Rare Plant Protocol Survey

Bear Valley Solar Energy Project

PREPARED FOR
EDF Renewables Distribution-Scale Power

DATE
11 June 2026

REFERENCE
0739207

DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.	
DOCUMENT TITLE	Rare Plant Protocol Survey
DOCUMENT SUBTITLE	Bear Valley Solar Energy Project
PROJECT NUMBER	0739207
DATE	11 June 2026
VERSION	01
AUTHOR	Nicholas Smith
CLIENT NAME	EDF Renewables Distribution-Scale Power

DOCUMENT HISTORY

				ERM APPROVAL TO ISSUE		
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
01	000	Nicholas Smith	Erin Fortenberry	Ian Todd	9 June 2026	
01	001	Nicholas Smith	Ian Todd	Ian Todd	10 June 2026	
01	002	Nicholas Smith	Ian Todd	Ian Todd	11 June 2026	

SIGNATURE PAGE

Rare Plant Protocol Survey

Bear Valley Solar Energy Project

0739207

Nicholas Smith
Principal Technical Consultant, Scientist

Ian Todd
Partner

Environmental Resources Management, Inc.
1920 Main Street
Suite 300
Irvine, California

T +1 949 623 4700

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
ERM	Environmental Resources Management, Inc.
FE	federally endangered
FT	federally threatened
IPaC	Information for Planning and Conservation
Project	Bear Valley Solar Energy Project
SE	state endangered
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

EXECUTIVE SUMMARY

Environmental Resources Management, Inc. (ERM) conducted a protocol-level botanical survey of the approximately 29.53-acre Bear Valley Solar Energy Project (Project) site in unincorporated San Bernardino County, California. ERM completed the survey to document special-status plant species and sensitive natural communities and to evaluate potential Project impacts under the California Environmental Quality Act (CEQA).

The Project site occurs within the Bear Valley/Baldwin Lake basin, a region recognized for its concentration of endemic pebble plain and wet meadow plant species. ERM conducted protocol-level surveys on 28 May 2026 in accordance with California Department of Fish and Wildlife (CDFW) protocols; ERM supplemented these surveys with reference population visits conducted on 27 May 2026 to evaluate species detectability and survey timing.

ERM documented four special-status plant taxa within the Project site:

- *Astragalus lentiginosus* var. *sierrae* (Big Bear Valley milk-vetch; California Rare Plant Rank [CRPR] 1B.2): ERM documented approximately 20 individuals within the proposed Project site.
- *Boechera parishii* (Parish's rockcress; CRPR 1B.2): ERM documented 17 individuals on the northern hillside outside the proposed development footprint.
- *Eriogonum kennedyi* var. *austromontanum* (southern mountain buckwheat; federally Threatened, CRPR 1B.2): ERM documented three individuals on the northern hillside outside the proposed development footprint.
- *Linanthus killipii* (Baldwin Lake linanthus; CRPR 1B.2): ERM previously documented during a 2024 site visit; not observed during the 2026 protocol survey.

ERM did not identify any CDFW Sensitive Natural Communities. ERM mapped three vegetation alliances within the Project site: big sagebrush shrubland, pinyon-juniper woodland, and ruderal herbaceous vegetation.

The principal biological issue associated with the Project is the presence of *Astragalus lentiginosus* var. *sierrae* within the proposed development footprint. Implementation of the Project as currently designed would result in direct loss of occupied habitat and removal of documented *Astragalus lentiginosus* var. *sierrae* individuals. The federally threatened *Eriogonum kennedyi* var. *austromontanum* and *Boechera parishii* occur outside the proposed development footprint; potential impacts to these taxa are limited primarily to indirect effects, including fugitive dust and the spread of non-native plant species.

Survey timing coincided with the identifiable periods of most target taxa and is considered adequate for evaluation of most species included in the target list.

ERM recommends avoidance, minimization, and mitigation measures to reduce potential impacts to special-status plant resources. These measures include avoidance of occupied habitat where feasible, implementation of construction-phase dust control measures, invasive species management, worker environmental awareness training, and consideration of compensatory mitigation where impacts cannot be avoided.

1. INTRODUCTION

1.1 PURPOSE AND SCOPE

Environmental Resources Management, Inc. (ERM) conducted a botanical survey of the Bear Valley Solar Energy Project (Project) site to document special-status plant species and sensitive natural communities and to evaluate potential Project impacts to those resources under the California Environmental Quality Act (CEQA). This report presents the methods, results, and impact analysis of that survey.

ERM conducted the survey in response to agency and public comments the Project proponent, EDF Renewables Distribution-Scale Power, received on the Project's Initial Study/Mitigated Negative Declaration. The California Department of Fish and Wildlife (CDFW), acting as a CEQA trustee agency, concluded that previous site visits did not constitute protocol-level botanical surveys and recommended that protocol surveys be completed by qualified personnel (CDFW 2025). Public comments submitted by Dr. Timothy Krantz, Professor Emeritus at the University of Redlands, identified additional special-status plant taxa warranting evaluation and highlighted the proximity of the Project site to pebble plain and wet meadow habitats supporting numerous endemic plant species (Krantz 2026). ERM developed the survey methods, target taxa, and analyses presented in this report in consideration of the above comments.

ERM prepared this report in accordance with CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). It incorporates botanical observations collected during 2024 site investigations together with the results of a protocol-level rare plant survey ERM conducted in 2026. Where interpretations differ from earlier reconnaissance-level observations, the protocol survey results provide the primary basis for evaluation.

1.2 PROJECT DESCRIPTION AND LOCATION

The Project proposes construction of an approximately 5-megawatt alternating-current solar photovoltaic facility. The Project is located at 2151 Erwin Ranch Road on a 29.53-acre parcel (APN 0314-401-29) in unincorporated San Bernardino County, California. The site lies approximately 2.5 miles southeast of Big Bear City, 4 miles southeast of Big Bear Lake, 1.5 miles south of Baldwin Lake, and 0.6 miles northwest of Erwin Lake, at elevations ranging from approximately 6,780 to 6,875 feet above mean sea level (Appendix A; Figures 1, 2, and 3).

Bear Valley Electric Service, Inc. owns the Project and EDF Renewables Distribution-Scale Power is developing it. Project facilities would include ground-mounted solar arrays, access roads, electrical collection infrastructure, inverters, transformers, and associated interconnection facilities. Approximately 21 acres of the 29.53-acre parcel would be developed. According to the current site plan, development is concentrated within the flatter southern and central portions of the parcel, and the developer would avoid steeper northern hillside containing historic mining features.

The site is bounded by Lakewood Drive and rural residential/equestrian uses to the west, the San Bernardino National Forest to the north, undeveloped private land to the east, and Erwin Ranch Road to the south.

1.3 REGULATORY FRAMEWORK

1.3.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

Under CEQA, a plant species may qualify as rare, threatened, or endangered if it meets the criteria of CEQA Guidelines Section 15380, regardless of whether it is formally listed under state or federal law. Plant taxa assigned a California Rare Plant Rank (CRPR) of 1 or 2 are generally considered to meet this definition and are therefore subject to CEQA significance analysis. CEQA Guidelines Section 15065 further establishes Mandatory Findings of Significance, which apply where a project has the potential to substantially reduce the number or restrict the range of a rare, threatened, or endangered species.

1.3.2 CALIFORNIA ENDANGERED SPECIES ACT AND NATIVE PLANT PROTECTION ACT

The California Endangered Species Act (CESA; Fish & G. Code § 2050 et seq.) and Native Plant Protection Act (Fish & G. Code § 1900 et seq.) provide protection for state-listed and state-rare plant species. Where impacts to CESA-listed plants cannot be fully avoided, authorization from the CDFW may be required. CDFW also serves as a CEQA trustee agency for the state of California's biological resources.

1.3.3 FEDERAL ENDANGERED SPECIES ACT

The federal Endangered Species Act provides protection for federally listed species and establishes consultation requirements where a federal nexus exists, such as a federal permit, authorization, funding source, or land ownership interest. In the absence of a federal nexus, federal listing status remains an important indicator of rarity and informs the CEQA significance analysis conducted pursuant to CEQA Guidelines Section 15380.

1.3.4 CLEAN WATER ACT / WATERS JURISDICTION

An aquatic resources delineation ERM conducted (ERM 2024a) determined that no waters of the United States, waters of the State, or CDFW-jurisdictional streambed occur within the Project site. Accordingly, no Clean Water Act Section 404 permit, Section 401 water quality certification, or Fish and Game Code Section 1602 authorization is anticipated. This determination is relevant to the absence of a federal permitting nexus and to the hydrologic setting discussed in Section 2.

1.3.5 CALIFORNIA RARE PLANT RANK SYSTEM

Special-status plant taxa discussed in this report are assigned CRPRs maintained by the California Native Plant Society (CNPS) and CDFW. CRPR 1A taxa are presumed extirpated in California; CRPR 1B taxa are rare, threatened, or endangered throughout their range; and CRPR 2A and 2B taxa are rare in California but more common elsewhere. Threat extensions (.1, .2, and .3) reflect the degree of threat to a taxon. CRPR 1B and 2B taxa are generally considered to meet the CEQA Guidelines Section 15380 definition of rare, threatened, or endangered species.

2. ENVIRONMENTAL SETTING

The Bear Valley and Baldwin Lake basin occupies an isolated intermontane flat at approximately 6,700-7,000 feet in the San Bernardino Mountains and is recognized as one of California's most significant centers of plant endemism. The basin's combination of alkaline lake margins, alkaline wet meadows, and pebble (pavement) plains—a substrate-specific community type essentially confined to this single basin—supports an exceptional concentration of local endemic plant taxa. Multiple federally and state-listed threatened and endangered plant species are documented from the basin, and several have global ranges largely restricted to the Bear Valley region. The pebble plain and wet meadow habitats associated with Baldwin Lake, Shay Meadow, and Erwin Lake, all within approximately 1.5 miles of the Project site, support much of this endemic flora. This ecological setting provides the context for the special-status plant analysis presented in Sections 3 through 5.

The Project site occupies a transition between the Bear Valley floor and the lower flank of the San Bernardino Mountains. It comprises three principal physiographic settings: a steep pinyon-juniper woodland hillside in the north; a low, poorly drained topographic depression in the northwest to north-central portion of the site; and a flat big sagebrush community across the southern portion of the site.

2.1 TOPOGRAPHY AND LANDSCAPE FEATURES

The northern pinyon-juniper woodland hillside is characterized by 30 to 50 percent slopes and elevations ranging from approximately 6,785 to 6,875 feet. At the base of the slope, a shallow topographic depression (0 to 2 percent slopes) is defined by subtle (1-2 foot) elevation differences relative to the hillside to the north, Lakewood Drive to the west, and the adjacent sagebrush plain to the south. The southern portion of the Project site consists of a gently sloping to nearly level sagebrush plain (0 to 2 percent slopes) at elevations of approximately 6,785 to 6,790 feet.

An inactive gold mine occupies a portion of the northern hillside and includes an abandoned mineshaft containing standing water during ERM's 2024 field investigations, a capped ventilation shaft, a backfilled production shaft, and an associated tailings pile.

2.2 SOILS

ERM used the United States Department of Agriculture (USDA) Natural Resources Conservation Service Web Soil Survey to characterize soil resources within the Project site (NRCS 2026). We identified three soil map units within the Project site, summarized in Table 1 and depicted in Appendix A, Figure 4.

TABLE 1 SOIL MAP UNITS WITHIN THE PROJECT SITE

Map Unit	Slopes	Drainage/Character	Location on Site
Aquents-Grunney complex (2dvmq)	0-4%	Poorly drained; hydric; sandy loam to muck/mucky loam	Northwest–north-central depression
Moonridge-Shayroad-Caribou creek complex (2dvn1)	0-4%	Well drained; non-hydric; loam to sandy/clay loam	Southern big sagebrush flat

Map Unit	Slopes	Drainage/Character	Location on Site
Goldmountain-Deadmansridge-Deadpan complex (2dvn6)	30-50%	Well drained; non-hydric; very gravelly to cobbly loam	Northern pinyon-juniper woodland hillside

2.3 HYDROLOGY

The Project site lies within the Baldwin Lake subwatershed (HUC12 180702030101) and the Bear Valley Groundwater Basin. ERM evaluated hydrologic conditions within the Project site as part of an aquatic resources delineation (ERM 2024a). ERM did not identify any jurisdictional aquatic resources on site; however, the northwestern depression contains hydric soils, is mapped within a Department of Water Resources Best Available Maps 100-year floodplain awareness area, and exhibited historic (1938) surface hydrologic connectivity to an off-site palustrine emergent wetland approximately 290 feet to the northwest. National Wetlands Inventory features, including an intermittent streambed, riverine system, and palustrine emergent wetland, occur off site beginning approximately 65 feet northwest of the parcel boundary.

The broader hydrologic setting includes Shay Pond and the Shay Meadow/Erwin Lake complex, which support groundwater-influenced meadow and wetland habitats associated with several special-status plant taxa evaluated in this report. Additional information regarding hydrology and aquatic resources is provided in the aquatic resources delineation report (ERM 2024a).

2.4 VEGETATION AND NATURAL COMMUNITIES

ERM mapped and classified vegetation communities within the Project site during 2024 biological surveys (ERM 2024b). We identified and field-verified three vegetation alliances in accordance with the *Manual of California Vegetation* (CNPS 2026b); these are depicted in Table 2 below, and in Appendix A, Figure 5. ERM did not identify any CDFW Sensitive Natural Communities.

TABLE 2 VEGETATION ALLIANCES MAPPED WITHIN THE PROJECT SITE

Scientific Name	Common Name	CDFW Natural Community Code	CDFW Sensitive?	Acreage
Artemisia tridentata Shrubland Alliance	Big Sagebrush	35.110.01	No	12.8
Brassica nigra - Centaurea (solstitialis, melitensis) Herbaceous Semi-Natural Alliance	Upland Mustards or Star-Thistle Fields	42.013.00	No	7.1
Pinus monophylla – (*Juniperus osteosperma*) Woodland	Singleleaf Pinyon – Utah Juniper Woodlands	87.040.16	No	9.6

Notes:
CDFW = California Department of Fish and Wildlife

The Project site is primarily characterized by big sagebrush scrub, singleleaf pinyon – Utah juniper woodland, and upland mustard/star-thistle fields, classified in accordance with the Manual of California Vegetation (MCV), with disturbed areas exhibiting evidence of grazing and dominance of ruderal non-native species.

The proposed development footprint does not support intact pebble plain habitat. Pebble plain habitat is characterized by distinct, open, treeless patches with clay soils, pebble pavement, and low-growing vegetation, typically occurring within lower montane and pinyon-juniper woodland zones; these defining features were not identified within the Project footprint during field surveys.

CNDDB occurrences of pebble plain habitat are recorded on the hillside terrain within the pinyon-juniper woodland, which is topographically and vegetatively distinct from the disturbed valley floor comprising the proposed development footprint; the nearest occurrence is approximately 500 feet northeast of the proposed development footprint with a mapped locational accuracy of approximately 1/5 mile.

2.5LAND USE AND SURROUNDING SETTING

The Project site consists of rural, undeveloped private land. Historic land use includes gold mining on the northern hillside, although mining activities are no longer active. The site abuts the San Bernardino National Forest along its northern boundary. Rural residential and equestrian properties associated with the Erwin Ranch community occur to the west and south, and undeveloped private land occurs to the east. Feral burros (wild donkeys) are present on the site (ERM 2024b) and are an ongoing source of grazing, trampling, and soil disturbance. The northwestern depression and surrounding lower portions of the site support abundant non-native ruderal vegetation, including annual mustards.

The Project site does not function as a movement bottleneck within the broader landscape, and contiguous surrounding habitat remains available for wildlife passage:

- A defined wildlife movement corridor is typically supported by evidence such as telemetry data, track station data, or repeated systematic observations demonstrating consistent directional movement; such evidence is not present for the Project site.
- The Project site is not identified within any mapped habitat linkage, wildlife corridor, or essential connectivity area in any regional or county-scale biological resources planning document.

Stormwater at the Project site is retained on site, as no stormwater outlet or flow occurs beneath Lakewood Drive; the Project will maintain runoff patterns consistent with pre-project conditions and is not expected to alter hydrologic inputs to downstream aquatic habitats, including those supporting unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) at Shay Pond.

3. SURVEY METHODS

3.1 BACKGROUND REVIEW AND SURVEY PREPARATION

Survey preparation included review of existing biological resources documentation for the Project site, including the aquatic resources delineation report and Biological Resources Technical Report ERM prepared (ERM 2024a, ERM 2024b), together with a review of regional biological and regulatory databases. ERM used these sources to characterize biological resources potentially occurring within the Project site and to support development of the target species list we evaluated during the protocol survey.

ERM queried the following resources for the Big Bear City USGS 7.5-minute quadrangle and the eight surrounding quadrangles:

- Calflora (Calflora 2026);
- California Natural Diversity Database (CNDDB) (CDFW 2026);
- California Native Plant Society Rare Plant Inventory (CNPS 2026a);
- Consortium of California Herbaria (CCH 2026);
- Google Earth imagery (Google 2026);
- iNaturalist (iNaturalist 2026);
- Jepson eFlora (Jepson Flora Project 2026);
- United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) (USFWS 2026a);
- USFWS Critical Habitat Portal (USFWS 2026b);
- USDA Natural Resources Conservation Service Web Soil Survey (NRCS 2026); and
- United States Geological Survey (USGS) 7.5-minute topographic maps (USGS 2026).

Consistent with CDFW protocol guidance (CDFW 2018), ERM reviewed CNDDB and CNPS Rare Plant Inventory records using a nine-quadrangle search centered on the Big Bear City quadrangle. We also generated a federal special-status species list using the USFWS IPaC system.[1]

3.2 SPECIAL-STATUS PLANTS AND SENSITIVE NATURAL COMMUNITIES WITH POTENTIAL TO OCCUR

The agency review process established the target taxa surveyed under this protocol. Following the CDFW's review of the Initial Study/Mitigated Negative Declaration (SCH No. 2025101328), the CDFW identified 12 special-status plant taxa as having potential to occur within or adjacent to the Project site and directed that EDF Renewables Distribution-Scale Power conduct protocol-level botanical surveys. Public comments submitted by Dr. Timothy Krantz on 19 March 2026 identified two additional taxa, *Sidalcea pedata* and *Thelypodium stenopetalum*, as warranting evaluation based on documented occurrences at Shay Meadow and Erwin Lake. Additional special-status

[1] This report utilizes publicly available information from the USFWS IPaC system solely for preliminary desktop review of biological resources potentially occurring within the Project site. Review of IPaC information does not constitute initiation of consultation under the Endangered Species Act and does not imply eligibility for consultation through the IPaC system. Any future federal coordination or consultation, if required, would occur separately through the appropriate USFWS Field Office.

plant taxa identified during database review were evaluated for potential to occur within the Project site as part of the Biological Resources Technical Report (ERM 2024b). The resulting target species list is presented in Table 3.

TABLE 3 TARGET SPECIAL-STATUS PLANT TAXA EVALUATED DURING PROTOCOL SURVEYS

Species	Common Name	Special-Status	Habitat Requirements
Astragalus lentiginosus var. *sierrae*	Big Bear Valley milk-vetch	CRPR 1B.2	Mojavean desert scrub, meadows and seeps, pinyon and juniper woodland, upper montane coniferous forest. Microhabitat: gravelly (sometimes), rocky (sometimes).
Astragalus leucolobus	Big Bear Valley woollypod	CRPR 1B.2	Lower montane coniferous forest, pebble (pavement) plain, pinyon and juniper woodland, upper montane coniferous forest. Microhabitat: rocky.
Boechera dispar	pinyon rockcress	CRPR 2B.3	Joshua tree "woodland," Mojavean desert scrub, pinyon and juniper woodland. Microhabitat: granitic, gravelly.
Boechera parishii	Parish's rockcress	CRPR 1B.2	Pebble (pavement) plain, pinyon and juniper woodland, upper montane coniferous forest. Microhabitat: quartzite on clay, carbonate (sometimes), rocky.
Castilleja cinerea	ash-gray paintbrush	FT, CRPR 1B.2	Mojavean desert scrub, meadows and seeps, pebble (pavement) plain, pinyon and juniper woodland, upper montane coniferous forest (clay, openings).
Dudleya abramsii ssp. *affinis*	San Bernardino Mountains dudleya	CRPR 1B.2	Pebble (pavement) plain, pinyon and juniper woodland, upper montane coniferous forest. Microhabitat: quartzite (sometimes), carbonate (sometimes), granitic (sometimes).
Eremogone ursina	Big Bear Valley sandwort	FT, CRPR 1B.2	Meadows and seeps, pebble (pavement) plain, pinyon and juniper woodland. Microhabitat: mesic, rocky.
Eriogonum kennedyi var. *austromontanum*	southern mountain buckwheat	FT, CRPR 1B.2	Lower montane coniferous forest (gravelly), pebble (pavement) plain.
Ivesia argyrocoma var. *argyrocoma*	silver-haired ivesia	CRPR 1B.2	Meadows and seeps (alkaline), pebble (pavement) plain, upper montane coniferous forest.
Linanthus killipii	Baldwin Lake linanthus	CRPR 1B.2	Joshua tree "woodland", meadows and seeps (alkaline), pebble (pavement) plain, pinyon and juniper woodland.
Poa atropurpurea	San Bernardino bluegrass	FE, CRPR 1B.2	Meadows and seeps (mesic).
Sidalcea pedata	bird-foot checkerbloom	FE, SE, CRPR 1B.1	Meadows and seeps (mesic), pebble (pavement) plain.
Thelypodium stenopetalum	slender-petaled mustard	FE, SE, CRPR 1B.1	Meadows and seeps (mesic, alkaline).

Species	Common Name	Special-Status	Habitat Requirements
Viola pinetorum ssp. *grisea*	grey-leaved violet	CRPR 1B.2	Meadows and seeps, subalpine coniferous forest, upper montane coniferous forest.

Notes:
CRPR = California Rare Plant Rank; FE = federally endangered; FT = federally threatened; SE = state endangered

ERM compiled bloom-period detectability windows for target taxa (Appendix D) from the Jepson eFlora (Jepson Flora Project 2026), CNPS Rare Plant Inventory (CNPS 2026a), Calflora (Calflora 2026), iNaturalist (iNaturalist 2026), and the Consortium of California Herbaria (CCH 2026). ERM synthesized information from these sources to evaluate survey timing relative to the 28 May 2026 protocol survey date and to inform the detectability assessment presented in Section 4.5 of this report.

3.3 REFERENCE SITES AND PHENOLOGY

On 27 May 2026, ERM conducted reference population visits at documented CNDDB occurrences in the Baldwin Lake and Big Bear Valley region to evaluate the detectability and phenological condition of target taxa under conditions concurrent with the protocol survey. We selected reference sites based on proximity, accessibility, and occurrence records available during survey planning. The purpose of the visits was to determine whether target taxa were evident and identifiable at the time of survey and to provide context for evaluating survey timing adequacy (see Section 4.5).

Table 4 summarizes the observation status and phenological condition of target taxa at visited reference occurrences. Occurrence numbers correspond to CNDDB element occurrences used during survey planning (CDFW 2026).

TABLE 4 REFERENCE POPULATION VISITS AND PHENOLOGICAL CONDITION OF TARGET TAXA

Species	Reference Occurrence	Observed?	Phenological State
Astragalus lentiginosus var. *sierrae*	Project site occurrence documented in 2024 and evaluated during protocol survey	N/A	--
Astragalus leucolobus	OCCNUMBER 76	Yes	Flowering / Fruiting
Boechera dispar	OCCNUMBER 28 not visited (access limitations)	N/A	--
Boechera parishii	OCCNUMBER 13	Yes	Flowering / Fruiting
Castilleja cinerea	OCCNUMBER 68	Yes	Flowering
Dudleya abramsii ssp. *affinis*	OCCNUMBER 7	Yes	Flowering
Eremogone ursina	OCCNUMBER 30	No	--

Species	Reference Occurrence	Observed?	Phenological State
Eriogonum kennedyi var. *austromontanum*	OCCNUMBER 24	Yes	Flowering
Ivesia argyrocoma var. *argyrocoma*	OCCNUMBER 4	Yes	Vegetative
Linanthus killipii	Project site occurrence documented in 2024 (OCCNUMBER 12); evaluated during protocol survey	N/A	--
Poa atropurpurea	OCCNUMBER 17	Yes	Flowering
Sidalcea pedata	OCCNUMBER 12	No	--
Thelypodium stenopetalum	OCCNUMBER 7	Yes	Flowering
Viola pinetorum ssp. *grisea*	OCCNUMBER 96 not visited (historic record with low locational precision)	N/A	--

Notes:
N/A = not applicable

ERM's reference site evaluation of *Viola pinetorum* ssp. *grisea* was constrained by the absence of relocatable nearby occurrences. The only documented occurrence in the vicinity of the Project site is a historical record dating to 1886 with an estimated locational accuracy of approximately 5 miles, precluding its use as a reference population for evaluating species detectability at the time of survey.

3.4FIELD SURVEY METHODS AND SURVEY EXTENT

ERM conducted this rare plant protocol survey in accordance with the methodological principles of CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018), CNPS's *Botanical Survey Guidelines* (CNPS 2001), and USFWS's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 2000). We timed the protocol survey to coincide with the identifiable periods of the majority of target taxa, as confirmed through reference population visits described in Section 3.3. Survey timing relative to individual target taxa is evaluated in Section 4.5.

Surveys were floristic in nature and provided complete visual coverage of the Project site through meandering pedestrian transects. The survey area encompassed the proposed development footprint, adjacent areas potentially subject to indirect effects, and the San Bernardino National Forest-adjacent northern parcel boundary, consistent with CDFW protocol guidance. ERM identified plant taxa to the taxonomic level necessary to evaluate special-status designation. Because the survey was floristic rather than limited to target species, ERM documented special-status taxa detectable during the survey period regardless of their inclusion on the target species list.

3.5 SURVEY DATES, PERSONNEL, AND LEVEL OF EFFORT

ERM obtained botanical observations supporting this report during the site visits summarized in Table 5.

TABLE 5 SURVEY DATES, PERSONNEL, AND LEVEL OF EFFORT

Date	Purpose	Personnel	Effort
1 July 2024	Aquatic resources delineation	Nicholas Smith, Marissa Juarez	6 hours
4 September 2024	Vegetation community mapping and habitat assessment	Nicholas Smith	6 hours
28 May 2026	Rare plant protocol-level survey	Nicholas Smith	8 hours

ERM conducted the 1 July 2024 and 4 September 2024 visits for aquatic-resource, vegetation community mapping, and habitat assessment purposes. Botanical observations ERM recorded during those visits were incidental to those objectives and were not collected as part of a protocol-level rare plant survey. ERM conducted the 28 May 2026 visit as a protocol-level botanical survey. The adequacy of survey timing and coverage relative to the phenological windows of target taxa is evaluated in Section 4.5.

3.6 SURVEYOR QUALIFICATIONS

Nicholas Smith, MS, Principal Technical Consultant, Scientist at ERM led all biological and aquatic resources field investigations for this Project, including the aquatic resources delineation, vegetation community mapping and habitat assessment, reference population visits, and rare plant protocol survey.

Mr. Smith holds a BS in Ecology and Evolutionary Biology from The Evergreen State College and an MS in Environmental Biotechnology from Northeastern University; he has more than 20 years of botanical field experience and more than 12 years of professional experience in environmental consulting, wetland ecology, botany, and field biology. Mr. Smith's experience includes rare plant protocol surveys, vegetation community mapping, wetland delineations, and biological resource assessments throughout California and the western United States.

Mr. Smith is authorized by the CDFW to take and possess CESA- and Native Plant Protection Act-listed plant species for identification and voucher collection purposes under Plant Voucher Collecting Permit No. 2081(a)-25-134-V. Mr. Smith also holds the Professional Wetland Scientist designation from the Society of Wetland Scientists. A plant-focused curriculum vitae and permit documentation are provided in Appendix E and Appendix F.

Marissa Juarez of ERM participated in the 1 July 2024 aquatic resources delineation in a field support capacity. Ms. Juarez did not conduct botanical surveys or make botanical determinations for this report.

3.7 TAXONOMIC NOMENCLATURE

ERM based plant identification on morphological characters using the Jepson eFlora and *The Jepson Manual: Vascular Plants of California*, Second Edition (Baldwin et al. 2012). Plant

nomenclature follows Calflora (Calflora 2026), which generally aligns more closely with nomenclature currently used by the CNDDB than recent taxonomic revisions reflected in the Jepson eFlora. Special-status designations follow the CNDDB Special Vascular Plants, Bryophytes, and Lichens List and the CNPS Rare Plant Inventory (CNPS 2026a).

4. RESULTS

4.1 DATA SENSITIVITY

Precise GPS coordinates and detailed occurrence locality data for special-status plant species are withheld from this publicly available report in accordance with California Government Code Section 6254(aa), which exempts from public disclosure the locations of rare or endangered plants where disclosure could endanger their continued existence. ERM recorded precise locational data in field notes and submitted it to CDFW via CNDDB Online Field Survey Forms, which are not reproduced in this document. Occurrence maps included in this report display species locations at a scale sufficient for impact assessment without enabling precise identification of individual plants.

4.2 VEGETATION AND NATURAL COMMUNITIES MAPPED

ERM confirmed the three vegetation alliances mapped during the 2024 investigations during the 28 May 2026 protocol survey (Figure 5), consistent with the Manual of California Vegetation (CNPS 2026b) and CDFW Survey of California Vegetation Classification and Mapping Standards (CDFW 2022). ERM did not observe any changes in community boundaries between the 2024 mapping and the 2026 survey visit. The surveyors did not identify pebble (pavement) plain sensitive natural community on the Project site; the CNDDB contains no active element occurrence records for pebble plain on the parcel (CDFW 2026), and no Combined Vegetation Rapid Assessment and Relevé form submission is required. The northern hillside is mapped as Singleleaf Pinyon–Utah Juniper Woodland (87.040.16), and the distribution of pebble plain indicator species within that woodland is addressed in Section 5.3.

4.3 FLORISTIC INVENTORY

A complete list of all plant taxa observed within the Project site, identified to the level necessary to determine special-status status, was completed as part of the survey. ERM documented a total of 70 plant taxa across the survey record (Appendix C). Native species account for the majority of observed richness. Non-native species are concentrated in the northwestern depression, where *Sisymbrium altissimum*, *Descurainia sophia*, and other ruderal forbs dominate.

4.4 SPECIAL-STATUS PLANTS OBSERVED

ERM documented four special-status plant taxa within the Project site during the 2024 and 2026 survey records (Appendix A, Figure 6). Representative photographs are provided in Appendix B. Detailed occurrence data, including location, observation dates, counts, life-stage composition, and habitat descriptions have been submitted to CDFW via CNDDB Online Field Survey Forms. Table 6 summarizes special-status species observed within the Project site and provides corresponding CNDDB source codes to facilitate agency review and database cross-referencing.

TABLE 6 OBSERVED SPECIAL-STATUS SPECIES WITHIN PROJECT SITE

Species	Status	Individuals Observed	General Location	Relationship to Project Footprint	CNDDB Source Codes
Astragalus lentiginosus var. *sierrae*	CRPR 1B.2	20	Upland mustard field and southern big sagebrush flat	Inside footprint	SMI24F0010; SMI26F0005
Boechera parishii	CRPR 1B.2	17	Northern hillside near historic mine access road	Outside footprint	SMI26F0006
Eriogonum kennedyi var. *austromontanum*	FT; CRPR 1B.2	3	Northern hillside near historic mine access road	Outside footprint	SMI26F0007
Linanthus killipii	CRPR 1B.2	8	Northern hillside	Outside footprint	SMI24F0011

Notes:
CRPR = California Rare Plant Rank; FT = federally threatened

4.4.1 ASTRAGALUS LENTIGINOSUS VAR. SIERRAE

The 28 May 2026 protocol survey documented approximately 20 individuals of *Astragalus lentiginosus* var. *sierrae* distributed across the Project site. Approximately 12 individuals occurred within the southern sagebrush flat, seven individuals occurred along the eastern margin of the upland mustard habitat, and one individual was documented adjacent to the eastern access route. These observations expand upon the incidental documentation of two individuals recorded during the 1 July 2024 site visit, which were not observed during the 28 May 2026 surveys.

4.4.2 ERIOGONUM KENNEDYI VAR. AUSTROMONTANUM

The 28 May 2026 protocol survey documented three individuals of *Eriogonum kennedyi* var. *austromontanum* occurring within two localized groups on the northern hillside near the historic mine access road. ERM surveyors observed plants on gravelly substrate within pinyon-juniper woodland exhibiting pebble plain characteristics. The surveyor based identification on vegetative morphology and persistent inflorescence stalks and corroborated identification through comparison with nearby reference populations visited on 27 May 2026.

4.4.3 BOECHERA PARISHII

The 28 May 2026 protocol survey documented 17 individuals of *Boechera parishii* on the northern hillside near the historic mine access road. Plants occurred on gravelly substrate within pinyon-juniper woodland and were concentrated in the same general area as the documented occurrence of *Eriogonum kennedyi* var. *austromontanum*. The surveyor based identification on the presence of basal rosettes, lavender flowers, pubescent vegetative structures, and ascending siliques.

4.4.4 LINANTHUS KILLIPII

The 4 September 2024 site visit documented eight individuals of *Linanthus killipii* on the northern hillside. The surveyors based identification on stellate calyx morphology visible in fruiting material, growth habit, occurrence on suitable gravelly substrate, and spatial coincidence with an overlapping CNDDB occurrence record. Because the observation was made from senesced fruiting material and no voucher specimen was collected, the identification is based on the available photographic and field evidence rather than direct examination of flowering material. The species was not re-detected during the 28 May 2026 protocol survey.

4.4.5 NON-DETECTED TARGET TAXA WITH REFERENCE SITE CONFIRMATION

Reference population visits conducted on 27 May 2026 confirmed *Astragalus leucolobus*, *Castilleja cinerea*, *Dudleya abramsii* ssp. *affinis*, *Poa atropurpurea*, and *Thelypodium stenopetalum* in flower, and *Ivesia argyrocoma* var. *argyrocoma* in vegetative condition, under field conditions comparable to those present at the Project site during the survey period. The surveyor did not detect any of these taxa during the 28 May 2026 protocol survey.

The absence of detections despite contemporaneous observations of identifiable reference populations provides substantial evidence that these taxa are absent from the Project site or occur, if present, at densities below those reasonably detectable during protocol-level surveys.

4.4.6 NON-DETECTED TARGET TAXA WITHOUT REFERENCE SITE CONFIRMATION

ERM did not detect *Eremogone ursina* and *Sidalcea pedata* during the 28 May 2026 protocol survey. Reference population visits did not provide confirmation of species detectability at the time of survey, and the survey date only partially overlapped the primary detectability periods of these taxa. Consequently, the survey results provide a lower degree of confidence regarding absence relative to the taxa discussed in Section 4.4.5.

Boechera dispar and *Viola pinetorum* ssp. *grisea* were also not detected during the protocol survey. Reference population visits were not completed for either species, and evaluation relied on available occurrence records, habitat characteristics, and observations made during the floristic survey.

4.5 SURVEY ADEQUACY AND LIMITATIONS

CDFW's protocols (CDFW 2018) recommend that botanical surveys be conducted during periods when target taxa are evident and identifiable, typically during flowering or fruiting, and recognize that multiple visits may be necessary where target taxa exhibit differing phenological schedules. Survey adequacy for the Project site was evaluated with respect to survey timing, target species detectability, and survey coverage.

4.5.1 SURVEY TIMING RELATIVE TO TARGET PHENOLOGY

ERM conducted the protocol-level survey on 28 May 2026. Our comparison of the survey date with documented periods of detectability indicates that the survey coincided with the identifiable period of many target taxa. Reference population visits conducted on 27 May 2026 further confirmed that several target species were evident and identifiable under field conditions comparable to those present at the Project site during the survey period.

For other taxa, the survey occurred near the beginning of, or only partially within, the documented period of detectability. Consequently, confidence in non-detection varies among target species. A detailed summary of species-specific detectability windows is provided in Appendix D.

4.5.2 SURVEY COVERAGE AND COMPLETENESS

Protocol-level survey effort consisted of a single floristic survey ERM conducted on 28 May 2026. Previous site investigations conducted in 2024 provided additional botanical observations but were not completed as protocol-level rare plant surveys.

The 28 May 2026 survey provided complete pedestrian coverage of the Project site through floristic meander surveys designed to evaluate all portions of the site for special-status plant species. The survey documented four special-status plant taxa and confirmed the continued distribution of the vegetation communities mapped during previous site investigations.

5. IMPACT ASSESSMENT

5.1 SIGNIFICANCE CRITERIA

ERM evaluated Project impacts to special-status plants using the significance criteria established by CEQA, CDFW, and other applicable regulatory guidance.

Under CEQA Guidelines Section 15380, a plant species qualifies as rare, threatened, or endangered in California if it meets statutory criteria for listing or can otherwise be shown to be numerically small, in a state of decline, or confined to a limited geographic distribution. Plant taxa assigned a CRPR of 1B or 2B are generally considered to meet this definition and are therefore subject to CEQA significance analysis. CEQA Guidelines Appendix G identifies as a potentially significant impact any project that would substantially reduce the number of, or restrict the range of, a rare, threatened, or endangered plant or animal.

CEQA Guidelines Section 15065 requires a lead agency to determine whether a project may have a significant effect on the environment. Under Section 15065(d)(3), a project may be considered significant if it has the potential to substantially reduce the number or restrict the range of a rare or endangered species.

In addition to CEQA, impacts to special-status plants may be subject to requirements established by CDFW and other regulatory agencies. The type and extent of avoidance, minimization, and compensatory mitigation required for special-status plant impacts depend on the status of the affected species and the nature of the impact.

5.2 SIGNIFICANCE OF SPECIAL-STATUS PLANT POPULATIONS

5.2.1 ASTRAGALUS LENTIGINOSUS VAR. SIERRAE

Astragalus lentiginosus var. *sierrae* is a CRPR 1B.2 taxon documented primarily from the Bear Valley basin of the San Bernardino Mountains, with 68 element occurrences recorded in the CNDDB (CDFW 2026). Additional occurrences have been documented outside the basin, including two herbarium collections from Los Padres National Forest deposited at the Santa Barbara Botanic Garden, demonstrating that the species is not restricted exclusively to Bear Valley (Calflora 2026; CCH 2026). The 28 May 2026 survey documented approximately 20 individuals distributed across the Project site. Based on the current Project design, one or more occurrence areas may be subject to direct disturbance through vegetation removal, grading, soil compaction, and alteration of occupied habitat.

In the context of the species' documented distribution, permanent removal of approximately 20 individuals is not anticipated to substantially reduce the number or restrict the range of the species and would therefore result in a less-than-significant impact. To further reduce impacts, the Project proponent would implement avoidance, minimization, and mitigation measures as described in Section 6.

5.2.2 BOECHERA PARISHII

Boechera parishii is a CRPR 1B.2 taxon associated with pebble plain and related montane habitats. The 28 May 2026 survey documented 17 individuals on the northern hillside outside the proposed

development footprint. Potential impacts are limited to indirect effects, including fugitive dust deposition and invasive species spread. Dust suppression and invasive species control measures described in Section 6 would reduce the potential for such impacts to less than significant levels.

5.2.3 ERIOGONUM KENNEDYI VAR. AUSTROMONTANUM

Eriogonum kennedyi var. *austromontanum* is a federally threatened species associated with the pebble plain ecosystem of the Bear Valley region. ERM surveyors documented three individuals on the northern hillside outside the proposed development footprint during the 28 May 2026 survey. Potential impacts are limited to indirect effects, including fugitive dust deposition, invasive species spread, and other edge effects associated with nearby construction activities. Avoidance and minimization measures as described in Section 6 would reduce impacts to less than significant levels.

5.2.4 LINANTHUS KILLIPII

Linanthus killipii is a CRPR 1B.2 annual herb associated with pebble plain, alkaline meadow, and pinyon-juniper habitats in the Bear Valley region. ERM documented eight individuals during the 4 September 2024 survey on the northern hillside outside the proposed development footprint. The species was not re-detected during the 28 May 2026 protocol survey. Potential impacts are limited to indirect effects associated with nearby construction activities and would be reduced to less than significant with implementation of mitigation measures as described in Section 6.

5.2.5 ASTRAGALUS LEUCOLOBUS, CASTILLEJA CINEREA, DUDLEYA ABRAMSII SSP. AFFINIS, POA ATROPURPUREA, AND THELYPODIUM STENOPETALUM

Astragalus leucolobus, *Castilleja cinerea*, *Dudleya abramsii* ssp. *affinis*, *Poa atropurpurea*, and *Thelypodium stenopetalum* were not detected during the protocol survey. Consequently, no direct or indirect impacts to documented occurrences of these taxa are anticipated.

5.2.6 IVESIA ARGYROCOMA VAR. ARGYROCOMA

Ivesia argyrocoma var. *argyrocoma* is a CRPR 1B.2 taxon associated with alkaline meadows, pebble plains, and upper montane habitats within the Bear Valley region. ERM observed a reference population in vegetative condition on 27 May 2026 under environmental conditions comparable to those present at the Project site. The species was not detected during the 28 May 2026 protocol survey.

Based on the survey evidence available, occurrence within the Project site appears unlikely. Consequently, no direct or indirect impacts to documented occurrences of this species are anticipated.

5.2.7 EREMEGONE URSINA AND SIDALCEA PEDATA

Eremogone ursina (federally threatened, CRPR 1B.2) and *Sidalcea pedata* (federally endangered, state endangered, CRPR 1B.1) were not detected during the 28 May 2026 protocol survey. Reference population visits did not provide confirmation of species detectability at the time of survey, and the survey date only partially overlapped the primary detectability periods of these taxa.

Potentially suitable habitat for *Eremogone ursina* occurs on portions of the gravelly northern hillside, while hydric soils within the northwestern depression may provide suitable habitat for *Sidalcea pedata*. Because the existing survey data provide a lower degree of confidence regarding absence relative to other target taxa, uncertainty remains regarding the occurrence of these species within the Project site.

5.2.8 BOECHERA DISPAR AND VIOLA PINETORUM SSP. GRISEA

Boechera dispar and *Viola pinetorum* ssp. *grisea* were not detected during the 28 May 2026 protocol survey. Reference population visits were not completed for either species; however, neither species was observed during complete floristic coverage of the Project site. Based on available occurrence information, habitat conditions observed within the Project site, and the absence of detections during the survey, occurrence of these taxa appears unlikely. Consequently, direct or indirect Project impacts to documented occurrences of these species are not anticipated.

5.3 SIGNIFICANCE OF SENSITIVE NATURAL COMMUNITIES

ERM did not identify any sensitive natural communities within the Project site. Although *Boechera parishii* and *Eriogonum kennedyi* var. *austromontanum* are associated with pebble plains habitat and were documented within pinyon-juniper woodland on the northern hillside, the Project site does not support a mappable pebble plain community under current CDFW classification standards. The significance of these observations is addressed through the species-level analysis presented in Sections 5.2.2 and 5.2.3.

5.4 EXISTING ECOLOGICAL STRESSORS

Non-native plant species are widespread within portions of the Project site, particularly within the northwestern depression. These species may compete with native vegetation for space, light, water, and other resources.

ERM observed evidence of weed abatement and mowing within portions of the Project site; these activities have the potential to affect vegetation composition, flowering, seed production, and detectability of annual and perennial herbaceous species.

ERM observed feral burros in the Project site during both 2024 site visits and again during the 2026 protocol survey. Burros are a source of grazing, trampling, and soil disturbance within the Project site and represent an ongoing influence on site conditions independent of the Project.

5.5 CONCLUSION

As documented above, the Project site contains *Astalagus lentiginosus var. sierrae* within the proposed development footprint. The Project would not substantially reduce the number or restrict the range of the species. In addition, the Project would implement mitigation measures as defined in Section 6 to lessen impacts to less than significant levels.

Boechera parishii, Linanthus killipii, and *Eriogonum kennedyi* var. *austromontanum* were documented on the northern hillside outside the proposed development footprint. Potential impacts are limited to indirect effects associated with nearby construction activities and would be

reduced to less than significant with implementation of mitigation measures as described in Section 6.

6. AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

6.1 AVOIDANCE MEASURES

6.1.1 A1 – AVOIDANCE OF SPECIAL-STATUS PLANT OCCURRENCES

Avoid direct impacts to documented occurrences of *Astragalus lentiginosus* var. *sierrae* to the maximum extent feasible through refinement of the proposed development footprint, access routes, and construction staging areas. Prior to construction, all special-status plant occurrences outside approved disturbance areas shall be clearly flagged and fenced under the direction of a qualified botanist.

6.1.2 A2 – NORTHERN HILLSIDE EXCLUSION

The northern hillside supporting documented occurrences of *Eriogonum kennedyi* var. *austromontanum*, *Boechera parishii*, and *Linanthus killipii* shall remain outside all construction activities, equipment access, staging, and vegetation clearing.

6.2 MINIMIZATION MEASURES

6.2.1 M1 – DUST AND CONSTRUCTION CONTROLS

Dust suppression best management practices shall be implemented during all ground-disturbing activities adjacent to special-status plant habitat. Construction limits shall be clearly delineated, and a qualified botanist shall monitor compliance with avoidance measures during active ground disturbance.

6.2.2 M2 – NON-NATIVE SPECIES MANAGEMENT

Construction equipment shall arrive free of soil and plant material. Disturbed areas shall be stabilized and revegetated as appropriate, and non-native plant establishment within avoidance areas shall be monitored.

6.3 COMPENSATORY MITIGATION MEASURES

6.3.1 C-1 MITIGATION FOR UNAVOIDABLE IMPACTS TO SPECIAL-STATUS PLANTS

If direct impacts to *Astragalus lentiginosus* var. *sierrae* or other special-status plant taxa cannot be fully avoided, compensatory mitigation shall be explored in coordination with the lead agency. Mitigation shall include conservation banking, habitat acquisition, habitat preservation, or other mechanisms.

6.3.2 C-2 TRANSPLANTATION

If direct impacts to *Astragalus lentiginosus* var. *sierrae* or other special-status plant taxa cannot be fully avoided and compensatory mitigation is not available, transplantation of the species to a viable site could occur with lead agency coordination. If transplantation is a feasible mitigation measure, the botanist shall develop and implement a transplantation plan through coordination with the appropriate agencies.

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APPENDIX A FIGURES

FIGURE 1 – REGIONAL MAP

FIGURE 2 – VICINITY MAP

FIGURE 3 – PROJECT SITE MAP

FIGURE 4 – SOILS MAP

FIGURE 5 – VEGETATION COMMUNITIES AND LAND COVER MAP

FIGURE 6 – SPECIAL-STATUS PLANT SURVEY RESULTS MAP

DRAWN BY: Jimmy Holcomb

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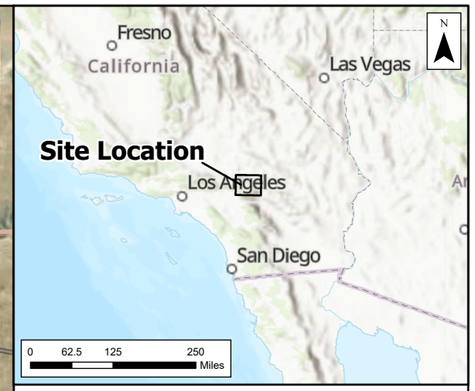
FIFTEENMILE VALLEY
BUTLER PEAK
LUCERNE VALLEY
FAWNSKIN
COUGAR BUTTES
BIG BEAR CITY
OLD WOMAN SPRINGS
RATTLESNAKE CANYON
MELVILLE LAKE
BIGHORN CANYON
247
18
Big Bear City
Big Bear Lake
Bighorn Mountain Wilderness
BUTLER PEAK
KELLER PEAK
FAWNSKIN
BIG BEAR LAKE
MOONRIDGE
ONYX PEAK
RIMROCK
CATCLAW FLAT
SAN GORGONIO MTN
FOREST FALLS
YUCAIPA
MORONGO VALLEY
Heart Bar Campground
38
San Gorgonio

0 6,000 12,000 24,000 Feet



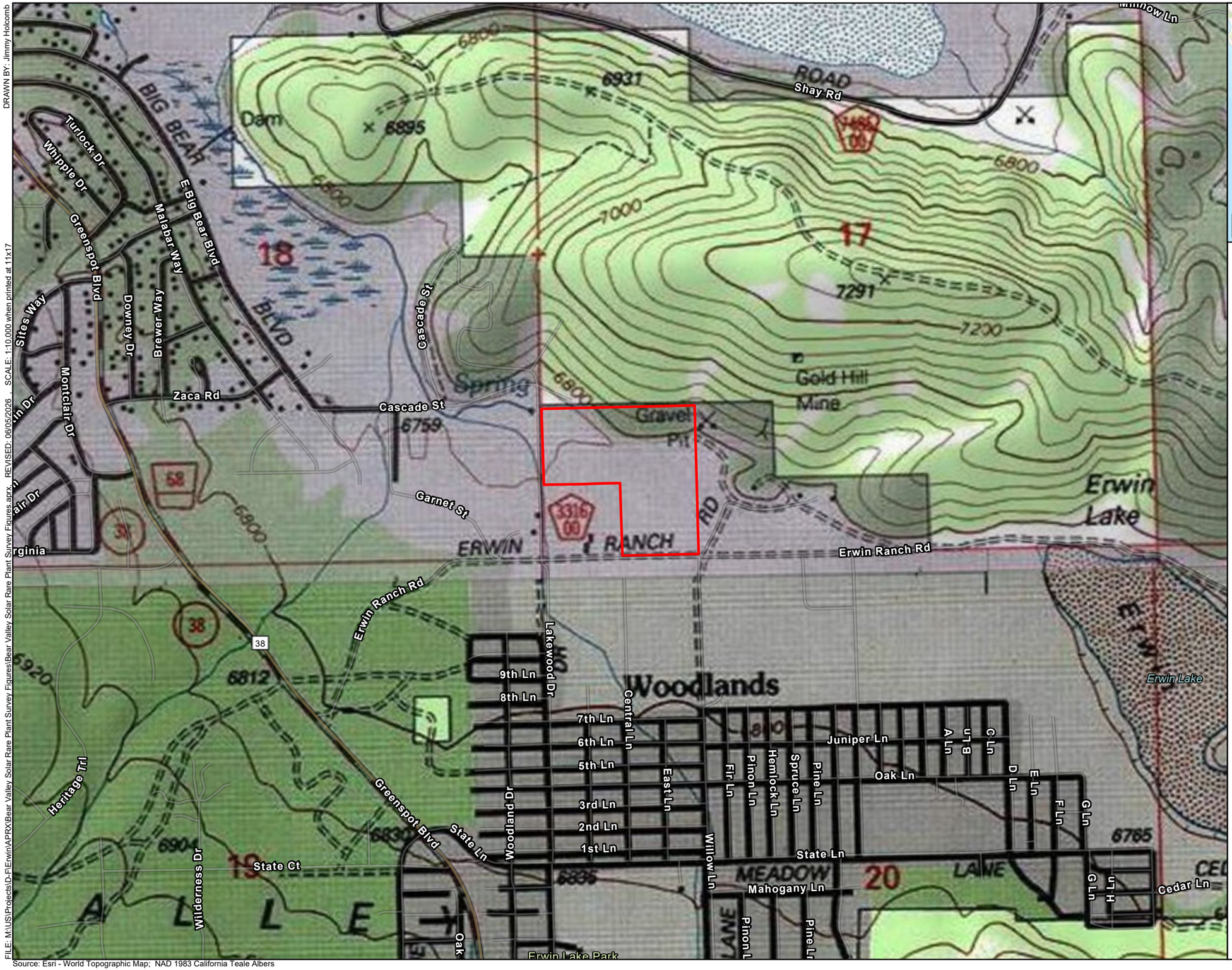
Legend

- Project Location
- USGS 7.5-Minute Topographic Quadrangle

Source: Esri - World Topographic Map; NAD 1983 California Teale Albers

Figure 1
Regional Map
Bear Valley Solar Energy
Rare Plant Protocol Survey
San Bernardino County, CA

ERM



Legend

Site Boundary

Figure 2
Project Location Map
Bear Valley Solar Energy
Rare Plant Protocol Survey
San Bernardino County, CA

ERM

Source: Esri - World Topographic Map; NAD 1983 California Teale Albers

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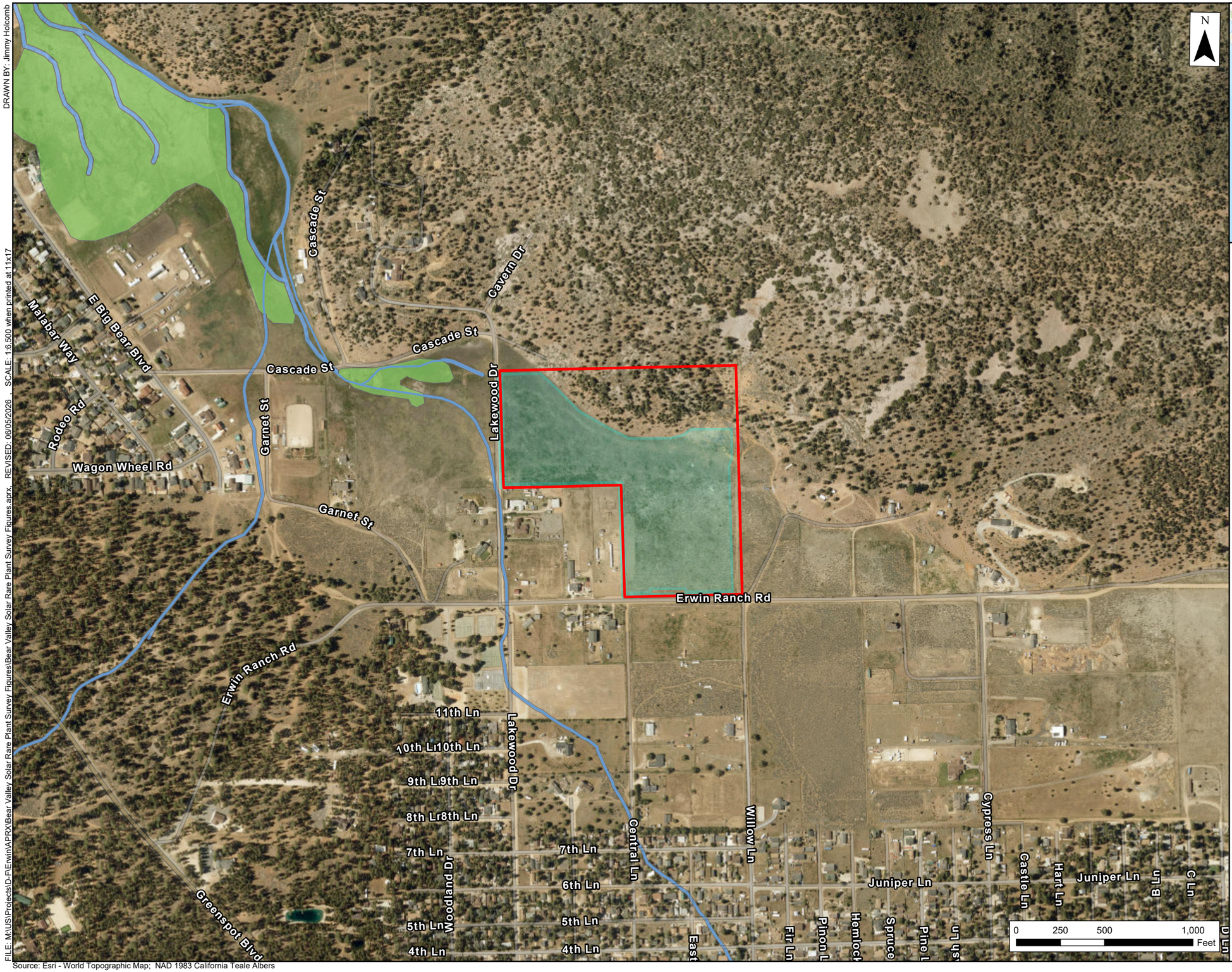


Legend

- Site Boundary
- Project Footprint
- NHD Streams

NWI

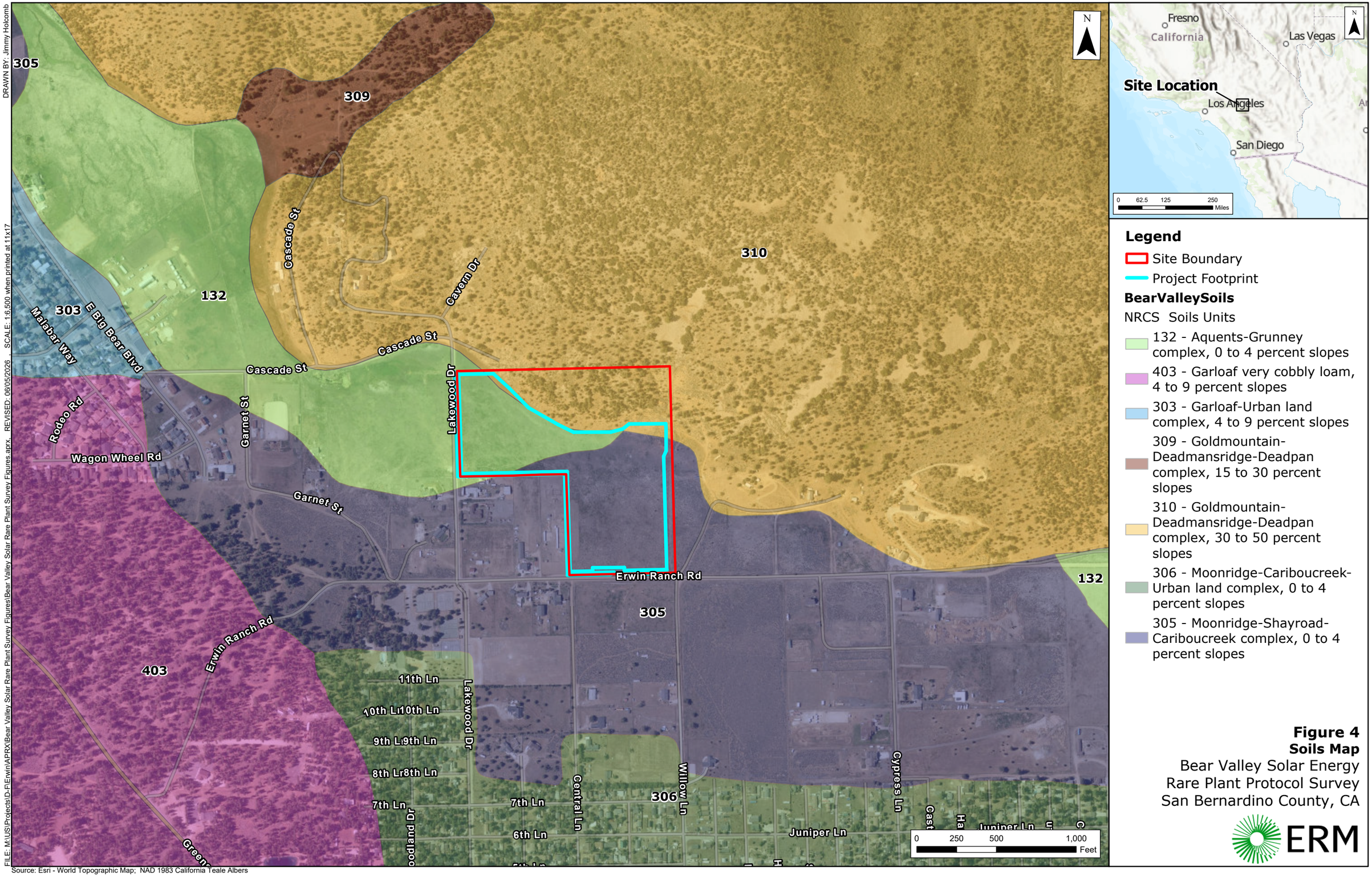
NWI Wetland Type

- Freshwater Emergent Wetland
- Riverine

Figure 3
Survey Area Map
Bear Valley Solar Energy
Rare Plant Protocol Survey
San Bernardino County, CA

ERM

Source: Esri - World Topographic Map; NAD 1983 California Teale Albers



Legend

- Site Boundary
- Project Footprint

BearValleySoils

NRCS Soils Units

- 132 - Aquents-Grunney complex, 0 to 4 percent slopes
- 403 - Garloaf very cobbly loam, 4 to 9 percent slopes
- 303 - Garloaf-Urban land complex, 4 to 9 percent slopes
- 309 - Goldmountain-Deadmansridge-Deadpan complex, 15 to 30 percent slopes
- 310 - Goldmountain-Deadmansridge-Deadpan complex, 30 to 50 percent slopes
- 306 - Moonridge-Caribou creek-Urban land complex, 0 to 4 percent slopes
- 305 - Moonridge-Shayroad-Caribou creek complex, 0 to 4 percent slopes

Figure 4
Soils Map
Bear Valley Solar Energy
Rare Plant Protocol Survey
San Bernardino County, CA

ERM

Source: Esri - World Topographic Map; NAD 1983 California Teale Albers

Lakewood Dr
Erwin Ranch Rd
0 50 100 200 Feet

Fresno
California
Las Vegas
Site Location
Los Angeles
San Diego
0 62.5 125 250 Miles

Legend

- Site Boundary
- Project Footprint

MUSYM

- Aquents-Grunney complex
- Moonridge-Shayroad-Caribou creek complex
- Goldmountain-Deadmansridge-Deadpan complex

Note:

- Aquents-Grunney complex vegetation community:
  - Upland Mustards (Brassica nigra - Centaurea (solstitialis, melitensis)
  - Herbaceous Semi-Natural Alliance (Upland mustards or star-thistle fields)).

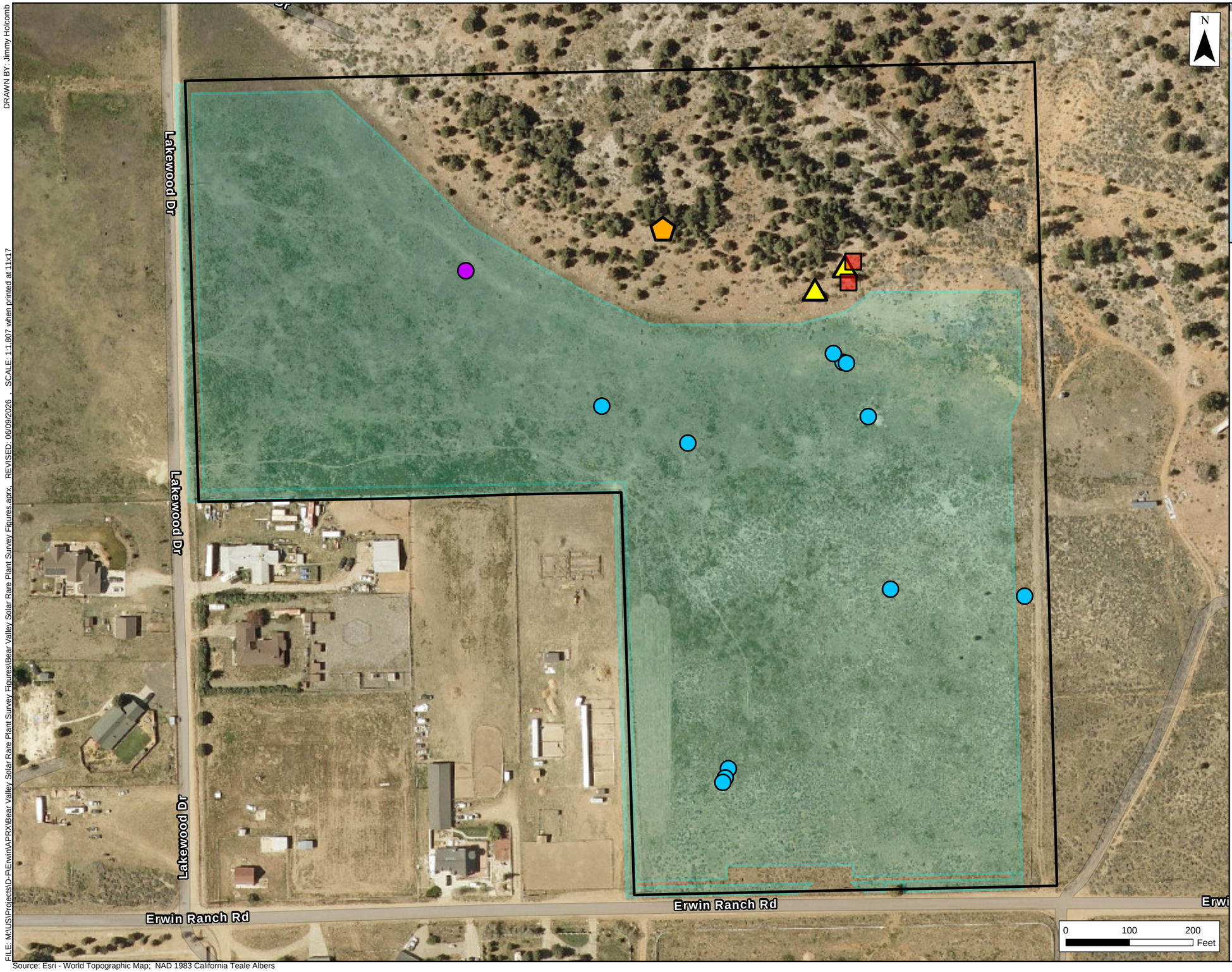
- Moonridge-Shayroad-Caribou creek complex vegetation community:
  - Big Sagebrush (Artemesia tridentata Shrubland Alliance (Big Sagebrush)).

- Goldmountain-Deadmansridge-Deadpan complex vegetation community:
  - Pinyon-Juniper Woodland (Pinus monophyla – (Juniperus osteosperma) Woodland Alliance (Singleleaf pinyon – Utah juniper woodlands))

Figure 5
Vegetation Communities Map
Bear Valley Solar Energy
Rare Plant Protocol Survey
San Bernardino County, CA

ERM

Source: Esri - World Topographic Map; NAD 1983 California Teale Albers



Legend

- Site Boundary
- Project Footprint

Special Status Plants Point

- Astragalus lentiginosus var. sierrae (Observed in both visits)
- Astragalus lentiginosus var. sierrae (Observed in second visit)
- Boechera parishii
- Eriogonum kennedyi var. austromontanum
- Linanthus killipii

Figure 6
Survey Results Map
Bear Valley Solar Energy
Rare Plant Protocol Survey
San Bernardino County, CA

ERM

Source: Esri - World Topographic Map; NAD 1983 California Teale Albers

DRAWN BY: Jimmy Holcomb , REVISED: 06/09/2026 , SCALE: 1:1,807 when printed at 11x17

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APPENDIX B REPRESENTATIVE PHOTOS

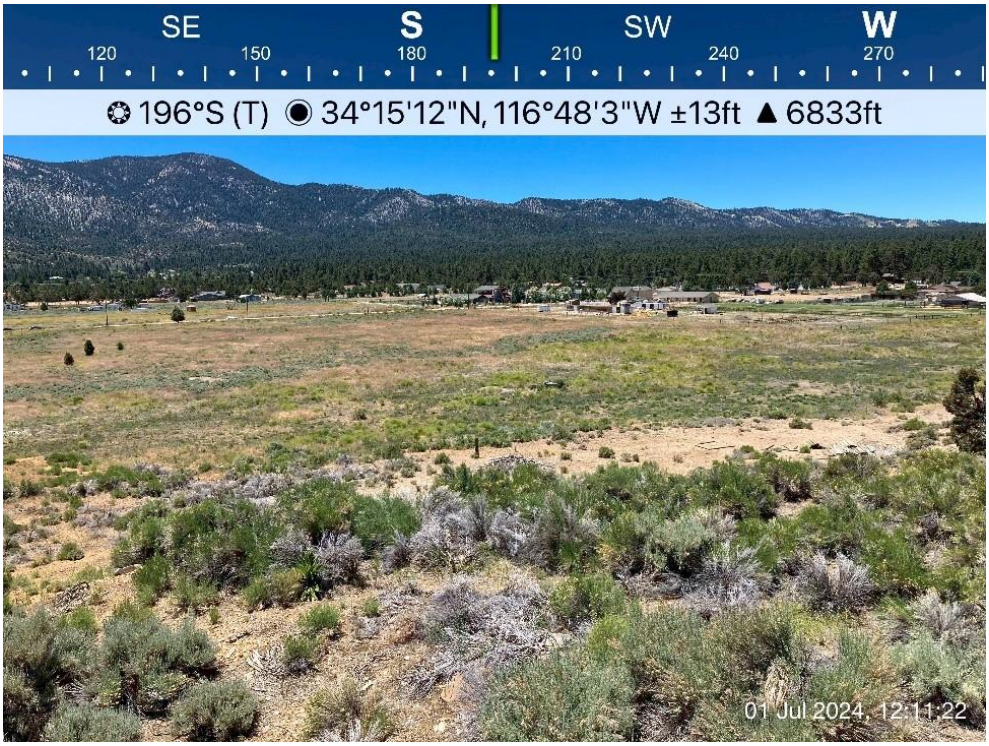

Photo 1: Overview of Project Area, taken from pinyon-juniper hillside, facing south.

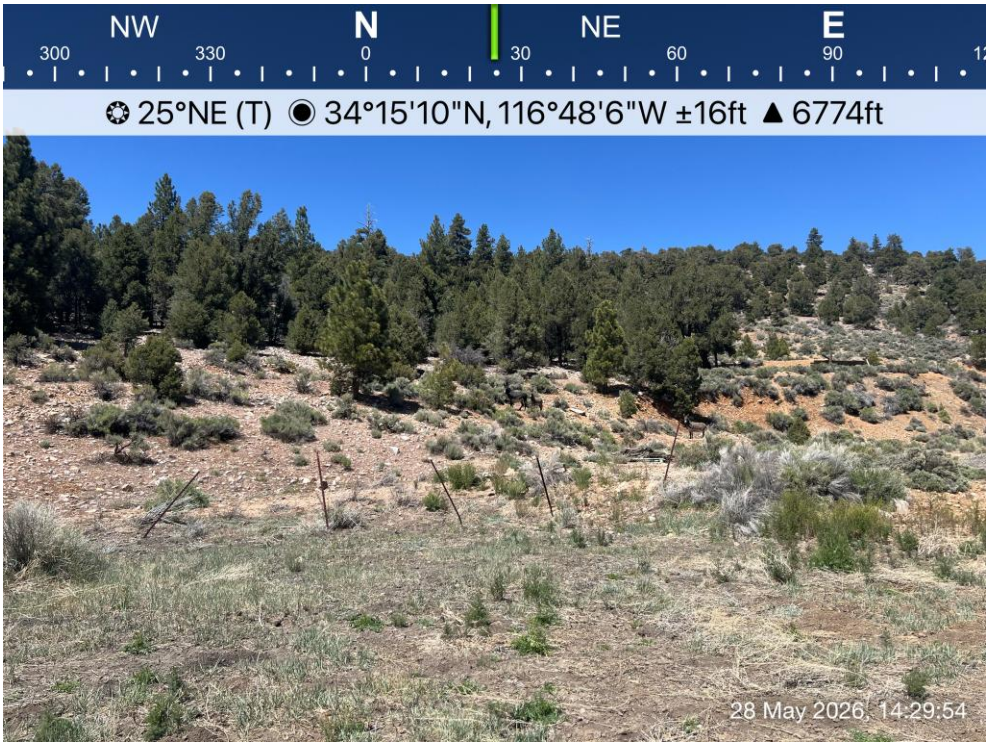

Photo 2: Overview of northwestern corner of the site, with pinyon-juniper woodland in the background, facing northeast.

Photo 3: Overview of disturbed upland mustard fields, taken in July 2024, facing east.

Photo 4: Overview of disturbed upland mustard fields, taken in September 2024, facing east.

Photo 5: Overview of disturbed upland mustard fields taken in May 2026, facing southeast.

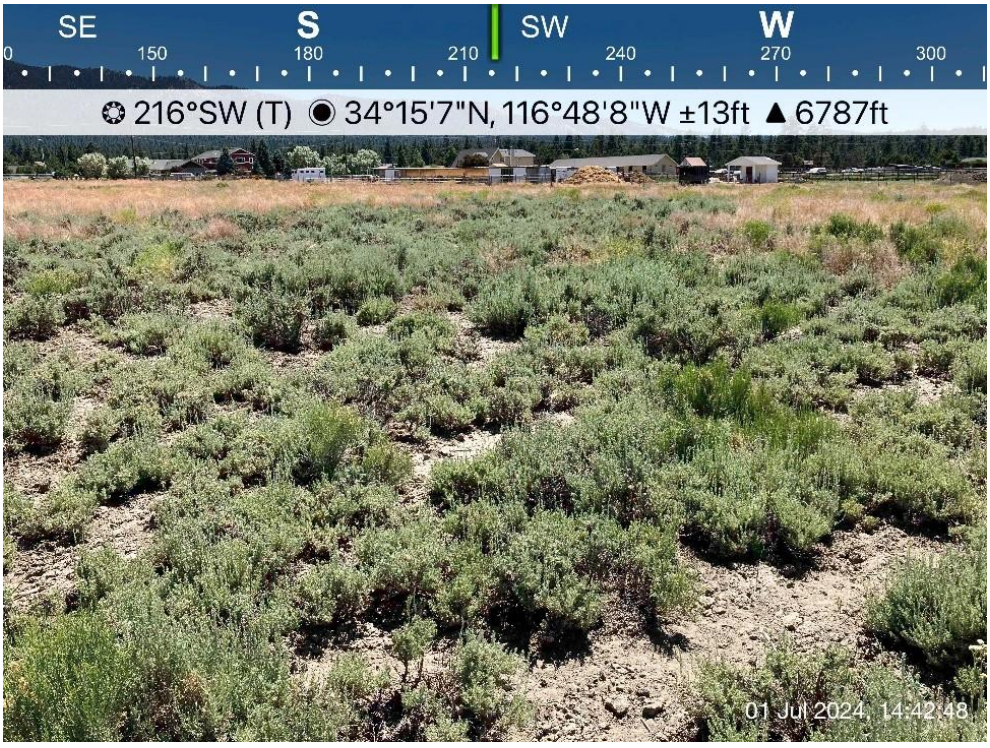

Photo 6: Overview of big sagebrush flat, facing southwest.

Photo 7: Close up of flowers and fruits of *Astragalus lentiginosus* var. *sierrae* on site.

Photo 8: Close up of vegetative *Astragalus lentiginosus* var. *sierrae* on site, relative to key fob.

Photo 9: Close up of *Boechera parishii* on site, depicting ascending silique and senescing lavender petals.

Photo 10: Overview of *Boechera parishii* individuals on hillside beneath *Artemisia tridentata*.

Photo 11: Close up of *Eriogonum kennedyi* var. *austromontanum* with persistent inflorescence stalks

Photo 12: Overview mat-forming habitat of *Eriogonum kennedyi* var. *austromontanum*

Photo 13: Overview of reference population of *Eriogonum kennedyi* var. *austromontanum* in flower, taken off-site.

Photo 14: Overview of senesced *Linanthus killipii*, observed on hillside in 2024, overlapping with CNDDB occurrence.

Photo 15: Overview of feral burros grazing on site, taken in 2024.

APPENDIX C FLORISTIC INVENTORY

Phylogenetic Category	Family	Scientific Name	Common Name	Lifeform	Native Status
Pteridophytes	Pteridaceae	*Pellaea mucronata*	birdfoot fern	fern	native
Gymnosperms	Cupressaceae	*Juniperus californicus*	California juniper	tree	native
		Juniperus grandis	Sierra juniper	tree	native
	Ephedraceae	*Ephedra viridis*	green ephedra	shrub	native
	Pinaceae	*Pinus jeffreyi*	Jeffrey pine	tree	native
		Pinus monophylla	single-leaf pinyon	tree	native
Angiosperms (Eudicots)	Amaranthaceae	*Amaranthus albus*	pigweed amaranth	annual herb	non-native
		Amaranthus biltoides	mat amaranth	annual herb	non-native
	Asteraceae	*Achillea millefolium*	common yarrow	perennial herb	native
		Artemesia ludoviciana	mugwort	perennial herb	native
		Artemesia tridentata	big sagebrush	shrub	native
		Chaenactis glabriuscula	Common yellow Chaenactis	Annual herb	native
		Ericameria nauseosa	rubber rabbitbrush	shrub	native
		Erigeron aphanactis	rayless fleabane	perennial herb	native
		Erigeron divergens	spreading fleabane	annual/biennial herb	native
		Gutierrezia sarothrae	broom snakeweed	shrub	native
		Pseudognaphalium canescens	Wright's cudweed	perennial herb	native

Phylogenetic Category	Family	Scientific Name	Common Name	Lifeform	Native Status
		Stephanomeria exigua	small wirelettuce	annual herb	native
		Symphyotrichum spathulatum	western mountain aster	perennial herb	native
	Boraginaceae	*Cryptantha muricata*	pointed cryptantha	annual herb	native
		Greeneocharis circumcissa	cushion cryptantha	annual herb	native
		Helitropium curassavicum	salt heliotrope	perennial herb	native
		Lappula redowskii	stickweed	annual herb	native
	Brassicaceae	*Boechera parishii*	Parish's rockcress	perennial herb	native
		Descurainia sophia	flix weed	annual herb	non-native
		Descurainia pinnata	Yellow tansy mustard	annual herb	native
		Sisymbrium altissimum	tall tumble mustard	annual herb	non-native
	Cactaceae	*Echinocereus mojavensis*	Mojave kingcup cactus	shrub (stem succulent)	native
		Opuntia phaecantha	brown-spined pricklypear	shrub (stem succulent)	native
	Chenopodiaceae	*Chenopodium berlandieri*	pit seed goosefoot	annual herb	native
		Chenopodium capitatum	strawberry blite	annual herb	non-native
		Krascheninnikovia lanata	winterfat	shrub	native
	Euphorbiaceae	*Euphorbia albomarginata*	rattlesnake sandmat	perennial herb	native
		Euphorbia lurida	woodland spurge	perennial herb	native

Phylogenetic Category	Family	Scientific Name	Common Name	Lifeform	Native Status
	Fabaceae	*Astragalus lentiginosus* var. *sierrae*	Bear Valley milkvetch	perennial herb	native
		Lupinus excubitus	grape lupine	shrub	native
		Lupinus lepidus	Pacific lupine	perennial herb	native
		Medicago polymorpha	California burclover	annual herb	non-native
	Geraniaceae	*Erodium cicutarium*	redstem filaree	annual herb	non-native
	Malvaceae	*Malva neglecta*	dwarf mallow	annual, perennial herb	non-native
		Fremontodendron californicum	California flannel bush	shrub	native
		Sphaeralcea ambigua	apricot mallow	perennial herb	native
	Namaceae	*Eriodictyon trichocalyx*	hairy yerba santa	shrub	native
	Nyctaginaceae	*Mirabilis laevis*	desert wishbone bush	perennial herb	native
	Onagraceaea	*Oenothera californica* ssp. *avita*	California primrose	perennial herb	native
	Orobanchaceae	*Castilleja applegatei* ssp. *martinii*	Martin's paintbrush	perennial herb (hemiparasitic)	native
		Castilleja chromosa	desert paintbrush	perennial herb (hemiparasitic)	native
	Polemoniaceae	*Leptosiphon breviculus*	Mojave linanthus	annual herb	native
		Linanthus killipii	Baldwin lake linanthus	annual herb	native
		Linanthus pungens	prickly phlox	shrub	native
		Microsteris gracilis	slender phlox	annual herb	native

Phylogenetic Category	Family	Scientific Name	Common Name	Lifeform	Native Status
	Polygonaceae	*Eriogonum davidsonii*	Davidson's buckwheat	annual herb	Native
		Eriogonum kennedyi var. *austromontanum*	southern mountain buckwheat	perennial herb	native
		Polygonum aviculare	common knotweed	annual herb	non-native
	Rosaceae	*Amelanchier utahensis*	western serviceberry	shrub	native
		Cercocarpus ledifolius	desert mountain mahogany	tree, shrub	native
		Horkelia rydbergii	Rydberg's horkelia	perennial herb	native
		Purshia tridentata	antelope bitterbrush	shrub	native
		Rosa woodsii	Woods' rose	shrub	native
	Rubiaceae	*Galium angustifolium* ssp. *angustifolium*	narrowleaf bedstraw	perennial herb	native
	Scophulariaceae	*Verbascum thapsus*	common mullein	perennial herb	non-native
Angiosperms (Monocots)	Cyperaceae	*Carex* sp.	sedge (grazed; no reproductive structures)	perennial grass-like herb	unknown
	Iridaceae	*Iris missouriensis*	blue flag iris	perennial herb	Native
	Juncaceae	*Juncus* sp.	rush (grazed; no reproductive structures)	perennial grass-like herb	unknown
	Poaceae	*Bromus tectorum*	cheatgrass	annual grass	invasive
		Elymus elymoides	squirreltail	perennial grass	native
		Elymus hispidus	intermediate wheatgrass	perennial grass	non-native
		Elymus repens	quackgrass	perennial grass	non-native

Phylogenetic Category	Family	Scientific Name	Common Name	Lifeform	Native Status
		Hordeum murinum	wall barley	annual grass	non-native
		Poa secunda	one-sided bluegrass	perennial grass	native

APPENDIX D SPECIES-SPECIFIC DETECTABILITY WINDOWS

Target Taxa Detectability Windows

Species	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
Astragalus lentiginosus var. sierrae	0	0	0	1	3	3	2	1	0	0	0	0
Astragalus leucolobus	0	0	0	0	3	2	2	0	0	0	0	0
Boechera dispar	0	0	1	2	3	1	0	0	0	0	0	0
Boechera parishii	0	0	1	3	3	0	0	0	0	0	0	0
Castilleja cinerea	0	0	0	0	2	3	2	2	0	0	0	0
Dudleya abramsii ssp. affinis	0	0	0	1	2	3	2	0	0	0	0	0
Eremogone ursina	0	0	0	0	2	2	1	1	0	0	0	0
Eriogonum kennedyi var. austromontanum	0	0	0	0	0	3	2	2	1	0	0	0
Ivesia argyrocoma var. argyrocoma	0	0	0	1	2	2	2	1	0	0	0	0
Linanthus killipii	0	0	0	0	3	2	1	0	0	0	0	0
Poa atropurpurea	0	0	0	3	3	3	1	0	0	0	0	0
Sidalcea pedata	0	0	0	0	2	3	2	2	0	0	0	0
Thelypodium stenopetalum	0	0	0	0	2	3	2	2	1	0	0	0
Viola pinetorum ssp. grisea	0	0	0	1	1	3	2	0	0	0	0	0

Detectability scores represent the relative likelihood that a species would be evident and identifiable during a botanical survey (0 = not detectable; 1 = low; 2 = moderate; 3 = peak). Scores were derived from published phenology information, occurrence databases, and reference population observations. **Bold species** were identified by CDFW (Comment 3A, 2025); non-bold species were identified by Dr. Timothy Krantz (2026). The protocol survey was conducted on 28 May 2026.

APPENDIX E SURVEYOR QUALIFICATIONS

Nicholas Smith, MS

Principal Technical Consultant, Scientist

SUMMARY

Nicholas Smith is a Principal Consultant based in Los Angeles, California, USA. Nicholas holds an MS degree in Environmental Biotechnology, and at ERM he works primarily as a wetland ecologist, botanist, and field biologist, supporting projects involving wetland delineations, habitat assessments, vegetation community mapping, energy permitting, and GIS analysis. Prior to joining ERM's Arid West team, Nicholas worked across private, governmental, nonprofit, and academic sectors in regions including the Pacific Northwest, Rocky Mountains, Great Plains, Great Lakes, New England, Florida Keys, Chilean Patagonia, and Costa Rica. Nicholas brings deep practical expertise in plant identification, systematics, biogeography, and vegetation ecology, applying this knowledge to support natural resource conservation, regulatory compliance, and sustainable energy development.

EXPERIENCE: 12+ years of professional experience in wetland ecology, botany, and field biology

LINKEDIN: https://www.linkedin.com/in/nick-smith-6aa666265/

EMAIL: nicholas.smith@erm.com

EDUCATION

- MS. Biotechnology. Northeastern University, USA, 2023
- BS. Ecology and Evolutionary Biology, The Evergreen State College, USA, 2008

LANGUAGES

- English, native speaker
- Spanish, fluent speaker
- Portuguese, basic conversational speaker

FIELDS OF COMPETENCE

- Wetland delineation
- Wetland ecology
- Botany and plant identification
- Rare, threatened, and endangered plant surveys
- Plant taxonomy
- Plant systematics

- Soil sampling
- Geospatial data collection and analysis
- Biological monitoring
- Invasive species management
- Biostatistics and data analysis
- Technical writing
- Scientific communication

PERMITS AND CERTIFICATIONS

- California Endangered Species Act (CESA) and Native Plant Protection Act (NPPA) Plant Voucher Collecting Permit, CDFW Permit No. 2081(a)-25-134-V
- Professional Wetland Scientist (PWS), Society of Wetland Scientists
- Certified Field Safety Officer – Responsible for implementing site-specific health and safety protocols in accordance with project-level Health and Safety Plans (HASPs)
- Adult First Aid & CPR Certification – American Red Cross

RELEVANT BOTANICAL WORK AT ERM

Rare Plant Survey and Floristic Inventory in the Great Basin

Conducted a rare plant survey and comprehensive floristic inventory in the Great Basin targeting special-status plant taxa consistent with Bureau of Land Management special status species requirements. Target taxa included meadow pussytoes (*Antennaria arcuata*), broad-pod freckled milkvetch (*Astragalus lentiginosus var. latus*), Osgood Mountains milkvetch (*Astragalus yoder-williamsii*), Elko rockcress (*Boechera falcifructa*), Deeth wild buckwheat (*Eriogonum nutans var. glabratum*), Davis' peppercress (*Lepidium davisii*), sagebrush cholla (*Opuntia pulchella*), Idaho beardtongue (*Penstemon idahoensis*), least phacelia (*Phacelia minutissima*), Nachlinger's catchfly (*Silene nachlingerae*). Contributed to a site-specific floristic inventory.

Rare Plant Protocol Survey in Simi Valley, CA

Conducted a rare plant protocol survey targeting five special-status plant taxa with documented potential to occur in the Simi Valley area: Plummer's mariposa-lily (*Calochortus plummerae*), mesa horkelia (*Horkelia cuneata var. puberula*), Payne's bush lupine (*Lupinus paynei*), Lyon's pentachaeta (*Pentachaeta lyonii*), white rabbit tobacco (*Pseudognaphalium leucocephalum*). Surveys were timed to coincide with the identifiable bloom periods of target taxa and were conducted using floristic, meandering transect methods consistent with CDFW's 2018 *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Authoring a protocol-level Rare Plant Survey Report presenting methods, results, and significance determinations (in preparation).

Rare Plant Protocol Survey in Santa Clarita, CA

Conducted a rare plant protocol survey targeting fifteen special-status plant taxa in the Santa Clarita area, including federally Endangered and CRPR 1B taxa associated with coastal sage scrub, grassland, and alluvial wash habitats: Nevin's barberry (*Berberis nevinii*), slender mariposa-lily

(*Calochortus clavatus var. gracilis*), Plummer's mariposa-lily (*Calochortus plummerae*), Peirson's morning-glory (*Calystegia peirsonii*), San Fernando Valley spineflower (*Chorizanthe parryi var. fernandina*), paniculate tarplant (*Deinandra paniculata*), slender-horned spineflower (*Dodecahema leptoceras*), Palmer's grapplinghook (*Harpagonella palmeri*), Newhall sunflower (*Helianthus inexpectatus*), California black walnut (*Juglans californica*), Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*), California Orcutt grass (*Orcuttia californica*), white rabbit tobacco (*Pseudognaphalium leucocephalum*), Coulter's matilija poppy (*Romneya coulteri*), chaparral ragwort (*Senecio aphanactis*). Surveys were conducted in accordance with CDFW's 2018 Protocols using floristic, meandering transect methods. Authoring a Rare Plant Survey Report presenting survey methods, results, and significance determinations for target and incidentally detected taxa (in preparation).

Rare Plant Protocol Survey in Santa Clarita, CA

Conducted a distinct rare plant protocol survey in the Santa Clarita area targeting six special-status plant taxa: Nevin's barberry (*Berberis nevinii*), club-haired mariposa lily (*Calochortus clavatus var. clavatus*), Plummer's mariposa-lily (*Calochortus plummerae*), Peirson's morning-glory (*Calystegia peirsonii*), San Fernando Valley spineflower (*Chorizanthe parryi var. fernandina*), California black walnut (*Juglans californica*). Surveys were conducted in accordance with CDFW's 2018 Protocols. Authoring a Rare Plant Survey Report summarizing methods, results, and impact analysis for surveyed taxa (in preparation).

Rare Plant Surveys in Los Angeles County, CA

Scheduled to conduct pre-construction rare plant surveys in the San Gabriel Mountains targeting the following species: San Gabriel manzanita (*Arctostaphylos glandulosa subsp. gabrielensis*), Palmer's mariposa lily (*Calochortus palmeri*), and Mt. Gleason's paintbrush (*Castilleja gleasonii*). Will collect existing conditions and habitat suitability information using Survey123 and document incidental threatened and endangerd species observations in Field Maps.

Rare Plant Surveys in Fresno and Tulare Counties, CA

Conducted pre-construction rare plant surveys in the western Sierra Nevada targeting the following species: Abrams' onion (*Allium abramsii*), Weston's mariposa lily (*Calochortus westonii*), Sierra suncup (*Camissonia sierrae* ssp. *sierrae*), Springville clarkia (*Clarkia springvillensis*), hoary cryptantha (*Cryptantha incana*), unexpected larkspur (*Delphinium inopinum*), cryptic monkeyflower (*Erythranthe inconspicua*), mouse buckwheat (*Eriogonum nudum* var. *murinum*), shortleaf hulsea (*Hulsea brevifolia*), madera leptosiphon (*Leptosiphon serrulatus*), whitebark pine (*Pinus albicaulis*), and Tulare gooseberry (*Ribes tularense*). Collected data with Survey123 and documented incidental threatened and endangered species observations in Field Maps.

Habitat Assessment in Kern County, CA

Conducted habitat assessment and botanical reconnaissance across a 6,859-acre utility-scale wind energy project footprint to evaluate rare plant habitat suitability, potential special-status plant occurrence, and permitting constraints informing survey design. Mapped populations of Joshua tree (*Yucca brevifolia*) and CDFW S3-ranked vegetation alliances per the *Manual of California Vegetation*. Compiled site-specific plant inventories to support impact assessment and recommendations for focused rare plant surveys and regulatory pathways. Co-authored the Habitat Assessment Report summarizing methods, findings, and permitting-oriented survey recommendations.

Habitat Assessment in Kern County, CA

Conducted a habitat assessment and preliminary wetland / waters investigation for a proposed solar development project, integrating desktop and literature reviews to evaluate the potential presence of special-status species, sensitive habitats, and potentially jurisdictional aquatic resources. Documented four populations of the federally endangered, state endangered, CRPR 1B.1 plant, Bakersfield cactus (*Opuntia basilaris var. treleasei*). Compiled a comprehensive species list based on field observations. Authored a Habitat Assessment Report summarizing methods, findings, and recommendations for focused surveys and permitting pathways.

Larval Host Plant Monitoring for Fiber Optic Conduit Installation at Dockweiler State Beach, Los Angeles County, CA

Conducted three months of biological construction monitoring during underground fiber optic conduit installation to ensure compliance with permit conditions and agency-approved avoidance and minimization measures. Performed pre-construction surveys and monitoring for dune buckwheat (*Eriogonum parvifolium*), including mapping and impact avoidance coordination, due to its role as the obligate larval host plant for the federally endangered El Segundo blue butterfly (*Euphilotes battoides allyni*). Supported implementation of avoidance and minimization measures to prevent direct and indirect impacts to host plant individuals and associated coastal dune habitat.

Aquatic Resources Delineation and Special-Status Plant Discovery in Tulare County, CA

Conducted an aquatic resources survey for a proposed solar development site on agricultural land in southeastern Tulare County, CA. Identified and mapped basins with artificial hydrology that met wetland criteria but qualified for exemption under the Clean Water Act (Section 404) and Porter-Cologne Act due to ongoing agricultural use. Documented the presence of a CRPR 1B.2 special status plant, Sanford's arrowhead (*Sagittaria sanfordii*), which was not identified in the CNDDB query prior to the site visit, thereby expanding the species' known distribution in California. Authored a CEQA-level Aquatic Resources Delineation report characterizing jurisdictional and non-jurisdictional features and recommending voluntary mitigation strategies to address potential impacts to aquatic resources.

Biological Resource Surveys and Jurisdictional Wetland Delineations in Bear Valley, CA

Surveyed vegetation and delineated wetlands on a prospective solar development site outside the city of Big Bear City, CA. Conducted a desktop analysis using geospatial wetlands, waters, and biological resource data sets from state and federal agencies. Identified a population of the CRPR 1B.2 plant, Bear Valley milk vetch (*Astragalus lentiginosus* var. *sierrae*), and a population of the CRPR 1B.2 plant, Baldwin Lake linanthus (*Linanthus killpii*). Authored a CEQA-level Aquatic Resources Delineation Report and Biological Resources Assessment.

Jurisdictional Wetland Delineations and Vegetation Community Mapping in Inyo, Kern, Los Angeles, Mono, Riverside, Santa Barbara, San Bernardino, and Tulare Counties, CA

Delineated wetlands and conducted field-based botanical inventories to support deteriorated pole replacement and vegetation management activities adjacent to electrical transmission and distribution infrastructure. Mapped vegetation communities consistent with the *Manual of California Vegetation* and delineated jurisdictional features with sub-meter accuracy. Quantified tree trimming

and brush removal extents (area and linear measurements), estimated prescribed treatments, and evaluated potential impacts to state and federal wetland resources to support regulatory compliance and avoidance/minimization measures.

RELEVANT BOTANICIAL WORK PRIOR TO ERM

Rare Plant Surveys and Jurisdictional Wetland Delineations in Central Maine

Led rare plant surveys for a state endangered orchid, small whorled pogonia (*Isotria medeoloides*), and delineated jurisdictional wetlands across several thousand acres of prospective solar development sites in Central Maine. Communicated the presence of rare plant populations to Maine Natural Areas Program and authored technical reports cataloguing natural resources and offering compliance recommendations.

Plant Community Composition Data Collection and Analysis in Response to Fluctuating Water Levels in Lake Ontario for the New York Natural Heritage Program

Participated in a research study examining the relationship between water-level fluctuations and plant community composition along an elevation gradient in Lake Ontario lacustrine wetlands. Findings revealed significant correlations between fluctuation intensity and vegetation patterns, providing valuable insights for modelling Lake Ontario plant communities and informing adaptive management strategies in response to water-level regulation changes.

Vulnerable Plant Population Mapping for Grant-Funded Academic Research in Chilean Patagonia

Ground-truthed and mapped the boundaries of both undisturbed and regenerating stands of cipres de la guiateca (*Pilgerodendron uviferum*), a conifer classified by the IUCN as vulnerable. Sampled vascular plant and bryophyte composition, soil characteristics, hydrology, and presence and severity of anthropogenic disturbance across 15 sites to elucidate the relationship between microsite variables, plant abundance, and stand structure. Designed and implemented an experimental plantation of *P. uviferum* seedlings to test the effects of specific microsite variables on seedling survival and growth.

Lead Botanist for USGS to Assess Impacts of Oil and Gas Development in Williston Basin, ND

Led a comprehensive vegetation survey across 44 sites in the Williston Basin to assess the impact of energy development on non-native plant species. Designed and implemented a systematic sampling methodology, collecting data on species richness and cover at oil well sites of varying ages and control sites in native prairie environments. Analysis revealed significantly higher non-native species richness and cover near well pads, providing valuable insights for land management and conservation efforts in areas affected by energy development.

Ecological Site Description for Intermontane Prairie Potholes in Western MT with Montana Natural Heritage Program

Conducted ecological site descriptions of Intermontane Prairie Pothole systems in northwestern Montana, focusing on their unique hydrological characteristics and floristic composition. Analyzed water permanence patterns and vegetation zonation across various wetland types, identifying

dominant emergent graminoids and assessing the influence of invasive species. Contributed to the classification of these wetlands as Wetlands of Special Significance due to their limited distribution and importance as wetland-grassland complexes.

Assistant Botanist for the 2011 National Wetland Condition Assessment in Montana

Served as Assistant Botanist for the National Wetland Condition Assessment, a comprehensive survey of wetland health across the United States funded by the EPA. Conducted vegetation surveys in diverse wetland types, identifying plant species and assessing community composition, structure, and indicators of disturbance. Contributed to data collection and analysis that informed national-scale wetland management policies and conservation strategies.

Wetland Condition Assessments for Montana's Rotating Basin Project

Contributed to the development of a comprehensive Wetland and Riparian Mapping, Assessment and Monitoring Program for the state. Helped establish clear objectives for increasing knowledge about wetland and riparian ecosystems, enhancing protection, supporting regulatory decisions, and prioritizing restoration activities. Assisted in defining specific goals and intended outcomes, including creation of statewide digital maps, evaluation of human impacts, collection of biotic and abiotic field data, and promotion of data exchange across jurisdictions to support various stakeholders in wetland management and conservation efforts.

Vegetation Sampling on Robinson Crusoe Island, Chile with Post-Doctoral Researcher from Stanford University

Led a field vegetation sampling team on a multi-year, post-doctoral experimental study to assess the effects of rabbit presence and soil disturbance on plant species frequency in grassland ecosystems. Executed a comprehensive field experiment involving eight 20- x 40-meter blocks with rabbit exclusion fencing and soil disturbance treatments, resulting in four distinct treatment combinations. Conducted annual austral spring censuses in 2009 and 2011, utilizing a novel frequency-based sampling method to efficiently capture plant diversity and community composition across 384 permanent subplots.

Larval Host Plant and Community Composition Surveys in Western WA Prairies with WA Department of Fish and Wildlife

Contributed to the evaluation and implementation of Prairie Quality Monitoring (PQM) and Land Condition Mapping (LCM) surveys for assessing habitat suitability for populations of the federally endangered Taylor's checkerspot butterfly (*Euphydryas editha taylori*). Assisted in in data collection and analysis of host plant distribution and abundance, particularly paintbrushes (*Castilleja* spp.), in 10- x 10-meter plots, contributing to habitat enhancement planning and potential reintroduction efforts at new sites.

Invasive Species Mapping and Exotic Plant Removal on Big Pine Key, FL with the Institute for Regional Conservation

Participated in invasive species mapping and exotic pest plant removal efforts in the Florida Keys Wildlife and Environmental Area, targeting invasive species that threaten native ecosystems. Implemented manual and chemical control methods to eradicate or manage priority invasive plants, such as Brazilian pepper (*Schinus terebinthifolius*) and Australian pine (*Casuarina* spp.).

Collaborated with local agencies and stakeholders to develop and execute strategic removal plans, contributing to the restoration and preservation of pine-rockland habitats.

Plant Community Composition Variation Analysis Following Prescribed Burns in Western WA Prairies with The Nature Conservancy

Evaluated prairie plant community composition variation across a matrix of restoration treatments with different burning histories and grass-specific herbicide applications. Analyzed data using a combination of GIS modelling and non-parametric, multivariate statistics. Findings confirmed increases in plant species richness following a prescribed fire in addition to lower exotic and higher native cover following herbicide treatment.

Tropical Plant Systematics Research at the Osa Biodiversity Center on the Osa Peninsula, Costa Rica

Conducted an independent academic research project on tropical plant systematics, collecting and identifying approximately 250 angiosperms for the compilation of a plant list for a biological research center in the neotropics. Collaborated with a wildlife photographer to craft an interpretive field guide to the common flora and fauna surrounding the station. Maintained a native plant nursery for local restoration initiatives.

APPENDIX F CDFW VOUCHER COLLECTING PERMIT

State of California -The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Habitat Conservation Planning Branch
Native Plant Program
P.O. Box 944209
Sacramento, CA 94244-2090
http://www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Date: 5/8/2025

Nicholas Smith
1137 14th Street, Apartment A
Santa Monica, CA 90403

California Endangered Species Act and Native Plant Protection Act Plant Voucher Collecting Permit (2081(a)-25-134-V)

Dear Nicholas Smith:

Enclosed please find a fully executed plant voucher collecting permit (2081(a)-25-134-V). Please read the permit conditions carefully and note that this authorization permits the collection of voucher specimens only under limited circumstances. Your permit will be valid until **December 31, 2027**. You must submit an annual report after each calendar year that the permit is valid. The report must indicate if collections were made during the previous calendar year and provide the required information for any collections that were made. Based on the terms of your permit, you must report calendar-year collections by the following dates: **January 31, 2026**; **January 31, 2027**; and **January 31, 2028**.

Below, you will find hyperlinks to the Annual Report Form, the California Natural Diversity Database (CNDDB) Online Field Survey Form and PDF Field Survey Form, and the Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities that you may use to easily report your activities as required in the permit (see Forms and Guidance links at the end of the letter).

This permit does not authorize the collection of seeds or cuttings for propagation, nor the collection of plants or plant parts under any circumstance other than those specifically listed in the permit. To request additional authorization for actions not covered in your permit, or if you have any questions, please contact the Native Plant Program at nativeplants@wildlife.ca.gov or (916) 594-4005.

Sincerely,

DocuSigned by:
36A908313DB6442...
Isabel Baer
Native Plant Program Manager
Habitat Conservation Planning Branch

Forms and guidance:

- Annual Report Form
- CNDDB Online Field Survey Form or PDF Field Survey Form (General Instructions)
- Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
HABITAT CONSERVATION PLANNING BRANCH
NATIVE PLANT PROGRAM
P.O. BOX 944209
SACRAMENTO, CA 94244-2090

California Endangered Species Act
Native Plant Protection Act
Plant Voucher Collecting Permit No. 2081(a)-25-134-V

Authority:
This California Endangered Species Act (CESA) and Native Plant Protection Act (NPPA) Permit (Permit) is issued by the California Department of Fish and Wildlife (CDFW). CESA prohibits the take[1] and possession of any species, or any part or product of a species that is designated by the California Fish and Game Commission as an endangered, threatened, or candidate species. The NPPA prohibits the take and possession of any native plant that is designated by the California Fish and Game Commission as endangered or rare. CDFW, however, may authorize the take or possession of such species by permit for scientific, educational, or management purposes pursuant to Fish and Game Code section 2081, subdivision (a) and California Code of Regulations, Title 14, section 786.9, subdivision (c).

Permittee:	**Nicholas Smith**
Address:	**1137 14th Street, Apartment A** **Santa Monica, CA 90403**
Current Affiliation:	**Managing Technical Consultant, Scientist** **Environmental Resources Management** **1920 Main Street, Suite 300** **Irvine, CA 92614**
Contact Information:	**(207) 595-9773** **nlsmith031@gmail.com**

Effective Date and Expiration Date of this Permit:
This Permit becomes effective on the date of CDFW's signature. This authorization shall expire on **December 31, 2027**.

Notwithstanding the expiration date, Permittee's obligations pursuant to this Permit do not end until all voucher sheets are deposited in approved herbaria, all findings have been reported to the California Natural Diversity Database (CNDDB) and all annual reports have been submitted as required in the Conditions of Approval of this Permit.

[1] Pursuant to Fish and Game Code section 86, "Take" means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.

Take Authorization:
This Permit authorizes Permittee and only Permittee to take and possess plants designated as rare pursuant to the NPPA or designated as endangered, threatened, or candidate species pursuant to CESA (Covered Species) for identification and voucher collection purposes subject to the limitations described in this Permit. This Permit does not authorize take and possession of Covered Species for activities other than plant identification and voucher collection, take and possession of Covered Species resulting from violation of this Permit, or take and possession of Covered species not authorized by law. This Permit does not authorize import, export, or sale of Covered Species. Activities allowed under this Permit do not represent nor shall be construed as mitigation for any current or future impacts to Covered Species.

Conditions of Approval:
CDFW's issuance of this Permit and Permittee's authorization to take and possess Covered Species are subject to Permittee's compliance with and implementation of the following conditions of approval:

1) **Legal Compliance:** This Permit does not necessarily create an entitlement to collect voucher specimens. Permittee shall comply with all applicable state, federal and local laws in existence on the effective date of this Permit or adopted thereafter. Permittee shall not conduct activities authorized in this Permit without first obtaining landowner permission, and all other necessary permits and approvals. Permittee shall obtain a separate written authorization from CDFW prior to conducting any activities authorized by this Permit on CDFW lands.
2) **Permit Possession:** Permittee shall carry a copy of this Permit whenever collections are made and shall present it to CDFW personnel or personnel from another state, federal, or local agency upon request.
3) **Voucher Collection:** Permittee shall become familiar with all existing Covered Species occurrences in an area before making a collection in that area. Permittee may only collect a voucher specimen for the following reasons:
    a) To verify the identity of a plant;
    b) To document a new occurrence of a Covered Species unknown previously to the botanical community, including, but not limited to CDFW and the CNDDB;
    c) To voucher a specimen from a population or occurrence from which no specimen exists in an herbarium;
    d) To voucher a specimen from a population or occurrence from which all existing voucher specimens lack the key characteristics necessary for identification; or
    e) To voucher a specimen from a population or occurrence from which no vouchers have been collected within the past ten years.
4) **Collection Precautions:** Permittee shall ensure that collection of individual plants does not harm the reproductive success of the population they are collected from.

Permittee shall limit the number of individuals collected from a population of any taxon to the minimum necessary to positively identify the plant and make either one or two voucher sheets. If Permittee will prepare one voucher sheet, Permittee shall not collect more than five individuals or two percent of the population, whichever is less. If Permittee will prepare two voucher sheets, Permittee shall not collect more than ten individuals or two percent of the population, whichever is less.

5) **Deposit in Herbarium:** For each collection of a Covered Species, Permittee shall provide the material sufficient to create one or two voucher sheets and deposit the specimens in herbaria that are members of the Consortium of California Herbaria.[2] The specimens shall either be properly mounted on one or two voucher sheets before submittal, or submitted as instructed by the herbaria. Permittee shall provide the Permit number to the herbaria, along with the other information submitted with the specimens. If two voucher sheets will be prepared, Permittee shall send them to two separate herbaria in California. Permittee shall not deposit Covered Species voucher sheets in personal, agency, or company herbaria, or herbaria located outside of California unless CDFW authorizes such actions in writing.

6) **Report of Findings:** Permittee shall report the current status of any Covered Species populations visited, and any new discovery of a Covered Species or any other species of CDFW conservation concern[3] by submitting a CNDDB Field Survey Form.[4] The survey form may either be submitted through CNDDB's Online Field Survey Form or via the PDF Field Survey Form.[5] Permittee shall provide locations, documented with global positioning systems (GPS) if possible, and include the datum[6] in which the data was collected. If the Permittee submits a PDF Field Survey Form, Permittee shall complete the form according to the General Instructions for Filling Out California Natural Diversity Database Field Survey Forms,[7] and shall include a copy of the relevant portion of a 7.5-minute topographic map with the occurrence or population mapped. Permittee shall submit a completed Field Survey Form no later than January 31 of the year following the observation.

7) **Annual Report:** Permittee shall provide a summary of the Covered Species collection activities each calendar year that this Permit is in effect to CDFW's Habitat Conservation Planning Branch by January 31 of the following year. Reports may be provided by Permittee using the one-page Annual Report form, which is available from CDFW's web page.[8] If collections of Covered Species were made, each collecting report shall include: (1) the list of taxa collected, (2) collection numbers for the voucher sheets, (3) dates of collection, (4) the number of voucher

[2] https://ucjeps.berkeley.edu/consortium/participants.php
[3] Species of conservation concern include "Special Plants" described on page i of CDFW's Special Vascular Plants, Bryophytes, and Lichens List: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383
[4] https://wildlife.ca.gov/Data/CNDDB/Submitting-Data
[5] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=25739
[6] NAD83, NAD27 or WGS84
[7] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=25736
[8] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=56762

sheets made, (5) the codes for the herbaria where voucher sheets were deposited,[9] (6) the CNDDB occurrence number for the population (if there is one), (7) the purpose of the collection (see Condition of Approval #3), and (8) the Permit number and Permittee contact information. If collections of Covered Species were not made in the previous calendar year, Permittee shall notify CDFW's Habitat Conservation Planning Branch of this in writing (e-mail is acceptable).

Permit Execution and Contact Information:
This Permit becomes effective on the date of CDFW's signature. Written notices, annual reports, and other communications relating to this Permit shall be e-mailed to CDFW at nativeplants@wildlife.ca.gov and shall reference the Permit number (2081(a)-25-134-V) in the e-mail and on any associated documents. If it is not possible for Permittee to e-mail documents, Permittee may mail written notices, annual reports, and other communications relating to this Permit to:

California Department of Fish and Wildlife
Habitat Conservation Planning Branch
Native Plant Program
P.O. Box 944209
Sacramento, CA 94244-2090

Liability:
Permittee shall be solely liable for any violations of this Permit, CESA, the NPPA, or any other law or regulation. This Permit does not constitute CDFW's endorsement of, or require Permittee to proceed with, voucher collection activities. The decision to proceed with voucher collection activities is Permittee's alone.

Amendment, Revocation, and Enforcement:
This Permit may be amended or revoked by CDFW for any reason, at any time without the concurrence of Permittee. Nothing in this Permit precludes CDFW from pursuing an enforcement action against Permittee instead of, or in addition to amending or revoking this Permit. Nothing in this Permit limits or otherwise affects CDFW's enforcement authority or that of its enforcement personnel.

Hyperlinks:
Annual Report Form

CNDDB Online Field Survey Form or PDF Field Survey Form (General Instructions)

Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities

[9] https://ucjeps.berkeley.edu/consortium/participants.html

ISSUED BY THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

ON 5/8/2025

DocuSigned by:
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ISABEL BAER
NATIVE PLANT PROGRAM MANAGER
HABITAT CONSERVATION PLANNING BRANCH

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ERM's Irvine Office

1920 Main Street
Suite 300
Irvine, CA 92614

T +1 949 623 4700
F +1 949 623 4711

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