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# Biological Evaluation
## Painted Desert Solar Project

**Prepared for:**

Navajo Nation Natural Heritage Program
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# Abbreviations and Acronyms

| | |
|---|---|
| AC | alternating current |
| ac-ft | acre-feet |
| ADOT | Arizona Department of Transportation |
| APS | Arizona Public Service |
| BE | Biological Evaluation |
| BESS | battery energy storage system |
| BIA | Bureau of Indian Affairs |
| BRLC | Biological Resource Land Use Clearance Policies and Procedures |
| CIDH | case-in-drilled-hole |
| DC | direct current |
| Ecosphere | Ecosphere Environmental Services, Inc. |
| ESA | Endangered Species Act |
| ft | feet/foot |
| ISO | International Organization for Standardization |
| kV | kilovolts |
| $m^3/s$ | cubic meter per second |
| MBTA | Migratory Bird Treaty Act |
| MV | medium voltage |
| MW | megawatt |
| MWdc | megawatt of direct current |
| Navajo Power | Navajo Power, PBC |
| NGS | Navajo Generating Station |
| NNC | Navajo Nation Code |
| NNDFW | Navajo Nation Department of Fish and Wildlife |
| NNHP | Navajo Nation Natural Heritage Program |
| O&M | operations and maintenance |
| POD | Plan of Development |
| Project | Painted Desert Project |
| PV | photovoltaic |
| SH | State Highway |
| USFWS | U.S. Fish and Wildlife Service |

# 1. Executive Summary

Painted Desert Power, LLC proposes to develop and operate the Painted Desert Project a proposed photovoltaic solar generating facility. The proposed Project is located on approximately 5,000 acres Navajo Nation lands in Coconino County, Arizona. The Project is a proposed 750-megawatt photovoltaic solar-generating and battery energy storage system facility in the Cameron and Coalmine Canyon chapters of the Navajo Nation Reservation, approximately 4 miles east of Cameron, Arizona.

The purpose of this Biological Evaluation is to determine if, and to what extent, the proposed Project may affect any U.S. Fish and Wildlife Service endangered, threatened, or proposed endangered or threatened species; designated or proposed critical habitat; or any Navajo Nation listed special status species.

The Navajo Nation Department of Fish and Wildlife is responsible for managing and protecting the Navajo Nation's fish, wildlife, plants, and their habitat and has established wildlife habitat, sensitive areas, and associated Biological Resource Land Use Clearance Policies and Procedures. As classified by the agency, approximately 26 percent of the Project Site is located in Area 1 – Highly Sensitive Area, 58 percent is located in Area 2 – Moderate Sensitive Area, 15 percent is designated as Area 3 – Less Sensitive Area, and 1 percent is in Area 4 – Community Development.

Ecosphere Environmental Services, Inc. biologists conducted special status species habitat assessments, overall vegetation cover type surveys, and raptor nest surveys within and adjacent to the Project Site in March, April, May 2020. Of the 19 federally and tribally listed special status species with the potential to occur in the Project Site and action area, eight were eliminated from detailed consideration in this assessment. There is no designated or proposed critical habitat in the Project Site or action area.

Of the federally listed species with the potential to occur in the Project or action areas, only the California condor, a USFWS experimental, non-essential population, and the endangered southwestern willow flycatcher have potential to be present and impacted by the proposed action. With the implementation of conservation and avoidance measures, the Proposed Project is not likely to jeopardize the continued existence of the California condor. The Proposed Project may affect but is not likely to adversely affect the USFWS endangered southwestern willow flycatcher.

Three Navajo Nation sensitive raptor species, the golden eagle, ferruginous hawk, and peregrine falcon, have the potential to occur in the Project Site and action area. A ferruginous hawk and a golden eagle were observed during the field surveys; however, no nests were observed, nor are there any records of nests within the action area. Peregrine falcon is known to occur within 3 miles of the Project Site.

The Project Site also contains suitable habitat for yellow warbler, northern leopard frog, milk snake, Wupatki pocket mouse, Peebles' blue-star, and Beath's milkvetch. Milk snake, northern leopard frog, Wupatki pocket mouse, have been recorded as occurring within 1 mile of the Project Site. None of these species were observed in the Project Site during the biological surveys; however, species specific surveys were not conducted.

Specific and general species conservation and mitigation measures are described in this assessment for each species with the potential to occur in the area. These measures would minimize or avoid impacts to Navajo Nation special status species that may occur in the Project Site.

The Project Site also includes foraging habitat for many species of raptors, and other migratory birds. A red-tailed hawk nest was observed in the Project Site. Impacts on migratory birds include the long-term loss of potential shrub- and ground-nesting, foraging, migration, and dispersal habitat throughout the permanent impact area of the Project (approximately 1,342 acres). Additional impacts include the avoidance of the Project Site due to construction noise, increased human activity, vehicles, lights, and infrastructure. Other impacts to migratory birds may result from collisions with photovoltaic panels and associated transmission infrastructure.

# 2. Introduction

Painted Desert Power, LLC (PDP) proposes to develop and operate the Painted Desert Project (Project), a proposed photovoltaic (PV) solar generating facility. The proposed Project is located on Navajo Nation lands in Coconino County, Arizona. The Project is a proposed 750-megawatt (MW) PV solar-generating and battery energy storage system (BESS) facility in the Cameron and Coalmine Canyon chapters of the Navajo Nation Reservation, approximately 4 miles east of Cameron, Arizona. The Project is planned in two distinct areas—Areas 1 and 2—which are separated by an ephemeral floodplain. The combined solar development areas encompass just under 5,000-acres. The Project also includes the proposed substation/BESS area and a gen tie corridor to the Moenkopi substation located southwest of the proposed solar development areas (refer to Appendix A, Maps 1-4). Additional components included in the Project are expansion of the existing Moenkopi Substation (south) and the Arizona State Route 89 (SR 89) turnout, improvement and widening of Bureau of Indian Affairs (BIA) Route 6730 (BIA RT 6730), construction of three new access roads from BIA RT 6730 to the solar array areas, and East and West Connectors linking Areas 1 and 2. Also analyzed in this Biological Evaluation (BE) are proposed alternative collector substations, gen tie corridor, and a potential "dual-use" solar array area between Areas 1 and 2.

This BE was prepared in compliance with the Endangered Species Act (ESA) of 1973, as amended, and the Navajo Nation Code (NNC) requirement for species of concern (17 NNC 507) administered by the Navajo Natural Heritage Program (NNHP).

The purpose of this BE is to determine if, and to what extent, the proposed Project may affect any U.S. Fish and Wildlife Service (USFWS) endangered, threatened, or proposed endangered or threatened species; designated or proposed critical habitat; or any NNHP-listed species. The objectives of this BE are as follows:

1. Compile a list of federally listed threatened, endangered, and proposed species and NNHP-listed species potentially occurring in the plan area.
2. Provide a physical and biological description of the Project Site.
3. Determine the presence of federally listed threatened, endangered, and proposed species and NNHP-listed species in the Project Site.
4. Determine the presence of critical habitat for federally listed species in the Project Site.
5. Assess potential impacts the proposed action may have on any federally listed or proposed species, or critical habitat, or NNHP-listed species present in the Project Site.
6. Identify recommended mitigation measures, best management practices, and avoidance measures to minimize or impacts.

The determinations made in this BE are based on research, available species reports, NNHP and geospatial data, field surveys of the Project Site, and the professional judgment of experienced biologists.

# 3. Project Description

## 3.1 Location

The Project Site is located in Sections 7-9, 16-22, and 27-32 of Township 29 North, Range 10 East, in Coconino County, Arizona, in both the Cameron and Coalmine Canyon chapters of the Navajo Nation. The gen tie crosses Townships 28 and 29 North, Range 9 East.

The Project and surrounding lands are all part of the Navajo Nation. State Highway 89 is the main highway used to access the Project Site, and the nearest town is Cameron, Arizona. The Project would be located next to several partially reclaimed uranium mines and just east of the Little Colorado River canyon and has traditionally been used by Navajo people for sheep grazing. Two major sets of existing high-voltage transmission lines run adjacent to the Project—the Arizona Public Service (APS) Four Corners transmission corridor immediately to the south of Area 1 and the APS Navajo Generating Station (NGS) transmission corridor approximately 3.5 miles to the west of Area 1. The APS-operated Moenkopi substation is located approximately 6 miles to the west-southwest.

## 3.2 Proposed Action

### 3.2.1 Overview

The Project is planned in two distinct areas, Areas 1 and 2, separated by a floodplain and presumed USACE jurisdictional wash. To the south of the wash lies Area 1, consisting of a large area of solar arrays and related facilities (such as inverters and access roads), one or more operations and maintenance (O&M) buildings, and a new high-voltage Project substation/BESS area. Area 1 would be accessed via Access Road 1, running east from BIA RT 6730. The larger Area 2 is located north of Area 1 by approximately 0.3 to 0.7 mile and would feature additional solar arrays. Area 2 would be accessed via Access Roads 2 South and 2 North running east from BIA RT 6730. The gap between Areas 1 and 2 would be connected via the East and West Connectors. These corridors would contain medium voltage (MV) circuits (i.e., aboveground, on poles, or underground), all-weather access roads (passable through the seasonal wash), and overhead or underground communications (fiber-optic) cable.

The Proposed Project includes specific proposed locations and sizes for two array areas—Areas 1 and 2. It also includes the Proposed Substation/BESS Area and Proposed gen tie corridor to the Moenkopi substation. Additional components included in the Proposed Project are expansion of the Moenkopi substation (south) and the State Highway 89 turnout, improvement and widening of BIA RT 6730, three new access roads from BIA RT 6730 to the solar array areas, and East and West Connectors linking Areas 1 and 2.

**Table 3-1. Proposed Project Components and Acreages**

| Proposed Project Components | Permanent Impacts *(in acres)* | Temporary Impacts *(in acres)* |
|---|---|---|
| Proposed Solar Array Area 1 | 62.2 | 1,180 |
| Proposed Solar Array Area 2 | 1,231 | 3,766 |

| Proposed Project Components | Permanent Impacts *(in acres)* | Temporary Impacts *(in acres)* |
|---|---|---|
| Proposed Substation/BESS Area | 15.1 | 2.6 |
| Proposed Gen Tie Segment East | 0.05 | 13.2 |
| Proposed Gen Tie Segment West | 0.02 | 4.8 |
| Proposed Moenkopi Substation Expansion | 1.3 | 0.08 |
| Access Road 1 | 1.2 | 0.08 |
| Access Road 2 South | 2.5 | 1.7 |
| Access Road 2 North | 8.0 | 5.3 |
| BIA RT 6730 Improvement and Widening | 13.7 | 9.1 |
| SR 89 Turnout Expansion | 0.5 | 0.2 |
| East Connector | 3.1 | 2.3 |
| West Connector | 3.1 | 2.3 |
| Total | 1,342 | 4,988 |

At full build-out, solar panels and single-axis trackers (solar panel mounting structures) and related equipment would occupy most of the Project Site. Temporary construction laydown or on-site assembly facility areas, construction trailers, and parking areas would be provided within the Project Site. Due to the size of the Project Site, one or more of the laydown or on-site assembly facility areas would be relocated periodically within Areas 1 and 2 as construction progressed.

#### 3.2.1.1 Alternative Project Components

Several alternative Project components are described here and evaluated in this BE. There are two alternative substations and BESS area locations, Alternative substations/BESS Areas 1A and 1B (refer to Appendix A, Map 4). Alternative 1A would require an additional short access road, Alternative Access Road 1A. Three alternative gen tie alignments are presented for evaluation:

- Gen Tie Alternative 1A starts at Alternative Substation/BESS Area 1A and adds Alternative Gen Tie Segment 1A to the proposed Gen Tie and then follows the proposed Gen Tie to the Moenkopi substation.
- Gen Tie Alternative 1B North to South runs from Alternative Substation/BESS Area 1B along the Alternative Gen Tie Segment East and crosses under the APS Four Corners transmission corridor just east of the APS NGS transmission corridor. It then crosses SR 89 before accessing the south side of the Moenkopi substation using Proposed Gen Tie Segment West.
- Gen Tie Alternative 1B North runs along the north side of the APS Four Corners transmission corridor to the Moenkopi substation from Alternative Substation/BESS Area 1B using Alternative Gen Tie Segments East and West.

These components and the location of each are shown on Maps 3 and 4 in Appendix A.

### 3.2.2 Solar Array and Photovoltaic System

PV panels would produce all electricity generated by the Project. PV panels convert sunlight into direct current (DC) electricity. The major equipment in the solar field includes:

- PV solar panels
- Single-axis trackers
- Inverters
- BESS
- Three-phase pad-mounted transformers and circuit breakers

The current design groups the PV panels, inverters, and MV transformers into approximately 4 MW of direct current (MWdc) blocks that, when combined, would produce the Project output. MWdc block, inverter, and transformer sizes would be finalized closer to the time of construction.

The degree of tilt for the trackers would change during each day. The peak height of a solar tracker would be approximately 7 to 13 feet (ft), reached during the morning and evening hours when the panels are tilted to face the rising or setting sun.

The trackers would be mounted on driven piles, ground screw, or cast-in-drilled-hole (CIDH) foundations to support the panel mounting system. The electrical equipment (inverters and transformers) would be housed in containers or small shelters or skid platforms approximately 8 to 10 ft tall. The Project would also include small meteorological monitoring stations to track solar insulation, temperature, and wind direction and speed from a height of approximately 30 ft.

The PV panels utilize non-reflective surfaces to maximize efficiency and convert sunlight into DC electricity. The DC output of multiple rows of PV panels is collected through one or more combiner boxes and directed to an inverter that converts the DC electricity to alternating current (AC) electricity. From the inverter, the generated energy flows to a transformer where it is stepped up to distribution-level voltage, approximately 34.5 kilovolts (kV). Multiple transformers are connected in parallel via 34.5kV lines (installed either overhead or below ground) to a single 34.5/500kV substation.

### 3.2.3 Substation, BESS, Gen Tie, and Telecommunications

A new collector substation located at the southwest corner of the Project Site would step up power from 34.5kV to 500kV for transmission. The Project substation would consist of one or more general step-up transformers, a control house, and a substation superstructure within an approximately 8-ft-tall fence enclosure.

Certain phases of the Project may include a BESS that would store electricity for dispatch into the transmission grid via the gen tie. At complete buildout, the BESS may consist of approximately 75 to 150 battery storage containers. The battery storage containers would be built using standard International Organization for Standardization (ISO) shipping containers and would each measure approximately 53 ft in length, 8 ft in width, and 9 ft in height, though other form-factor structures may be used. The entire BESS area would be fenced off. The combined substation and BESS area is expected to cover approximately 30 acres.

An approximately 4.5-mile, 500kV gen tie line would run west from the Project substation near Area 1 to interconnect directly with the APS-operated Moenkopi substation on the west side of SR 89. Fully built out, the gen tie would support up to three circuits of suspended 500kV electrical conductors and one or two communications lines. The communications lines would be either suspended overhead or buried in a trench within the gen tie corridor.

The gen tie's estimated 28 towers would be steel monopole structures, steel H-frame structures, or a combination of the two. The towers' maximum heights would be approximately 140 ft. Tower structure designs would be finalized after further geotechnical and engineering studies. The proposed transmission lines would span 900 to 1,400 ft. The gen tie would largely parallel the existing 500kV APS Four Corners transmission corridor to minimize visual impacts and would cross the Little Colorado River, the APS NGS transmission corridor, and SR 89. Stringing circuits and cabling across the Little Colorado River canyon would likely require the use of a helicopter.

### 3.2.4 Water Supply and Use

During construction and operation, the Project would use water trucked to the Project Site or pumped from on-site or nearby wells. There are existing wells in the vicinity of Cameron.

The anticipated construction water use for the entire buildout of the Project Site is approximately 750 acre-feet (ac-ft). Actual use could be much lower depending upon climatic conditions during construction. Construction water needs would be limited to soil conditioning and dust suppression. Potable water would be transported to the Project Site for drinking and domestic needs.

During the operational phase, solar PV plants use minimal water. The annual water consumption for the operation of the facility would be expected to be approximately 30 ac-ft. This consumption includes the water required for washing the PV panels up to six times per year. Specialized cleaning techniques are expected to be used to minimize water consumption.

### 3.2.5 Temporary and Permanent Access Roads

Access to the Project Site would be via SR 89 and BIA RT 6730. Primary access would be controlled through a security gate at the main entrance to Area 1 located at the southwest corner of the Project Site. The Project substation would have its separate access and secured gate off BIA RT 6730. Two secondary access roads are proposed for access to Area 2. Access Road 2 South would provide access to the southwest corner of Area 2, while Access Road 2 North would provide access to the northwest corner of the Project Site via the Cameron airstrip. These access roads would be used during construction. During operations, Access Road 2 North may only be used for emergencies. All the access roads would be graded and improved (e.g., widened, compacted, covered with gravel, or paved) due to the increased traffic volume and heavy loads to be transported on these roads during construction. Also, BIA RT 6730, a public road, would likely need to be widened and resurfaced to handle the Project construction traffic during all weather conditions. Finally, the turnout from BIA RT 6730 onto SR 89 would likely need to be enlarged, improved, or paved. Detailed specifications for improvements to the SR 89 turnout and BIA RT 6730 would be defined through consultation with the Arizona Department of Transportation (ADOT) and the BIA.

### 3.2.6 Construction Schedule

Construction would be expected to require approximately 12 to 36 months from the beginning of site preparation to the completion of a commercially operational facility. Construction of Area 1 is expected to begin first, but the construction of Area 2 could precede, overlap with, or follow the construction of Area 1. The schedule would depend on future commercial arrangements.

### 3.2.1 Construction Sequence

#### 3.2.1.1 Site Preparation

Construction of the Project would begin with the clearing and grading (if required) of staging areas. Access to the Project Site would be improved to appropriate construction standards. Staging areas typically include temporary construction trailers, worker parking, truck loading and unloading facilities, and fabric buildings and areas for assembly. Road corridors would be surveyed, cleared, and graded to bring equipment, materials, and workers to the locations under construction. Existing buried electrical lines or pipelines, PV array locations, and locations of other facilities could be flagged and staked to guide construction activities. Cultural sites and other sensitive resources would be permanently fenced or temporarily roped off before construction activity in their vicinity. Best management practices for stormwater and erosion control would be in place during the site preparation phase and before significant grading activities.

Across most of the Project Site, a low-impact mow and disc-and-roll technique would be used to remove surface vegetation and keep root balls in place. This practice minimizes dust generation and water usage related to dust suppression and promotes faster regeneration of vegetation cover than re-seeding alone. Grubbing and grading would be required to level particularly rough areas of the Project Site and to prepare the ground for concrete foundations for substation equipment and inverters. Access roadbeds would also be grubbed, graded, and compacted. The fence line would be grubbed and graded to create a level surface for proper fence installation.

#### 3.2.1.2 Solar Array Construction

PV system installation would include earthwork, grading, and erosion control, as well as the erection of the trackers, PV panels, foundations, and associated electrical equipment. System installation would begin with teams installing the single-axis trackers and steel pile support structures. Their exact design would be determined by the specific soil conditions but would likely include pneumatically driven steel beams (W, C, or Sigma profiles) attached to a tracker racking system. Panel installation and electrical work would follow.

Concrete may be required for the footings and foundations and would be required for the pads for inverters, transformers, and BESS. Concrete would be produced at an off-site location by a local provider and transported to the Project Site by truck. Final concrete specifications would be determined during detailed design engineering and would meet applicable building codes. Inverter and MV transformers are typically delivered on prefabricated skids (or placed on skids assembled on-site) then lifted onto concrete foundations via crane.

The trackers require a moderately flat surface for installation. Some minor earthwork, including grading, fill, compaction, and erosion control, may be required to accommodate the placement of trackers, foundations or

footings, access roads, and drainage features. Construction of the solar arrays would include installation of trackers, PV panels, inverters, transformers, buried electrical cables, and other related equipment. Some parts of the solar field might be assembled near the laydown yard instead of the field.

Trackers would generally follow existing land contours with localized grading only where necessary to address major variations in topography and in areas where it would not significantly impact existing vegetation or surface hydrology. Grading within the Project Site would be limited to the locations of access roads, inverter pads, laydown areas, some trackers where topography requires it, internal and external transmission poles, and ancillary facilities (including the parking and material storage areas, one or more O&M buildings, and the Project substation).

#### 3.2.1.3 Substation and Gen Tie Construction

Medium-voltage collection circuits would be routed to the Project substation at the southwestern corner of the Project Site. The main components of the substation are the steel riser structures, electrical bus work, circuit breakers, main power transformer, pad transformers, switches, reactive power equipment, and electronic cabinets. All are installed on poured concrete pads or column foundations. As many as three step-up transformers would be installed within concrete oil containment basins to prevent environmental spills. The control building of the substation would be prefabricated and installed on-site on a poured concrete pad. The perimeter of the entire substation would be fenced, and electrically rated rock gravel would be spread within the fence line and for approximately 2 ft outside the fence line.

As discussed in Section 7.4 of the Plan of Development (POD), the 500kV transmission line structures would consist of monopole or steel H-frame towers anchored to poured concrete column or footing foundations. Transmission line structures typically house single or multiple electrical circuits, with each circuit consisting of three cables for each electrical phase. Closer to the start of construction, detailed transmission line routing, span lengths, and conductor tensioning would be designed by an engineer based on environmental conditions for structural and electrical loading.

### 3.2.2 Construction Workforce, Equipment, and Traffic

Construction of Area 1 would be expected to require approximately 200 to 300 on-site construction workers at peak workforce. For the construction of Area 2, more than 500 construction workers could be required at peak workforce depending on the construction schedule duration and phasing of the buildout. No on-site housing facilities are expected to be built.

Construction equipment expected to be required for the Project are listed in the POD and include off-highway vehicles, skid-steer loaders, rubber-tired dozers, tractors, loaders, backhoes, excavators, graders, rollers, bore drill rigs, cranes and variety of smaller equipment hauled on trailers and on trucks. There will also be a helicopter used during the construction of the gen tie.

The number of workers expected on the Project Site during construction would vary over the construction period and is expected to average approximately 500 each day at peak workforce, generating about 250 daily round trips. The number of equipment and supply deliveries to the Project Site would also vary over the

construction period but is conservatively estimated at an average of 20 trips per day, with a total of approximately 5,000 trips over a material delivery period of 48 weeks. All Project-related parking during construction would be on-site, moving within the solar field as it is developed. A traffic and transportation plan would be prepared for the Project.

### 3.2.3 Operations and Maintenance

When fully operational, the Project could require as many as approximately 25 on-site technicians and personnel. Additional O&M personnel would travel to the Project Site regularly to perform specialized preventative maintenance or respond to unplanned outages.

During operations, primary access to the Project Site would be via the gate off BIA RT 6730. The operation of the Project would generally be expected to generate fewer than 10 trips per day by maintenance and security personnel. Each panel cleaning period could require as many as 10 water truck deliveries per day. Other deliveries of supplies or equipment could be necessary to support operations and maintenance.

## 3.3 Conservation or Avoidance Measures

Conservation, avoidance, and other mitigation measures are presented within the sensitive species assessments presented in Section 5.3 Species Evaluated Further.

## 3.4 Consultation/Coordination History

There have been no past USFWS consultations associated with the Proposed Project. Navajo Power has coordinated with the NNHP and obtained a Navajo endangered species list for species evaluated in this BE.

# 4. Methods

## 4.1 Desktop Review and Field Methods

Ecosphere biologists compiled a list of USFWS- and NNHP-listed species that occur or have the potential to occur in or near the Project Site. Species data were obtained from the Information, Planning, and Consultation (IPaC) decision support system (USFWS 2020a) and through a consultation with the NNHP (NNHP 2020). Both lists are included in Appendix B.

Ecosphere reviewed available aerial imagery, species accounts, and geographic information system (GIS) data for the Project Site.

Ecosphere biologists conducted special status species habitat assessments, overall vegetation cover type surveys, and raptor nest surveys within and adjacent to the Project Site. Surveys were conducted within the Project Site on March 14, 23, 24, 25, and 26, 2020, April 6 and 7, 2020, and on May 7 and 8, 2020. All plant and wildlife species and signs thereof observed in the Project Site were recorded, and digital photographs of the Project Site were taken. Binoculars were used to survey for raptors and potential nest habitat.

A raptor nest survey was conducted at cliffs east of the Project Site using binoculars and a high-powered spotting scope. Surveyors walked transects throughout the Project Site to characterize vegetation, topography, and water resources.

## 4.2 Delineation of the Action Area

The Project Site encompasses approximately 5,000 acres (Appendix A, Maps 2 and 3). The action area includes all areas that could be affected by the Proposed Project and is not limited to the actual footprint where disturbance would occur. The action area was delineated as a 0.50-mile buffer around the Project Site (refer to Appendix A, Map 6). This area has been identified as the area where increased noise, human disturbance, and emissions may occur during construction and operation of the Proposed Project.

# 5. Existing Habitat Conditions

## 5.1 Wildlife Areas

The Navajo Nation Department of Fish and Wildlife (NNDFW) is responsible for managing and protecting the Navajo Nation's fish, wildlife, plants, and their habitat. The NNDFW has established wildlife habitat, sensitive areas, and associated Biological Resource Land Use Clearance Policies and Procedures (BRLC) to help direct development to areas where impacts to wildlife and habitat would be less significant (Navajo Nation Council 2008). There are six wildlife area classifications mapped on the Navajo Nation. There are four area classifications within the Proposed Project Site (refer to Appendix A, Map 3).

As classified by the NNDFW, approximately 26 percent (1,829 acres) of the Project Site is located in Area 1 – Highly Sensitive Area, 58 percent (4,088 acres) is located in Area 2 – Moderate Sensitive Area, 15 percent (1,031 acres) of the Proposed Project Site is designated as Area 3 – Less Sensitive Area, and 1 percent (52 acres) is in Area 4 – Community Development (Appendix A, Map 4).

### 5.1.1 Area 1 – Highly Sensitive Areas

Areas considered Highly Sensitive are recommended for no development with a few exceptions. According to the NNDFW, these areas contain the best habitat for endangered and rare plants and animals, and game species. The purpose of this designation is to protect valuable and sensitive biological resources to the maximum extent practicable. In general, no activity or development is allowed that would result in significant impacts to wildlife resources. A BE that fully considers alternatives is required for all proposed development within Highly Sensitive areas and must present a compelling reason to develop the area. In the Project Site, Restricted development in Highly Sensitive Areas is allowable if the following criteria are met. Residential and business development is allowed if it is:

- not within or close enough to habitat to cause significant impacts,
- on the perimeter of the area. If not on the perimeter, there must be no reasonable alternatives, or
- within 1/8 mile of similar development.

Other types of development are allowed if it is:

- not within or close enough to habitat to cause significant impacts, or
- there are no reasonable alternatives outside the area.

### 5.1.2 Area 2 – Moderate Sensitive Areas

Moderate sensitive areas are those areas with a high concentration of rare, endangered, sensitive, and game species occurrences, or areas that have a high potential for these species to occur throughout the landscape. The purpose of Area 2 is to minimize impacts to these species and their habitats and to ensure that the habitats in Area 1 do not become fragmented.

Development in Area 2 is required to be placed to avoid NESL species and their habitats. Avoidance includes an adequate buffer to address long-term and cumulative impacts and will depend on the species and the type of development. All development in Area 2 requires a BE.

### 5.1.3 Area 3 – Less Sensitive Areas

Less Sensitive Areas contain low or fragmented concentrations of sensitive-status species. These species may occur on the landscape in "islands" of well-spaced habitat that are limited in number on the landscape. Additionally, lands considered Less Sensitive may not be completely surveyed for potential occurrences of sensitive-status species or habitat.

### 5.1.4 Area 4 – Community Development

Community development areas are those areas within certain communities that do not support the habitat for species of concern, and therefore development can proceed without further biological evaluation.

## 5.2 Physiography and Climate

The Project Site is in the Little Colorado River Valley/Painted Desert ecoregion within Coconino County (USEPA 2011). The Project Site is bordered to the east by cliffs 50 and 100 feet in height. Along the eastern boundary of the Project Site, Ward Terrace is characterized by cliffs ranging between 800 and 1,100 feet in height. The Little Colorado River is a little over 0.5-mile to the west of the proposed solar development areas and would be spanned by the proposed gen tie near existing transmission line crossings. Elevation within the Project Site ranges between 4,150 and 4,500 feet. Surface water generally flows in sheet flows and ephemeral channels to the south in Areas 1 and 2 and drains into the Little Colorado River. West of the Little Colorado River, surface water flows northeast in ephemeral and intermittent channels into the Little Colorado River. Slopes within Areas 1 and 2 are generally flat, between 0 and 4 percent. Slopes in the proposed transmission corridors are generally flat, except where the transmission corridors cross the Little Colorado River, and slopes are variable and steep in places.

The Project Site is in semi-arid upland desert. The closest climate data station to the Project Site is the Cameron 1 NNE, located in Cameron, Arizona, approximately 2 miles west of the Project Site. Mean monthly temperatures range between 37- and 83-degrees Fahrenheit (WRCC 2020a). Precipitation in the Project Site averages approximately 5.7 inches and falls mostly between August and October (WRCC 2020).

## 5.3 Soils and Geology

There are 7 soil map units within the Project Site (NRCS 2020; NRCS 2012).

1. Leupp-Hoskinnini complex, 2 to 15 percent slopes – this map unit is typically found on structural benches between 4,920 and 5,680 feet. Leupp soils comprise approximately 45 percent of this complex. Hoskinnini soils comprise approximately 40 percent. Other minor components include Typic Torriorthents and similar soils, Typic Haplargids and similar soils, and rock outcrop. This map unit occurs

along the proposed access road leading into the Project Site and comprises approximately 32 acres of the Project Site.

2. Jocity-Joraibi-Navajo-Riverwash complex, 0 to 2 percent slopes – this map unit is found in channels or on flood plains between 4,690 and 5,100 feet. Jocity soils comprise approximately 40 percent of this map unit. Navajo soils and Joraibi soils comprise approximately 15 pecent, respectively. Riverwash soils comprise approximately 10 percent. Minor components include Tours or similar soils and Typic Haplocambrids. This map unit occurs within the proposed gen tie rights-of-way where it spans the Little Colorado River and comprises approximately 29 acres within the Project Site.
3. Hoskinnini-Moenkopi complex, 2 to 8 percent slopes – this map unit is typically found on structural benches between 4,920 and 5,350 feet. Approximately 45 percent of this complex is comprised of Hoskinnini soils. Moenkopi soils comprise approximately 40 percent. Other minor components include Typic Torriorthents and Typic Haplargids. This map unit occurs within the proposed gen tie rights-of-way west of the Little Colorado River and comprises approximately 320 acres within the Project Site.
4. Persayo-Hanksville complex, 4 to 60 percent slopes – this map unit is typically found on hillslopes between 4,900 and 6,000 feet. Perseyo soils comprise approximately 60 percent of this map unit. Hanksville soils comprise approximately 30 percent. Other minor components include Rock outcrop and Lithic Torriorthents. This map unit comprises approximately 59 acres within the proposed gen tie rights-of-way west of the Little Colorado River, approximately 2.3 acres along the proposed main access road, and 728 acres in the western portion of Area 2.
5. Shinume-Leupp-Rock outcrop complex, 4 to 35 percent slopes – This map unit is typically found on structural benches between 5,000 and 5,450 feet. Shinume soils comprise approximately 40 percent of this map unit. Approximately 30 percent of the map unit is comprised of Leupp soils. Rock outcrop comprises approximately 15 percent of the map unit. Other minor components include Sheppard and similar soils, Typic Torriorthents, and Typic Haplargids. This map unit is located due west of the Little Colorado River within the proposed gen tie rights-of-way and comprises approximately 25 acres of the Project Site.
6. Claysprings-Huerfano-Tuba complex, 2 to 15 percent slopes – This map unit is typically found on structural benches between 4,140 and 5,330 feet. Claysprings soils comprise approximately 40 percent of the map unit. Huerfano soils comprise approximately 30 percent of the map unit. Tuba soils comprise approximately 15 percent of the map unit. Minor components of the map unit include Badland, Hanksville and similar soils, and Ives and similar soils. This soil map unit occurs in most of Area 1, the eastern portion of Area 2, portions of the proposed access roads, and portions of the proposed gen tie rights-of-way east of the Little Colorado River. This map unit comprises approximately 3,847 acres within the Project Site.
7. Epikom-Leupp complex 2 to 15 percent slopes – This map unit is typically found on structural benches between 4,220 and 5,430 feet. Epikom soils comprise approximately 50 percent of the map unit. Leupp soils comprise approximately 35 percent. Minor components include Lithic Haplargids and similar soils, Typic Torrorthents and similar soils, and Rock outcrop. This map unit comprises approximately 65 acres

at the western terminus of the proposed gen tie rights-of-way and the Moenkopi substation expansion areas.

Soil Descriptions:

- Leupp soils are loamy, mixed, superactive, calcareous, mesic Lithic Torriorthents that typically occur on structural benches. Parent materials are Shinarump conglomerate derived residuum weathered from sandstone or mudstone. Leupp soils are well-drained with a very low available water capacity and a very high runoff class.
- Hoskinnini soils are loamy, mixed, superactive, mesic Lithic Haplargids derived from Shinarump conglomerate residuum weathered from sandstone and/or mudstone. Hoskinnini soils are well-drained with a very low available water capacity and a very high runoff class.
- Jocity soils are fine-loamy, mixed, superactive, calcareous mesic Typic Torrifluvents. Parent material is alluvium derived from sandstone and shale. These soils are well-drained with a high available water capacity and medium runoff class. Flooding hazard for these soils is considered frequent.
- Joraibi soils are sandy over clayey, mixed, superactive, calcareous, mesic Typic Torrifluvents. Parent materials is alluvium derived from sandstone and shale. These soils are somewhat excessively drained with a low available water capacity and a high runoff class. Flooding hazard for these soils is considered occasional.
- Navajo soils are fine, mixed, superactive, calcareous, mexic Vertic Torrifluvents. Parent material is alluvium derived from sandstone and shale. These soils are well-drained with a very high available water capacity and a high runoff class. Flooding hazard for these soils is considered occasional.
- Riverwash soils are unstabilized sandy, clayey, silty or gravely sediment that is flooded, washed, and reworked frequently by rivers. Typically, these soils are unvegetated.
- Moenkopie soils are loamy, mixed, superactive, calcareous, mesic Lithic Torriorthents derived from colluvium over Moenkopie formation residuum weathered from calcareous sandstone. These soils are well-drained with a very low available water capacity and a very high runoff class.
- Shinume soils are loamy-skeletal, mixed, superactive, calcareous mesic Lithic Torriorthents. Parent material is Moenkopi formation colluvium over residuum weathered from calcareous sandstone. These soils are excessively drained with a very low available water capacity and a very high runoff class.
- Claysprings soils are clayey, smectitic, calcareous, mesic, shallow Typic Torriorthents derived from residuum weathered from sandstone or shale. These soils are well-drained with a very low water capacity and a high runoff class.
- Huerfano Soils are loamy, mixed, superactive, mesic, shallow Typic Natragids derived from alluvium over residuum weathered from sandstone or shale. These soils are well-drained with a very low water capacity and a high runoff class.
- Tuba soils are mixed, mesic Typic Torripsamments derived from eolian sands over residuum weathered from sandstone and shale. These soils are excessively drained with a low available water capacity and a low runoff class.
- Epikom soils are loamy, mixed, superactive, mesic Lithic Haplocambids derived from residuum weathered from calcareous sandstone. These soils are well-drained with a very low water capacity and a low runoff class.

Surficial geology within the Project Site is comprised of the Chinle Formation. The Chinle Formation is comprised of colorful mudstone and less abundant lenses of sandstone and conglomerate, deposited by a large river system. This unit typically is eroded into badlands and contains clayey soils that are prone to shrinking and swelling (AZGS 2020).

## 5.4 Water Resources

The Project Site contains a typical representation of water courses in the Arid West Region. The predominant surface water resource in the Project Site is the Little Colorado River. This perennial stream (Hydrologic Unit Code 15020016) at Cameron has a contributing drainage area of 26,091 square miles and is the principle drainage from the Painted Desert region. The Little Colorado River is one of the two major tributaries of the Colorado River in Arizona. It discharges to the Colorado River approximately 57 river miles downstream from the Project Site. Runoff typically peaks twice a year, first in the early spring (February–April) from snowmelt and highland rain, and in the summer (July–September) from monsoon storms. The annual runoff is extremely variable, with the possibility of no flow occurring due to a weak snowpack or lack of summer rain. Only the upper reaches of the river above St. Johns, and the lowermost stretch below Cameron, flow year-round; the middle section carries water only during the wet seasons.

According to a streamflow gauge near Cameron (USGS 09402000), before the river enters the Grand Canyon, the river's average annual flow was 367.2 cubic feet per second (10.40 cubic meter per second [$m^3/s$]) from 1948 to present. The highest annual average was 1,127 cubic feet per second (31.9 $m^3/s$) in 1973, and the lowest was 14.1 cubic feet per second ($m^3/s$) in 2000. The river's peak flows can be far higher than its average flow, because of quick desert runoff from cloudbursts. At the same gauge, peak flows were recorded from 1923 to 2008, with intermittent data from 1924 to 1947. The highest recorded peak was 120,000 cubic feet per second (3,400 $m^3/s$) on September 20, 1923, while the lowest was 1,590 cubic feet per second (45 $m^3/s$) in 1974. Only the alternative gen ties from the proposed solar site to the existing Moenkopi Substation would span across this water feature. No Project components are proposed within the Little Colorado River floodplain.

The remainder of the water resources in the Project Site are ephemeral drainages. Unlike perennial streams, the ephemeral drainages only transport water in response to precipitation events. These can range from rain and occasional snowstorms during the winter and spring to violent thunderstorms in the summer months. As a result, flows are temporally irregular and variable in volume and intensity. A large unnamed wash bisects the two proposed solar development areas. This wash drains a much larger area and is fed by all the washes in the proposed solar development areas.

Although ordinary high water mark indicators are present in all drainages found in the Project Site, key hydrologic features were lacking at every sample point. Soil textures were found to be the same from the lowest points (channel bottoms) to adjacent areas above the channel banks. Vegetation, though often absent or much reduced in the low-flow channels, did not differ in community composition or growth form/habit from that growing in the floodplain and, in many cases, beyond the floodplain. Additionally, of all the observed plant species, only alkali sacaton has a wetland indicator status (facultative), all other species, whether growing in the channels or on the banks, are classified as upland. Given these factors and their ephemeral nature, it was determined that they do not qualify as jurisdictional waters of the U.S. The large wash is not classified on the

National Hydrography Dataset map but is likely ephemeral. There are no signs, such as developed riparian vegetation, that suggest that water flows continuously, or the water table is near the surface for certain portions of the year. This large wash discharges to the Little Colorado River less than 1/8-mile south of the existing BIA RT 6730 at-grade crossing of this wide ephemeral wash.

## 5.5 Vegetation

The Project Site is located within the Great Basin Desert scrub vegetation community (Brown 1982). This biome consists of a high elevation desert. In the Project Site, vegetative ground cover is overall very sparse, ranging between 0 and 25 percent. Most of the Project Site is dominated by desert pavement with gravel, pebbles, or cobble covering much of the surface. Inclusions of sandy areas or dunes are scattered throughout the Project Site. Vegetation is generally scattered and dominated by shrubs, including mound saltbush (*Atriplex obovata*), shadscale (*Atriplex confertifolia*), four-wing saltbush (*Atriplex canescens*) and rubber rabbitbrush (*Ericameria nauseosa*). Forbs and grass species in the Project Site include alkali sacaton (*Sporobolus airoides*), James' galleta (*Pleuraphis jamesii*), and sand dropseed (*Sporobolus cryptandrus*). A complete list of plants observed in the Project Site is included in Appendix C.

## 5.6 Representative Environmental Setting Photographs

Representative photos depicting the predominate environmental setting associated with Project components are included in Appendix D.

# 6. Species/Critical Habitat Considered

According to the USFWS, there are five threatened, endangered; or experimental population, non-essential species that have the potential to occur within the action area (USFWS 2020). There is no proposed or designated critical habitat within the Project or action area (USFWS 2020).

The NNHP identified six species on the Navajo Endangered Species List (NESL) known to occur within the Project or action area, and nine additional NESL species with the potential to occur within the Project and action area (NNHP 2020). Navajo endangered species include NNHP and federally protected, candidate, and other rare or otherwise sensitive species. NESL species are designated by group. Group 1 species are those species or subspecies that no longer occur on the Navajo Nation. Group 2 species are considered endangered, or a species or subspecies whose prospects of survival or recruitment on the Navajo Nation are in jeopardy. Group 3 are those species whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future. Group 4 are those species for which the NNDFW does not currently have sufficient information to support them being listed as Group 2 or Group 3 but has reason to consider them. The species listed by the Navajo Nation are specific to the 7.5-minute quadrangle, rather than specific to a Project Site. The Project Site encompasses all or part of two USGS 7.5-minute quadrangle maps; Lees Ferry and White Dome, Arizona (Appendix A, Map 2).

The USFWS IPaC species list and the data response from the NNHP are provided in Appendix C.

## 6.1 USFWS Designated or Proposed Critical Habitat

There are no designated or proposed critical habitats for federally listed species within the Project Site. A search of designated critical habitat within 50 miles of the Project Site was performed using geographic information system software. There are five designated critical habitats located within 50 miles of the Project Site (USFWS 2020b). Designated critical habitat within 40 miles of the Project Site includes:

- Fickeisen plains cactus (*Pediocactus peeblesianus fickeiseniae*) approximately 11 miles south
- Mexican spotted owl (*Strix occidentalis lucida*) approximately 27 miles north, and 36 miles southwest
- Razorback sucker (*Xyrauchen texanus*) occurs within Grand Canyon, 30 miles northwest
- Humpback chub (*Gila cypha*) in Grand Canyon National Park, located approximately 30 miles northwest

None of these designated critical habitat areas are within the action area analyzed in this BE and therefore, would not be impacted by the Proposed Project.

## 6.2 Species Eliminated from Further Consideration

Of the 19 USFWS and NNHP special status plant and wildlife species with the potential to occur within the Project and action area, eight species have been eliminated from further consideration in this BE. Table 5-1 describes these species, their regulatory status, habitat associations, and rationale for elimination from further consideration.

**Table 6-1. U.S. Fish and Wildlife Service and Navajo Endangered Listed Species Eliminated from Further Consideration**

| Name | Habitat Description | Conservation Status | Rationale for Elimination from Further Consideration |
|---|---|---|---|
| **Birds** | | | |
| Yellow-billed cuckoo (*Coccyzus americanus*) | Breeds in riparian woodlands with developed canopies and dense understory vegetation greater than 12.3 acres in size. | USFWS Threatened, Critical Habitat proposed; NESL G2 | There are no riparian woodlands with the preferred size and structure for this species. There is no habitat for this species in the Project or action area. |
| American dipper (*Cinclus mexicanus*) | Occurs from Arizona and New Mexico northward to Alaska. Found along clear, unpolluted rushing mountain streams, as high as timberline. Generally non-migratory but may descend to lower elevations in winter. | NESL G3 | There are no clear mountain streams within the Project Site. There is no habitat for this species in the Project or action area. |
| Mexican spotted owl (*Strix occidentalis lucida*) | Found in narrow canyons, typically with permanent water and clumps or stringers of riparian or mixed conifer vegetation and downed woody debris and litter to support prey base. On the Navajo Nation, Mexican spotted owls are known to occur in the Chuska Mountains, Defiance Plateau, Canyon de Chelly, Black Mesa, and canyonlands in northern Arizona and southern Utah. | USFWS Threatened, Critical Habitat designated; NESL G3 | There are no narrow canyons with the preferred habitat structure, vegetation composition, or prey base habitat within the Project Site. There is no habitat for this species in the Project or action area. |
| **Fish** | | | |
| Razorback sucker (*Xyrauchen texanus*) | Occurs in medium to large rivers with silty to rocky substrates. Adults prefer strong currents and deep pools. Young are found in warm backwater or flooded areas. Spawns in areas with shallow, swift riffles over gravel or cobble substrate or backwater habitats. Currently found in the larger-order rivers in the Colorado and Green River basins. | USFWS Endangered, Critical Habitat designated; NESL G2 | There would be no construction within the Little Colorado River. BMPs installed would prevent or minimize the potential for spills or sedimentation. There are no water depletions associated with the Proposed Project. |

| Name | Habitat Description | Conservation Status | Rationale for Elimination from Further Consideration |
|---|---|---|---|
| Humpback chub (*Gila cypha*) | First-year chubs (<65 mm in length) are found in shallow waters along edges of deeper waters. Adults use a variety of habitats including pools, riffles, and eddies; they seem to prefer whitewater reaches with deep, swirling eddies and the turbulent waters near boulders and submerged rocks. Spawning occurs over gravel beds in swift water. | USFWS Endangered, Critical Habitat designated; NESL G2 | There would be no construction within the Little Colorado River. BMPs installed would prevent or minimize the potential for spills or sedimentation. There are no water depletions associated with the Proposed Project. |
| **Reptiles** | | | |
| Northern Mexican gartersnake (*Thamnophis eques megalops*) | Occurs up to 8,500 feet in elevation, but mostly found between 3,000 and 5,000 feet. Habitat consists of wet areas such as cienegas, stock tanks, and backwaters and pools of rivers. Current range is restricted to watersheds found in the central and southern regions of Arizona. Believed extirpated on the Navajo Nation | USFWS Threatened, Critical Habitat proposed | This species is extirpated from the Navajo Nation |
| **Plants** | | | |
| Fickeisen plains cactus (*Pediocactus peeblesianus* var *fickeiseniae*) | Soils overlain by Kaibab Limestone in Navajoan desert or Great Plains Grassland, along canyon rims and flat terraces along washes, typically with limestone chips scattered across the surface. Populations are known to occur between 4000 and 6000-foot elevation. | USFWS Endangered, NESL G3 | No soil overlain with Kaibab Limestone were found within the Project Site. This species is known from populations east of the Project Site and on Gray Mountain to the south. |

| Name | Habitat Description | Conservation Status | Rationale for Elimination from Further Consideration |
|---|---|---|---|
| Round dunebroom (*Errazurizia rotundata*) | Occurs in outcrops in sandy soils in sandstone to gravelly soils in calcareous outcrops, and deep alluvial cinders in sandstone breaks. Found in generally exposed habitats. Populations on the Navajo Nation are known from sandy pockets of Moenave Sandstone between 4,600 and 5,200 feet. | NESL G3 | No Moenave Sandstone derived soils in the Project Site. |

Notes: NESL=Navajo Endangered Species List; USFWS=U.S. Fish and Wildlife Service.

Group 1 Species: Those species or subspecies that no longer occur in the Navajo Nation. Group 2 Species: Endangered – A species or subspecies whose prospects of survival or recruitment on the Navajo Nation are in jeopardy. Group 3 Species: Endangered – A species or subspecies whose prospects for survival or recruitment are likely to be in jeopardy in the foreseeable future. Group 4 Species: Any species or subspecies for which the NNDFW does not currently have sufficient information to support their being listed in G2 or G3 but has reason to consider them.

## 6.3 Species Evaluated Further

Eleven USFWS and NESL special status species were evaluated for potential impacts from the development of the Proposed Project. Impacts to species were made conservatively from the preliminary design presented in Maps 3 and 4 in Appendix A and as detailed in the Project POD provided to NNHP as part of this BE submittal. Appropriate site-specific protection measures are discussed where feasible; however, additional measures may be identified during the final design of the Project. Preconstruction presence/absence surveys may be required, as directed by the NNDFW and USFWS. Such surveys, when required, would follow established federal or tribal guidelines and protocols. Additional site-specific measures may be developed and required pursuant to continued consultation/coordination with agencies.

### 6.3.1 California Condor

**Status:** The California condor (*Gymnogyps californianus*) is a USFWS experimental, non-essential population. This species is also a NESL Group 4 species; however, it was not included in the data response from NNHP for this BE. California condors reintroduced into the wild by the USFWS are considered part of the experimental non-essential population. The experimental, non-essential population area includes the Navajo Nation, west of US Highway 191 and north of US Interstate 40 (USFWS 1996). This species is also protected by the Migratory Bird Treaty Act (MBTA).

**Description, Distribution, and Habitat:** The California condor is a large vulture, mostly black, with a bare head and neck. A California condor may be confused with a turkey vulture or eagle at a distance but is differentiated based on flight behavior and feather patterns. This species feeds on carrion and finds food by traveling long distances and soaring hundreds of meters above the landscape (Finkelstein et al. 2015). This species nests on large cliffs within large canyon systems. Pairs form in late fall to early winter, and eggs are laid in January and February. Chicks hatch in late spring and fledge in the early fall (Finkelstein et al. 2015). California condors are

found in southern California, southern Nevada, southern Utah, and northern Arizona. In the 1990s, condors were reintroduced to northern Arizona near the Vermillion Cliffs, north of the Grand Canyon. California condors are breeding in the wild in Marble and Grand Canyons but are not known to breed in the Navajo Nation. Condors may forage or travel through the Navajo Nation (Mikesic and Roth 2008). Because this species travels long distances in search of food, it may occur over a variety of habitats while searching for carrion.

**Status and Habitat within the Project and Action Area:** This species is not likely to breed within the Project Site (NNHP 2019). There are no known records of breeding on the Navajo Nation (Mikesic and Roth 2008). This species may fly through or forage within the Project Site; however, it is not likely to permanently reside within the Project Site. No California condors were observed during the field survey. Condors have been observed within the Grand Canyon, approximately 30 miles to the west, and Wupatki National Monument, approximately 18 to the south of the Project Site.

**Impacts**: Direct impacts to California condors may include the avoidance of the Project Site during construction and operation activities. Condors are also curious and construction activities may result in increased visitation by individual condors to the construction sites. These impacts would be year-round for the duration of construction. Impacts on condors would be greater during the breeding season if there was an active nest in the action area. Indirect impacts would include the long-term avoidance of the Project Site by adult condors for the life of the Project due to the increase in human presence, general disturbance, and buildings. Increased human disturbance, trash, new buildings, or reflective surfaces may also be an attractant for condors over the long-term. Individuals attracted to the Project would be at increased risk of collision with power lines, PV panels, buildings, and vehicles. Increased traffic in the Project Site may result in vehicle collisions and mortality or injury to individual California condors that may be on roadways feeding on carrion. Higher traffic volumes in the Project Site may also result in more road-kill carrion, which may attract condors to the area and increase the risk of vehicle collisions. Direct and indirect impacts would result from the construction of power lines, which would increase the risk of collision with man-made structures and, therefore, injury or mortality to California condors. Condors roosting or perching on powerlines may be electrocuted, causing injury or mortality.

**Conservation and/or Avoidance Measures**: The NNDFW requires activity to cease at Project Sites if condors are observed, and the NNDFW or USFWS should be contacted immediately. Because California condors do not breed within the Project Site, surveys for this species would not be required unless the NNDFW or USFWS discovers evidence of roosting or breeding in the action area in the future. The USFWS and NNDFW have identified the following conservation measures for this species:

- Construction will cease if a condor is observed at the construction site until the condor leaves on its own, or until a permitted individual from the USFWS or NNDFW can travel on-site to use techniques that would result in the individual condor leaving the area.
- The construction site will be cleaned up at the end of each workday to minimize the likelihood of attracting condors. This would include trash removal, picking up scrap materials, ensuring that no open liquids are left, cleaning up puddles.
- A vehicle fluid-leakage plan will be developed and implemented for construction to avoid water contamination and potential poisoning of condors.
- A condor deterrent device may be necessary, as determined by NNDFW or the USFWS.

- Before construction activities, agency personnel monitoring California condor locations will be contacted to determine the location and status of individual condors in or near the Project Site.
- Light and heavy construction activities would be restricted within 0.5-mile of the Project Site should condors' nest in the immediate vicinity.
- Powerlines constructed within the Project Site would be built to APLIC raptor-safe standards and per NNHP Raptor Electrocution Prevention Regulations to avoid electrocution of individual California condors (NNHP 2008a).

**Effect Determination**: With the implementation of conservation and avoidance measures, the Proposed Project is not likely to jeopardize the continued existence of the California condor.

### 6.3.2 Ferruginous Hawk

**Status:** The ferruginous hawk (*Buteo regalis*) is a NESL Group 3 species. This species is also protected by the MBTA.

**Description, Distribution, and Habitat:** The ferruginous hawk is a large buteo hawk with mostly white underparts and primaries, and rufous legs feathered to the feet (Mikesic and Roth 2008). Ferruginous hawks are found in most of the Western U.S. On the Navajo Nation, this species mostly occurs in northwestern New Mexico, but are known from areas near the Chinle Valley and Dilkon (Mikesic and Roth 2008). Habitat for this species is mostly badland, grassland, and shrubsteppe areas with abundant prey base (cottontail, jackrabbits, prairie dogs, or ground squirrels). This species builds nests on clay or rock pinnacles, short cliffs, buttes, and occasionally on top of juniper trees or the ground (Mikesic and Roth 2008). Nesting begins in early March, and fledglings usually disperse in late summer, July through September (Mikesic and Roth 2008).

**Status and Habitat within the Project and Action Area:** There is suitable foraging habitat throughout the entire Project and action area for ferruginous hawks. Suitable nesting habitat occurs in the action area on an unnamed escarpment and Ward Terrace to the east where more protected geologic structures such as outcrops and cliffs exist. A ferruginous hawk was observed during the field survey; however, no nests were observed, nor were there any records of nests within the action area.

**Impacts:** Direct impacts to ferruginous hawks include the long-term loss and fragmentation of potential foraging habitat, which exists throughout the Project Site. Additional direct impacts to ferruginous hawks would include avoidance of the Project Site during construction. These impacts would be year-round for the duration of construction. Impacts on ferruginous hawks would be greater during the breeding season if there was an active nest in the action area. Indirect impacts would include the long-term avoidance of the Project Site for the life of the Project due to the increase in human presence, noise, general disturbance, and the solar facility. Direct and indirect impacts would result from the construction of powerlines and the facility, which would increase the risk of collision with man-made structures and, therefore, injury or mortality for ferruginous hawks. Ferruginous hawks roosting or perching on powerlines may be electrocuted, causing injury or mortality. Increased traffic may also cause an increase in vehicle collisions.

**Conservation and/or Avoidance Measures:** The NNDFW stipulates that no disturbance shall occur with ½-mile of active nests between March 1 and July 31 for brief activities, 0.6-mile for light activities, 0.75-mile for heavy

activities, and 1-mile for loud activities. Descriptions of activity categories and more detailed protocols for nest protection can be found in *Ferruginous Hawk Management Guidelines for Nest Protection* (NNDFW 2005). Surveys may be required to assess the presence or absence of this species prior to construction activities. Surveys for this species include the use of high-powered optics to locate nest sites and breeding adults.

### 6.3.3 Golden Eagle

**Status:** The golden eagle (*Aquila chrysaetos*) is a NESL Group 3 species. The MBTA also protects this species.

**Description, Distribution, and Habitat:** The golden eagle is a large, mostly dark, eagle with white on the base of the tail and primary feathers. This species is widespread throughout North America, mostly occurring in the west. This species is widespread on the Navajo Nation. Golden eagles' nest on steep cliffs usually over 100 feet tall, and forage in surrounding shrublands and grasslands (Mikesic and Roth 2008). Typically, this species avoids heavily forested areas. This species feeds on lagomorphs, such as black-tailed jackrabbits (*Lepus californicus*), and other small mammals (Kochert et al. 2002).

**Status and Habitat within the Project and Action Area:** The entire Project Site provides suitable foraging habitat for the golden eagle. There is no suitable nesting habitat within the Project Site due to the lack of large cliffs or large trees. Suitable nesting habitat occurs in the action area east towards Ward Terrace; however, no active nests were observed during the raptor nest survey. One golden eagle was observed soaring above the proposed Area 2 during the field surveys. Golden eagles have been observed in Cameron, Arizona, and along the Little Colorado River in the Project Site, as well as along US 89 and Highway 64 (eBird 2020). According to the NNDFW, there is a known occurrence within 3 miles of the proposed transmission line corridor, presumably a nest within the Little Colorado River canyon (NNDFW 2020). No nests were observed during the raptor nest survey of the Little Colorado River. The south and west-facing cliffs of Ward Terrace in the eastern portion of the action area provide suitable nesting substrate for golden eagles. No nests were seen on the suitable habitat in the action area.

**Impacts:** Direct impacts to golden eagles include the long-term loss and fragmentation of potential foraging habitat. Additional direct impacts to golden eagles would include avoidance of the Project Site during construction. These impacts would be year-round for the duration of construction. Impacts on golden eagle would be greater during the breeding season if there were an active nest in the action area. Indirect impacts would include the long-term avoidance of the Project Site for the life of the Project due to the increase in human presence, noise, general disturbance, and buildings. Direct and indirect impacts would result from the construction of powerlines and buildings, which would increase the risk of collision with man-made structures and, therefore, injury or mortality for golden eagles. Golden eagles roosting or perching on powerlines may be electrocuted, causing injury or mortality. Increased traffic may also cause an increase in road-kill carrion, which may attract golden eagles to the area and increase the risk of vehicle collisions.

**Conservation and/or Avoidance Measures:** The NNDFW stipulates that activities around active golden eagle nests should be limited between January 15 and July 15. Brief activities are prohibited within 0.4 mile of an active nest during that time frame. No light activity is allowed within 0.5 mile of an active nest, no heavy activity is allowed within 0.6 mile, and no loud activity is permitted within 0.75 mile. The NNDFW also prohibits the use of daily-use permanent structures within 0.6 mile of any nest throughout the year. The Golden and Bald Eagle

Nest Protection Regulations (NNHP 2008b) provide further detail on protection and management of golden eagle nests on the Navajo Nation. Any activities in areas where eagles are known to occur requires consultation with NNDFW wildlife biologists. A preconstruction survey may be necessary if construction were scheduled between March 1 and June 15. Speed limits within the Project Site should be low to avoid the risk of collision with golden eagles feeding on carrion within the Project Site. Powerlines constructed within the Project Site would be built to APLIC raptor-safe standards and in accordance with NNHP Raptor Electrocution Prevention Regulations to avoid electrocution of individual golden eagles (NNHP 2008a).

### 6.3.4 Peregrine Falcon

**Status:** The peregrine falcon (*Falco peregrinus*) is a NESL Group 4 species. Formerly, the peregrine falcon was a USFWS endangered species, but it was delisted by the USFWS in 1998. This species is also protected by the MBTA.

**Description, Distribution, and Habitat:** The peregrine falcon is a large falcon with long, pointed wings, and a dark head with mustache-like markings below each eye. Adults are slate gray above with a barred chest (White et al. 2002).

The peregrine falcon is a widely distributed bird throughout North America. On the Navajo Nation, this species is known to breed where nesting substrate exists including—but not limited to—the Chuska Mountains; Canyon de Chelly; Black Mesa and north to Glen Canyon; the Dilkon buttes region; and canyon reaches of the San Juan, Colorado, and Little Colorado Rivers (Mikesic and Roth 2008). This species prefers nesting habitats with cliffs close to open gulfs of air or near large bodies of water. Peregrine falcons have been known to breed in urban habitats and nest on towers or buildings, provided foraging opportunities occur nearby (White et al. 2002). This species may nest on cliffs ranging from 25 feet to 1,200 feet tall. Nest sites generally consist of small, protected ledges (White et al. 2002).

**Status and Habitat within the Project and Action Area:** The entire Project Site provides suitable foraging habitat for the peregrine falcon. There is no suitable nesting habitat in Areas 1 and 2, most of the gen tie line, and the substation locations due to the lack of large cliffs or large trees. Suitable nesting habitat occurs along the canyon walls of the Little Colorado River and cliffs in the eastern portion of the action area. No peregrine falcons were observed during the field survey, and there are no known nests within the action area. This species is known to occur within 3 miles of the proposed transmission line corridor. Peregrine falcons have been observed in Cameron and Gray Mountain Arizona as well as along the Little Colorado River and SR 89 (eBird 2020).

**Potential Impacts:** Direct impacts to peregrine falcons include the long-term loss and fragmentation of potential foraging habitat. Additional direct impacts to peregrine falcons would include avoidance of the Project Site during construction. These impacts would be for the duration of the construction and life of the solar development. Impacts on peregrine falcons from construction would be greater during the breeding season if there were an active nest in the action area. Indirect impacts would include the long-term avoidance of the Project Site for the life of the Project due to the increase in human presence, noise, general disturbance, and buildings. Direct and indirect impacts would result from the construction of powerlines and buildings, which would increase the risk of collision with man-made structures and, therefore, injury or mortality for peregrine falcons. Peregrine falcons roosting or perching on powerlines may be electrocuted, causing injury or mortality.

**Conservation and/or Avoidance Measures:** The NNDFW stipulates that no activity occur within 0.5 mile of an active peregrine falcon nest between March 1 and July 31, and no use of explosives within 1 mile of an active nest. Pre-construction surveys for this species would be necessary if construction were scheduled during that time. These surveys consist of two 8-hour surveys in each of the two nesting periods—between February 1 and April 30 and May 1 and July 31 (Mikesic and Roth 2008).

### 6.3.5 Southwestern Willow Flycatcher

**Status:** The southwestern willow flycatcher (*Empidonax traillii extimus*) is a USFWS endangered species and a NESL Group 2 species. This species was not included in the initial USFWS list downloaded from the IPaC website. This species is also protected by the MBTA.

**Description, Distribution, and Habitat:** Southwestern willow flycatchers are neotropical migrants that occur in dense riparian habitats along streams, rivers, and other wetlands (USFWS 2002). This species arrives on territories in the southwestern U.S. starting in May. Nest initiation occurs in late May through June. Young fledge from late June through August. This species is an insectivore (USFWS 2002).

The southwestern willow flycatcher historically occupied much of the southwestern U.S., including southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, and southwestern Colorado. The current range is similar in breadth; however, the quantity of suitable habitat within that range has been significantly reduced (USFWS 2002). On the Navajo Nation, this species is known to breed along the San Juan and Colorado Rivers. Migrant flycatchers have been found in less dense or abundant riparian habitat throughout the Navajo Nation (Mikesic and Roth 2008).

Southwestern willow flycatchers are found in thickets of trees and shrubs, primarily 13 to 23 feet in height, and among dense and homogenous foliage located close to permanent water and riparian areas (USFWS 2002). Habitat occurs at elevations below 8,500 feet (USFWS 2002). The USFWS divides habitat types for this species into one of three categories: native broadleaf riparian, monotypic exotic, and mixed exotic/native broadleaf (Sogge et al. 2010). This species primarily prefers very dense mid-story (i.e., 6.6 to 9.8 feet tall) stands of riparian vegetation that are at least 33 feet wide. Habitat structure is typically more important than vegetation composition when considering whether an area is suitable southwestern willow flycatcher habitat (Sogge et al. 2010). Flycatchers have only rarely been found nesting in isolated, narrow linear riparian habitats that are less than 33 feet wide, although they will use such habitats during migration. This species, along with the northern subspecies, may migrate through suitable nesting habitat and riparian corridors with sufficient cover. This species sings during migration, prior to arrival on the nesting territory, which may cause some confusion between subspecies before the nesting season when conducting protocol surveys (Sogge et al. 2010).

**Status and Habitat within the Project and Action Area:** There are no known breeding records of this species in the Project or action area (NNHP 2020). Native and exotic riparian vegetation along the Little Colorado River generally does not have the preferred characteristics for breeding habitat for this species, primarily due to a lack of thicket stature and density. Thickets of exotic species, such as tamarisk, or scattered riparian vegetation near water features may provide migratory habitat for this species. This species was not observed during the field survey; however, protocol surveys were not conducted. Willow flycatchers have been observed along the Little

Colorado River within the action area, at Tappan Spring immediately south of Cameron, and at Cameron Trading Post (eBird 2020).

**Impacts:** No loss of suitable southwestern willow flycatcher habitats (e.g., removal of riparian vegetation) would occur. Migrant willow flycatchers may occur in riparian habitats that are structurally unsuitable for breeding (for example, too sparse, smaller patch size, etc.), and in non-riparian habitats. Such migration stopover areas, even though not used for breeding, may be critically important resources affecting local and regional flycatcher productivity and survival (Sogge et al. 2010). Based on species occurrence records in the action area, southwestern willow flycatcher may be present in the Project Site or action area during migration—from May to June and from August to September. If present, potential impacts to this species would be limited to avoidance of the area due to increased noise and activity associated with gen tie and solar field development that would be audible from habitat areas within the Little Colorado River canyon and floodplain. Potential indirect impacts to the southwestern willow flycatcher could result from continued human activity during O&M activities following construction. Direct and indirect impacts to migratory flycatchers would be insignificant because individuals are unlikely to use the area for more than short periods during migration and there is suitable migratory habitat outside the area along the Little Colorado River. Species-specific surveys may be required to assess the presence or absence of the species.

**Conservation and/or Avoidance Measures:** The NNDFW requires that no activity occur within 0.25-mile of potential habitat or within 0.25-mile of an active nest between May 1 and August 31. This buffer may be less depending on the proposed activities and noise levels if the nest location is known. No alteration of suitable habitat is permitted year-round within 0.25-mile of potential habitat unless surveys have been conducted and are negative for flycatchers. No activity is permitted in migratory habitat between May 1 and June 15 (Mikesic and Roth 2008). Surveys for this species require a USFWS federal permit and consist of call back surveys within potential habitat during the migratory and breeding seasons. Five survey rounds are required and are spaced to capture nesting phenology of this species. Additional survey details may be found in *A Natural History and Survey Protocol for the Southwestern Willow Flycatcher* (Sogge et al. 2010).

**Effect Determination**: With the implementation of site-specific analyses, coordination with the USFWS and NNDFW, surveys, and avoidance measures, the proposed action **may affect, but is not likely to adversely affect** the USFWS-endangered/NESL Group 2 southwestern willow flycatcher. This impact would be associated with noise disturbance generated during Project construction.

### 6.3.6 Yellow Warbler

**Status:** The yellow warbler (*Setophaga petechia*) is a NESL Group 4 species. It is also protected by the MBTA.

**Description, Distribution, and Habitat:** Yellow warblers are entirely yellow medium-sized warblers. Males are brilliant yellow and may have rusty streaks on their breasts. Females are similarly all yellow but are slightly duller in color (Lowther et al. 2020). This species is widespread in North America, and breeds in the western, midwestern, and northeastern U.S. (Lowther et al. 2020). On the Navajo Nation, this species is known from riparian areas (Mikesic and Roth 2008). Habitat for this species includes wet, deciduous riparian vegetation, typically dominated by willow species, riparian forests, and disturbed or early successional riparian habitats. Yellow warblers migrate in semi-open scrub or shrublands and forests, often in proximity to wetlands or riparian

areas (Mikesic and Roth 2008). This species overwinters in Mexico, Central America, and northern South America (Lowther et al. 2020).

**Status and Habitat within the Project and Action Area:** No yellow warblers were observed in the Project Site during field surveys; however, surveys were conducted prior to when this species would arrive within the action area on migration. Yellow warblers have been observed along the Little Colorado River within the Project and action area, at Cameron Trading Post, and at Tappan Spring south of Cameron, Arizona (eBird 2020).

**Impacts:** There would be no loss of riparian habitat from the development of the proposed Project. No suitable nesting habitat for this species occurs in the Project Site. However, there is suitable migratory and foraging habitat in the Project Site and action area. Potential impacts to this species would be limited to noise impacts audible from the Little Colorado River corridor. Increased activity and noise during both construction and operation, would likely cause yellow warblers to disperse from the area interrupting feeding, resting, or other activities. Since there is suitable habitat adjacent to the action area, dispersal would not be expected to result in reduced fitness from energy expenditure.

**Conservation and/or Avoidance Measures:** The NNDFW required no activity within 0.125-mile of an active nest from April 15 through July 31. Extreme disturbances (e.g., blasting may require a larger buffer. Additionally, the NNDFW requires no alteration of suitable habitat year-round within 0.125 mile of habitat patches used for breeding or potential habitat until surveyed. Preconstruction surveys may be required, which consist of one pedestrian survey between May 1 and June 30 (Mikesic and Roth 2008).

### 6.3.7 Northern Leopard Frog

**Status:** The northern leopard frog (*Lithobates pipiens*) is a NESL Group 2 species.

**Description, Distribution, and Habitat:** The northern leopard frog is brown or green with irregular rows of dark dorsal spots. Individuals are between 3 and 5 inches long (Smith and Keinath 2007). This species is associated with cooler climates and ranges from Canada and Alaska to New Mexico and Arizona. On the Navajo Nation, historical records for this species are known from the Chuska Mountains, Little Colorado, Colorado, and San Juan Rivers, Navajo and Chinle Creeks, Canyon de Chelly, and Tuba City, Cameron, Thoreau, and Newcomb (Mikesic and Roth 2008). The northern leopard frog requires a variety of habitats types during its life history: wintering habitat, summer/foraging habitat, and breeding/tadpole habitat. In the winter, this frog is found in lakes, streams, or ponds. Summer/foraging habitat generally occurs in upland areas such as grassy meadows, often far from breeding areas (Smith and Keinath 2007). Breeding and tadpole habitat are typically found in permanent, low salinity, palustrine waterbodies under 20 acres with no wave-formed or bedrock shorelines (Smith and Keinath 2007). The northern leopard frog begins breeding upon emergence from overwintering areas, typically in April through July. Eggs are deposited in shallow water attached to vegetation (Mikesic and Roth 2008; Smith and Keinath 2007).

**Status and Habitat within the Project and Action Area:** There were no northern leopard frogs observed during the field surveys; however, no species-specific surveys were conducted. The potential for this species to occur is based on the presence of the Little Colorado River within the Project and action area. Suitable habitat for this species occurs in the riparian vegetation fringe and adjacent upland areas along the Little Colorado River.

**Impacts:** There would be no loss in riparian habitat from the development of the Proposed Project. During construction and operation of the Proposed Project, there would be an increase in noise and human activity in the Project Site and action area. If present, Individual northern leopard frogs may flee the area due to noise, activity, and vibration. Emigration or avoidance of the area may interrupt natural breeding, feeding, or sheltering activities. There would also be the potential for accidental spills of industrial materials or petrochemicals, or increased sediment from ground disturbance, to reach the Little Colorado River; however, installation of best management practices would be implemented to minimize impacts from chemical or sediment transfer into suitable habitat.

**Conservation and/or Avoidance Measures**: The NNDFW indicates that surface disturbance is not allowed in occupied habitats within 200 feet of lakes, 15 to 200 feet of streams, or 200 feet of wetlands. No activities that may impact water quality or chemistry are permitted upstream of occupied habitats. Surveys for this northern leopard frog include a pedestrian survey between May 1 and July 31 (Mikesic and Roth 2008).

### 6.3.8 Milk Snake

**Status:** The milk snake (*Lampropeltis triangulum*) is a NESL G4 species.

**Description, Distribution, and Habitat:** Milk snakes are a uniquely colored snake species with orange or red-orange bands bordered by black bands and separated by yellow or white bands. This species can be between 14 and 52 inches in length (Mikesic and Roth 2008). The milk snake is a widespread species in North America. This species has been found in areas bordering the Navajo Nation in Farmington, New Mexico; Bluff, Utah; Cameron, Arizona; and Wupatki National Monument and Petrified Forest National Park in Arizona. This secretive species uses rocks, logs, stumps, and other surface objects as cover within a range of habitats, including river valleys, desert scrub and grasslands, piñon-juniper woodlands, and coniferous forests (Mikesic and Roth 2008).

**Status and Habitat within the Project and Action Area:** No milk snakes were observed within the Project Site. Their potential to occur is based on the presence of suitable habitat and proximity to known observations in Cameron and Wupatki National Monument. Habitat for this species occurs near the Little Colorado River, where outcrops of rock and scattered boulders may provide cover. Habitat in Areas 1 and 2 is generally marginal for this species, where cover is sparse.

**Impacts:** Dirt dirt-moving activities and vehicle traffic may impact this species if present. Potential impacts include modification to habitat areas and possible death or injury from construction equipment and/or vehicle movement in the Project Site. While there is a possibility for impacts to this species, overall, they are expected to be very low due to poor quality habitat within the Project Site.

**Conservation and/or Avoidance Measures:** The NNDFW recommends no surface disturbance in occupied habitat that could result in take of individuals or habitat alteration (Mikesic and Roth 2008). Species-specific pre-construction surveys may be required to determine presence.

### 6.3.9 Wupatki Pocket Mouse

**Status:** The Wupatki (Arizona) pocket mouse (*Perognathus amplus cineris*) is a NESL G4 species.

**Description, Distribution, and Habitat:** The Wupatki pocket mouse is a small mouse that is brown to orange dorsally and lighter below. Its tail is thinly furred and is relatively long compared to its body size. This species overlaps with several other *Perognathus* species and is likely best differentiated by range. This subspecies occurs on the western Navajo Nation from the Echo Cliffs south to Wupatki National Monument. Potential habitat for this species likely occurs from the Colorado River east to the Kaibito Plateau, and south to Cameron and Leupp, Arizona (Mikesic and Roth). This species occurs in Great Basin Desert scrub habitat with sparse ground cover – typically broom snakeweed (*Gutierrezia sarothrae*), *Ephedra* sp., short grasses, and junipers. This species is most active at night but may forage during the day. In the fall, when temperatures are cooler, individuals retreat to their burrows and remain inactive until the spring. This species feeds on seeds and may occasionally eat insects and green vegetation (AZGFD 2014)

**Status and Habitat within the Project and Action Area:** No Wupatki pocket mice were observed within the Project Site. Their potential to occur is based on the presence of suitable habitat and proximity to known observations of this species. Suitable habitat in the Project and action area includes areas with scattered vegetation and sparsely vegetated areas.

**Impacts:** The Proposed Project would result in the long-term loss of suitable habitat for this species throughout the Project Site. Construction activities, including blading and compaction, may cause burrows to collapse and trap individual Wupatki pocket mice underground, causing injury or mortality. The loss of vegetation within the Project Site would result in the loss of food resources for this species. The mouse may also avoid the area due to increased activity and noise during construction. It is not known if this species would return to the area once the Project is operational.

**Conservation and/or Avoidance Measures:** The NNDFW recommends no activity within 60 meters of occupied habitat that could result in the destruction of burrows or take of individuals. Live-trapping may be necessary within suitable habitat in potential range for large ground-disturbing activities (Mikesic and Roth 2008). This may be prudent or required prior to proposed construction activities in the Project Site.

### 6.3.10 Peebles' Blue-star

**Status:** The Peebles' blue-star (*Amsonia peeblesii*) is a NESL G4 species.

**Description, Distribution, and Habitat:** The Peebles' blue-star is an herbaceous perennial with light blue to white flowers that is approximately 16 to 35 inches tall. Lower leaves are oblong and wider than upper leaves; which are linear. This species is found in Coconino, Navajo, and Apache Counties in Arizona. On the Navajo Nation, it is known from populations in Coconino County from Grand Falls to Gray Mountain and north to Cedar Ridge and west of US 89 between Cameron and Cedar Ridge. Potential distribution on the Navajo Nation also includes Marble Canyon south to the reservation boundary near Gray Mountain and east to Holbrook. This species occurs in plains grasslands, Great Basin shrub-grassland, and Great Basin desertscrub communities between 4,000 and 5,620 feet. Soil substrate is typically strongly alkaline sedimentary conglomerates to volcanic cinders and may occur along sandy desert washes and sandstone outcrops of the Shinarump formation (Mikesic and Roth 2008).

**Status and Habitat within the Project and Action Area:** This species was not observed within the Project Site, nor are there any records of it in the action area; however, surveys were not conducted when this species flowers, mid-May to mid-July. The potential for this species to occur is based on the presence of suitable habitat within the Project and action area.

**Impacts:** Individual plants or small populations may be impacted (destroyed) by Project development if present. Most likely, suitable habitats in the Project Site are associated with the sandier soil substrates near large ephemeral drainage that separates solar areas 1 and 2.

**Conservation and/or Avoidance Measures:** Presence/absence surveys may be required for this species in suitable habitat during appropriate flowering periods prior to construction. If individuals are located, a 200-foot buffer zone is recommended to avoid disturbance. This zone may be more or less depending on the nature and size of the Proposed Project or the nature of the activities in proximity to individuals or populations (Mikesic and Roth 2008).

### 6.3.11 Beath's Milkvetch

**Status:** The Beath's milkvetch (*Astragalus beathii*) is a NESL G4 species.

**Description, Distribution, and Habitat:** Beath's milkvetch is a perennial growing up to 60 cm in height and often nearly prostrate. Leaves are deep green and composed of 11-21 narrowly elliptic leaflets. Flowers are long and bright purple with pale wing tips. The overall distribution of this species is limited to the Navajo Nation, in areas North of Gray Mountain and west and southwest of Cameron, Arizona. This species is found on sandy flats, red clay knolls, and gullied washes in badlands on selenium-bearing soils derived from Moenkopi Shale Formation between 4,000 and 4,800 feet (Mikesic and Roth 2008).

**Status and Habitat within the Project and Action Area:** This species was not observed during the field survey; however, intensive targeted surveys were not conducted for this species due to the size of the survey area. The potential for this species to occur is based on the presence of suitable habitat within the Project Site. The most likely habitats in the Project Site are in the gully washes near the proposed gen tie alternatives.

**Impacts:** Potential impacts on this species are expected to be minimal if present in the Project Site. The most suitable habitats are associated with the gen tie alternatives at the south end of the proposed development area. Little to no construction or access is anticipated to occur in these washes to construct the gen tie towers.

**Conservation and/or Avoidance Measures:** Presence/Absence surveys may be required for this species in suitable habitats at the south end of the proposed development area. If individuals are located, a 200-foot buffer zone is recommended to avoid disturbance. This zone may be more or less depending on the nature and size of the Proposed Project.

## 6.4 Migratory Birds

Under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712; Ch. 128, as amended) and Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, federal agencies are required to consider management impacts to migratory birds. While all migratory birds are protected under the MBTA,

some species have been identified as being of conservation concern. Data collected through breeding bird surveys coordinated by the USFWS as well as other private sector efforts have provided the basis for the USFWS's *Birds of Conservation Concern* (USFWS 2008). This list identifies bird species that "without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." Species on this list have been assessed based on population trends, threats, distribution, abundance, and relative density (USFWS 2008).

Migratory bird species on the USFWS's *Birds of Conservation Concern* that have the potential to occur within the Project Site include (USFWS 2008):

- Ferruginous hawk
- Golden eagle
- Peregrine falcon
- Mountain plover (*Charadrius vociferus*)
- Burrowing owl (*Athene cunicularia*)
- Brewer's sparrow (*Spizella breweri*

The Project Site also includes foraging habitat for many species of raptors, including red-tailed hawks (*Buteo jamaicensis*), ferruginous hawks, peregrine falcons, prairie falcons (*Falco mexicanus*), and golden eagles. A red-tailed hawk nest was observed in the Project Site—approximately 0.25 mile west of the Little Colorado River within the existing transmission line corridor. Golden eagles, red-tailed hawks, and ferruginous hawks were observed within the Project Site. A complete list of birds observed within the Project Site is include in Appendix C.

Impacts on migratory birds include the long-term loss of potential shrub- and ground-nesting, foraging, migration, and dispersal habitat throughout the permanent impact area of the Project. Additional impacts include the avoidance of the Project Site due to construction noise, increased human activity, vehicles, lights, and infrastructure. Impacts on migratory birds are expected to be greater should construction occur within the migratory bird breeding season, generally between the beginning of May and the end of July. A pre-construction survey for nesting migratory birds may be necessary before vegetation clearing scheduled to occur during migratory bird nesting season.

Additional impacts to migratory birds may result from collisions with photovoltaic panels and associated transmission infrastructure. Kosciuch et al. (2020) analyzed avian fatality data from 13 studies at 10 PV solar sites in the Southwestern US and calculated an average fatality estimate of 2.49 birds per megawatt per year. Kosciuch et al. (2020) found the species with the highest adjusted composition of fatalities among projects were widely distributed ground dwelling birds with large populations in the area where the studies occurred. Fatalities of water-obligate birds (species that cannot take-off from land including loons and grebes) were higher at PV solar sites near the Salton Sea, a known stop-over area (Kosciuch et al. 2020). However, no study that Kosciuch et al. (2020) reviewed investigated the potential cause of water-obligate mortality at PV solar.

# 7. Discussion and Conclusions

Of the federally listed species with the potential to occur in the Project or action areas, only the California condor, a USFWS experimental, non-essential population, and the endangered southwestern willow flycatcher have potential to be present and impacted by the proposed action. With the implementation of conservation and avoidance measures, the Proposed Project is not likely to jeopardize the continued existence of the California condor. The Proposed Project may affect but is not likely to adversely affect the USFWS endangered southwestern willow flycatcher. It may be necessary or prudent to conduct pre-construction follow-up surveys for each species, and/or to follow other listed species conservation and mitigation measures detailed in this BE before Project construction activities.

The other non-federally listed sensitive raptors—golden eagle, ferruginous hawk, and peregrine falcon all may warrant follow up raptor nesting surveys prior to Project construction. The most likely nesting habitat areas for these species are on the cliff walls of the Little Colorado River canyon, on the rock escarpments/cliffs in the eastern portion of the action area, and also on existing power lines that are present in the action area. There are also specific and general species conservation and mitigation measures described in this BE for each raptor species with the potential to occur in the area.

The milk snake, Wupatki pocket mouse, Peebles' blue-star, and Beath's milkvetch are all NESL listed Group 4 sensitive species; species for which the NNDFW does not currently have sufficient information to support them being listed as Group 2 or Group 3 but has reason to consider them. The NNDFW may require follow up surveys for the two sensitive plants prior to habitat disturbing clearing or grading activities. Similarly, pre-construction surveys and/or trapping may also be required or prudent to conduct for the Wupatki pocket mouse. Other species conservation and/or mitigation measures described for each species in this BE may also be required or prudent, closer to planned Project development.

Noise generated by construction, may impact the yellow warbler or northern leopard (Group 2 species) by causing them to disperse or avoid suitable habitat in the Little Colorado River floodplain. Avoidance or emigration may interrupt daily activities and result in increased energy expenditure. However, there is suitable dispersal habitat for these species outside the action area. There would also be the potential for accidental spills of industrial materials or petrochemicals, or increased sediment from ground disturbance, to reach the Little Colorado River; however, installation of best management practices would be implemented to minimize impacts from chemical or sediment transfer into suitable northern leopard frog habitat.

Impacts on migratory birds include the long-term loss of potential shrub- and ground-nesting, foraging, migration, and dispersal habitat throughout the permanent impact area of the Project. Additional impacts include the avoidance of the Project Site due to construction noise, increased human activity, vehicles, lights, and infrastructure. Impacts on migratory birds are expected to be greater should construction occur within the migratory bird breeding season, generally between the beginning of May and the end of July. Other impacts to migratory birds may result from collisions with photovoltaic panels and associated transmission infrastructure.

# 8. Certification

Results and conclusions contained in this report are based on actual field examination and represent Ecosphere's best professional judgment, based on information provided by the Project proponent, applicable agencies, and other sources.

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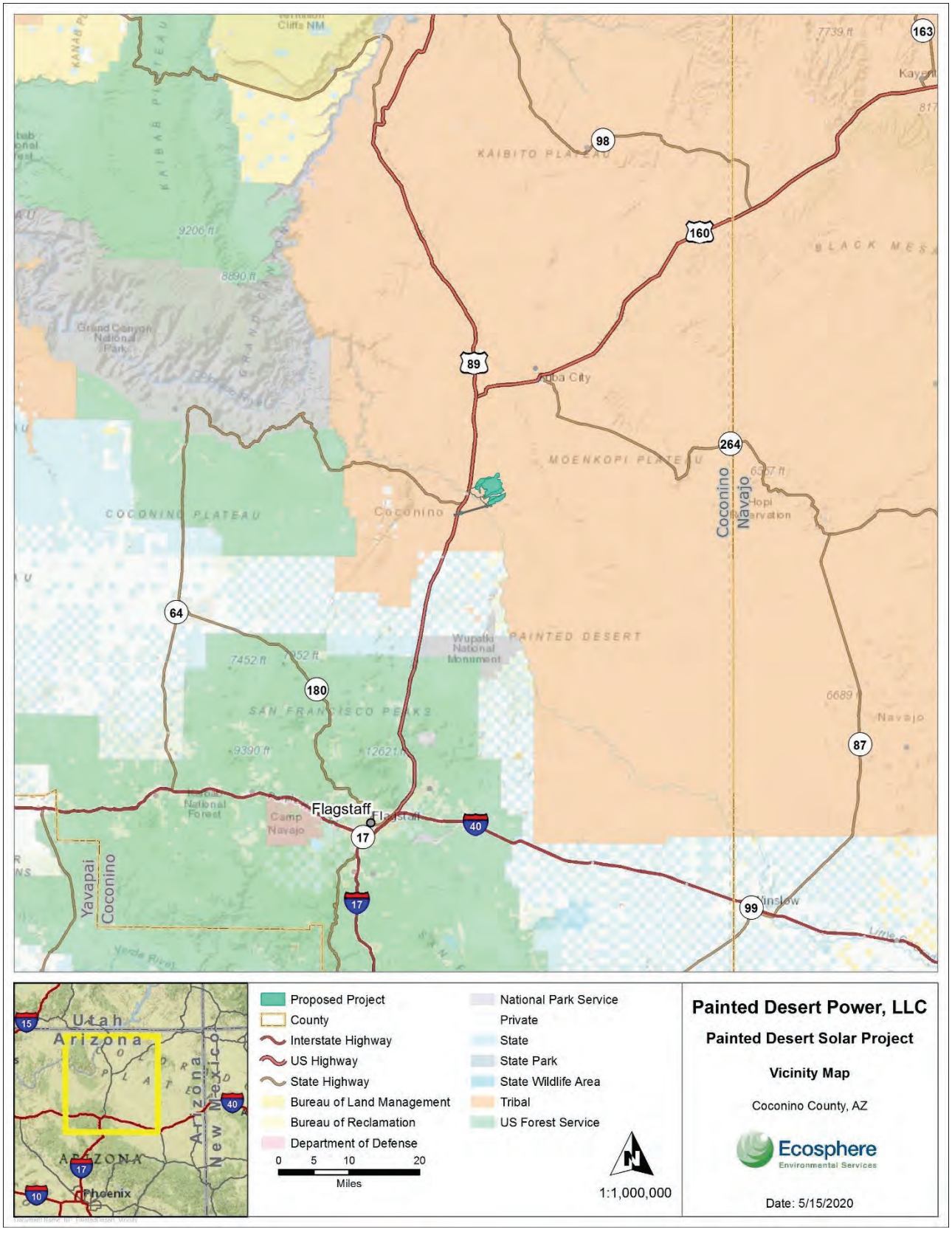
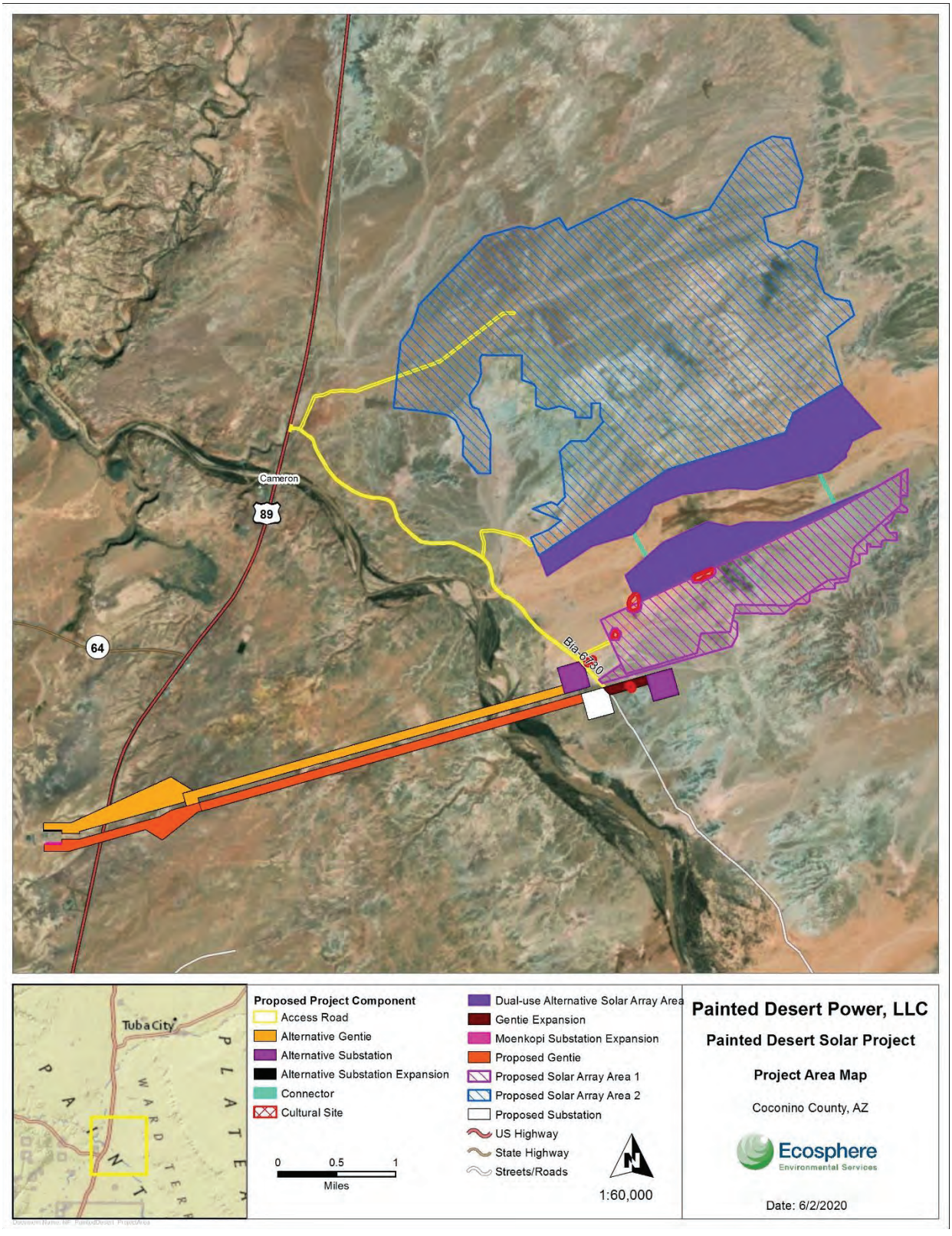
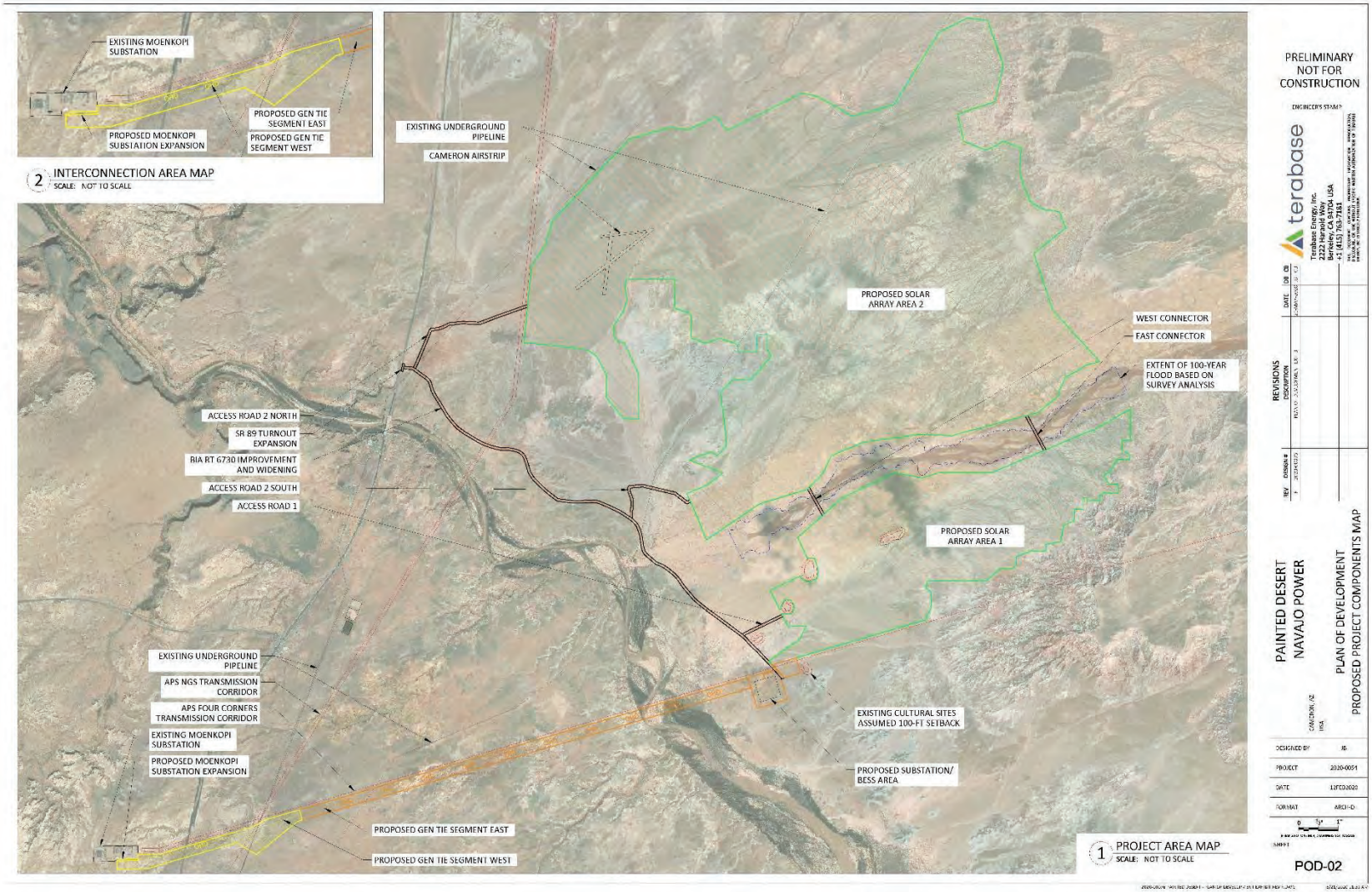
# Appendix A – Maps



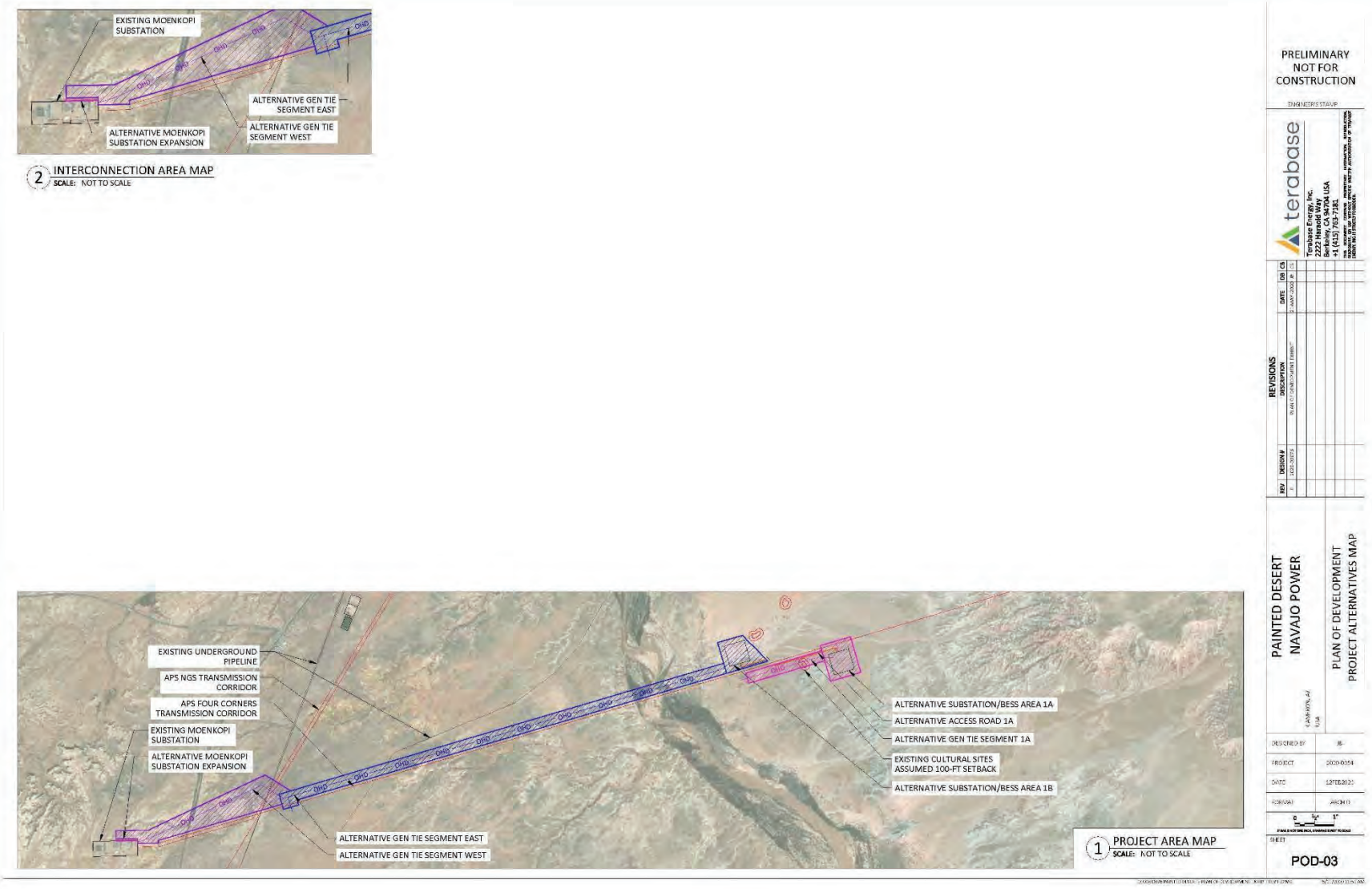

**Map 1 – Vicinity Map**



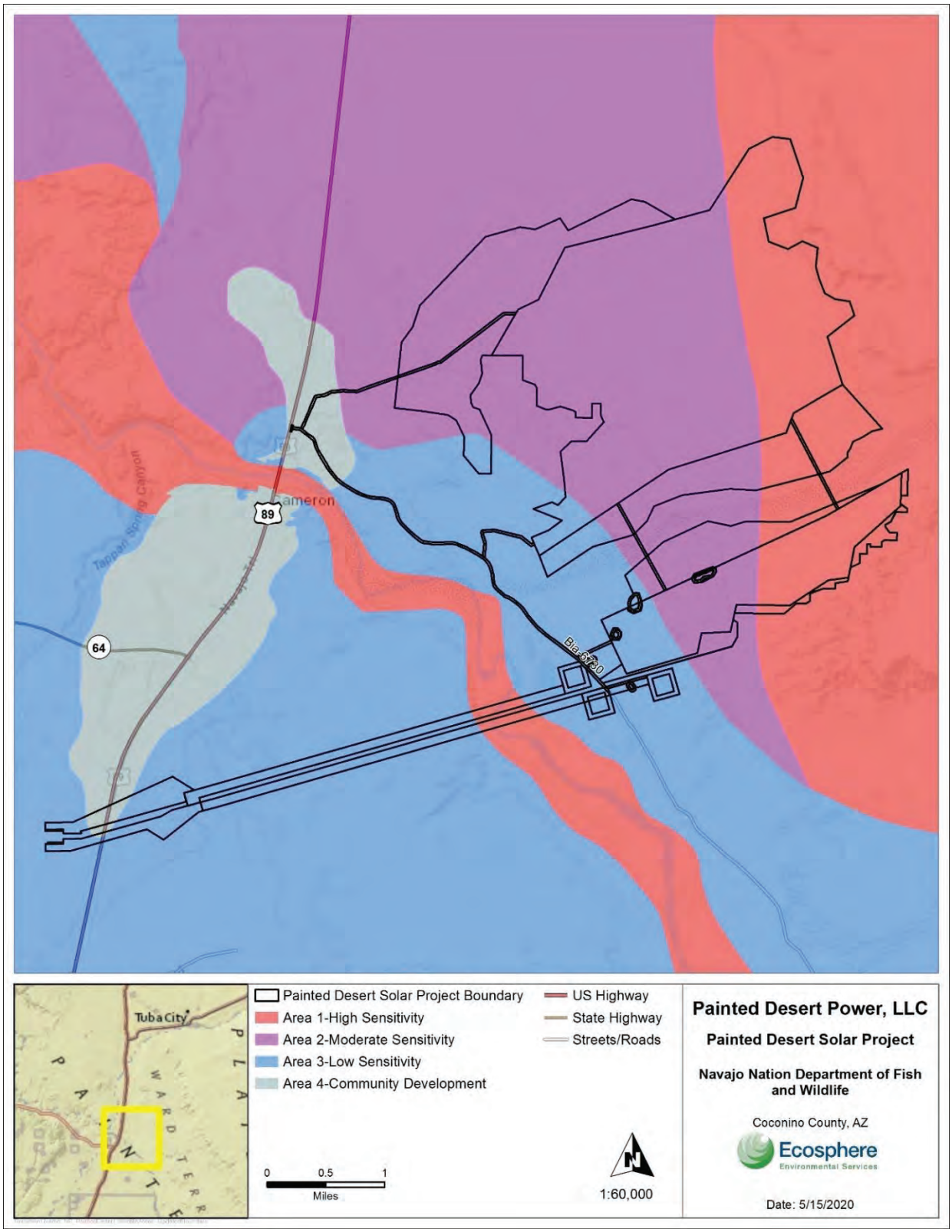

**Map 2 – Project Area**



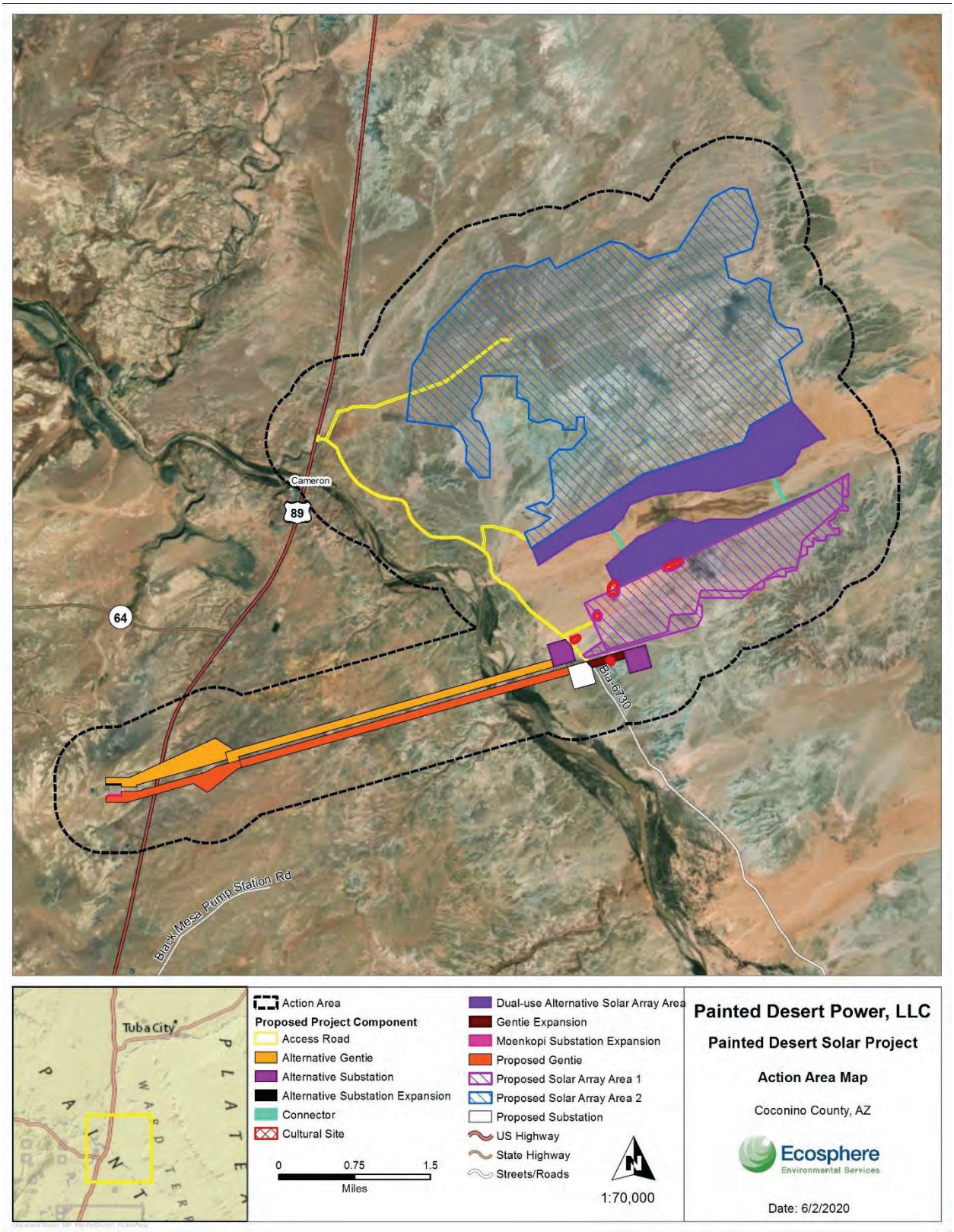

**Map 3 – Project Area Map from Plan of Development**




**Map 4 – Substation and Gen Tie Alternatives**




**Map 5 – NNDFW Mapped Wildlife Sensitivity Areas**




**Map 6 – Action Area**

# Appendix B – USFWS and NNHP Species Lists

NNHP
Navajo Natural Heritage Program

20skyl101

25-February-2020

Jennifer Rouda
Navajo Power Planning
7Skyline, LLC

**SUBJECT: Painted Desert Project - Solar Power Project**

Jennifer Rouda,

NNHP has performed an analysis of your project in comparison to known biological resources of the Navajo Nation and has included the findings in this letter. The letter is composed of seven parts. The sections as they appear in the letter are:

1. **Known Species** – a list of all species within relative proximity to the project
2. **Potential Species** – a list of potential species based on project proximity to respective suitable habitat
3. **Quadrangles** – an exhaustive list of quads containing the project
4. **Project Summary** – a categorized list of biological resources within relative proximity to the project grouped by individual project site(s) or quads
5. **Conditional Criteria Notes** – additional details concerning various species, habitat, etc.
6. **Personnel Contacts** – a list of employee contacts
7. **Resources** – identifies sources for further information

Known Species lists "species of concern" known to occur within proximity to the project area. Planning for avoidance of these species is expected. If no species are displayed then based upon the records of the Navajo Nation Department of Fish and Wildlife (NNDFW) there are no "species of concern" within proximity to the project. Refer to the Navajo Endangered Species List (NESL) Species Accounts for recommended avoidance measures, biology, and distribution of NESL species on the Navajo Nation (www.nndfw.org/nnhp/sp_account.htm).

Potential Species lists species that are potentially within proximity to the project area and need to be evaluated for presence/absence. If no species are found within the Known or Potential Species lists, the project is not expected to affect any federally listed species, nor significantly impact any tribally listed species or other species of concern. Potential for species has been determined primarily on habitat characteristics and species range information. A thorough habitat analysis, and if necessary, species specific surveys, are required to determine the potential for each species.

Species of concern include protected, candidate, and other rare or otherwise sensitive species, including certain native species and species of economic or cultural significance. For legally protected species, the following tribal and federal statuses are indicated: NESL, federal Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and Eagle Protection Act (EPA). No legal protection is afforded species with only ESA candidate, NESL group 4 status, and species listed on the Sensitive Species List. Please be aware of these species during surveys and inform the NNDFW of observations. Reported observations of these

species and documenting them in project planning and management is important for conservation and may contribute to ensuring they will not be up listed in the future.

In any and all correspondence with NNDFW or NNHP concerning this project please cite the Data Request Code associated with this document. It can be found in this report on the top right corner of the every page. Additionally please cite this code in any biological evaluation documents returned to our office.

## 1. Known Species *(NESL=Navajo Endangered Species List, FE=Federally Endangered, FT=Federally Threatened, FC=Federal Candidate)*

**Species**

AMPE = Amsonia peeblesii / Peebles' Blue-star NESL G4
AQCH = Aquila chrysaetos / Golden Eagle NESL G3
ASBE = Astragalus beathii / Beath Milk-vetch NESL G4
LATR = Lampropeltis triangulum / Milk Snake NESL G4
LIPI = Lithobates pipiens / Northern Leopard Frog NESL G2
PEAMCI = Perognathus amplus cineris / Wupatki Pocket Mouse NESL G4

## 2. Potential Species

**Species**

AMPE = Amsonia peeblesii / Peebles' Blue-star NESL G4
AQCH = Aquila chrysaetos / Golden Eagle NESL G3
ASBE = Astragalus beathii / Beath Milk-vetch NESL G4
BURE = Buteo regalis / Ferruginous Hawk NESL G3
CIME = Cinclus mexicanus / American Dipper NESL G3
COAM = Coccyzus americanus / Yellow-billed Cuckoo NESL G2 FT
DEPE = Dendroica petechia / Yellow Warbler NESL G4
EMTREX = Empidonax traillii extimus / Southwestern Willow Flycatcher NESL G2 FE
ERRO = Errazurizia rotundata / Round Dunebroom NESL G3
FAPE = Falco peregrinus / Peregrine Falcon NESL G4
GICY = Gila cypha / Humpback Chub NESL G2 FE
LIPI = Lithobates pipiens / Northern Leopard Frog NESL G2
PEAMCI = Perognathus amplus cineris / Wupatki Pocket Mouse NESL G4
PEPEFI = Pediocactus peeblesianus var. fickeiseniae / Fickeisen Plains Cactus NESL G3 FE
XYTE = Xyrauchen texanus / Razorback Sucker NESL G2 FE

## 3. Quadrangles (7.5 Minute)

**Quadrangles**

Cameron NE (35111-H3) / AZ
Cameron North (35111-H4) / AZ
Cameron SE (35111-G3) / AZ
Cameron South (35111-G4) / AZ

## 4. Project Summary *(EO1 Mile/EO 3 Miles=elements occuring within 1 & 3 miles., MSO=mexican spotted owl PACs, POTS=potential species, RCP=Biological Areas)*

| SITE | EO1MI | EO3MI | QUAD | MSO | POTS | RCP |
|---|---|---|---|---|---|---|
| Alternate NGS path gen tie | PEAMCI, LIPI | AMPE, AQCH, PEAMCI, LIPI | Cameron North (35111-H4) / AZ | None | AMPE, AQCH, ASBE, BURE, CIME, EMTREX, FAPE, GICY, LIPI, PEAMCI, XYTE | Area 2, Area 3 |
| Alternate NGS path gen tie | AMPE, LATR, PEAMCI, LIPI | AMPE, AQCH, ASBE, LATR, PEAMCI, LIPI | Cameron South (35111-G4) / AZ | None | AMPE, AQCH, ASBE, BURE, CIME, COAM, DEPE, EMTREX, FAPE, LIPI, PEAMCI, PEPEFI | Area 1, Area 3, Area 4 |
| Alternate substation location | PEAMCI | AMPE, PEAMCI, LIPI | Cameron North (35111-H4) / AZ | None | AMPE, AQCH, ASBE, BURE, CIME, EMTREX, FAPE, GICY, LIPI, PEAMCI, XYTE | Area 2 |
| Mae/CCC 383 Acres | PEAMCI | AMPE, PEAMCI, LIPI | Cameron NE (35111-H3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, PEAMCI | Area 2, Area 3 |
| Mae/CCC 383 Acres | PEAMCI | AMPE, PEAMCI, LIPI | Cameron North (35111-H4) / AZ | None | AMPE, AQCH, ASBE, BURE, CIME, EMTREX, FAPE, GICY, LIPI, PEAMCI, XYTE | Area 2, Area 3 |
| Mae/CCC 383 Acres | PEAMCI | AMPE, PEAMCI, LIPI | Cameron SE (35111-G3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, LIPI, PEAMCI | Area 2, Area 3 |
| Mae/CCC 650Acres | None | PEAMCI, LIPI | Cameron NE (35111-H3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, PEAMCI | Area 2 |
| Mae/CCC 650Acres | PEAMCI | AMPE, PEAMCI, LIPI | Cameron North (35111-H4) / AZ | None | AMPE, AQCH, ASBE, BURE, CIME, EMTREX, FAPE, GICY, LIPI, PEAMCI, XYTE | Area 2 |
| Mae/CCC 970 acres | None | PEAMCI, LIPI | Cameron NE (35111-H3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, PEAMCI | Area 1, Area 2 |

| SITE | EO1MI | EO3MI | QUAD | MSO | POTS | RCP |
|---|---|---|---|---|---|---|
| Mae/CCC South 1200 acres | None | None | Cameron NE (35111-H3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, PEAMCI | Area 1 |
| Mae/CCC South 1200 acres | None | AMPE, PEAMCI, LIPI | Cameron SE (35111-G3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, LIPI, PEAMCI | Area 1, Area 2, Area 3 |
| Polyline [4EE3D1]:0 | PEAMCI | AMPE, PEAMCI, LIPI | Cameron NE (35111-H3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, PEAMCI | Area 1, Area 2, Area 3 |
| Polyline [4EE3D1]:0 | PEAMCI | AMPE, AQCH, PEAMCI, LIPI | Cameron North (35111-H4) / AZ | None | AMPE, AQCH, ASBE, BURE, CIME, EMTREX, FAPE, GICY, LIPI, PEAMCI, XYTE | Area 2, Area 3 |
| Polyline [4EE3D1]:0 | PEAMCI | AMPE, PEAMCI, LIPI | Cameron SE (35111-G3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, LIPI, PEAMCI | Area 1, Area 2, Area 3 |
| Preferred 4 corners path gen-tie | None | AMPE, PEAMCI, LIPI | Cameron SE (35111-G3) / AZ | None | AMPE, AQCH, ASBE, BURE, COAM, DEPE, EMTREX, ERRO, FAPE, LIPI, PEAMCI | Area 1, Area 3 |
| Preferred 4 corners path gen-tie | AMPE, LATR, PEAMCI | AMPE, ASBE, LATR, PEAMCI, LIPI | Cameron South (35111-G4) / AZ | None | AMPE, AQCH, ASBE, BURE, CIME, COAM, DEPE, EMTREX, FAPE, LIPI, PEAMCI, PEPEFI | Area 1, Area 3, Area 4 |
| Preferred substation location | None | PEAMCI, LIPI | Cameron SE (35111-G3) / AZ | None | AMPE, AQCH, ASBE, BURE, EMTREX, ERRO, FAPE, LIPI, PEAMCI | Area 3 |

## 5. Conditional Criteria Notes *(Recent revisions made please read thoroughly. For certain species, and/or circumstances, please read and comply)*

**A. Biological Resource Land Use Clearance Policies and Procedures (RCP)** - The purpose of the RCP is to assist the Navajo Nation government and chapters ensure compliance with federal and Navajo laws which protect, wildlife resources, including plants, and their habitat resulting in an expedited land use clearance process. After years of research and study, the NNDFW has identified and mapped wildlife habitat and sensitive areas that cover the entire Navajo Nation.
The following is a brief summary of six (6) wildlife areas:
1. **Highly Sensitive Area** – recommended no development with few exceptions.
2. **Moderately Sensitive Area** – moderate restrictions on development to avoid sensitive species/habitats.
3. **Less Sensitive Area** – fewest restrictions on development.
4. **Community Development Area** – areas in and around towns with few or no restrictions on development.
5. **Biological Preserve** – no development unless compatible with the purpose of this area.
6. **Recreation Area** – no development unless compatible with the purpose of this area.
**None** - outside the boundaries of the Navajo Nation
This is not intended to be a full description of the RCP please refer to the our website for additional information at www.nndfw.org/clup.htm.

**B. Raptors** – If raptors are known to occur within 1 mile of project location: Contact the NNHP zoologist at 871-7070 regarding your evaluation of potential impacts and mitigation.
Golden and Bald Eagles- If Golden or Bald Eagle are known to occur within 1 mile of the project, decision makers need to ensure that they are not in violation of the *Golden and Bald Eagle Nest Protection Regulations* found at www.nndfw.org/nnhp/docs_reps/gben.pdf.
Ferruginous Hawks – Refer to *Navajo Nation Department of Fish and Wildlife's Ferruginous Hawk Management Guidelines for Nest Protection* (www.nndfw.org/nnhp/docs_reps.htm) for relevant information on avoiding impacts to Ferruginous Hawks within 1 mile of project location.
Mexican Spotted Owl - Please refer to the *Navajo Nation Mexican Spotted Owl Management Plan* (www.nndfw.org/nnhp/docs_reps.htm) for relevant information on proper project planning near/within spotted owl protected activity centers and habitat.

**C. Surveys** – Biological surveys need to be conducted during the appropriate season to ensure they are complete and accurate please refer to NN Species Accounts www.nndfw.org/nnhp/sp_account.htm. Surveyors on the Navajo Nation must be permitted by the Director, NNDFW. Contact Jeff Cole at (928) 871-6450 for permitting procedures. Questions pertaining to surveys should be directed to the NNDFW the NNHP Zoologist for animals, and the NNHP Botanist for plants. Questions regarding biological evaluation should be directed to Jeff Cole at 871-6450.

**D. Oil/Gas Lease Sales** – Any settling or evaporation pits that could hold contaminants should be lined and covered. Covering pits, with a net or other material, will deter waterfowl and other migratory bird use. Lining pits will protect ground water quality.

**E. Power line Projects** – These projects need to ensure that they do not violate the regulations set forth in the *Navajo Nation Raptor Electrocution Prevention Regulations* found at www.nndfw.org/nnhp/docs_reps/repr.pdf.

**F. Guy Wires** – Does the project design include guy wires for structural support? If so, and if bird species may occur in relatively high concentrations in the project area, then guy wires should be equipped with highly visual markers to reduce the potential mortality due to bird-guy wire collisions. Examples of visual markers include aviation balls and bird flight diverters. Birds can be expected to occur in relatively high concentrations along migration routes (e.g., rivers, ridges or other distinctive linear topographic features) or where important habitat for breeding, feeding, roosting, etc. occurs. The U.S. Fish and Wildlife Service recommends marking guy wires with at least one marker per 100 meters of wire.

**G. San Juan River** – On 21 March 1994 (Federal Register, Vol. 59, No. 54), the U.S. Fish and Wildlife Service designated portions of the San Juan River (SJR) as critical habitat for Ptychocheilus lucius (Colorado pikeminnow) and Xyrauchen texanus (Razorback sucker). Colorado pikeminnow critical habitat includes the SJR and its 100-year floodplain from the State Route 371 Bridge in T29N, R13W, sec. 17 (New Mexico Meridian) to Neskahai Canyon in the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian) up to the full pool elevation. Razorback sucker critical habitat includes the SJR and its 100-year floodplain from the Hogback Diversion in T29N, R16W, sec. 9 (New Mexico Meridian) to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian). All actions carried out, funded or authorized by a federal agency which may alter the constituent elements of critical habitat must undergo section 7 consultation under the Endangered Species Act of 1973, as amended. Constituent elements are those physical and biological attributes essential to a species conservation and include, but are not limited to, water, physical habitat, and biological environment as required for each particular life stage of a species.

**H. Little Colorado River** - On 21 March 1994 (Federal Register, Vol. 59, No. 54) the U.S. Fish and Wildlife Service designated Critical Habitat along portions of the Colorado and Little Colorado Rivers (LCR) for Gila cypha (humpback chub). Within or adjacent to the Navajo Nation this critical habitat includes the LCR and its 100-year floodplain from river mile 8 in T32N R6E, sec. 12 (Salt and Gila River Meridian) to its confluence with the Colorado River in T32N R5E sec. 1 (S&GRM) and the Colorado River and 100-year floodplain from Nautuloid Canyon (River Mile 34) T36N R5E sec. 35 (S&GRM) to its confluence with the LCR. All actions carried out, funded or authorized by a federal agency which may alter the constituent elements of Critical Habitat must undergo section 7 consultation under the Endangered Species Act of 1973, as amended. Constituent elements are those physical and biological attributes essential to a species conservation and include, but are not limited to, water, physical habitat, and biological environment as required for each particular life stage of a species.

**I. Wetlands** – In Arizona and New Mexico, potential impacts to wetlands should also be evaluated. The U.S. Fish & Wildlife Service's National Wetlands Inventory (NWI) maps should be examined to determine whether areas classified as wetlands are located close enough to the project site(s) to be impacted. In cases where the maps are inconclusive (e.g., due to their small scale), field surveys must be completed. For field surveys, wetlands identification and delineation methodology contained in the "Corps of Engineers Wetlands Delineation Manual" (Technical Report Y-87-1) should be used. When wetlands are present, potential impacts must be addressed in an environmental assessment and the Army Corps of Engineers, Phoenix office, must be contacted. NWI maps are available for examination at the Navajo Natural Heritage Program (NNHP) office, or may be purchased through the U.S. Geological Survey (order forms are available through the NNHP). The NNHP has complete coverage of the Navajo Nation, excluding Utah, at 1:100,000 scale; and coverage at 1:24,000 scale in the southwestern portion of the Navajo Nation. In Utah, the U.S. Fish & Wildlife Service's National Wetlands Inventory maps are not yet available for the Utah portion of the Navajo Nation, therefore, field surveys should be completed to determine whether wetlands are located close enough to the project site(s) to be impacted. For field surveys, wetlands identification and delineation methodology contained in the "Corps of Engineers Wetlands Delineation Manual" (Technical Report Y-87-1) should be used. When wetlands are present, potential impacts must be addressed in an environmental assessment and the Army Corps of Engineers, Phoenix office, must be contacted. For more information contact the Navajo Environmental Protection

Agency’s Water Quality Program.

**J. Life Length of Data Request** – The information in this report was identified by the NNHP and NNDFW's biologists and computerized database, and is based on data available at the time of this response. If project planning takes more than two (02) years from the date of this response, verification of the information provided herein is necessary. It should not be regarded as the final statement on the occurrence of any species, nor should it substitute for on-site surveys. Also, because the NNDFW information is continually updated, any given information response is only wholly appropriate for its respective request.

**K. Ground Water Pumping** - Projects involving the ground water pumping for mining operations, agricultural projects or commercial wells (including municipal wells) will have to provide an analysis on the effects to surface water and address potential impacts on all aquatic and/or wetlands species listed below. NESL Species potentially impacted by ground water pumping: Carex specuicola (Navajo Sedge), Cirsium rydbergii (Rydberg's Thistle), Primula specuicola (Cave Primrose), Platanthera zothecina (Alcove Bog Orchid), Puccinellia parishii (Parish Alkali Grass), Zigadenus vaginatus (Alcove Death Camas), Perityle specuicola (Alcove Rock Daisy), Symphyotrichum welshii (Welsh’s American-aster), Coccyzus americanus (Yellow-billed Cuckoo), Empidonax traillii extimus (Southwestern Willow Flycatcher), Rana pipiens (Northern Leopard Frog), Gila cypha (Humpback Chub), Gila robusta (Roundtail Chub), Ptychocheilus lucius (Colorado Pikeminnow), Xyrauchen texanus (Razorback Sucker), Cinclus mexicanus (American Dipper), Speyeria nokomis (Western Seep Fritillary), Aechmophorus clarkia (Clark's Grebe), Ceryle alcyon (Belted Kingfisher), Dendroica petechia (Yellow Warbler), Porzana carolina (Sora), Catostomus discobolus (Bluehead Sucker), Cottus bairdi (Mottled Sculpin), Oxyloma kanabense (Kanab Ambersnail)

## 6. Personnel Contacts

**Wildlife Manager**
**Leanna Begay**
**928.871.6450**
**lbegay@nndfw.org**

**Zoologist**
**Vacant**
**928.871.7070**

**Botanist**
**Nora Talkington**
**ntalkington@nndfw.org**

**Biological Reviewer**
**Pamela Kyselka**
**928.871.7065**
**pkyselka@nndfw.org**

**GIS Supervisor**
**Dexter D Prall**
**928.645.2898**
**prall@nndfw.org**

**Wildlife Tech**
**Sonja Detsoi**
**928.871.6472**
**sdetsoi@nndfw.org**

## 7. Resources

**Navajo Endangered Species List:**
www.nndfw.org/nnhp/endangered.htm

**Species Accounts:**
www.nndfw.org/nnhp/sp_account.htm

**Biological Investigation Permit Application**
www.nndfw.org/nnhp/study_permit.htm

**Navajo Nation Sensitive Species List**
www.nndfw.org/nnhp/trackinglist.htm

**Various Species Management and/or Document and Reports**
www.nndfw.org/nnhp/docs_reps.htm

**Consultant List**
www.nndfw.org/bi_consult_list_2014.pdf

Dexter D Prall

Digitally signed by Dexter D Prall
DN: cn=Dexter D Prall, o=Navajo Nation Department of Fish and Wildlife, ou=Navajo Natural Heritage Program, email=prall@nndfw.org, c=US
Date: 2020.02.25 11:53:23 -07'00'

Dexter D Prall, GIS Supervisor - Natural Heritage Program
Navajo Nation Department of Fish and Wildlife

NNHP
Navajo Natural Heritage Program

PO Box 1480
Window Rock, AZ
86515

P 928.871.6472
F 928.871.7603

http://nnhp.ndfw.org

# Invoice for 20skyl101

2/25/2020

Please make payable to NAVAJO NATION

## Project Measurements

| | |
|---|---|
| **Total Number of Quads:** | 4 |
| **Number of Additional Quads:** | 0 |
| **Cost ($75 plus $5 each additional Quad):** | $75.00 |

**(Please cut along the dashed line and return with payment)**

**Navajo Natural Heritage Program**
**PO Box 1480**
**Window Rock, AZ 86515**

2/25/2020

**PLEASE PAY THIS AMOUNT**

Payment for Data Response 20skyl101 — $75.00

Please make payable to NAVAJO NATION

Or, if you would like to pay with a credit card, fill out and return the Credit Card Authorization Form with the invoice stub.

NAVAJO FISH & WILDLIFE

# THE NAVAJO NATION

JONATHAN NEZ PRESIDENT MYRON LISTER VICE PRESIDENT

## Department of Fish and Wildlife Credit Card Authorization Form

Sign and complete this form to authorize the Navajo Nation Department of Fish and Wildlife to make a one-time charge to your credit card listed below.

By signing this form, you give us permission to charge your account for the amount indicated on or after the indicated date. This is permission for a single transaction only, and does not provide authorization for any additional, unrelated debits or credits to your account.

---

**Please complete the information below:**

I _____ authorize the Department of Fish and Wildlife to charge my credit
(Full Name)

card account indicated below for $75.00 on or after 2/25/2020. This payment is for
(Amount) (Date)

Data Request Report - 20skyl101

(Description of Good/Services)

---

Billing Address _____ Phone _____

City, State, Zip _____ Email _____

Account Type Visa Mastercard AMEX Discover

Cardholder Name _____

Account # _____

Expiration Date _____ CVV2_____

Signature _____ Date_____

I authorize the above named business to charge the credit card indicated in this authorization form according to the terms outlined above. This payment authorization is for the goods/services described above, for the amount indicated above only, and is valid for one time use only. I certify that I am an authorized user of this credit card and that I will not dispute the payment with my credit card company; so long as the transaction corresponds to the terms indicated on this form.

**Department of Fish and Wildlife - P.O. Box 1480 - Window Rock, AZ 86515 - (928) 871 6450 - Fax (928) 871 7069**

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arizona Ecological Services Field Office
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
Phone: (602) 242-0210 Fax: (602) 242-2513
http://www.fws.gov/southwest/es/arizona/
http://www.fws.gov/southwest/es/EndangeredSpecies_Main.html

In Reply Refer To: April 10, 2020
Consultation Code: 02EAAZ00-2020-SLI-0695
Event Code: 02EAAZ00-2020-E-01543
Project Name: Painted Desert Solar Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The Fish and Wildlife Service (Service) is providing this list under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The list you have generated identifies threatened, endangered, proposed, and candidate species, and designated and proposed critical habitat, that may occur within one or more delineated United States Geological Survey 7.5 minute quadrangles with which your project polygon intersects. Each quadrangle covers, at minimum, 49 square miles. In some cases, a species does not currently occur within a quadrangle but occurs nearby and could be affected by a project. Please refer to the species information links found at:
http://www.fws.gov/southwest/es/arizona/Docs_Species.htm
http://www.fws.gov/southwest/es/arizona/Documents/MiscDocs/AZSpeciesReference.pdf .

The purpose of the Act is to provide a means whereby threatened and endangered species and the habitats upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of Federal trust resources and to consult with us if their projects may affect federally listed species and/or designated critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, we recommend preparing a biological evaluation similar to a Biological Assessment to determine whether the project may

affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If the Federal action agency determines that listed species or critical habitat may be affected by a federally funded, permitted or authorized activity, the agency must consult with us pursuant to 50 CFR 402. Note that a "may affect" determination includes effects that may not be adverse and that may be beneficial, insignificant, or discountable. You should request consultation with us even if only one individual or habitat segment may be affected. The effects analysis should include the entire action area, which often extends well outside the project boundary or "footprint. For example, projects that involve streams and river systems should consider downstream effects. If the Federal action agency determines that the action may jeopardize a proposed species or adversely modify proposed critical habitat, the agency must enter into a section 7 conference. The agency may choose to confer with us on an action that may affect proposed species or critical habitat.
Candidate species are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend considering them in the planning process in the event they become proposed or listed prior to project completion. More information on the regulations (50 CFR 402) and procedures for section 7 consultation, including the role of permit or license applicants, can be found in our Endangered Species Consultation Handbook at:
http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF.

We also advise you to consider species protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) and the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668 et seq.). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the Service. The Eagle Act prohibits anyone, without a permit, from taking (including disturbing) eagles, and their parts, nests, or eggs. Currently 1026 species of birds are protected by the MBTA, including species such as the western burrowing owl (Athene cunicularia hypugea). Protected western burrowing owls are often found in urban areas and may use their nest/burrows year-round; destruction of the burrow may result in the unpermitted take of the owl or their eggs.

If a bald eagle (or golden eagle) nest occurs in or near the proposed project area, you should evaluate your project to determine whether it is likely to disturb or harm eagles. The National Bald Eagle Management Guidelines provide recommendations to minimize potential project impacts to bald eagles:
https://www.fws.gov/migratorybirds/pdf/management/
nationalbaldeaglenanagementguidelines.pdf
https://www.fws.gov/birds/management/managed-species/eagle-management.php.

The Division of Migratory Birds (505/248-7882) administers and issues permits under the MBTA and Eagle Act, while our office can provide guidance and Technical Assistance. For more information regarding the MBTA, BGEPA, and permitting processes, please visit the following: https://www.fws.gov/birds/policies-and-regulations/incidental-take.php. Guidance for minimizing impacts to migratory birds for communication tower projects (e.g. cellular, digital television, radio, and emergency broadcast) can be found at:

https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/communication-towers.php.

Activities that involve streams (including intermittent streams) and/or wetlands are regulated by the U.S. Army Corps of Engineers (Corps). We recommend that you contact the Corps to determine their interest in proposed projects in these areas. For activities within a National Wildlife Refuge, we recommend that you contact refuge staff for specific information about refuge resources.
If your action is on tribal land or has implications for off-reservation tribal interests, we encourage you to contact the tribe(s) and the Bureau of Indian Affairs (BIA) to discuss potential tribal concerns, and to invite any affected tribe and the BIA to participate in the section 7 consultation. In keeping with our tribal trust responsibility, we will notify tribes that may be affected by proposed actions when section 7 consultation is initiated.

We also recommend you seek additional information and coordinate your project with the Arizona Game and Fish Department. Information on known species detections, special status species, and Arizona species of greatest conservation need, such as the western burrowing owl and the Sonoran desert tortoise (Gopherus morafkai) can be found by using their Online Environmental Review Tool, administered through the Heritage Data Management System and Project Evaluation Program https://www.azgfd.com/Wildlife/HeritageFund/.

For additional communications regarding this project, please refer to the consultation Tracking Number in the header of this letter. We appreciate your concern for threatened and endangered species. If we may be of further assistance, please contact our following offices for projects in these areas:

Northern Arizona: Flagstaff Office 928/556-2001
Central Arizona: Phoenix office 602/242-0210
Southern Arizona: Tucson Office 520/670-6144

Sincerely,
/s/ Jeff Humphrey Field Supervisor

Attachment

Attachment(s):

Official Species List

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Arizona Ecological Services Field Office**
9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517
(602) 242-0210

# Project Summary

Consultation Code: 02EAAZ00-2020-SLI-0695

Event Code: 02EAAZ00-2020-E-01543

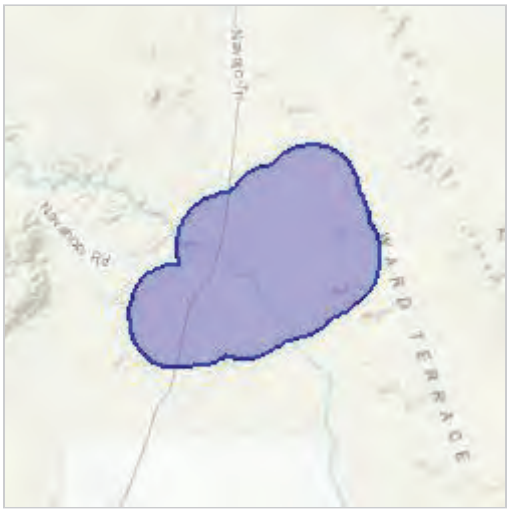
Project Name: Painted Desert Solar Project

Project Type: POWER GENERATION

Project Description: Proposed Solar Project located south of Cameron AZ.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/35.87519209988249N111.36215081417377W




Counties: Coconino, AZ

# Endangered Species Act Species

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Birds

| NAME | STATUS |
|---|---|
| California Condor *Gymnogyps californianus*<br>Population: U.S.A. only, except where listed as an experimental population<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/8193 | Endangered |
| California Condor *Gymnogyps californianus*<br>Population: U.S.A. (specific portions of Arizona, Nevada, and Utah)<br>There is **proposed** critical habitat for this species. The location of the critical habitat is not available.<br>Species profile: https://ecos.fws.gov/ecp/species/8193 | Experimental Population, Non-Essential |
| Mexican Spotted Owl *Strix occidentalis lucida*<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/8196<br>Species survey guidelines:<br>https://ecos.fws.gov/ipac/guideline/survey/population/129/office/22410.pdf | Threatened |
| Yellow-billed Cuckoo *Coccyzus americanus*<br>Population: Western U.S. DPS<br>There is **proposed** critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/3911 | Threatened |

## Reptiles

| NAME | STATUS |
|---|---|
| Northern Mexican Gartersnake *Thamnophis eques megalops*<br>There is **proposed** critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/7655 | Threatened |

## Flowering Plants

| NAME | STATUS |
|---|---|
| Fickeisen Plains Cactus *Pediocactus peeblesianus fickeiseniae*<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/5484 | Endangered |

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

# Appendix C – Plants and Wildlife Documented in the Project Area

**Plants**

*Atriplex obovata*

*Sporobolus airoides*

*Pleuraphis jamesii*

*Eriogonum inflatum*

*Eriogonum wrightii*

*Isocoma rusbyi*

*Mentzelia sp.*

*Yucca sp. (narrowleaf)*

*Ephedra viridis*

*Ephedra torreyana*

*Sporobolus giganteus*

*Plantago patagonica*

*Gutierrezia sarothrae*

*Opuntia polyacantha*

*Opuntia phaeacantha*

*Atriplex canescens*

*Tamarix sp.*

*Alhagi pseudalhagi*

*Ericameria nauseosa*

*Conyza canadensis*

*Xanthium strumarium*

*Salsola tragus*

*Sphaeralcea grossulariifolia*

*Sphaeralcea ambigua*

*Achnatherum hymenoides*

*Atriplex confertifolia*

*Lapula occidentalis*

*Descurainia pinnata*

*Cymopterus sp.*

*Sporobolus pyramidatus*

*Phacelia sp.*

*Cryptantha sp.*

*Allium sp.*

*Erodium cicutarium*

*Artemisia dracunculoides*

*Populus deltoides*

*Distichlis spicata*

*Calichordis nuttallii*

*Echinocereus sp.*

*Mammillaria sp.*

*Artemisia filifolia*

*Erinarium sp.*

*Ribes sp.*

*Aristida purpurea*

*Stanleya pinnata*

*Lysium sp.*

*Chamaesyce sp.*

*Juniperus sp.*

*Oenothera sp.*

*Astragalus mollissimus*

*Bromus rubeus*

*Artemisia bigelovii*

*Townsendia incana*

*Sisymbrium altissimum*

*Lepidium alyssoides*

*Amsonia tomentosa*

**Mammals**

Jackrabbit

Ground Squirrel

**Birds**

Raven

Red-tailed Hawk

Ferruginous Hawk

Horned Lark

Rock Wren

Black-throated Sparrow

House Finch

Say's Phoebe

**Reptiles**

Sagebrush Lizard

# Appendix D – Environmental Setting Photos

## Proposed Solar Array Area 1

**Photograph 1. Vegetation in Area 1 Parcel, Facing North from Southwest Corner**

**Photograph 2. Representative setting for Area 1, Facing East from Center of Parcel**

## Proposed Solar Array Area 2

**Photograph 3. Facing North from Southwest Corner of Area 2**

**Photograph 4. Facing Southwest from East Side of Area 2**

**Photograph 5. Facing East from East Side of Area 2**

**Proposed Gen Tie**

**Photograph 6. Facing East from Western End of Preferred Gen Tie Route**

## Alternative Gen Tie

**Photograph 7. Facing West from the East Side of Alternative Gen Tie**

## Substation and Battery Storage Site

**Photograph 8. Facing East from Western Edge of Proposed Substation and Battery Site**

## Substation and Battery Storage Alternative Site

**Photograph 9. Facing West from Center of Alternate Substation and Battery Storage Site**

## Access Roads

**Photograph 10. Facing South from Beginning of Access Road at Turn Off of SR 89**

## Connector Access Road/Utility Corridor East

**Photograph 11. Facing South from North End of East Medium Voltage/Access Corridor**