, and pinch points. Avoid constructing any facilities in or above areas of high wildlife use.</p>	<p>BMPs for general wildlife are listed in Table 5 and include wildlife-friendly fencing, and implementation of the Coconino County-approved Wildlife Protection Plan. No solar facilities are included in the Proposed Action.</p>

Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-9	<p><b>Raptors:</b> Locate raptor nests prior to construction and enforce an appropriate construction buffer from solar facilities and transmission lines. Time construction activities to avoid harm to raptors and migratory birds.</p>	<p>BMPs for migratory birds (including raptors) are listed in Table 5 and include active nest surveys prior to clearing, grubbing, or tree/limb removal during the breeding season (February 1–August 31). No solar facilities or transmission lines are included in the Proposed Action. As described in Table 5, the intertie line(s) and overhead collector lines will be constructed in accordance with APLIC guidelines (APLIC 2006, 2012) to minimize the risk of raptor collisions or electrocution.</p>
Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-10	<p><b>Bats:</b> No mitigation measures are proposed for bats because there are no records of the species of interest within 3 miles. Northern Arizona’s bats can travel large distances daily or seasonally. For example, Townsend’s big-eared bats can move 13-40 km at a time (8-25 miles).<sup>10</sup> In fact, it is extremely common for bat surveys to identify 40 km (25 mile) migrations, including in the Grand Canyon region.<sup>11</sup> There are many lava tube caves within 8-9 miles of the location (at least a dozen caves within 12 miles), and likely more that haven’t been located and mapped. Some of those lava tubes are known to host large summer maternity colonies and winter hibernacula. Water sources are highly important in influencing bat migrations, and site fidelity is high.</p> <p>Northern Arizona hosts 22 bat species and remains a refuge from White Nose Syndrome while bat populations throughout the nation have been decimated. We need to protect these animals. The DEA makes no mention of any bat surveys in the Project Area. If surveys were already conducted,</p>	<p>The Proposed Action does not include the use of wind turbines. As described in Table 8, the only surface waters in the analysis area are ephemeral. Sensitive bat species (Allen’s lappet-browed bat, pale Townsend’s big-eared bat, and spotted bat) are unlikely to use the analysis area for breeding or roosting but may forage in the area or pass through during migration or when travelling between roost sites (see Section 3.5.2). As described in Section 3.5.2, the amount of foraging habitat would be disturbed by the Proposed Action is small (91.2 acres temporary, 39.2 acres permanent) and direct impacts to bats are unlikely because project activities would not occur at night when bats are active. Given the low potential for impacts to bats under the Proposed Action, additional mitigation measures or</p>

			<p>identify the methods, locations, dates, and time of day of the surveys that the DEA refers to.</p> <p>There must be bat surveys prior to creating a plan for how to mitigate bat impacts. A plan for mitigating bat impacts must apply to the entire area affected by the facilities that this project will enable. Ensure that wind facilities are not located between known caves and water sources. If so, either the water sources or the wind turbines should be moved to avoid conflicts.</p> <p>Bat surveys should be conducted in locations in and around the project area (particularly near water sources). In order to adequately determine what species are present in the project area, surveys must be conducted year-round, during different seasons, at varying times of night, and in various locations. Different bat species are more active at different times of night and during particular times of the year, so surveys only occurring at a particular time may not be able to identify that species' presence. Similarly, different species may be more prevalent in certain localities in the project area, even if the habitat is fairly uniform; without conducting surveys throughout the project area, it may not be possible to determine which species are actually present.</p>	<p>pre-construction surveys are not warranted.</p>
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Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-11	<p><b>Prairie Dog, Burrowing Owl:</b> Surveys for prairie dogs and western burrowing owls should be conducted in the entirety of the project area and the area of the wind and solar facilities that this project will enable. All construction activities should attempt to avoid negative impacts to these species, relocating them if necessary. Organizations such as Habitat Harmony are helpful in addressing this.</p> <p>Burrowing owl numbers have declined due primarily to loss of habitat. While not a federally threatened or endangered species, it is listed by United States Fish and Wildlife Service as a National Bird of Conservation Concern protected federally by the Migratory Bird Treaty Act. If burrowing owls are displaced by the project, every effort should be made to relocate them in suitable habitat nearby. Arizona Game and Fish also has guidance for burrowing owl surveys and relocation.</p>	<p>No prairie dog colonies were observed in the project area during the site visits (see Section 3.5.2). As described in Section 3.5.2.1.2, there are no records of western burrowing owls within 3 miles of the project area, and suitable breeding habitat for the species is not present. As described in Section 3.5.2.2.1, BMPs would be implemented to minimize or avoid impacts to western burrowing owl, including pre-construction nest clearance surveys during the breeding season and avoidance of active nests. With the implementation of these measures, effects to western burrowing owl would be negligible.</p>
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Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-12	<p><b>General wildlife mitigation measures:</b> Several examples of other wildlife mitigation measures can be found in documents such as the Colorado Parks and Wildlife Best Management Practices for Solar Energy Development.</p> <p>All trenches should include escape ramps that will allow any wildlife that crawl or fall into them to get out.</p> <p>There should be consultation with the U.S. Fish and Wildlife Service to determine the construction schedule for this project in conjunction with other ongoing and reasonably foreseeable future projects so that construction will be less disruptive to resident and migrating species, including raptors, migratory birds, bats, predators, ungulates, and Monarch butterflies. (DEA Table 10 at pp. 70-71) It may be best to stagger construction timing so that the CO Bar Solar facility, Forged Ethic wind project, and the interconnection project are not all being built at the same time. Please ensure that wildlife impacts are predicted and mitigated to protect regional wildlife.</p>	<p>BMPs for general wildlife are listed in Table 5 and include filling or covering trenches and providing escape ramps while not in use.</p> <p>Reclamation consulted with USFWS during the development of the EA, as described in Section 5.2.2. USFWS concurred with Reclamation’s finding that the Proposed Action “may affect but is not likely to adversely affect” the Mexican wolf and “would not jeopardize” the monarch butterfly.</p>
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Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-13	<p><b>Vegetation:</b> We are glad to see that the project includes reseeding disturbed areas with native seed mixes. If ground needs to be cleared temporarily, please mow rather than blade the ground to protect the genetic structure of native plant populations. Soil disturbance should be minimized. Every effort to minimize introduction and spread of non-native species should be employed, including ensuring that reseeding mixtures are not polluted with non-native seed.</p>	<p>Temporary disturbance associated with laydown yards, access road improvements, and collector line installation would typically require all vegetation to be removed but would be limited to 91.2 acres. Grading would be kept to a minimum, and designated areas for equipment staging, stockpiling materials, and parking (i.e., the laydown areas) would be established to minimize the areas of ground disturbance. Where grading cannot be avoided, topsoil would be salvaged and stockpiled for use during reclamation. Several other BMPs related to soils and non-native plants are also listed in Table 5.</p>
Sandy Bahr	Sierra Club – Grand Canyon Chapter	4-14	<p><b>Noise, Lighting and Night Skies:</b> Noise and artificial lighting have negative impacts on animal behavior and on recreational use of nearby areas. Artificial light can have negative impacts on amateur and professional astronomical observers. Flagstaff, Flagstaff Area National Monuments, and Grand Canyon National Park are International Dark Sky locations. Light from these energy projects will be visible for huge distances, likely all the way to the North Rim of Grand Canyon, which is higher than the South Rim. Please work with local organizations and Coconino County to ensure that this project and all of the facilities it enables protect our region’s starry skies.</p>	<p>Impacts to wildlife are disclosed in Sections 3.4 and 3.5. BMPs to avoid or minimize impacts from noise and artificial lighting are listed in Table 5. As noted in this table, lighting for the Interconnection Project will comply with the Coconino County Zoning Ordinance (Coconino County 2022a) and a lighting permit will be obtained prior to the installation of any outdoor lighting.</p>