



Wetland Mitigation and Monitoring Plan for Impacts to Waters
Panoche Valley Solar Energy Project

Wetlands Mitigation and Monitoring Plan for Impacts to Waters and Habitats

Panoche Valley Solar Facility Project

San Benito County, California

June 2015

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June 2015

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Acronyms and Definitions

AC	alternating current
AMSL	above mean sea level
Applicant	Panoche Valley Solar, LLC (also PVS)
BLM	Bureau of Land Management
BMP	best management practice
BNLL	blunt-nosed leopard lizard
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CMP	Conservation Management Plan
CNLM	Center for National Lands Management
CNPS	California Native Plant Society
CTS	California tiger salamander
CWA	Clean Water Act
DEIR	Draft Environmental Impact Report
FEIR	Final Environmental Impact Report
FT ²	square feet
GIS	Geographical Information System
GKR	giant kangaroo rat
HMP	Habitat Management Plan
LF	linear foot/feet
LSAA	Lake and Streambed Alteration Agreement
M	meters
MUN	Municipal and Domestic Supply
MW	megawatt
NRCS	National Resource Conservation Service
OHWM	ordinary high water mark
PAR	Property Analysis Record
PCSW	Panoche/Silver Creek Watershed
PJD	preliminary jurisdictional determination
PV	photovoltaic
PVS	Panoche Valley Solar, LLC (also Applicant)
RWQCB	Central Valley Regional Water Quality Control Board
SCRCL	Silver Creek Ranch Conservation Lands
SJKF	San Joaquin kit fox
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VFCL	Valley Floor Conservation Lands
VRCL	Valadeao Ranch Conservation Lands
WMMP	Wetland Mitigation and Management Plan
WRCC	Western Regional Climate Center

1 INTRODUCTION AND PURPOSE

Panoche Valley Solar, LLC (PVS or Applicant) proposes to construct and operate a utility-scale, approximately 247 alternating current (AC) megawatt (MW), solar photovoltaic (PV) energy generating facility, known as the Panoche Valley Solar Facility (the Project or Project Footprint), on private lands in San Benito County (the County), California (**Appendix A, Figure 1**). Construction of the Project will result in impacts to areas under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Central Valley Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW) (**Appendix A, Figure 2**). State and Federal regulations require mitigation for impacts to waters of the United States (U.S.), also referred to as Federal waters, and waters of the State (State waters).

Mitigation for permanent impacts to waters of the U.S., State waters, and associated habitat is being accomplished through enhancement of wetlands and drainages, and preservation of waters within three tracts of conservation land (Valley Floor Conservation Lands [VFCL], Valadeao Ranch Conservation Lands [VRCL], and Silver Creek Ranch Conservation Lands [SCRCL]), collectively “Conservation Lands,” described herein. This Wetland Mitigation and Monitoring (WMMP or Plan) describes detailed mitigation activities and plans, performance criteria to measure success, initial monitoring and management actions, long-term management activities, and estimated costs for the above mentioned Conservation Lands for unavoidable impacts to State and Federal waters.

This WMMP has been prepared and formatted to meet permit conditions of the USACE (Clean Water Act Section 404), the RWQCB (Clean Water Act Section 401; Waste Discharge Requirements), and the CDFW (Lake and Streambed Alteration Agreement 1602).

1.1 Responsible Parties and Mitigation-related Roles

PVS is responsible for implementing mitigation for the Project. Energy Renewal Partners, LLC (Energy Renewal) is the Applicant's authorized agent and preparer of this WMMP to implement mitigation to offset impacts to Federal and State waters. Primary contact information for these parties is below:

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Authorized Agent: Energy Renewal Partners, LLC
305 Camp Craft Road, Suite 575
West Lake Hills, Texas 78746
Contact: Trisha Elizondo
Contact Phone: (512) 222-1125
Email: telizondo@energyrenewalpartners.com

Other roles related to mitigation for this Project include: implementation of enhancement activities, holding a conservation easement over the Conservation Lands, managing the Conservation Lands in perpetuity, and managing an endowment for Conservation Lands stewardship.

Implementation of enhancement activities: These enhancement activities, described in Section 7.0 (Mitigation Work Plan) may be contracted by the Project Applicant to qualified consultants, or may be conducted directly (or indirectly through contracts) by the Perpetual Land Manager.

Biological monitoring during performance period: This role could be provided by the Perpetual Land Manager or contracted to a qualified consultant.

Perpetual Land Management: The Center for Natural Lands Management (CNLM) or other qualified and approved third-party entity would conduct activities for this role as Perpetual Land Manager. This work is detailed in Section 4.0 (Long-term Site Protection) of this document. Management activities include all biological monitoring, protection (e.g., such as fencing), reporting, grazing management, and other appropriate stewardship activities to maintain the conservation functions and values of the Conservation Lands in perpetuity.

Conservation Easement Role: The owner of the Conservation Lands will grant Conservation Easement(s) to a qualified entity to protect and maintain their natural open space condition in perpetuity per the Conservation Management Plan (CMP) and the Habitat Management Plan (HMP). The grantee of the Conservation Easement(s) will be responsible in perpetuity for monitoring the Conservation Lands for compliance with terms of the Conservation Easement(s), defending and enforcing the Conservation Easement(s), and providing annual reports. The USACE, RWQCB, U.S. Fish and Wildlife Service (USFWS), the County, and CDFW are anticipated third-party beneficiaries of the Conservation Easement(s). It is anticipated that the Perpetual Land Manager would also hold the Conservation Easement(s), given the efficiency in use of financial resources.

The description of the long-term management and the restrictions for these Conservations Lands are summarized in Section 10.0 (Long-term Management).

1.2 Document Overview and Purpose

As stated above, this Plan describes detailed enhancement activities and plans, performance criteria to measure success, initial monitoring and management actions, and long-term management activities for unavoidable impacts to State and Federal waters resulting from construction of the Project. The WMMP will focus on enhancement to aquatic resources (e.g., creeks, drainages, and swales), whereas a separate Habitat Management Plan (HMP) will describe and define the management and monitoring activities that will occur on the more upland habitats (grasslands and shrublands) within the Conservation Lands as set forth in the Conservation Management Plan (CMP), which provides the strategy elements and standards proposed for protecting, maintaining, and enhancing Conservation Lands for Federal and State-listed species and their associated habitats. The intention of this document is to adhere to the requirements set forth in the 2008 Clean Water Act (CWA) Section 404 Final Compensatory Mitigation Rule (33 Code of Federal Regulations [CFR] Parts 325 and 332). This WMMP also provides information related to the function-based assessment of the impact and mitigation sites using appropriate assessment methods.

The mitigation, monitoring, and management activities described in this WMMP are intended to meet the permit requirements of the USACE, CDFW, and RWQCB, as well as the USACE regulatory requirements for preparation of mitigation plans set forth in 33 CFR 332.4(c). The regulatory requirements contained in 33 CFR 332.4(c), as issued by the USACE in 2008, generally encompass the requirements of mitigation and monitoring plans for all of the resource agencies (USACE 2008). The 2008 regulations require a WMMP to include:

- Mitigation Objectives, including resource type, amounts, and methods of compensation (see Section 2.0 of this document)
- Site Selection, including key factors for providing mitigation at a site (see Section 3.0 of this document)
- Site Protection Instrument (see Section 4.0 of this document)
- Baseline Information, including ecological characteristics of impacted and mitigation sites (see Section 5.0 of this document)
- Determination of Credits, including a description of how the mitigation will provide compensatory mitigation for impacts (see Section 6.0 of this document)
- Mitigation Work Plan, including detailed descriptions of the work to be performed in implementing mitigation (see Section 7.0 of this document)
- Maintenance Plan, including maintenance activities to continue viability of the mitigation site (see Section 8.0 of this document)
- Ecologically Based Performance Standards (see Section 9.0 of this document)
- Monitoring Requirements and Methods (see Section 9.0 of this document)
- Long-term Management Plan (see Section 10.0 of this document)
- Adaptive Management Plan (see Section 11.0 of this document)
- Financial Assurance (See Section 12.0 of this document)

Impacts to Federal and State waters are described in the Section 404(b)(1) Alternatives Analysis prepared for the USACE, as part of the Lake and Streambed Alteration Agreement (LSAA) Notification Package prepared for the CDFW, as part of the Section 401 Water Quality Certification Application prepared for the RWQCB. All permit application documents contain a complete project description and detailed impacts to Federal and State waters.

2 MITIGATION GOALS AND OBJECTIVES FOR THE CONSERVATION LANDS

The goal and purpose of this WMMP is to mitigate Project impacts and protect Federal and State waters on the Conservation Lands. This WMMP seeks to:

- Preserve and manage aquatic resources in perpetuity as a “watershed” approach to mitigation.
- Preserve and enhance stream, ephemeral drainage and wetland functions.

Mitigation activities include the total preservation of approximately 716,852 linear feet (LF) (approximately 136 miles) of stream/creek, ephemeral drainage, and wetland habitat within a total of approximately 24,176 acres in three large parcels of land (Conservation Lands), to be protected in

perpetuity (**Appendix A, Figure 3a and 3b**). Additional details of the Conservation Lands can be found in Section 2.1. (Resource Functions of the Mitigation Project).

The mitigation activities include the enhancement of approximately 11.96 acres of drainages and associated habitat by trash removal (0.44 acre), creation of three California tiger salamander (CTS; *Ambystoma californiense*) pool habitats (0.31 acre) for the Federal- and State-threatened CTS, pool enhancement for the two impacted vernal pools (0.05 acre), and grazing exclusion from portions of Panoche Creek (11.16 acres) (**Appendix A, Figure 4**). Mitigation approaches for the Project are defined as follows:

- **Preservation:** The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. Preservation includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms.
- **Enhancement:** The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s).
- **Establishment (creation):** The manipulations of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

2.1 Resource Functions of the Mitigation Project

All three of the Conservation Lands support a large amount of ephemeral and intermittent streams along with federally jurisdictional creeks (portions of Panoche and Las Aguilas Creeks), which have a perennial section with riparian and wetland habitat (**Appendix A, Figures 3a-3b**). The Conservation Lands were selected to provide local mitigation for special-status species and Federal and State waters, to preserve self-sustaining populations of special-status species, and to protect permanent movement corridors between adjacent Bureau of Land Management (BLM) controlled lands. Special status species is a broad term to refer to all the animal taxa tracked by the CDFW's California Natural Diversity Database. The CDFW considers taxa on this list to be those of greatest conservation need in California.

It is acknowledged that these preservation and enhancement activities will be conducted within a landscape context with other special-status and sensitive species and habitats. As expansion or enhancement of certain natural resources and habitat types may be at the expense of others, this WMMP is focused on appropriate protection and enhancement of protected waters, wetlands, and associated species with attention to minimizing adverse impacts on other conservation values. More specifically, many of the special-status species found on the conservation lands including San Joaquin kit fox (SJKF; *Vulpes macrotis mutica*), giant kangaroo rat (GKR; *Dipodomys ingens*), blunt-nosed leopard lizard (BNLL; *Gambelia silus*), and San Joaquin antelope squirrel (*Ammospermophilus nelsoni*) are desert-adapted (Germano et al., 2011). The Panoche Valley area is the northern-most area where viable populations of these species occur, and it is within a rainfall zone that is considerably higher than at least one core area for these species (i.e. western Kern County). These desert animals have persisted in the Panoche Valley area at relatively high densities in association with heavy grazing by livestock. It is plausible and even likely that these desert species have persisted in the Panoche Valley area because of livestock grazing and associated desertification of the habitat. Therefore, large-scale changes to the current grazing management could have unintended negative effects to desert species that thrive in

open, sparsely vegetated sites. Although grazing exclusion will likely have positive effects for some riparian species and for watershed function, the use of this tool will be restricted to relatively small sites so that potential negative effects to desert species are minimized.

The Conservation Lands are located in Panoche Valley, in San Benito and Fresno Counties, California, within the following sections of the Federal Townships:

Valley Floor – San Benito County

- Sections 4, 8-10, 13-16, and 19 of Township 15 south, Range 10 east

Valadeao Ranch – San Benito and Fresno Counties

- Sections 19, 30, and 31 of Township 14 south, Range 11 east;
- Sections 21-27 and 32-36 of Township 14 south, Range 10 east;
- Sections 1-8 and 10-14 of Township 15 south, Range 10 east; and
- Sections 6, 7, 19, and 20 of Township 15 south, Range 11 east.

Silver Creek Ranch – San Benito and Fresno Counties

- Sections 20-21 and 26-36 of Township 15 south, Range 11 east
- Sections 1-6 and 8-12 of Township 16 south, Range 11 east

Each of these three tracts of Conservation Lands is discussed in more detail in the following sections.

2.1.1 Valley Floor Conservation Lands

The VFCL is approximately 2,514 acres in size and will be protected in perpetuity to avoid detrimental effects to Panoche and Las Aguilas Creeks and special-status species, particularly BNLL, GKR, SJKF, and their associated habitats. PVS adjusted and reduced a previously proposed Project Footprint by greater than 75 percent to avoid a significant amount of impacts to Federal and State waters and habitat for the above stated special-status species. PVS will permanently preserve the highly suitable habitat as the VFCL. The VFCL is contiguous with the Project Footprint and the VRCL, and the VFCL is primarily California annual grassland habitat with an average slope of 11 percent, some seasonal vernal and ephemeral pools, as well as segments of the seasonally dry Panoche and Las Aguilas Creeks. The VFCL also includes the entire 100-year floodplain on the valley floor as well as a SJKF movement corridor, GKR avoidance areas, and BNLL avoidance buffers. The VFCL is currently grazed by livestock, which may enhance the habitat for some special-status species (Germano et al., 2012), and these lands will continue to be grazed under adaptive management in the future. The VFCL are contiguous with the Project Footprint (**Appendix A, Figure 3a**).

2.1.2 Valadeao Ranch Conservation Lands

Based upon initial biological surveys of the Project Footprint and discussions with CDFW and USFWS, PVS identified and acquired rights to permanently preserve and manage the adjacent Valadeao Ranch property (approximately 10,772 acres), which is located north, east, and west of the Project Footprint (**Appendix A, Figure 3a**).

These lands are also contiguous with the VFCL and SCRCL. The VRCL includes several seasonal drainages and is dominated by California annual grasslands (approximately 6,700 acres) and ephedra shrubland (approximately 2,700 acres), with smaller components of *Atriplex* shrubland and juniper and oak woodlands. Soils on this site are complex and range from sandy and clay loams to badlands (NRCS 2015). The VRCL contain approximately 2,945 acres with slopes between 0 and 11 percent (preferred slopes for several of the special-status species discussed in this document). Elevations on the VRCL range from approximately 1,400 feet to 2,100 feet above mean sea level (amsl). These lands are currently grazed, which may enhance the habitat for the special-status species, and this property will continue to be grazed under adaptive management in the future.

Special-status species observed (either directly or by their signs) on the VRCL include CTS, GKR, and SJKF. Portions of the VRCL were found to be suitable for BNLL, GKR, CTS, and SJKF in differing acreage amounts. The VRCL also supports one known CTS breeding pool and estivation habitat. The breeding pool and estivation habitat will be preserved in perpetuity and will increase the mitigation value for CTS.

2.1.3 Silver Creek Ranch Conservation Lands

During the 2010 Draft Environmental Impact Report (DEIR) public comment period, the Applicant consulted with the County, CDFW, USFWS, and various experts on the special-status species regarding additional possible mitigation for unavoidable impacts to sensitive biological resources. PVS then identified and secured the rights to permanently preserve and manage additional conservation lands in the Panoche Valley, known as the SCRCL.

The SCRCL is approximately 10,890 acres located southeast of the Project Footprint (**Appendix A, Figures 3a and 3b**). The northwestern-most corner of the proposed SCRCL is contiguous with a portion of the VRCL. Elevations on the SCRCL range from 900 to 2,200 feet amsl. California annual grasslands compose the majority of ground cover on the site (approximately 8,400 acres) which can be dominated by non-native species in some years. The site also supports ephedra shrubland (approximately 2,260 acres), riparian areas, seeps, springs, and barrens. Tamarisk shrubland occurs along Silver Creek and around other small areas of the perennial flowing creek. Field visits have indicated there are also emergent wetlands and marshes occurring along Panoche Creek. These lands include several seasonal drainages and upland habitat.

2.2 Basis for Request to Include Preservation as Part of Compensatory Mitigation

Preservation for each mitigation site is based upon requirements set forth under 33 CFR) Part 332: *Compensatory Mitigation for Losses of Aquatic Resources*. Under 33 CFR 332, Section 332.3 (h) establishes the general compensatory mitigation requirements. Section 332.3(h) states the following:

- (1) Preservation may be used to provide compensatory mitigation for activities authorized by [USACE] permits when all the following criteria are met:
 - (i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;
 - (ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources

- to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;
- (iii) Preservation is determined by the district engineer to be appropriate and practicable;
 - (iv) The resources are under threat of destruction or adverse modifications; and
 - (v) The Conservation Lands will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

USACE criteria (i) through (v), above, are satisfied by the mitigation activities planned for the Project. The following activities will be implemented as part of this WMMP:

- (2) Where preservation is used to provide compensatory mitigation, to the extent appropriate and practicable, the preservation shall be done in conjunction with aquatic resource restoration, establishment, and/or enhancement activities.
 - (i) Ensure that all of the waters within the Conservation Lands (approximately 716,852 LF of streams and drainages) will be preserved for natural resource functions.
 - (ii) Water enhancement actions that are proposed on the Conservation Lands include the removal and enhancement of seven debris dump sites, creation of three CTS breeding pools on VRCL and SCRCL, enhancement of vernal pools, and partial livestock exclusion to restore native vegetation and riparian areas within portions of Panoche Creek on SCRCL.
 - (iii) The Conservation Lands have experienced livestock grazing resulting in alteration of stream and drainage hydrology. A Grazing Plan will be developed as part of the HMP to manage the future livestock grazing regime in accordance with grazing standards and guidelines maintained by the BLM or agency-approved habitat management (under a mutual understanding between CDFW and USFWS).
 - (iv) All the Conservation Lands will be protected under a conservation easement executed by PVS.

2.3 Potential Future Use of Conservation Lands for Mitigation

The Conservation Lands described herein contain vast natural resources. This WMMP is directly enhancing only a portion of the aquatic features on these lands (approximately 11.96 acres) and preserving over 700,000 linear feet of existing stream channels and over 24,000 acres of land. Additional areas of these conservation lands could be enhanced as part of future mitigation of other development Projects or by other organizations to continue the recovery of threatened and endangers species, vegetation communities or habitat. Upon coordination with the land owner and manager and with guidance and approval from CDFW, USFWS, USACE, and RWQCB; other entities may utilize the Conservation Lands as long as these efforts do not conflict with this WMMP and the Project's HMP.

For instance, both wetland and stream mitigation are used to compensate for adverse impacts generally occurring within a specified service area, or designated watershed. Permittees needing to compensate for project-related unavoidable adverse impacts to streams or upland habitat may execute an agreement with the appropriate parties to compensate for those impacts within the Conservation Lands (excluding the 11.96 acres that will be directly enhanced by this WMMP). This will allow the opportunity

for future private or public entities to enhance, create, or establish aquatic or upland features that will further increase the value of natural resources within the Conservation Lands.

Adherence to all local, state, and federal regulations shall apply to the entity interested in utilizing the Conservation Lands as mitigation requirements. Coordination with the Land Owner and Manager will be a condition precedent to soliciting input from regulatory agencies.

3 SITE SELECTION

As stated in Section 2.1 above, the protection of the Conservation Lands ensures the preservation of a large portion of the local watershed(s). The Conservation Lands were selected based on the presence of a large intact watershed area—the Panoche/Silver Creek Watershed (Watershed) containing ephemeral, intermittent, and perennial streams along with some wetlands supporting emergent vegetation. The purchase and protection of these Conservation Lands would create a contiguous area of protected lands, connecting with each other and BLM land. The Conservation Lands are important to watershed health as they contain the headwaters of several streams and drainages. Improving hydrological conditions within the Conservation Lands will enhance the overall health of the entire watershed. As stated previously, these Conservation Lands also support a diverse number of both State and Federal special-status species as well as the habitats for those species. Provision for perpetual management will ensure protection of the upper watershed, including large expanses of California annual grassland, numerous Federal and State waters, including the wetland areas and perennial portions of Panoche Creek, as well as the surrounding riparian areas for Panoche Creek and Silver Creek.

3.1 Watershed Setting and Context

The Conservation Lands occur within the Panoche/Silver Creek Watershed (the Watershed) and are surrounded by a rural landscape. The Watershed is located in Fresno and San Benito Counties and lies on the western edge of the San Joaquin Valley in the Diablo Range. The Watershed lies within a semi-arid region, with precipitation occurring primarily between November and March. The Panoche/Silver Creek Watershed is characterized by a wide range of geologic, soil, climatic, vegetative, and flood-related conditions and phenomena. While land use throughout the watershed is primarily characterized as range land, there are also some irrigated croplands just upstream of the Interstate-5 freeway. Panoche Creek and Silver Creek are the two major streams which drain the Watershed. Silver Creek drains the southern portion of the Watershed, and Panoche Creek drains the central, western, and northern portions of the Watershed. Approximately two-thirds of the Watershed is drained by Panoche Creek, and the other one-third by Silver Creek. Silver Creek joins Panoche Creek approximately 4 to 5 miles upstream of the Interstate-5 freeway (PCSW 1998).

Implementation of the proposed mitigation activities through implementation of this WMMP would protect and enhance the headwaters within the Watershed, as well as ensure the hydrological and ecological connectivity of the site with its surrounding rural landscape.

3.2 Beneficial Uses Provided

Beneficial uses and water quality objectives are established by the California State Water Resources Control Board for certain major waters of the State, including both surface and ground waters. Panoche

Valley is located in the southeastern portion of San Benito County, within the Central Valley Planning Area and under the jurisdiction of the Central Valley RWQCB. The Project is located in the northwestern portion of the Tulare Lake Basin, which is made up of the drainage area of the San Joaquin Valley south of the San Joaquin River, and is subject to management direction provided by the Water Quality Control Plan for the Tulare Lake Basin. In accordance with California Water Code §13050, all surface and groundwater resources in the Project area are waters of the State and are subject to designated Beneficial Uses identified in the Tulare Lake Basin Water Quality Control Plan (FEIR 2010).

The Project is underlain by the Panoche Valley Groundwater Basin, which is also within the Central Valley Planning Area and subject to management direction of the Water Quality Control Plan for the Tulare Lake Basin. The Tulare Basin Plan includes Beneficial Use designations the Panoche Valley Groundwater Basin designated as “Municipal and Domestic Supply” or “MUN.” In accordance with the MUN designation, as defined by the Tulare Lake Basin Plan, “...uses of water for community, military, or individual water supply systems, including but not limited to drinking water supply” are permitted uses (FEIR 2010).

It is not anticipated that the Project will impact groundwater or adversely affect the Beneficial Use designation of surface or groundwater. Beneficial Use of waters of the State within the Conservation Lands will be preserved and managed through mitigation and monitoring of this Plan.

4 LONG-TERM SITE PROTECTION

Consistent with the Project’s Biological Assessment, CMP, and other permit applications prepared for the Project, the Applicant will transfer all of the Conservation Lands to a conservancy or other approved management entity. Details regarding long-term site protection are detailed below:

- Prior to commencement of construction, Conservation Lands shall be placed under a conservation easement to be preserved in perpetuity.
- The management entity shall implement all approved plans for managing and monitoring the Conservation Lands in perpetuity to maintain conservation values in accordance with the conservation easement.
- Long-term management tasks shall be funded through the endowment fund¹. The management entity (if the Perpetual Land Manager and conservation easement grantee are the same entity) shall be responsible for providing an annual report to the Implementation Group (Applicant and Permitting Agencies [CDFW, USFWS, RWCQB, and San Benito County], or others, as required by Permitting Agencies) that provides details on the management, biological monitoring, and Conservation Easement monitoring.
- Any and all enhancement, management, and/or maintenance activities undertaken by the Perpetual Land Manager or its representatives must be in accordance with all approved monitoring plans and implementing and legal documents, or must obtain separate approval and/or permits from the applicable Permitting Agencies prior to the activity.

¹ The initial and endowment costs for management and conservation easement activities will be presented in a Property Analysis Record (PAR) report.

- Develop a PAR3[®] (Property Analysis Record) for perpetual management costs, upon approval of management plans by the approval of appropriate agencies. The Applicant will provide payment in full for the endowment that will accompany the Conservation Lands.

Additional information pertaining to the long-term management of the Conservation Lands can be found in Section 10 (Long-term Management).

5 BASELINE INFORMATION

5.1 Preliminary Jurisdictional Determination and Function-Based Assessment of Impact Sites

A preliminary jurisdictional determination (PJD) of the extent of Federal waters within the Project Footprint has been preliminarily approved by the USACE from a site visit on November 10, 2014. The PJD describes impacts to Federal waters. The Project will result in impacts to 5 Federal jurisdictional drainages (waters of the U.S.), 31 State stream channels, 2 vernal pools, and 19 ephemeral pools (waters of the State). Additionally, three CTS pools will be created to offset potential impacts to CTS during construction. These CTS pools may be placed within or adjacent to a state stream channel to allow for proper inundation for the pools. The total impact area includes the conservative estimate of all three proposed CTS pools. The impacts to Federal waters at Las Aguilas Creek and Panoche Creek channels, as well as three additional crossings of unnamed unvegetated streambeds are included in **Table A** below. The two road crossings of Las Aguilas Creek and Panoche Creek channels are necessary for roads that will allow for emergency access and egress from within the Project Footprint. The five Federal waters are also included in the areas identified as State waters. The total amount of Federal and State waters identified within the Project Footprint is provided below in **Table A**.

Table A: Impact to Waters in the Project Footprint

	Area (acres)	Length (linear feet)
Waters of the U.S.	0.122	3,504
Waters of the State	8.588	21,357

5.1.1 Soils

Soils within the Conservation Lands reflect the underlying alluvial sediments, variability of source area, the extent of weathering, the degree of slope, and the degree of human modification. The Conservation Lands are underlain by seven main soil units identified by the National Resource Conservation Service (NRCS 2015). The soil units include the Panhill loam and Panoche loam formed on the alluvial fan surfaces at the base of the Panoche Hills; the Panoche sandy loam and Panoche loam in the central Panoche Valley; and the Yolo gravelly loam and Yolo loam formed on the fan deposits derived from Las Aguilas Mountains. Additional soils noted within the Conservation Lands include: Gaviota rocky loam, 15 to 50 percent slopes, eroded and somewhat excessively drained; Los Banos clay loam, 9 to 50 percent slopes, eroded and well drained; Vallecitos rocky loam with 15 to 50 percent slopes, eroded and well drained; Kettleman loam, 5 to 50 percent slopes and well drained.

5.1.2 Vegetation

Amount and timing of rainfall during the current and past growing seasons likely influences herbaceous species composition and cover on the Conservation Lands. In some years, non-native grasses are dominant species whereas in other years, native and non-native forb species are the most abundant class of vegetation. Species present in California Annual Grassland include ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), red brome (*Bromus rubens* ssp. *madritensis*), foxtail barley (*Hordeum murinum* ssp. *leporinum*), and rat-tail fescue (*Vulpia myuros*). Dominant forbs included broad-leaved filaree (*Erodium botrys*), red-stemmed filaree (*Erodium cicutarium*), shining peppergrass (*Lepidium nitidum* var. *nitidum*), and vinegarweed (*Trichostema lanceolatum*). Fiddleneck (*Amsinckia menziesii*), devils lettuce (*Amsinckia tessellata*), shepherds purse (*Capsella bursa-pastoris*), turkey mullein (*Eremocarpus setigerus*), and bur clover (*Medicago polymorpha*) were also common, especially along ranch roads. The native perennial grass (*Poa secunda*) is also locally common within portions of the Conservation Lands. Native species that maintain a presence must be generally tolerant of grazing and saline clay-rich soils. Areas which have not been previously disturbed by historic cultivation or been subject to heavy grazing also include a variety of native wildflowers such as blow wives (*Achyrachaena mollis*), blue dicks (*Dichelostemma capitatum*), California gold fields (*Lasthenia californica*), yellow daisy tidy-tips (*Layia platyglossa*), and California creamcups (*Platystemon californicus*).

Grasslands dominate the lower slopes and valley bottoms in continuous stands that are interrupted only by a few larger washes. Some grassland patches were entirely comprised of non-native species, though these areas were uncommon. One California Native Plant Society (CNPS) List 4 species, serpentine leptosiphon (*Leptosiphon ambiguous*), was identified in this alliance.

In addition to the grasslands there are Ephedra shrublands. Plant associations that were noted to occur within the Ephedra Shrublands include *Artemisia californica* - *Senecio flaccidus* scrub, *Eastwoodia elegans* - *Ephedra californica* scrub, *Ericameria linearifolia* - *Ephedra californica* scrub, *Ericameria linearifolia* - *Ericameria nauseosa* scrub, *Ericameria linearifolia* - *Gutierrezia californica* scrub, *Eriogonum fasciculatum* var. *polifolium* - *Artemisia californica* scrub, *Eriogonum fasciculatum* var. *polifolium* - *Ephedra californica* scrub, *Eriogonum fasciculatum* var. *polifolium* - *Gutierrezia californica* scrub, *Eriogonum fasciculatum* var. *polifolium* - *Yucca whipplei* scrub, and *Gutierrezia californica* - *Ephedra californica* scrub.

An example location of Ephedra Shrublands occurs in Las Aguilas Creek, an arroyo-like wash at the southwestern edge of VRCL, the Ephedra Shrublands occur in small patches along ridgelines, steep slopes with a northern aspect, lower slopes, along ephemeral drainages, and steep rocky and thin-soiled south-facing slopes. Most shrub species in this alliance are widespread at low frequencies in areas beyond the extent of the assemblage where they dominate. In the understory layer, introduced annual grasses generally attain overwhelming dominance. The understory assemblage is often sparse, and non-diverse cover is typical of all study area shrubland associations that occupy xeric, steep slopes with southern aspects, although some associations in this alliance had dense understory. Other notable plants found within this alliance include introduced grasses, coyote brush (*Baccharis pilularis*), silver lupine (*Lupinus albifrons*), narrow leaf milkweed (*Asclepias fascicularis*), Sandberg bluegrass (*Poa secunda*), crinkled onion (*Allium crispum*), white fiestaflower (*Pholistoma membranaceum*), foothill larkspur (*Delphinium hesperium* ssp. *pallescens*), and wild oats (*Avena* sp.). Native perennial species were generally sparse in this alliance. Two CNPS were observed within this alliance: naked buckwheat (*Eriogonum nudum* var. *indictum*) and Santa Clara thorn mint (*Acanthomintha lanceolata*). The transition

zone between the Ephedra alliance of hillsides and the Introduced Annual Grassland alliance typical of lowlands was observed to be extensive and broad.

Other shrubland association canopy dominants are present in this zone at very low frequencies or in small, highly grazed patches. It is likely the position of this transition is maintained by long-standing patterns of range cattle grazing. Mature *E. californica* are apparently among the least palatable shrubs available to cattle, but recruitment of this species was seen only rarely where the populations occupied lowland areas mapped as California annual grasslands. In contrast, diversity is much greater (especially among native species) where California annual grasslands occupy shrubland canopy gaps on the more remote, upper slopes of the VRCL.

Ephedra shrublands within the VRCL range from nearly pure California ephedra (*E. californica*) stands to highly diverse associations with typical desert shrubs. Occupied habitats occur from lower slopes and valley bottoms to rocky outcrops and alluvial slopes. The California ephedra, typically 3 to 15 foot tall shrub, rarely achieves greater than 10 percent cover (absolute), but the cover provided varies little with soil type, aspect, or grazing pressure. It is generally the only shrub present in the often very broad transition from Ephedra shrublands to California annual grasslands.

The Ephedra alliance is more prevalent east of Little Panoche Road. There is evidence that it was more widespread on the western face of the Panoche Hills prior to a widespread fire that affected this area within the last decade, leaving many large *E. californica* stumps. Otherwise, all associations that were mapped in this alliance exhibit relatively undisturbed canopy development, have not been recently burned, and due to landscape ruggedness have not received heavy grazing pressure.

The barrens habitat found within the Conservation Lands is along ridgelines and south- or (rarely) west-facing very steep slopes that exhibit a precipitous drop-off in vegetative cover. In terms of vegetation, the assembled species diversity is very low, and nearly all species are relatively short-lived annuals. Shrubs and trees are absent, and introduced annual grasses become minor components of the species mix. Barrens most commonly interrupt California annual grasslands where the transition was often observed to occur over the space of several feet. Barrens that interrupt shrublands alliance vegetation are less common, but were found to support occurrences of rare plant populations more often than any other mapped association. Botanical surveys conducted in the Panoche Valley and Panoche Hills suggest that barrens habitats, while comparatively lacking in total cover, can support assemblages with greater native character, and can include rare species.

Two plant associations were identified within the barrens: *Erodium cicutarium* - *Plantago erecta* and *Holocarpha obconica* - *Vulpia microstachys*. Total cover in barrens rarely exceeds 1 percent. Members of the relatively sparse barrens assemblage are adapted to some of the harshest habitat available within the study area. Low cover may result at least in part from low soil moisture retention and from erosion and use by rodents. Plants occurring in barrens include the introduced annual herb *E. cicutarium*, and native *P. erecta*, *Blepharizonia laxa*, *Monolopia* spp., *Phacelia tanacetifolia*, *Salvia columbariae*, and *Camissonia boothii*. Two CNPS List 4 species, naked buckwheat (*Eriogonum nudum* var. *indictum*) and benitoa (*Benitoa occidentalis*), and one CNPS List 2 species, California groundsel (*Senecio aphanactis*) were also identified in this alliance.

Saltbush shrublands are also found in the Conservation Lands, and they consist of nearly pure to mixed stands of saltbush (*Atriplex polycarpa*) associations. Occupied habitats range from white clay soils on hills immediately west of Little Panoche Road, to rocky outcrops and alluvial slopes experiencing high

ground creep rates near ridgelines east of the road. In all observed occurrences on hills, the aspect of greatest *A. polycarpa* cover is southern. This 2 to 3 foot tall shrub also attains dominance within several of the ephemerally flooded washes, where sandier soils are more common. It is always the most common shrub canopy contributor near seasonal springs and seeps that exhibit saline character.

Two associations within this alliance exist on the VRCL: *Atriplex polycarpa* - *Eriogonum fasciculatum* var. *polifolium* and *Atriplex polycarpa* - *Isocoma acradenia* var. *bracteosa*. *Atriplex polycarpa* - *Eriogonum fasciculatum* var. *polifolium* occurs on slopes, appearing as mainly open ground with scattered shrubs. Shrub canopy closure averages 5 to 10 percent, with scattered clumps of 20 percent closure. Canopy density is greatest on south-facing slopes, where *E. fasciculatum* is often more prevalent, and on slopes that are steep or slippery enough to exclude grazing. The herbaceous layer is largely absent, resembling barrens that are often present on adjacent slopes of similar aspect. Native character is thus relatively high, and undisturbed habitat (i.e., ungrazed) is available for potentially occurring rare plant species that are associated with saline soil. *Atriplex polycarpa* - *Isocoma acradenia* var. *bracteosa* occurs in the channel bottoms of ephemerally watered washes and very narrowly along the adjacent slope bases. All channels in which this association occurs also hold one or more ephemeral or seasonal springs that exhibit saline character and exhibit sandy soils that are somewhat atypical of the clay-dominated hill and valley soils of the study area. Shrub canopies are confined to wash edges due to trampling by range cattle, and average cover rarely exceeds 10 percent. The riparian corridor is thus normally rather indistinct in structure relative to the surrounding scrub, but the shift in species is consistent and sharply bounded. It is likely that this association was once and would become more widespread in ephemeral wash habitat in the absence of cattle use. But *A. polycarpa* appears to be highly palatable, and use by livestock in this steep and xeric landscape is concentrated in wash habitats.

Woodlands, including juniper woodlands and oak woodlands, occur only on north-facing slopes of moderate steepness. Rocky outcrops and talus, which are commonly prominent in the study area's shrublands alliances, are absent from woodlands habitat. Finally, the area's woodlands are rather sparsely treed and share a common understory assemblage with shrublands (mainly introduced annual grasses), yet are noticeably devoid of a significant shrub layer.

The ecotones with adjacent shrub associations are often visually distinct, appearing as a sudden loss of the tree canopy. Individual *J. californica* rarely exceed 15 feet in height. Girths of up to 20 inches diameter at breast height suggest that most of the trees in all occurrences have aged enough to be called "mature." The tree population structure, furthermore, appears to be skewed toward older trees, and recruitment was not apparent. It is possible recruitment has been excluded by grazing cattle, as the gentler slopes occupied by this association do not exclude cattle use for grazing and shading. It is apparent from old stumps that trees of narrower girth have been harvested. Both occurrences east of Little Panoche Road were clearly larger in extent prior to harvest, and the older fence posts in these areas appear to be rough juniper.

The juniper woodlands alliance is not common within the Conservation Lands. All occurrences are fewer than 16 acres individually. Two associations within this alliance occur on the Conservation Lands: *Juniperus californica* - *Ephedra californica* and *Juniperus californica* - *Ericameria linearifolia*. The *Juniperus californica* - *Ephedra californica* association occupies middle elevations of north-facing slopes. *J. californicus* canopy cover ranges from 5 to 20 percent. The shrub layer is sparse and is composed of mainly *E. californica*. Subdominant shrubs include *Ericameria linearifolia*, *Gutierrezia californica*, *Eriogonum fasciculatum*, and *Artemisia californica*. The herbaceous layer is not dense. It is composed mainly of introduced annual grasses, the same assemblage as found within the shrublands associations

that dominate the surrounding landscape. The contrast in the shrub and herbaceous layers of adjacent shrublands and woodland associations is likely due to the presence of the trees. *J. californicus* patches are the only significant provider of shade across much of the study area, and so are gathering places for range cattle during much or all of the year. As such, trampling and intensified herbivory appear to be important limiting factors for plants that have not reached escape height. Roosting habitat for birds is provided, and evidence was seen of use by other large mammals such as coyote (evidence of deer was not observed anywhere within the study area). It is likely that, in the absence of grazing use, the association would provide habitats for native plant species that require additional shading. The *Juniperus californica* - *Ericameria linearifolia* association occupies middle to upper elevations of north-facing slopes. On average, canopy closure does not exceed 10 percent. Both diversity and abundance of the shrub and understory assemblages are increased noticeably relative to the closely similar *Juniperus californica* – *Ephedra californica* association. In all occurrences, *E. linearifolia* achieves higher abundance and cover than other shrubs, including *Ephedra californica*. Greater understory development may be related to the higher elevation, along with relatively steep slopes occupied by this association, which would tend to limit use by range cattle.

The oak woodlands occupy lower slopes and wash edges with northern aspects. They transition upslope to *Juniperus californica* woodlands. The oak woodlands were found in the hills west of Little Panoche Road, only. These oak woodlands can be associated with acorn-processing cultural resource sites. The terrain within the oak woodlands can be very rough. Steeply banked, tree-shaded gullies were observed to support a higher diversity of native annual and perennial herbs than any other habitat available in the woodlands, shrublands, or grasslands associations. This greater diversity likely results from cattle exclusion through rough terrain and fencing. The dependable seasonal shading that is provided by dense canopies of *Quercus douglasii* (a winter-deciduous oak) creates additional microhabitats not available elsewhere, and generates considerably greater soil organic matter accumulation. The presence of trees enhance productivity and nutrient cycling functions, support diversity (including wildlife), and arrest ground creep (talus, gullies, and slides are common in shrublands).

This woodlands association likely represents the region's most xeric and lowest elevation plant community in which *Q. douglasii* is dominant in this area. One CNPS List 4 species, Salinas milkvetch (*Astragalus macrodon*), was identified in this alliance.

Stands associated with seasonally or perennially moist substrates, including seeps and springs, appear to be very rare and unevenly distributed within the area. Riparian habitats occur along the Panoche and Silver Creeks. It should be noted that the SCRCL was not surveyed during the wet season; therefore, seasonal seeps and vernal pools onsite may not have been identified during the reconnaissance surveys.

Habitats at springs and seeps would typically support plant species that are dependent on a reliable availability of shallow groundwater to survive the annual drought (May-October), and the vegetation extent would be expected to narrowly adhere to the wetted zone. Plant associations adjacent to these resources, however, would also be subject to heavy grazing and trampling, given the historical and ongoing use of SCRCL for raising livestock. No flowing springs were found in an upland setting. Evidence of seep zones that provide ephemeral flows and sustained root zone moisture in an upland setting were found only within one relatively deeply incised canyon near the southern survey edge. At the floor of this canyon, a small area of well-developed epialic crust was found at a clear shift from shrublands to dominance by saltgrass (*Distichlis spicata*). Although not all incised features could be viewed in the available time, areas outside the Silver Creek and Panoche Creek riparian zones appeared to convey little runoff during the 2010 wet season.

The Silver Creek riparian vegetation, where it briefly intersects the SCRCL, indicates a seasonally wet, somewhat saline habitat subject to annual or occasional energetic flows. The riparian corridor contains invasive tamarisk (*Tamarix* sp.) and is classified as Tamarisk semi-Natural shrubland. Tamarisk has developed semi-open to impassable stands in a 30- to 100-foot wide corridor. The population extends well offsite both upstream and downstream. In this area, saltgrass appears to be the native species most tolerant of the soil salination and groundwater drawdown effects of tamarisk infestation and often forms meadow-like swards between the tamarisk thickets.

Panoche Creek is gaining reach as it crosses through the SCRCL. The streambed upstream off the site for at least 3 miles was observed to be completely dry and largely devoid of plants. Within the surveyed area, this arroyo-like habitat quickly transitions to zonal wetlands characterized by gaseous springs, highly reduced soils, and marsh or meadow vegetation. The Panoche Creek riparian zone, which ranges from 100 to 500 feet in width, may provide the only reliable, naturally occurring surface water for much of the year. The dominant plants are consistently arrayed, with vegetation classified as emergent *Typha* marsh (*Typha* Herbaceous Alliance) centrally, *Schoenoplectus americanus* mid-marsh (*Schoenoplectus americanus* Herbaceous Alliance) at the outer saturated edge, and *Distichlis spicata* meadow (*Distichlis spicata* Herbaceous Alliance) extending across the moistened to seasonally drying soils at the riparian edge. All riparian zonal alliances within the survey area are patchy, with one or two species at most attaining dominance. Co-occurring with species such as *Frankenia salina* and *Juncus mexicanus*, dominants in these three alliances indicate a somewhat saline and possibly alkaline soil and shallow groundwater environment. Trees are largely absent, as are species adapted to a floating or submerged habitat. A marsh environment that developed in response to springs with excellent water quality would be expected to support a more diverse assemblage within each alliance, even with pressure from livestock use.

The small area of riparian woodland located south of Panoche Road is, like the *Distichlis* meadow, confined to the first terrace outside the saturated zone. The woodland canopy, classified as a degraded *Populus fremontii* Forest Alliance, reaches about 30 percent closure and includes a significant presence of red willow (*Salix laevigata*) where it is most dense. The stand currently exhibits many mature and dead trees, but essentially no recruitment and no understory due to intense livestock use. It is possible that this occurrence, and the marsh and meadow vegetation associated with the Panoche Creek riparian corridor on the SCRCL, are dependent upon annual inputs of relatively fresh water that originate in the upper Griswold Creek and Panoche Creek drainages and serve to flush salts and toxins that accumulate in the topsoil and the plants as evapotranspiration consumes the perennial spring flows.

5.1.3 Hydrology

Average precipitation values range from 9 inches for the majority of the valley to 13 inches at the western margin. Data collected by the Western Regional Climate Center (WRCC) show annual average precipitation of 9.75 inches at the Panoche 2 West Co-op Station, in the Project area. Most precipitation occurs between November and March.

Rainfall events in the Panoche/Silver Creek Watershed tend to yield erosion and sediment transport. High concentrations of selenium are contained within this sediment which, during rain events with greater than a 5-year return period, can contribute to San Joaquin River exceeding its water quality objectives. The Panoche alluvial fan is the principal source of selenium from the Panoche/Silver Creek Watershed to the downstream Grasslands Watershed and the San Joaquin River.

The Conservation Lands are entirely contained within the Tulare Lake Basin, which is essentially a closed basin, as surface water drains north into the San Joaquin River only in years of extreme rainfall. Surface water in the area is generally ephemeral, present only in response to precipitation events.

5.2 Baseline Condition Assessment

The Conservation Lands total approximately 24,176 acres and are comprised of three parcels, the VFCL, VRCL, and SCRCL. The Project Footprint and Conservation Lands are located approximately 2 miles north of the intersection of Panoche Road and Little Panoche Road. This location is approximately 2 miles southwest of the Fresno County Line and the Panoche Hills, and approximately 15 miles west of Interstate-5 and the San Joaquin Valley.

5.2.1 Baseline of Panoche Creek Assessment Area in the Silver Creek Ranch Conservation Lands

A baseline assessment of State and Federal waters will be performed within an approximately 8-acre site within the SCRCL along Panoche Creek to establish baseline conditions. The baseline conditions assessment will quantify the existing conditions of the streams, wetlands, and riparian areas. The qualified biologist (hired by the Applicant or the Perpetual Land Manager) will then use compiled data as a comparison tool to determine the success of the proposed enhancement sites described within this WMMP. The baseline assessment on the SCRCL Panoche Creek site will be conducted approximately 6 months to a year after the proposed Project has been completed and is operational (energized). The information will be gathered as baseline data, only; this 8-acre area will not be considered as enhancement.

The baseline assessment will measure either woody stem density or the cover of woody species within a 15 meter (m) belt transect, one on each side of Panoche Creek within the enhancement area, measuring from the outer edge of the cattails out onto the lower bench of the wash (where the cut bank is closer than 15 m and will only include the area up to the bottom of the bank). During the transect survey, woody stems will be counted or percent cover will be estimated within the area covered by the belt transect. In addition to the transect assessment, photo points will be established within the grazing exclusion area and in the grazed area adjacent to the exclusion area (either upstream or downstream in riparian habitat with similar existing structure) at 100 m intervals from both sides of the streambed, preferably at a distance of approximately 30 m from the creek edge. A set number of photo points will be established on both the grazed and exclusion areas. The purpose of photo points will be to assess observable qualitative changes within the enhancement area. The data will be analyzed and developed into a report so that the existing conditions can be compared to future assessments.

A baseline assessment within the same 8-acre area will be conducted and used as a comparative tool for the areas designated for debris removal. This baseline assessment will also be conducted approximately 6 months to a year after the proposed Project has been completed and is operational (energized).

6 DETERMINATION OF MITIGATION

The enhancement areas of the Panoche Creek (cattle exclusion), the debris removal, creation of three CTS pools, and the vernal pool enhancement will contribute to the total mitigation acreage needed for

the impacts from the construction of the Project. Mitigation acreages and credits are discussed in more detail in the following sections.

The Conservation Lands will provide 100 percent of the total mitigation acreage from Project impacts to waters of the U.S. and waters of the State. A summary of mitigation acres to be preserved or enhanced in each of the Conservation Lands is presented in **Table B**.

Table B: Summary of Aquatic Resource Mitigation within Conservation Lands

Conservation Land	Resource Type	Mitigation Area (approx. acres and linear feet [LF] for streams)	
		Preservation	Enhancement
VFCL	Intermittent and ephemeral streams	43.9 acres (81,957 LF)	0.05 acres
VRCL	Intermittent and ephemeral streams and creation of CTS pools	76.4 acres (326,519 LF)	0.35 acres (271 LF)
SCRCL	Intermittent and ephemeral streams	85.6 acres (308,377 LF)	11.56 acres (2,099 LF)
Total		205.9 acres (716,852 LF) ^{1,2}	11.96 acres ³ (2,370 LF)

¹ LF = Linear Feet within the designated State stream channel or pool. Sum may not equal the total due to rounding.

² Formal delineation of ephemeral pool habitats has not been conducted on the VRCL or SCRCL.

³ Total acreage includes three CTS pool creation and vernal pool enhancement. These are not included in the total linear feet calculation.

7 MITIGATION WORK PLAN

This section of the WMMP is divided into two parts. The first part provides a description of activities planned within the Conservation Lands, with maps and tables showing acreages and locations of proposed mitigation. The second part describes implementation methods for general mitigation activities for all proposed mitigation sites. All work within the mitigation areas will be conducted in accordance with the General Construction Permit and the Storm Water Pollution Prevention Plan that will be prepared prior to construction of the Project.

7.1 Activities Planned on the Conservation Lands for Waters Mitigation

Preservation and enhancement activities planned on the Conservation Lands are described in the following sections. Details regarding site preparation and best management practices (BMPs) used throughout all of the mitigation sites are described in Section 7.2. Livestock exclusion drawings for the enhancement activities at the Panoche Creek site on SCRCL are included in **Appendix A, Figure 5**, and planned mitigation activities are shown in **Appendix A, Figure 4**. Mitigation acreage on the Conservation Lands is separated by mitigation activity and presented in **Table B** above.

As described above in Section 3.0, the Conservation Lands were selected for mitigation for Project impacts to Federal and State waters based on the number of opportunities for preservation and enhancement. The Conservation Lands offer the opportunity to mitigate for Project impacts to waters. Mitigation activities proposed on the Conservation Lands include:

- Preservation of streams, and
- Enhancement of streams and habitat:
 - Removal and enhancement of seven debris dump sites,
 - Creation of three CTS breeding pools on VRCL and SCRCL,
 - Enhancement of vernal pool habitat, and
 - Partial livestock exclusion to restore native vegetation and riparian areas of Panoche Creek on SCRCL.

Descriptions of mitigation activities on the Conservation Lands have been separated into two categories: preservation and enhancement.

7.1.1 Preservation

As shown in **Table B** above, a total of approximately 716,852 linear feet of non-federal ephemeral stream channel habitat exists within the Conservation Lands that will be preserved through this mitigation action. The total acreage and linear feet of waters was calculated using a combination of aerial imagery, U.S. Geological Survey data, and field observations. Photographs and a corresponding mapbook, which depict the field efforts to verify streams, creeks, and drainages that will be preserved, are included as **Appendix B**. That acreage also includes a significant amount of Federal jurisdictional waters, although no formal jurisdictional delineation was conducted on the Conservation Lands. Land use restrictions and long-term financing mechanisms will make certain these waters and their surrounding habitats are preserved in perpetuity.

7.1.2 Enhancement

Enhancement activities which will take place within the VFCL, VRCL, and SCRCL are described in detail below, and implementation methods are described in Section 7.2. As shown in **Table B** above, a total of approximately 11.96 acres of ephemeral/intermittent/perennial stream channel and wetlands (non-federal and Federal waters) habitat within the Conservation Lands will be directly enhanced through this WMMP. Enhancement activities on the Conservation Lands will include the following:

- Removal and enhancement of seven debris dump sites (0.44 acre) with seeding of native vegetation and potential erosion control measures if necessary
- Creation of three CTS breeding pools (0.31 acre)
- Enhancement of approximately 0.05 acre of vernal pools on VFCL
- Partial livestock exclusion to restore native vegetation and riparian areas on portions of Panoche Creek on SCRCL (11.16 acres).

7.1.3 Sequence and Timing

Initial construction of compensatory mitigation for discharge of fill to waters of the State will be completed within one (1) year of initial impacts to waters of the State. In general, the debris removal and creation of the three CTS breeding pool and enhancement of the vernal pools will be conducted outside the rainy season. Seeding will take place as determined by a qualified biologist for the seven areas noted above as debris dump areas. Detailed timing requirements are presented in Section 7.2.2, which describes the planting methods that will be utilized.

7.2 General Mitigation Implementation Methods and BMPs

This section describes general methods for implementation of mitigation activities, including site preparation, debris removal, creation of three CTS pools, vernal pool enhancement, and cattle exclusion. In addition, all mitigation activities will avoid impacts to nesting birds and special-status species.

The Land Manager or persons responsible for implementing this WMMP will provide and/or contract all equipment and personnel necessary to maintain/construct fencing, access, operations, and other management activities on the Conservation Lands. These enhancement activities, described in this Section may be contracted by the Project Applicant to qualified consultants, or may be conducted directly (or indirectly through contracts) by the Perpetual Land Manager.

The overall goal of the WMMP is to document whether protection, management, and enhancement activities being conducted on Conservation Lands are contributing to the long-term viability of the Federal and State waters. Routine monitoring and maintenance tasks are necessary to assess whether Conservation Lands are meeting the performance criteria.

7.2.1 Removal and Enhancement of Seven Debris Dump Sites

The Applicant has identified seven areas on the Conservation Lands where debris (trash) dumping has occurred (**Appendix A, Figures 6 through 12**). Debris in these areas includes scrap metal, tires, appliances, and other large debris. As part of the WMMP, the Applicant will remove debris from these areas allowing the natural environment to stabilize. Once the debris is removed, the Applicant will seed the area as deemed necessary by the biologist, with a native seed mix sourced locally to prevent erosion and allow the natural plant and animal species to thrive in the area. Seeding the area will decrease soil erosion and siltation, which will ultimately enhance the upstream and downstream drainages of the debris dump sites. Removal of the debris areas will enhance a total of approximately 19,386 square feet (ft²) (0.44 acre or approximately 652 linear feet) by removing debris and reseeding when and where necessary. Any reseeding will utilize native-seed mix, and the biologist will consult CDFW prior to application. At the discretion of the biologist in areas where reseeding occurs, a temporary exclusion fence to deter cattle grazing may be installed for a minimum of 6 months, or until the biologist determines successful growth of seeded plants.

All debris will be removed by hand or by mechanical equipment (e.g. track hoe) to a truck mounted container using pre-existing roadways. Once removed, the debris will be disposed of according to Federal, State, and local regulations and taken to an approved permitted landfill or recycling center. Any debris deemed potentially hazardous will be dealt with in an approved manner so as not to further harm the environment. Any heavy equipment (e.g. backhoe, crane) utilized to remove the debris will be

located outside the top of banks to preserve bank stability and decrease erosion potential. During implementation, if it is determined that removing the debris would cause instability in the drainage, the debris material will be left in place. While complete removal may not be feasible, any removal of potentially harmful debris material from these areas will be an overall benefit for the identified stream channels and to the wildlife which occupy these areas.

Prior to the debris removal process, a pre-disturbance survey will be conducted by a qualified biologist or the biologist's representative. The biologist(s) shall identify and clearly mark the location of areas where special-status species and their dens or burrows and habitats that are to be avoided. If necessary, buffers will be established with highly visible markers. Furthermore, the qualified biologist or the biologist's representative shall be present while ground-disturbing activities are occurring. In addition to conducting preconstruction surveys, the biologist(s) shall aid debris removal crews in minimizing potential adverse effects of debris removal on biological resources (including avoidance of jurisdictional features and special-status species, as appropriate) and adhering to regulatory permit requirements.

Debris Removal Areas #1a and 1b are located on the VRCL east of the Project Footprint and are comprised of two smaller areas of landfilling at 36°38'54.98"North and 120°49'43.47"West (**Appendix A, Figure 6**). The Applicant will remove the debris and enhance approximately 537 ft² (0.012 acre) of land. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 73 linear feet of stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Debris Removal Area #2 is located on the SCRCL southeast of the Project Footprint at 36°33'50.93"North and 120°45'10.83"West. This debris pile is comprised of an old metal water tank that has been discarded within an ephemeral drainage and appears to be blocking the natural flow (**Appendix A, Figure 7**). The Applicant will remove debris and enhance approximately 0.008 acre of land. Removal of this debris pile coupled with bank stabilization, if necessary, will enhance the health and integrity of drainage downstream of the debris pile. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 23 linear feet of stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Debris Removal Area #3 is located on the VRCL east of the Project Footprint at 36°39'12.66"North and 120°49'24.39"West. This debris pile is located directly within an ephemeral drainage and is comprised of discarded water tanks (**Appendix A, Figure 8**). The applicant will remove debris and enhance approximately 67 ft² (0.002 acre) of the drainage. Removal of the debris within the drainage will enhance the health and integrity of the drainage. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 17 linear feet of stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Debris Removal Area #4 is located on the SCRCL southeast of the Project Footprint. This large debris pile sits directly south and adjacent to Panoche Creek at 36°35'7.57"North and 120°47'12.04"West (**Appendix A, Figure 9**). This debris pile is comprised of old tires, appliances, household debris, abandoned automobiles and etc. The Applicant will remove debris and enhance approximately 12,416 ft² (0.28 acre) of land. Removal of this debris pile coupled with bank stabilization will enhance the health and integrity of Panoche Creek both upstream and downstream of the debris pile. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 328 linear feet of stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Debris Removal Area #5 is located on the VRCL north/northeast of the Project Footprint at 36°40'55.64"North and 120°51'23.55"West (**Appendix A, Figure 10**). This debris pile is comprised of old tires and other ranch-related debris and is located within an ephemeral drainage. Removal of the debris will enhance approximately 5,096 ft² (0.116 acre) of the ephemeral drainage. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 164 linear feet of stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Debris Removal Area #6a is located on the VRCL southeast of the Project Footprint at 36°36'30.11" North and 120°48'12.97" West (**Appendix A, Figure 11**). This debris pile is comprised of old tires, appliances, household debris, etc. The Applicant will remove debris and enhance approximately 734 ft² (0.017 acre) of land. Removal of this debris pile coupled with bank stabilization will enhance the health and integrity of the ephemeral channel both upstream and downstream of the debris pile. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 22 linear feet of the stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Debris Removal Area #6b is located approximately 120 feet northeast of Debris Removal Area #6a on the VRCL southeast of the Project Footprint at 36°36'31.09" North and 120°48'11.94" West (**Appendix A, Figure 11**). This debris pile is comprised of old household appliances, fencing material debris, metal scraps, old water troughs, etc. The Applicant will remove debris and enhance approximately 66 ft² (0.001 acre) of land. Removal of this debris pile coupled with bank stabilization will enhance the health and integrity of ephemeral channel both upstream and downstream of the debris pile. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 10 linear feet of stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Debris Removal Area #7 is located on the VRCL north-northeast of the Project Footprint at 36°36'51.76"North and 120°48'18.91"West (**Appendix A, Figure 12**). This debris pile is comprised of old tires and other ranch related debris and is located within an ephemeral drainage. Removal of the debris will enhance approximately 130 ft² (0.003 acre) of the ephemeral drainage. This debris dumpsite is located within an incised stream channel. Removal of this debris will enhance approximately 15 linear feet of stream channel. If practicable, reseeding with native seed will further enhance the habitat in the trash removal area.

Due to the amount of time the debris has been situated within each respective stream channel, slight erosion along the stream channel may occur as a result of debris removal. If during the removal process the designated biologist or engineer is concerned removal of certain debris will lead to greater issues within the channel (i.e., increased erosion or bank instability), these items may be left within the channel to protect stream stability.

These debris dumpsites will be monitored after large rain events (precipitation greater than 0.5 inch in a 24-hour period) for the first 2 years, then annually during the wet season for years 3 to 5 to document any changes to bank stability (i.e., erosion concerns). Observations from monitoring shall be provided to the Land Manager and CDFW in the annual report. It will be at the discretion of the Land Manager and CDFW if additional bank stability control measures should be implemented.

7.2.2 Creation of CTS Breeding Pools on VRCL & SCRCL

The Applicant will create three CTS breeding pools on the VRCL and the SCRCL. The total size of the three pools will be approximately 0.31 acre (**Appendix A, Figure 13 & Figure 14**). CTS pool #1 will be located west-northwest of the known breeding pool on the VRCL west of the Project Footprint. The CTS Pool #1 has a drainage area of approximately 0.44 square miles and is expected to fill with runoff and then convey flows through a bypass spillway that is required for excess water to leave the pool and continue downhill. This new pool may support genetic diversity and will provide multiple breeding pool options for CTS in the vicinity.

Pool #2 will be located on the VRCL west of the Project Footprint and would result in the creation of approximately 0.05 acre of CTS pool habitat. Pool #2 will be fed by an ephemeral drainage northwest of the pool (**Appendix A, Figure 14**). Pool #3 will be located on the SCRCL southeast of the Project Footprint and would result in the creation of approximately 0.11 acre of CTS pool habitat. This pool will be fed by an ephemeral drainage located northeast of the pool (**Appendix A, Figure 15**).

The CTS mitigation pools may require the construction of shallow diversion canals perpendicular to the slope to capture sheet flow and direct it to the pools to allow the pools to remain inundated for a sufficient length of time. Exfiltration rates are the ruling factor in sizing the pool, as these are many times higher than the evaporation rates during winter and spring. To reduce the amount of exfiltration, the in-situ native soil may be amended with a less permeable material such as bentonite or clay. Objectives of each potential mitigation pool location are listed below:

- Mitigation pools will be ephemeral, filling in late fall, winter, and spring, and drying out by early June. Critical months of inundation are March to May.
- Mitigation pool(s) will be approximately 3 feet deep.
- Mitigation pools are desired to be inundated 5 out of every 10 years, with a minimum of 3 out of every 10 years. Depth and Inundation of pool(s) will be heavily dependent on annual extent of rainfall.

The CTS pools will be monitored twice a year to determine inundation, depth, and remove potentially harmful plants and wildlife (i.e., non-native invasive plant species and bullfrogs; non-native naturalized grasses would not be removed). Timing of removal or potentially harmful plants and wildlife will be outside of the CTS breeding season and at the discretion of the qualified biologist. Please see Section 8.1 for additional information on monitoring. Removal of potentially harmful plants and animals will be at the discretion of the designated biologist and in consultation with CDFW.

These pools will be preserved and managed in perpetuity. Total CTS pool creation for the three pools will be 0.31 acre.

7.2.3 Vernal and Ephemeral Pool Enhancement

The Applicant will enhance approximately 0.05 acre of vernal pools within the VFCL to offset the impacts to two vernal pools (0.05 acre) from the Project. Enhancement of vernal pools will consist of reseeding existing pools within the VFCL. The seed mix will be locally sourced to mimic the existing flora of the pools on the VFCL. A minimum of two pools (each with an enhancement area of approximately 0.025 acre [1,089 ft²]) will be enhanced to offset impacts to pools within the Project Footprint. Enhancement

activities will be conducted on pools that have been degraded by livestock grazing, rangeland activity, and environmental causes.

Prior to the pool enhancement, a qualified biologist will estimate absolute vegetation cover and relative vegetation cover using transects with point intercepts and photo-documentation on four existing reference pools in the VFCL. Additionally, the biologist will determine if vernal pool indicator plant species are present per identified reference pool. Soil type, presence/absence of sensitive species and indicator species, pool complex size, depth, and watershed hydrology will also be documented to determine biological viability for the enhanced pools. This data will be documented and recorded during the reference pools investigations. The data will provide baseline comparative tools to determine the success of the pool enhancements.

These pools will be preserved and managed in perpetuity. Total vernal pool enhancement will be 0.05 acre.

7.2.4 Partial Livestock Exclusion to Restore Native Vegetation and Riparian Areas to Portions of Panoche Creek on the SCRCL

Certain areas along creeks and drainages within the Conservation Lands are experiencing erosion due to heavy livestock grazing, which is adding to the siltation of these features. As part of this mitigation plan, the Applicant will erect approximately 0.35 mile of fencing in addition to the existing 0.47 mile of fence to exclude cattle for a majority of the year from grazing in approximately 11.16 acres of waters of the State (approximately 5.81 acres are federally jurisdictional waters are present within this Panoche Creek area). Livestock exclusion will allow for revegetation of riparian vegetation along the banks and slopes while also decreasing erosion and siltation. This exclusion of livestock will ultimately improve the health and integrity of Panoche Creek and downstream functions and values and directly enhance approximately 1,748 linear feet within the stream channel.

Through an adaptive management program, grazing livestock (e.g., cattle, sheep, horses, and feral pigs) will be strategically kept out of these areas for a majority of the year. Transect assessments will be conducted to evaluate the success of the livestock exclusion. If the results of the transect assessments do not meet success criteria, native vegetation will be planted to enhance these natural features, increasing the biotic value for local species. Livestock will be allowed to graze on the remainder of the Conservation Lands outside the exclusion area, but will be managed and monitored in order to maximize benefits to the special-status species that inhabit the Conservation Lands. A Grazing Plan will be created in coordination with a qualified range management specialist and incorporated into the Project's HMP. To properly manage grazing practices, the applicable standards and guidelines included in the BLM's Central California Standards for Rangeland Health and Guidelines for Livestock Grazing (1999) may be incorporated into a Grazing Plan.

The effectiveness of the required activities will be evaluated by the Land Manager, qualified biologists, or appropriate personnel when reporting on the activities. Any requirements found to be inadequate will be subject to adaptive management strategies and recommendations made in the annual report.

8 MAINTENANCE PLAN

Maintenance activities planned for the first 5 years are summarized in the following sections.

8.1 Maintenance Activities on Conservation Lands

The livestock exclusion fencing will be visually inspected twice a year (winter and summer) for 5 years to determine if repairs are needed. Fencing shall be stable and suitable for excluding livestock from the exclusion area. This will be determined by visual inspection of the fence and by searching for livestock tracks within the excluded area. Photographs of the fence and the excluded section of Panoche Creek will be taken during each visit, and repairs or adjustments noted in the annual report. Non-native invasive plant species will be noted and mapped.

If invasive plant species (especially those that are newly arrived or newly discovered) are observed within the exclusion area and are considered detrimental to the conservation values, measures will be taken to control those populations. Measures such as manual removal, targeted grazing, mowing, or pesticide use may be used, among others. If pesticide use is determined to be the most effective control method, a Pesticide Control Advisor and the appropriate regulatory agencies will be consulted to determine the most effective and least impactful method to the conservation values. Pesticides will only be applied by a licensed applicator familiar with using pesticides in these habitat types and in the vicinity of sensitive species and habitats. Pesticides will only be applied using EPA-approved products and in a manner that is consistent with the labels.

The debris dump site areas will be visually inspected after large storm events (rain events greater than 0.5 inch in a 24-hour period) for the first 2 years and then once per rainy season for years 3 through 5. The biologist and the Land Manager will be responsible for tracking rain events using a National Oceanic and Atmospheric Administration website to determine frequency of inspections.

The CTS pools will be visually inspected and surveys will be conducted twice a year (winter and spring) for the first 2 years to determine water transport to pool and overall success of pool, and then annually for years 3 through 5 during the wet season. The original size and dimensions of the three pools will be used as the control to determine whether maintenance or repair of the pool is necessary, and the hydrology will be monitored to confirm ephemeral conditions favorable to CTS breeding and conditions that will reduce the likelihood of the presence of CTS predators (e.g., bullfrogs).

The enhanced vernal pools will be visually inspected and surveys will be conducted twice during the wet season (late winter and spring) for the first 2 years and then once annually for years 3 through 5 during the wet season to determine pool inundation and to determine presence of vernal pool indicator species. Timing of the surveys will be at the discretion of the qualified biologist. The existing pool information collected prior to the proposed pools enhancement will be used as a reference to determine whether additional seeding may be needed. Reference pools will be monitored at the same frequency as the enhanced pools.

9 MONITORING REQUIREMENTS AND PERFORMANCE CRITERIA

The following Sections provide information for reporting, monitoring, and performance criteria for the enhancement areas.

9.1 Reporting

Monitoring reporting will take place at the end of the first year after the completion of the mitigation measures. This 1-year establishment period will serve to notify the Agencies of the completion of mitigation measures. In addition, the findings, if possible, will be reported as part of the annual monitoring report for the Conservation Lands noted in the CMP. The annual reports will include descriptions of the four major enhancement efforts described in Section 7.0. Any additional enhancement activities or repairs taking place during consecutive years will be documented, photographed, and provided in the annual report. The annual reporting will occur for the first 5 years after operation of the Project.

9.2 Initial Mitigation Monitoring Activities and Performance Criteria

The purpose of the Project's mitigation monitoring program is to assess the effects of mitigation enhancement activities, as well as to provide guidance for possible habitat management in the event of negative environmental stressors that may affect the ecosystem function of the mitigation lands. The Project will use belt transects and photo points within the livestock exclusion area of SCRCL to evaluate the effects of not grazing the mitigation site waters. In addition, the monitoring will include observations and mapping of non-native invasive species at these mitigation sites and other observed negative environmental stressors.

In regards to the CTS breeding pools, the Project will utilize a general assessment of the conditions of the breeding pool structure and the pool's ability to provide the necessary consistent features for successful breeding and metamorphosis. Monitoring at the mitigation sites will occur for a minimum 5-year period, with year 1 following the completion of the three CTS breeding pool creation. Monitoring would continue on an annual basis after year 2, until the site has met all performance criteria and all regulatory agencies have agreed in writing that the site has met performance criteria and is ready for transfer to the long-term manager.

The purpose, performance criteria, and monitoring methods are described below.

9.2.1 Monitoring Livestock Exclusion Area

Purpose: The purpose of monitoring the livestock exclusion areas is to evaluate the wetland and riparian habitat within the grazing exclusion area.

Performance Criteria: Increase woody stem density or cover by at least 10 percent over baseline conditions. Woody stem species include *Populus fremontii*, *Salix* sp., *Baccharis salicifolia*, *Atriplex lentiformis*, and other shrubs and trees found in the Panoche Creek riparian area within Silver Creek Ranch. Non-native, invasive plant species populations designated in the Project's Weed Control Plan will be managed per the Weed Control Plan so they do not impact the enhancement process of the exclusion area.

Methods: The methods for the monitoring the livestock exclusion area on a portion of Panoche Creek in the SCRCL includes:

- Measuring either woody stem density or cover of woody species within 15-m belt transect(s) on both sides of the stream, measuring from the outer edge of the cattails out onto the lower bench of the wash (where the cut bank is closer than 15 m, only include the area up to the bottom of the bank).
- Counting either woody stems (to obtain density within the belt) or estimate cover within the area covered by the belt in year 1 (advisable to compile both density and cover).
- Establishing photo points within the grazing exclusion area and in the grazed area adjacent to the exclusion area (either upstream or downstream in riparian habitat with similar existing structure) at 100 m intervals from both sides of the streambed, preferably at a distance of approximately 30 m from the stream edge. The same number of photo points should be established on both the grazed and exclusion areas. The purpose of photo points would be to assess observable qualitative changes.
- Following-up with repeat of 10-m belt transects in years 2 through 5.
- If the standard has not been met by year 3, conduct a qualitative assessment to determine whether there are variables that are preventing the desired rate of establishment (e.g., hydrologic conditions, invasive plant abundance, slower than expected growth and establishment of woody plant species). If by year 5, the standard has not been met, and the cover measurements are not increasing across years, consider other options such as active restoration by planting cuttings of woody species (*Salix* sp., *Populus fremontii*, *Baccharis salicifolia*, *Atriplex lentiformis*, etc.) collected from within Panoche Creek on Silver Creek Ranch using a planting plan prepared by a qualified botanist, restoration ecologist, or wetland specialist. A plan for implementation of remedial measures would be provided in the annual report.
- At the discretion of the specialist who prepares the planting plan, the width of the belt may be increased to accommodate a more extensive restoration area.
- During the belt surveys and the photo point assessments, any observations of non-native, invasive plant species in the enhancement area will be noted and mapped for inclusion in the annual report.

9.2.2 Constructed CTS Breeding Pools Evaluation

Purpose: Evaluate constructed CTS breeding pools during wet season monitoring period.

Performance Criteria: Construct three CTS breeding pools that will capture sufficient surface water runoff to fill to approximately 3 feet during the wet season and that will have continuous inundation for sufficient time for CTS larval development and metamorphosis (at least 10 weeks). The pools will need to have seasonal dry-down no later than September to preclude bullfrogs from colonizing the pools and successfully recruit metamorphs. Under average rainfall conditions the pools will be inundated a minimum of 3 out of every 10 years.

Methods: The methods for monitoring the constructed CTS breeding pools include:

- Monitoring the structural components of the pool and associated structures. Due to the presence of livestock, which will be allowed to graze in the area of the pool, there is a possibility that the livestock could damage the pool which could affect the effectiveness of the pool to retain water. Temporary fencing to exclude livestock from grazing may be used

to protect the pool. Any damage will have to be repaired outside the rainy season and avoid impacts to CTS, including adult individuals that may have moved to adjacent burrows.

- The tracking of rainfall during the rainy season (November through March) within the Project area to determine the rainfall amount for the 5-year monitoring period and how this compares to the long-term average.
- Establishing photo points preferably at a distance of approximately 30 m from the pool edge and take photographs during the rainy season and at the end of the rainy season to document proper seasonal dry-down of the pool. The purpose of photo points would be to assess observable qualitative and quantitative changes.
- Following-up with repeat surveys during a typical rainfall year to assess the pool's ability to hold water for at least 10 weeks, which is the minimum amount of time to successfully recruit metamorphs from the pools. In addition, a survey during the dry season to document if the pool will be ephemeral, filling in late fall, winter, and spring, and drying out by early June to determine adequate dry-down to confirm no colonization by bullfrogs (a predator of CTS) could occur.
- Sample for the presence of CTS larvae.

9.2.3 Qualitative Monitoring for Vernal/Ephemeral Pool Enhancement

Purpose: Evaluate enhancement of vernal pools during wet season monitoring period.

Performance Criteria: The performance standards for vegetation are absolute cover and relative cover by vernal pool indicator plant species in each enhanced pool shall be within 15 percent of the reference pools.

Methods: The methods for monitoring the enhanced vernal pools include:

- Monitoring the structural components of the pool and associated structures. Due to the presence of livestock, which will be allowed to graze in the area of the pool, there is a possibility that the livestock could damage the pool which may determine the effectiveness of the pool to retain water. Temporary fencing to exclude livestock from grazing may be used to protect the pools at the discretion of the biologist and Land Manager. Any damage will have to be repaired outside the rainy season and avoid impacts to plant and animal species. Timing of cattle exclusion will be at the discretion of a qualified biologist and will be based on protecting the physical integrity of the pools. Allowing grazing within individual pools during the dry period may be used to manage non-native vegetation cover if deemed necessary by a qualified biologist
- The tracking of rainfall during the rainy season (November through March) within the Project area to determine the rainfall amount for the 5-year monitoring period and how this compares to the long-term average.
- Establishing photo points preferably at a distance of approximately 30 m from the pool edge and take photographs during the rainy season and at the end of the rainy season to document proper seasonal dry-down of the pool. The purpose of photo points would be to assess observable qualitative and quantitative changes.
- Monitor reference pools and enhanced pools each year for percent coverage of vegetation (and type) comparison, as vegetation cover can vary greatly depending on the annual weather patterns.

- If performance criteria are not met, the biologist will determine if reseeding the same pool or reseeding another pool within the VFCL would be most beneficial for the vernal pool enhancement (the established 0.05 acre of enhancement shall be met).

9.2.4 Qualitative Monitoring for Trash Removal

Purpose: To monitor conditions during and after the removal of debris dumping on the Conservation Lands.

Performance Criteria: Indicate all debris has been removed (unless specifically left in the creek channel to maintain stability) and that at least a 10 percent increase in vegetation within the banks over 5 years over baseline conditions, or the annual qualitative assessments have determined the significant erosion potential to be similar to other areas within the channel. Increase vegetative cover of at least 50 percent of nearby reference areas, including 10 percent native species. Non-native, invasive plant species populations will be managed so they do not impact the enhancement process of seeded areas.

Methods: Prior to the removal of the debris, photo points will be established to provide baseline conditions. During the removal process, a monitor will observe the process to document all debris that is removed. Once the debris is removed, the Land Manager will reseed with a native seed mix in the debris removal area as deemed necessary by a qualified biologist, with native plants locally sourced to prevent erosion. At that time additional baseline photographs will be taken from the photo points to be included in the annual report. Each of the debris areas will be monitored by use of photo points, which will indicate an erosion and revegetation success. If significant erosion is observed and/or no revegetation is observed, additional seeding or other stabilization methods (e.g., non-toxic chemical stabilizers, straw mulch) may be employed as deemed necessary by the qualified biologist. In addition, during the photo point assessments, any observations of non-native, invasive plant species in the enhancement areas will be noted and mapped for inclusion in the annual report.

9.3 Monitoring Schedule and Reporting Requirements

Monitoring of the enhancement sites will occur until performance criteria are met (minimum of 5 years). Reporting will occur annually. Reports will include general condition of the site and management actions implemented in that year and/or recommended for the following year. Each report will include a minimum of the following:

- Project information (i.e., contact information for responsible parties, site location and directions, permit file numbers, acres and type of impacts being mitigated, date of field visit, corresponding permit conditions for the site, and any information on performance bonds or surety)
- Compensatory site information (i.e., existing habitat description, construction and planting implementation dates, weather conditions, dates of previous maintenance and monitoring visits)
- Maps and photographic record
- List of success criteria and status of mitigation success
- Table of results from the monitoring visits versus performance standards for specified target dates
- Summary of field data

- Summary of significant events that may affect mitigation success (i.e., significant weather events)
- Brief summary of remedial actions and maintenance of the compensatory mitigation site

Monitoring at mitigation sites will be completed during the appropriate time (e.g., late winter and late spring) of each monitoring year and will include vegetation monitoring, non-native, invasive plant species monitoring, and other monitoring, as required. A mitigation monitoring report will be prepared for the mitigation sites to enable clear communication to the Land Manager of the Conservation Lands. The report will be submitted to the USACE, CDFW, and RWQCB, and the County by March 1 summarizing activities from the preceding monitoring year (January through December).

10 LONG-TERM MANAGEMENT

Long-term management activities for the Conservation Lands mitigation sites are to be funded by a long-term endowment based on a Property Analysis Record (PAR3[®]). A final PAR will be conducted by the third party Land Manager.

10.1 Parties Responsible for Long-term Management

The entity identified as the Land Manager will be submitted to the resource agencies for approval prior to the start of construction.

10.2 Activities Included in Long-term Management

Long-term management activities are similar to maintenance activities described herein and outlined in Sections 4.0 and 9.0 above. Complete descriptions of each activity for the success of the mitigation sites are detailed below:

- Access to the Panoche Creek enhancement area and CTS pool creation sites will be controlled through the installation of barriers, gates, signs, and/or fencing. These will be maintained and replaced as needed. Should the Land Manager deem necessary, additional barriers or access controls may be installed. Fencing will only be installed in areas where sensitive resources or hazards are identified and will be of a design that does not interfere with any native wildlife movement.
- With the exception of widespread common and abundant species (e.g., red brome, farmer's foxtail, filaree), non-native, invasive plant species will be controlled by identifying the exact location and extent of the targeted species, determining the threat posed to sensitive vegetation communities within the mitigation sites, establishing and prioritizing remediation actions based on the severity of the threat and infestation, implementing effective methods for control, and scheduling of management actions. This will occur on an annual basis.
- Conservational Lands will be monitored for any signs of illegal dumping. Trash found within the parcels will be collected and disposed of as-needed.
- Annual inspections of the sites will be conducted to assess the overall conditions. These inspections will document any stresses or threats to habitats and species and allow for the Land Manager to identify priority areas where preventative and remedial measures are needed. Furthermore, the potential occurrence for special-status species will be assessed.

- A Geographical Information System (GIS) database will be maintained for the property by the Land Manager.
- Annual reports containing information on management activities, expenditures, and the status of the endowment will be prepared and submitted to all interested parties.

11 ADAPTIVE MANAGEMENT

Specific maintenance and management activities will be identified based on the results of each annual monitoring visit for at least 5 years. If performance criteria for enhancement areas are not met at the end of the 5-year monitoring period, the monitoring period will be extended up to an additional 5 years. As part of each annual monitoring report, maintenance and management activities implemented during the previous year will be described and the results will be evaluated under the framework of adaptive management. If management and maintenance methods are not successful in addressing negative environmental stressors identified as part of annual monitoring reports, the methods will be examined and altered to increase the potential for success based on best professional judgment and management methods that are shown to be successful based on scientific research. This will be done in consultation with CDFW and San Benito County. In some cases, success of management and maintenance activities may not be evident over the course of only 1 year. This will be accounted for in annual monitoring reports through evaluation of whether or not management actions are contributing to progress towards the ultimate goal through the use of control plots or other approved method. In these cases, it may be necessary to wait 2 years or more before altering methods as part of an adaptive management strategy. Each annual monitoring report will contain a section dedicated to evaluation of management and maintenance actions as part of the adaptive management strategy.

11.1 Natural Occurrences

Contingencies will be included in the conservation easement and funding agreement for costs of management activities to be carried out in the event that a fire, flood, or other natural disaster should have a negative impact on preserved, enhanced, and/or restored habitat during the initial monitoring period. The 5-year habitat management work program, which prioritizes biological resource and land stewardship tasks and includes 5-year staffing and materials budget, includes a fire management component developed in cooperation with the responsible fire agencies and in compliance with applicable State and local policies and regulations. In addition, the fire management component of the long-term management plan will be updated every 5 years. Remedial actions will be carried out during the initial monitoring period if habitat quality is reduced due to the occurrence of fire and/or other natural disasters. Remedial actions will also be carried out during long-term management if habitat quality is reduced due to management activities.

11.2 Potential Remedial Actions

Enhancement area habitat remediation consists of minor restoration of habitat from the effects of erosion, unauthorized access, or removal of exotics; it is not considered ecological habitat restoration or creation. This task may include seeding with native seeds or weed removal. Habitat remediation is included during the initial monitoring (start-up) period for the mitigation sites and is also an integral part of the enhancement area habitat management in perpetuity.

12 FINANCIAL ASSURANCES

PVS currently holds options to purchase the Conservation Lands. The purchase price paid for the property will be determined by standard appraisal methods that require analysis of comparable properties in the region.

12.1.1 Plan Implementation

The costs for implementation of enhancement activities for the WMMP will be determined within the conservation easement(s) and the funding agreement. Costs associated with this WMMP include mobilization, removal of trash and debris, removal of non-native invasive plant species, enhancement of riparian and wetland vegetation, creation of three CTS pools, and short-term management (5 years).

12.1.2 Long-term Maintenance

Long-term management funds will be provided by an endowment appropriate to provide the average (inflation-adjusted) annual budget required to cover management tasks (this includes monitoring). The endowment earnings assumptions are specific to the investment strategy, administrative costs, and inflation assumptions of the endowment management entity. The capitalization rate and details related to the endowment will be finalized upon approval of the management plans, including the WMMP, and selection of the Land Manager.

12.2 Form of the Letter of Credit

Financial assurance during the initial monitoring period will be guaranteed by PVS through issuance of a Letter of Credit or a Performance Bond. The dollar amount of the Letter of Credit will be based on the estimated cost of mitigation implementation to be determined upon acceptance of the mitigation plan by resource agencies and is subject to final approval by the USACE. The final dollar amount will be provided by PVS under separate cover prior to the start of construction. Detailed financial information will be provided in the conservation easement and funding agreement.

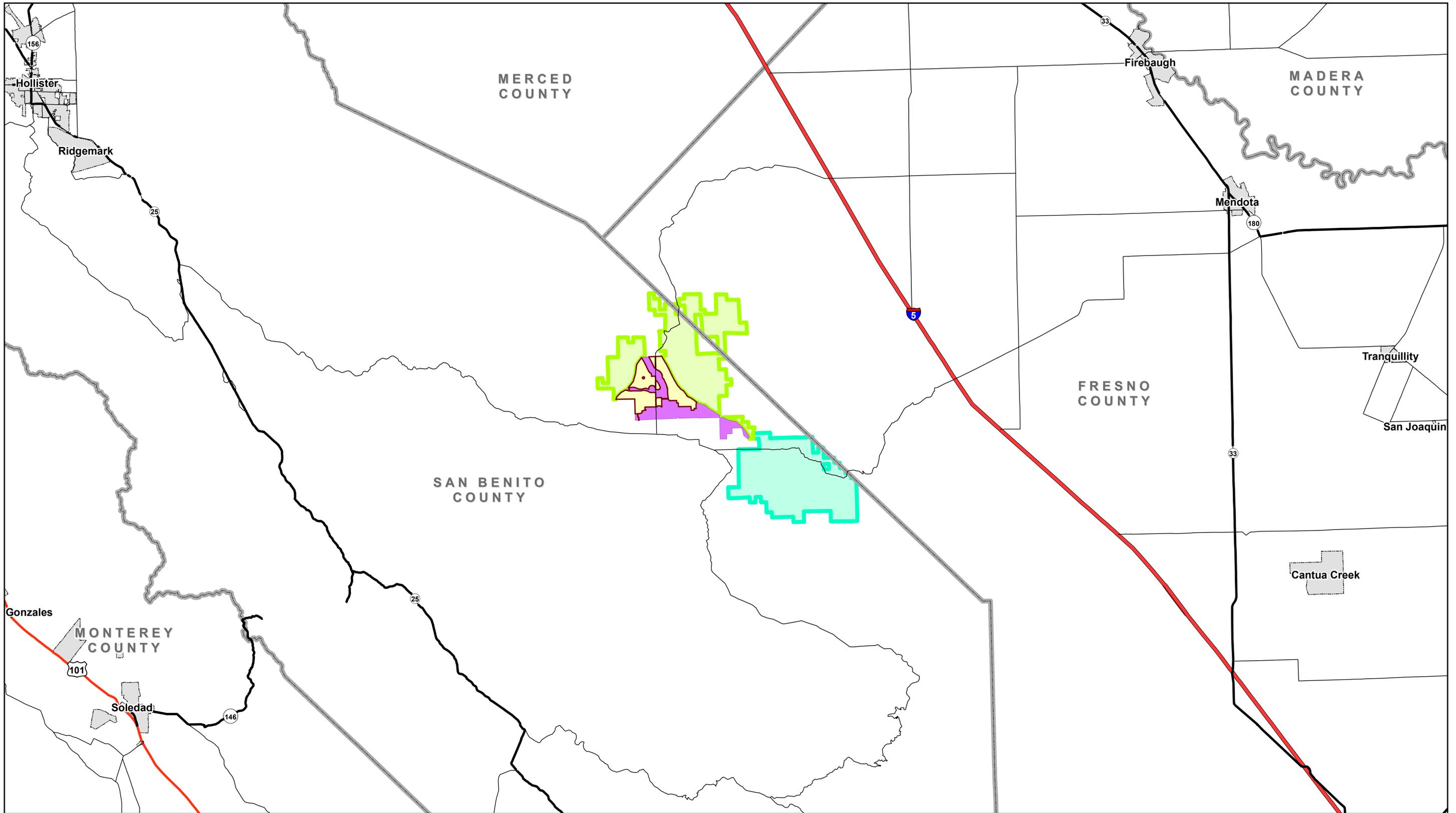
13 REFERENCES

- Aspen Environmental Group. 2010 Final Environmental Impact Report for the Panoche Valley Solar Farm Project. 2010. <http://www.cosb.us/Solargen/feir.htm>.
- Aspen Environmental Group. 2015 Final Supplemental Environmental Impact Report for the Panoche Valley Solar Farm Project. 2015. <http://www.cosb.us/county-departments/building-planning/panoche-valley-solar-project-final-supplemental-environmental-impact-report/#.VShD86Pn9zk>.
- Bureau of Land Management. Central California Standards for Rangeland Health and Guidelines for Livestock Grazing Management. 1999.
- California Regional Water Quality Control Board, Central Valley Region. Water Quality Control Plan for the Tulare Lake Basin Plan Second Edition. 2004.
- Ferren, W.R. Jr., Witham, C.W., Bauder, E.T., Belk, D., and Ornduff, R. (Eds). (1998). *Ecology, conservation, and management of vernal pool ecosystems – proceedings from a 1996 conference*. (pp. 217-223). Sacramento: California Native Plant Society.
- Germano, D. J., Rathbun, G. B., Saslaw, L. R., Cypher, B. L., Cyper, E. A., and Vredenburgh, L. (2011). The San Joaquin Desert of California: ecologically misunderstood and overlooked. *Natural Areas Journal*, 31, 138–147.
- Germano, D. J., Rathbun, G. B. and Saslaw, L. R. (2012). Effects of grazing and invasive grasses on desert vertebrates in California. *The Journal of Wildlife Management*, 76, 670-682.
- Natural Resources Conservation Service (NRCS), United States Department of Agriculture. Web soil survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed 21 January 2015.
- Panoche/Silver Creek Watershed Assessment Final Report (PSCW). (1998). McCulley, Frick & Gilman, Inc. Accessed 7 February 2015 from. http://www.water.ca.gov/pubs/environment/watersheds/panoche_silver_creek_watershed_assessment_final_report/psc-assessment.pdf
- U.S. Army Corps of Engineers (USACE). (2008). 33 CFR Part 322 § 332.3-332.8.

Appendices

APPENDIX A
Figures

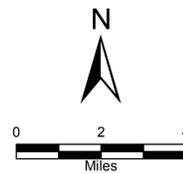
APPENDIX B
Photographs and Mapbook



BR
10/14/2014

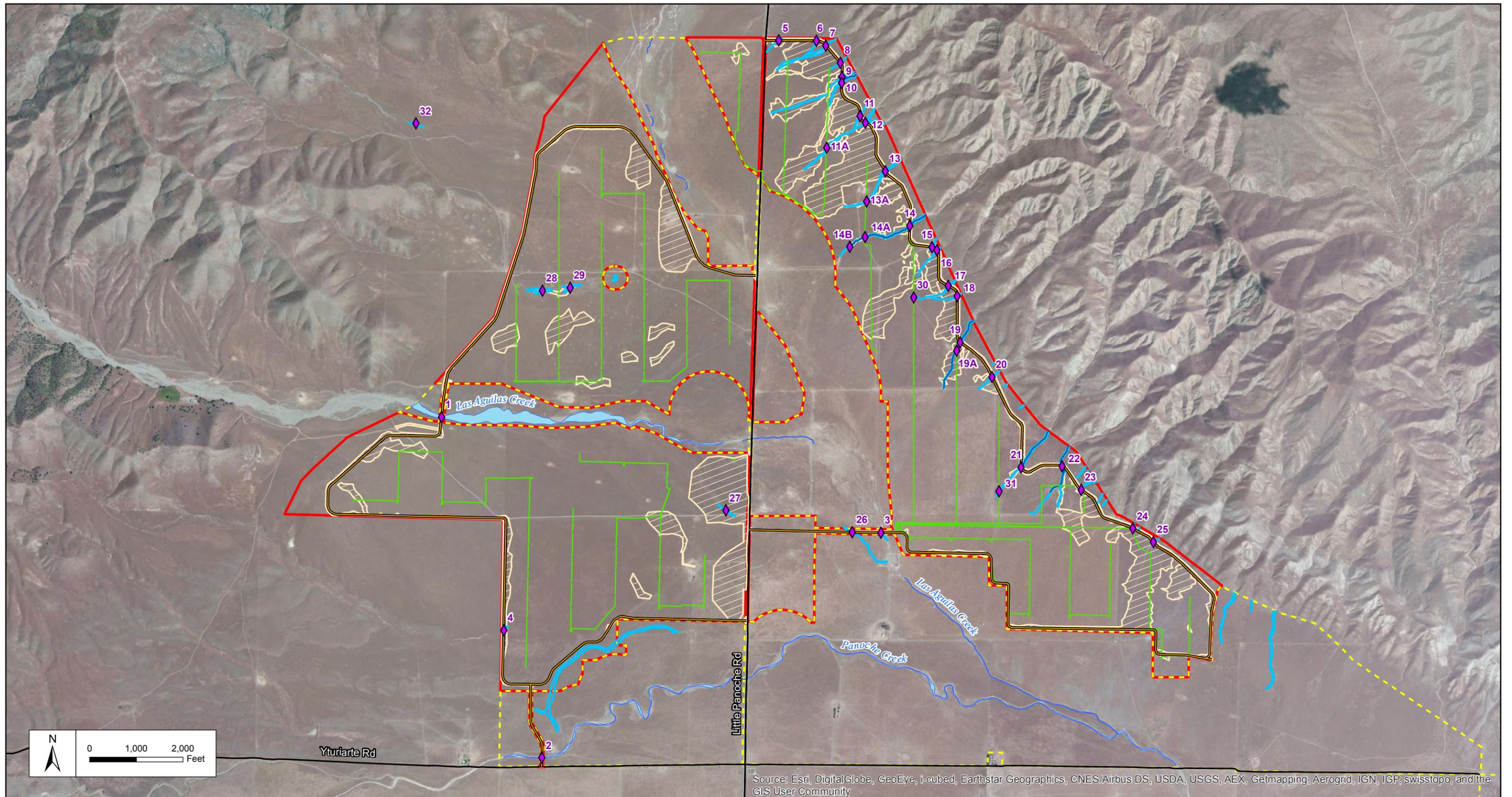
Legend

- County Line
- City Limit
- Project Footprint
- Valley Floor Conservation Lands
- Valadeao Ranch Conservation Lands
- Silver Creek Ranch Conservation Lands



Panoche Valley Solar Project
PV Project Location Overview

FIGURE
1



Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

305 Camp Craft Road, Suite 575
 West Lake Hills, Texas 78746
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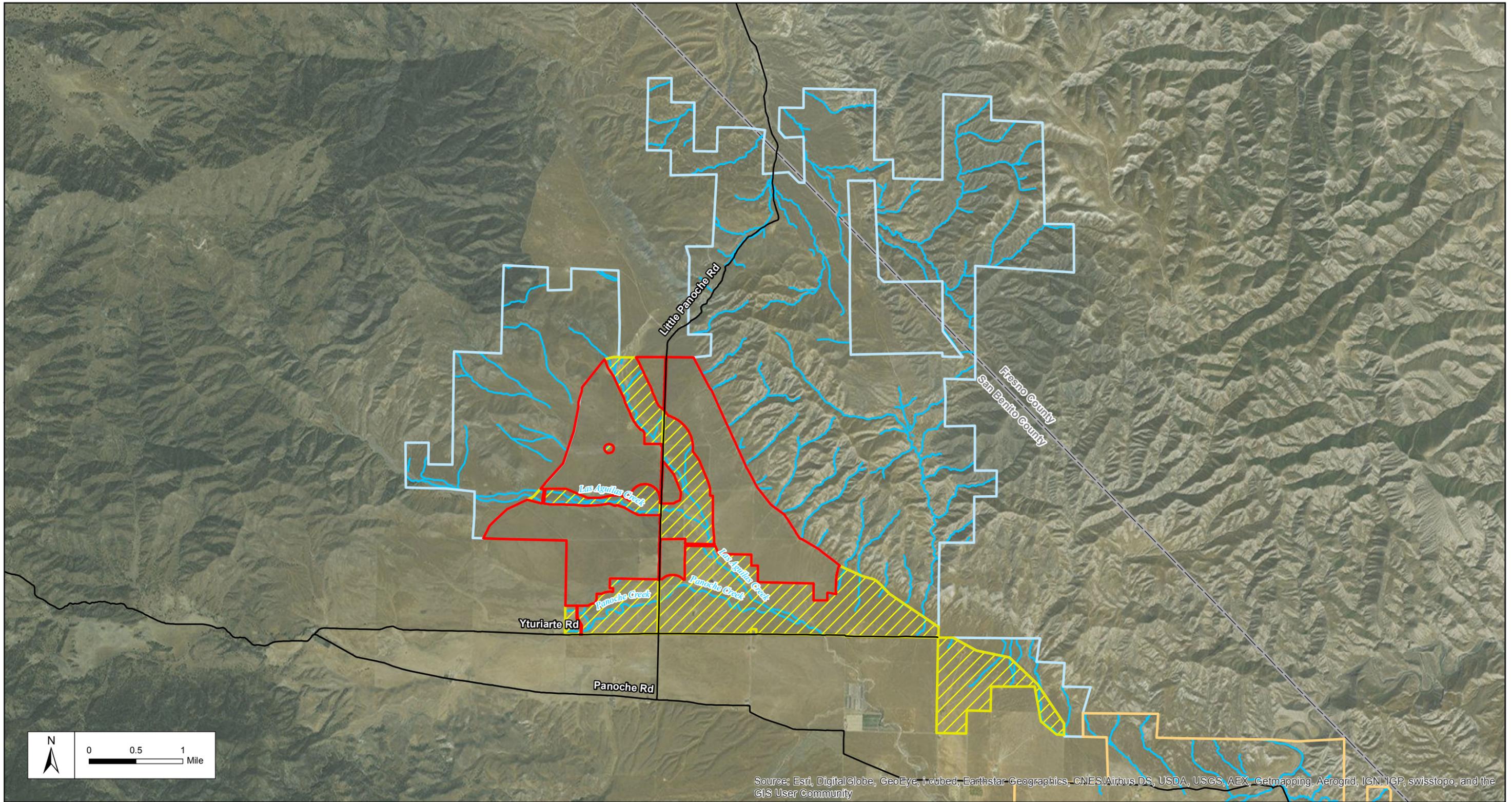


Legend

- | | | |
|---------------------------------|-----------------|-------------------------|
| Project Footprint | Drainage Impact | Jurisdictional Drainage |
| Valley Floor Conservation Lands | Perimeter Road | Drainage Outline |
| Grading Area | AC Block Feeder | Jurisdictional Water |

Panoche Valley Solar Project
 Drainage Impacts

FIGURE
2



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Legend

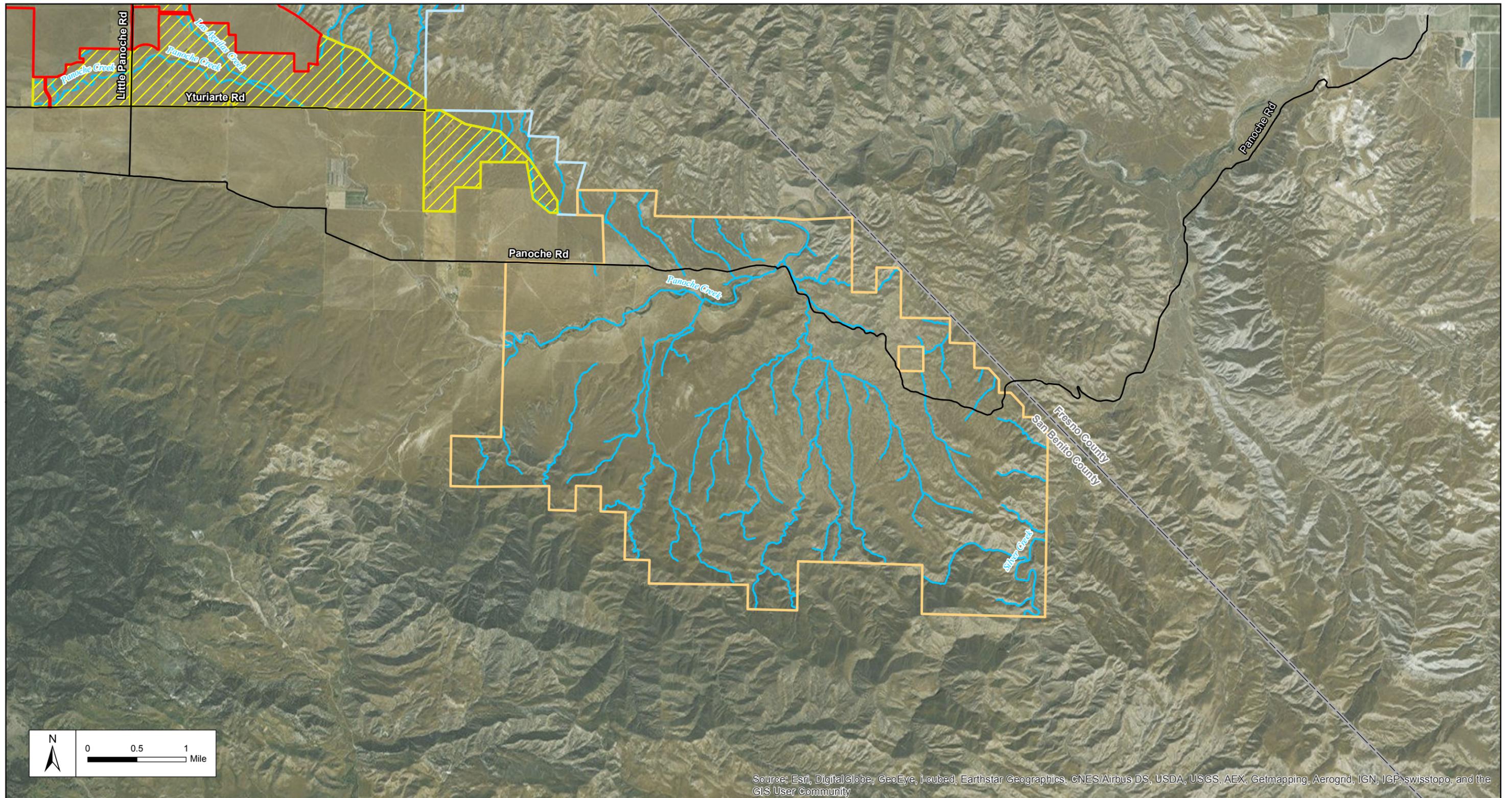
- Project Footprint
- Valadeao Ranch Conservation Lands
- Silver Creek Ranch Conservation Lands
- Valley Floor Conservation Lands
- ~ Stream/Drainage

Panoche Valley Solar Project

Waters on Conservation Lands

Valadeao Ranch and Valley Floor

**FIGURE
3a**



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Legend

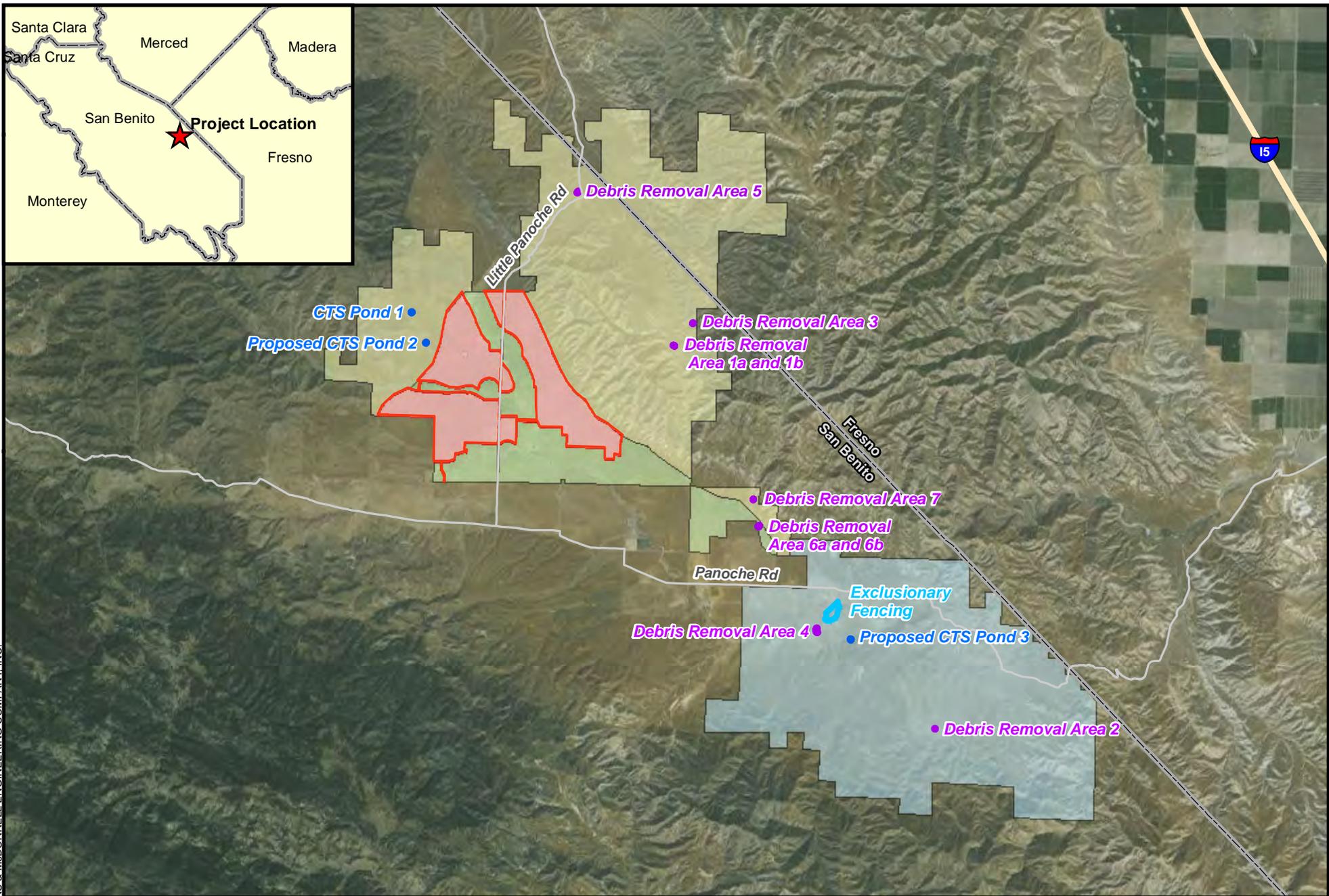
- Project Footprint
- Silver Creek Ranch Conservation Lands
- Valadeao Ranch Conservation Lands
- Valley Floor Conservation Lands
- ~ ~ ~ Stream/Drainage

Panoche Valley Solar Project

Waters on Conservation Lands

Silver Creek Ranch

**FIGURE
3b**



Path: G:\ESPA\panoche\ValleySolar\0258\Records\GIS_Figures_Photos\DataFiles\ArcDocs\Figure 4 Mitigation Areas Overview.mxd
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LEGEND

-  Exclusionary Fencing
-  Streets
-  County Boundary
-  CTS Areas
-  Debris Removal Area
-  Project Area
-  Silver Creek Ranch
-  Valley Floor
-  Valadeao Ranch

0 1 2 4 Miles

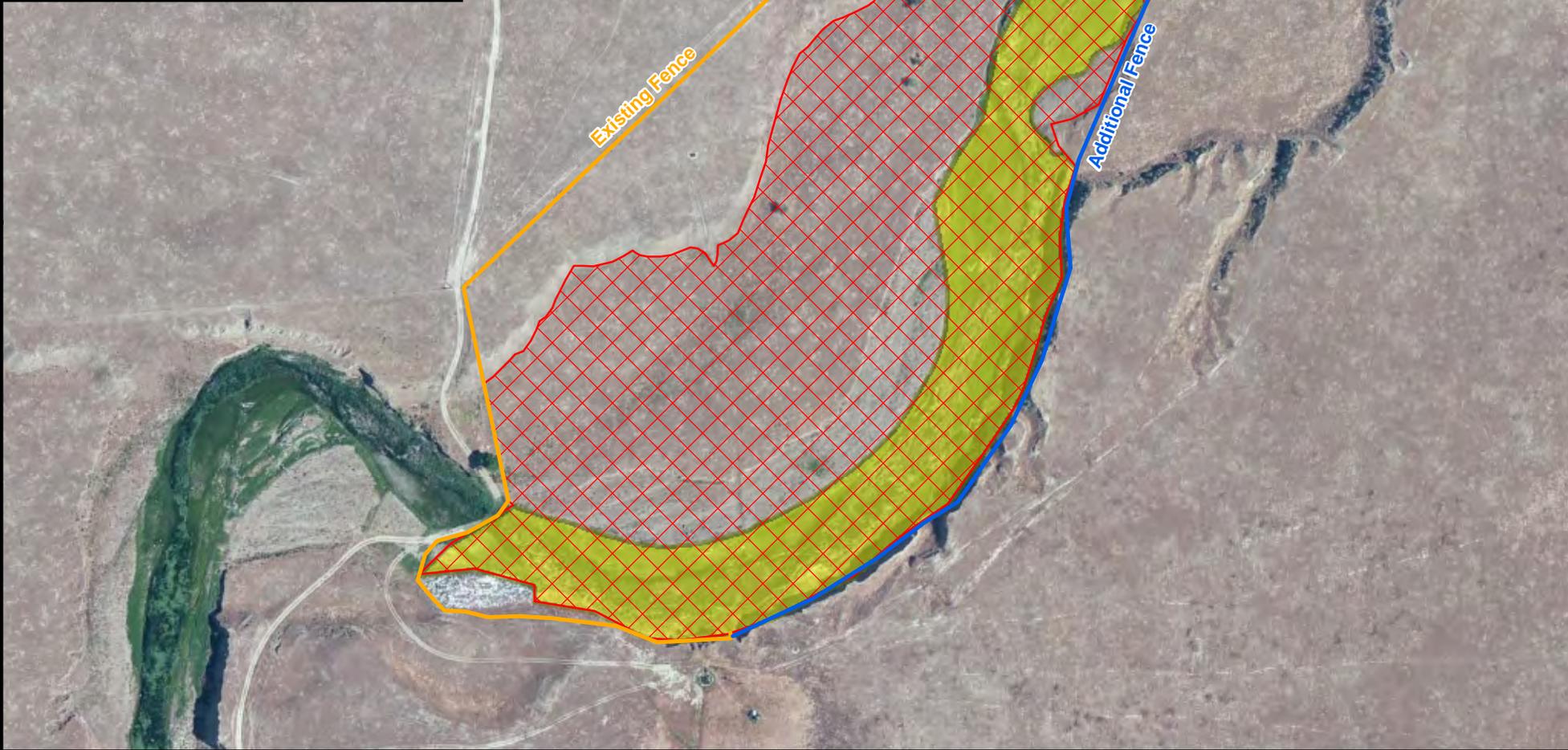
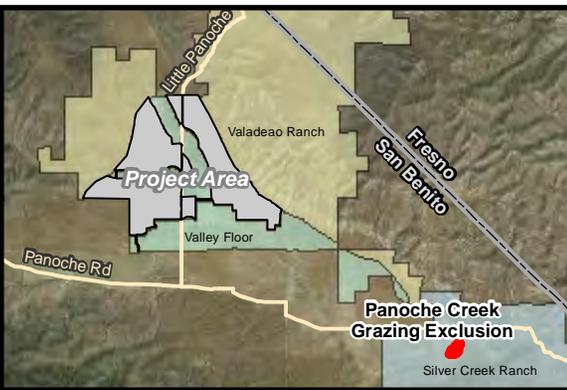


Source: ESRI and Burns & McDonnell Engineering.



Figure 4
MITIGATION AREAS
OVERVIEW

Path: F:\Projects\ESP\PanocheValley\Solar\80258\Records\GIS_Figures_Photos\DataFiles\ArcDocs\Figure 5 Panoche Creek Grazing Exclusion.mxd
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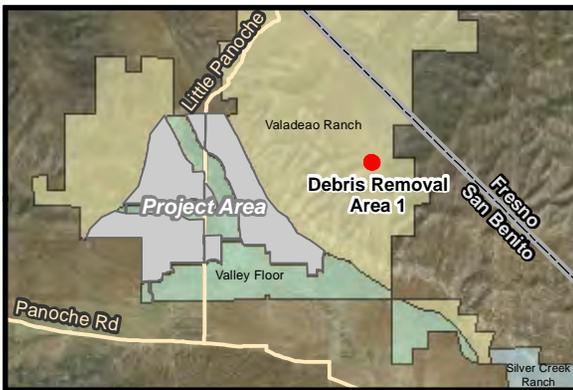
LEGEND

-  Additional Fence
-  Existing Fence
-  Jurisdictional Wetland Area, 5.81 acres
-  State Water Area, 16.97 acres



Figure 5
PANOCHÉ CREEK
GRAZING EXCLUSION

Source: ESRI and Burns & McDonnell Engineering.



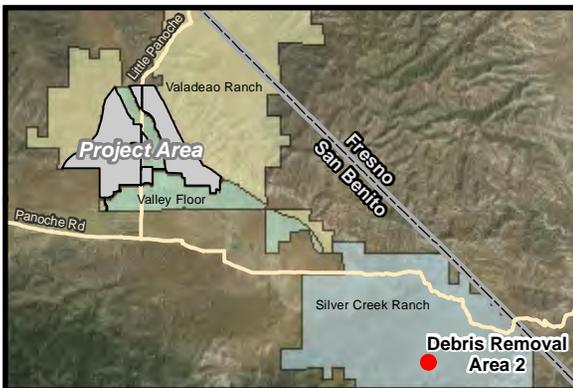
LEGEND

 Debris Removal Area



Figure 6
DEBRIS REMOVAL
AREA 1a AND 1b

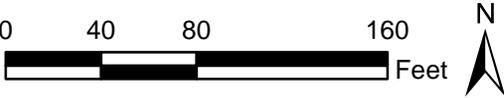
Path: F:\Projects\ESP\PanocheValleySolar\80258\Records\GIS_Figures_Photos\DataFiles\ArcDocs\Figure 7 Debris Removal Area 2.mxd
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LEGEND

 Debris Removal Area

0 40 80 160 Feet



Source: ESRI and Burns & McDonnell Engineering.



Figure 7
DEBRIS REMOVAL
AREA 2

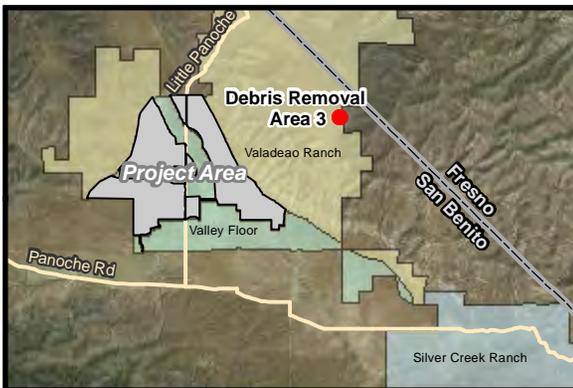
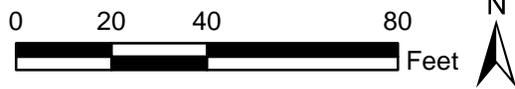


Photo: Debris Removal Area 3

LEGEND

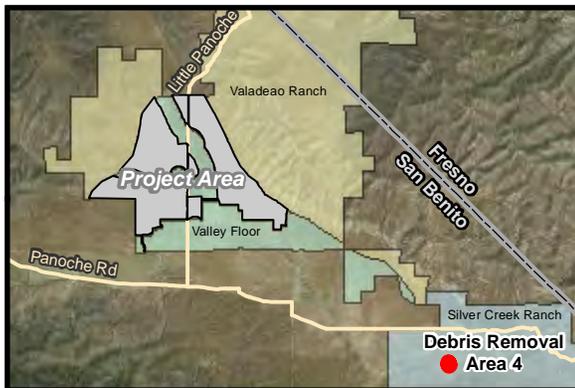
 Debris Removal Area



Source: ESRI and Burns & McDonnell Engineering.

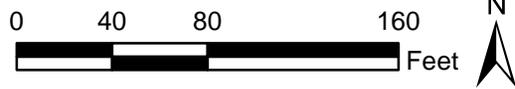


**Figure 8
DEBRIS REMOVAL
AREA 3**



LEGEND

 Debris Removal Area



Source: ESRI and Burns & McDonnell Engineering.



Figure 9
DEBRIS REMOVAL
AREA 4

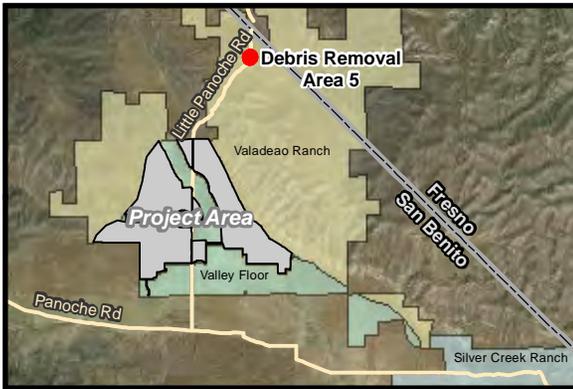


Photo: Debris Removal Area 5

LEGEND

 Debris Removal Area



**Figure 10
DEBRIS REMOVAL
AREA 5**

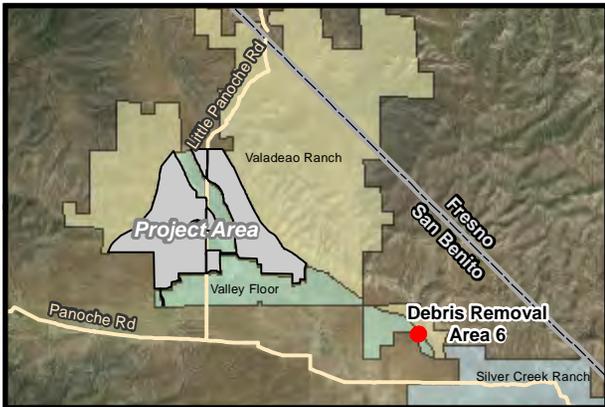


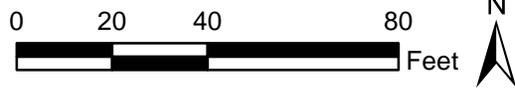
Photo: Debris Removal Area 6a



Photo: Debris Removal Area 6b

LEGEND

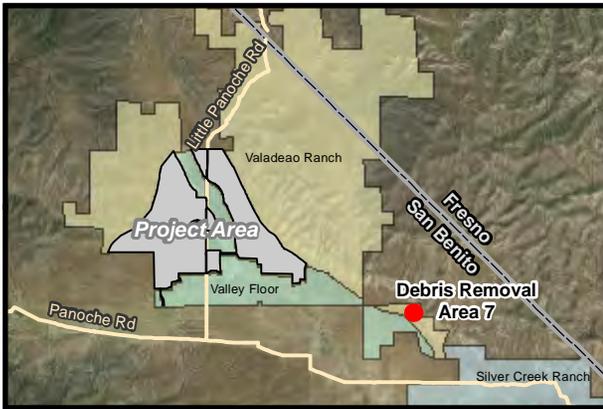
 Debris Removal Area



Source: ESRI and Burns & McDonnell Engineering.



Figure 11
DEBRIS REMOVAL
AREA 6a AND 6b

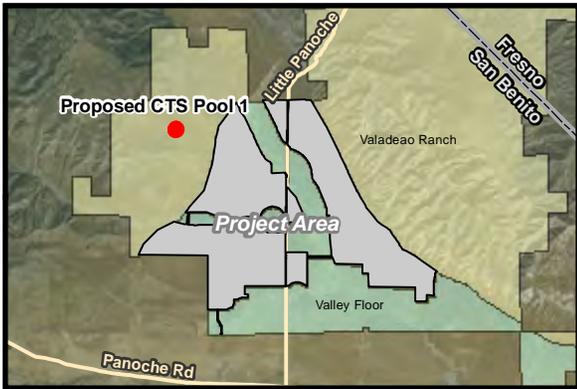


LEGEND

 Debris Removal Area



Figure 12
DEBRIS REMOVAL
AREA 7



Proposed CTS Pool 1

LEGEND

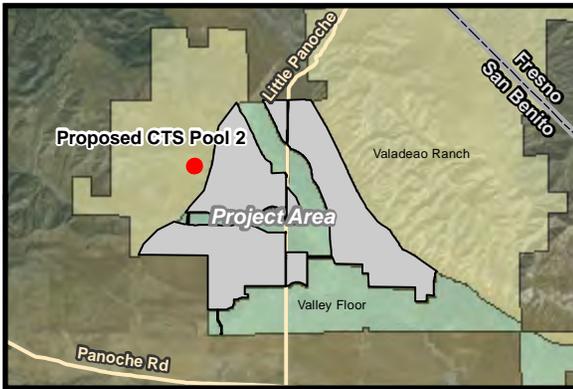
 CTS Pool



**Figure 13
PROPOSED CTS POOL 1**

Source: ESRI and Burns & McDonnell Engineering.

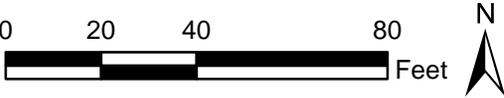
Path: G:\ESPA\panocho\ValleySolar\0258\Records\GIS_Figures_Photos\DataFiles\ArcDocs\Figure 14.Potential CTS Pool 2.mxd
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LEGEND

 CTS Pool

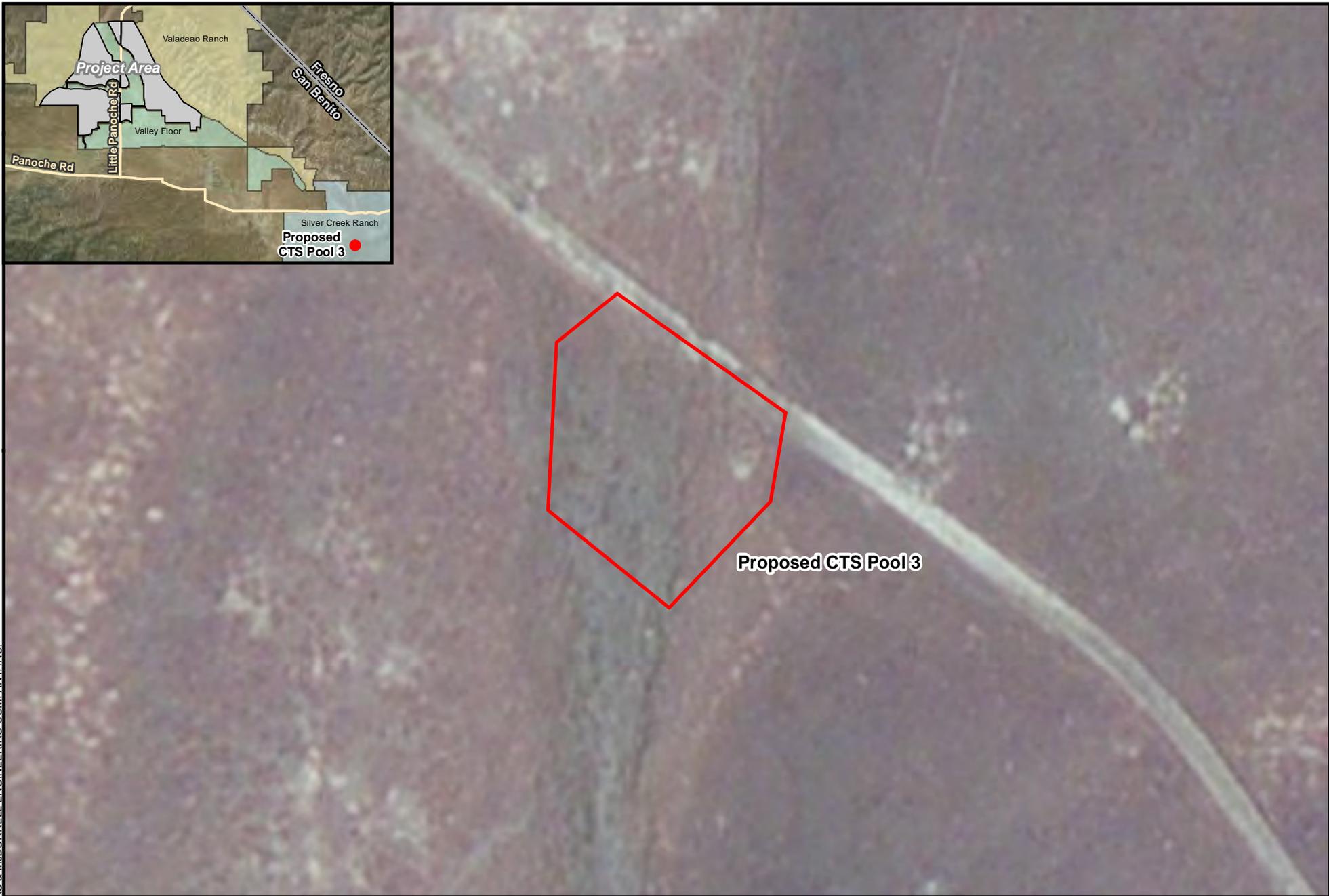
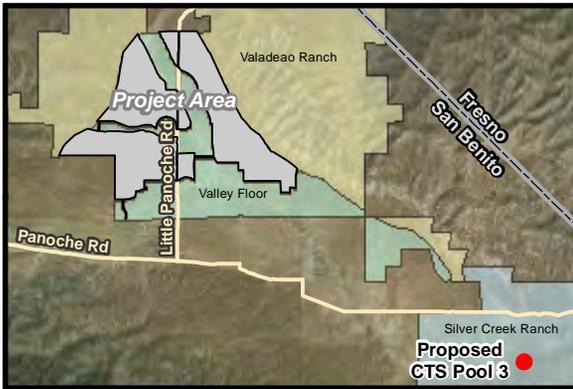
0 20 40 80 Feet



Source: ESRI and Burns & McDonnell Engineering.



Figure 14
PROPOSED CTS POOL 2



LEGEND

 CTS Pool



**Figure 15
PROPOSED CTS POOL 3**

Source: ESRI and Burns & McDonnell Engineering.

Path: G:\ESF\Panoche\ValleySolar\0258\Records\GIS_Figures_Photos\DataFiles\ArcDocs\Figure 15 Potential CTS Pool 3.mxd
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Photolog from January 12, 2015 Site Visit

Conducted by Energy Renewal Partners, McCormick Biological, and Burns & McDonnell



Figure 1: Photo 20 Upstream drainage channel



Figure 2: Photo 21 Downstream view



Figure 3: Photo 22 Upstream mid-channel



Figure 4: Photo 23a Upstream drainage with grazed ephedra



Figure 5: Photo 23 Downstream mid-channel



Figure 6: Photo 24 Upstream



Figure 7: Photo 25 Downstream



Figure 8: Photo 26 Upstream



Figure 9: Photo 27 Downstream



Figure 10: Photo 28 Top of drainage from above



Figure 11: Photo 29 Silver Creek



Figure 12: Photo 30 Top of drainage



Figure 13: Photo 31 Downstream



Figure 14: Photo 32 Upstream with head cut



Figure 15: Photo 33 Upstream



Figure 16: Photo 34 Downstream



Figure 17: Photo 35 Upstream



Figure 18: Photo 36 Downstream



Figure 19: Photo 37 In-line dam with ponded basin



Figure 20: Photo 38 Dam



Figure 21: Photo 39 Dam and basin looking downstream



Figure 22: Photo 40 Upstream



Figure 23: Photo 41 Downstream



Figure 24: Photo 42 Downstream



Figure 25: Photo 43 Upstream



Figure 26: Photo 44 Upstream



Figure 27: Photo 45 Downstream



Figure 28: Photo 47 Upstream



Figure 29: Photo 48 Upstream



Figure 30: Photo 49 Downstream



Figure 31: Photo 50 In-line dam structure

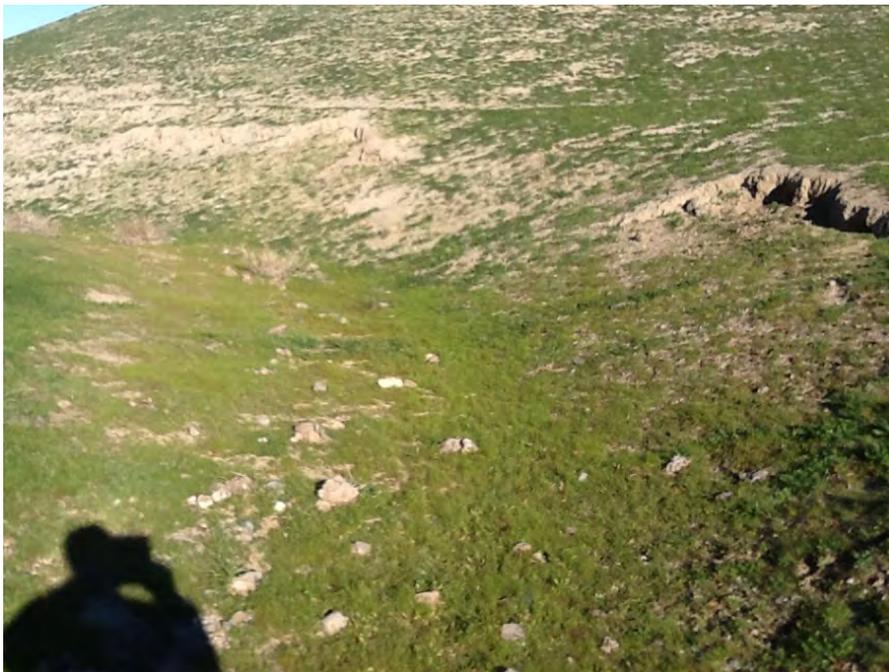


Figure 32: Photo 51 Downstream



**Figure 33: Photo 52 Upstream with drainage convergence on left.
Not indicated on USGS National Hydrography Dataset**



Figure 34: Photo 53 Drainage. Not indicated on USGS National Hydrography Dataset



Figure 35: Photo 54 Looking upstream from top of hill



Figure 36: Photo 55 Looking downstream from top of hill



Figure 37: Photo 56 Upstream



Figure 38: Photo 57 Downstream



Figure 39: Photo 58 Downstream



Figure 40: Photo 59 Upstream



Figure 41: Photo 60 Upstream



Figure 42: Photo 61 Downstream



Figure 43: Photo 62 Downhill. No channel evident



Figure 44: Photo 63 Uphill. No channel evident



Figure 45: Photo 64 Downstream

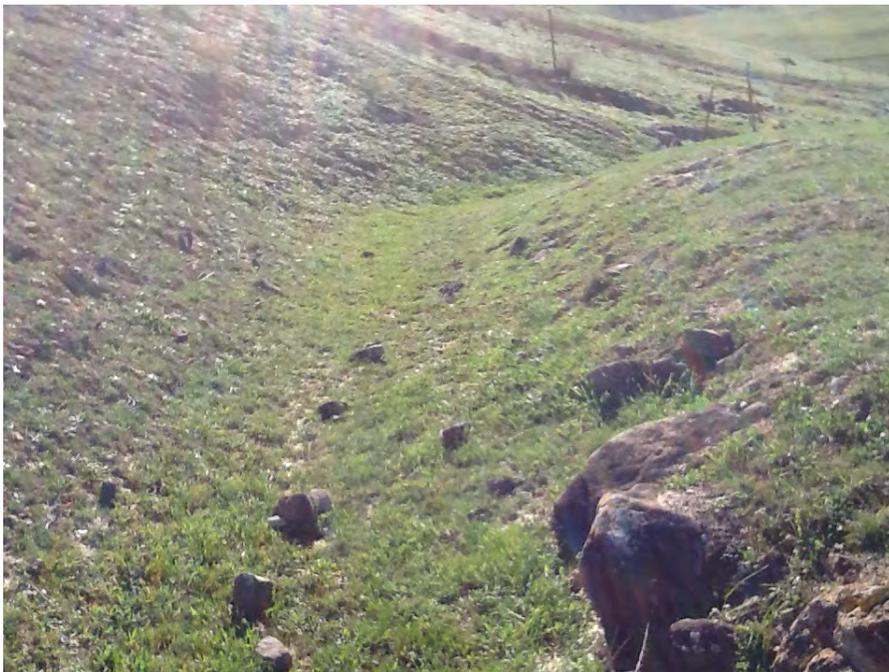


Figure 46: Photo 65 Upstream



Figure 47: Photo 67 Downstream



Figure 48: Photo 68 Upstream



Figure 49: Photo 69 Downstream of confluence



Figure 50: Photo 70 Upstream left channel



Figure 51: Photo 71 Upstream right channel



Figure 52: Photo 72 Upstream



Figure 53: Photo 73 Downstream



Figure 54: Photo 74 Upstream



Figure 55: Photo 75 Downstream



Figure 56: Photo 76 Upstream.



Figure 57: Photo 77 Downstream



Figure 58: Photo 78 Upstream



Figure 59: Photo 79 Downstream



Figure 60: Photo 82 Upstream



Figure 61: Photo 83 Downstream



Figure 62: Photo 84 Upstream



Figure 63: Photo 85 Downstream



Figure 64: Photo 86 CTS Potential Pond 2



Figure 65: Photo 87 Potential CTS 3 upstream



Figure 66: Photo 88 Potential CTS 3 down stream



Figure 67: Photo 90 Downstream



Figure 68: Photo 91 Upstream



Figure 69: Photo 92 Downstream



Figure 70: Photo 93 Upstream



Figure 71: Photo 94 Upstream



Figure 72: Photo 95 Upstream



Figure 73: Photo 96 Upstream



Figure 74: Photo 97 Downstream. Road and culvert



Figure 75: Photo 98 Upstream with small basin.



Figure 76: Photo 99 Downstream with road and culvert



Figure 77: Photo 100 Upstream right channel



Figure 78: Photo 101 Upstream left channel



Figure 79: Photo 102 In-line dam with inundated ponded basin looking downstream.



Figure 80: Photo 103 Dammed channel



Figure 81: Photo 104 Upstream Drainage. Not indicated on USGS National Hydrography Dataset



Figure 82: Photo 105 Downstream Drainage. Not indicated on USGS National Hydrography Dataset



Figure 83: Photo 106 Drainage. Not indicated on USGS National Hydrography Dataset drainage upstream



Figure 84: Photo 107 Drainage. Not indicated on USGS National Hydrography Dataset downstream



Figure 85: Photo 108 Upstream



Figure 86: Photo 109 Downstream



Figure 87: Photo 110 Upstream



Figure 88: Photo 111 Downstream



Figure 89: Photo 112 Upstream



Figure 90: Photo 113 Downstream



Figure 91: Photo 114 Upstream



Figure 92: Photo 115 Downstream



Figure 93: Photo 116 Upstream



Figure 94: Photo 117 Downstream



Figure 95: Photo 120 Convergence of channels – downstream



Figure 96: Photo 121 Convergence left historical channel looking upstream



Figure 97: Photo 122 Convergence of channels - man made channel looking upstream



Figure 98: Photo 123 Upstream



Figure 99: Photo 124 Downstream



Figure 100: Photo 125 Historical channel upstream



Figure 101: Photo 126 Open convergence meadow that has been dammed



Figure 102: Photo 127 Upstream



Figure 103: Photo 128 Downstream toward convergence



Figure 104: Photo 129 Upstream



Figure 105: Photo 130 Downstream



Figure 106: Photo 131 Upstream



Figure 107: Photo 132 Downstream



Figure 108: Photo 133 Upstream view of unmapped Drainage. Not indicated on USGS National Hydrography Dataset



Figure 109: Photo 134 Downstream view of unmapped waters



Figure 110: Photo 135 Upstream



Figure 111: Photo 136 Downstream



Figure 112: Photo 137 Upstream



Figure 113: Photo 138 Downstream



**Figure 114: Photo 139 On hill crest looking into project area at Drainage.
Not indicated on USGS National Hydrography Dataset.**



Figure 115: Photo 140 Downstream



**Figure 116: Photo 141 Looking downstream Drainage.
Not indicated on USGS National Hydrography Dataset unmarked on map**



Figure 117: Photo 142 Unmarked drainage looking downstream NE. Not indicated on USGS National Hydrography Dataset



Figure 118: Photo 143 Upstream



Figure 119: Photo 144 Downstream



Figure 120: Photo 146 Downstream



Figure 121: Photo 147 Upstream. Channel w some standing water



Figure 122: Photo 148 Downstream. Appears to discharge to land, no channel evident.



Figure 123: Photo 149 Upstream



Figure 124: Photo 150 Downstream



Figure 125: Photo 151 Upstream



Figure 126: Photo 152 Downstream



Figure 127: Photo 153 Upstream



Figure 128: Photo 154 Downstream



Figure 129: Photo 155 At bottom of confluence looking upstream



Figure 130: Photo 156 Downstream



Figure 131: Photo 157 Upstream



Figure 132: Photo 159 Downstream



Figure 133: Photo 160 Upstream



Figure 134: Photo 161 Downstream



Figure 135: Photo 162 Upstream from main channel



Figure 136: Photo 163 Upstream



Figure 137: Photo 164 Downstream.



Figure 138: Photo 165 Downstream looking down canyon



Figure 139: Photo 166 Upstream



Figure 140: Photo 167 Downstream



Figure 141: Photo 168 Upstream from main channel



Figure 142: Photo 169 Upstream



Figure 143: Photo 170 Downstream



Figure 144: Photo 171 Upstream Drainage. Not indicated on USGS National Hydrography Dataset



Figure 145: Photo 172 Downstream Drainage. Not indicated on USGS National Hydrography Dataset.



Figure 146: Photo 173 Upstream



Figure 147: Photo 174 Downstream.



Figure 148: Photo 175 Upstream from main channel



Figure 149: Photo 176 Upstream



Figure 150: Photo 177 Downstream



Figure 151: Photo 178 Upstream



Figure 152: Photo 180 Drainage. Not indicated on USGS National Hydrography Dataset



Figure 153: Photo 181 Downstream



Figure 154: Photo 182 Upstream



Figure 155: Photo 183 Downstream



Figure 156: Photo 184 Upstream. Headwater continues above blue-line end on map



Figure 157: Photo 185 Downstream



Figure 158: Photo 187 Upstream



Figure 159: Photo 188 Downstream



Figure 160: Photo 189 Dam.



Figure 161: Photo 191 Dam outlet north



Figure 162: Photo 192 Dam outlet south



Figure 163: Photo 193 Upstream



Figure 164: Photo 194 Downstream



Figure 165: Photo 196 Upstream



Figure 166: Photo 197 Downstream



Figure 167: Photo 198 Upstream.



Figure 168: Photo 199 Downstream



Figure 169: Photo 200 Upstream.



Figure 170: Photo 202 Upstream



Figure 171: Photo 203 Downstream



Figure 172: Photo 204 Upstream



Figure 173: Photo trash a-d Map figure Trash Removal Area 4



Figure 174: Photo trash a-d Map figure 5 Trash Removal Area 4

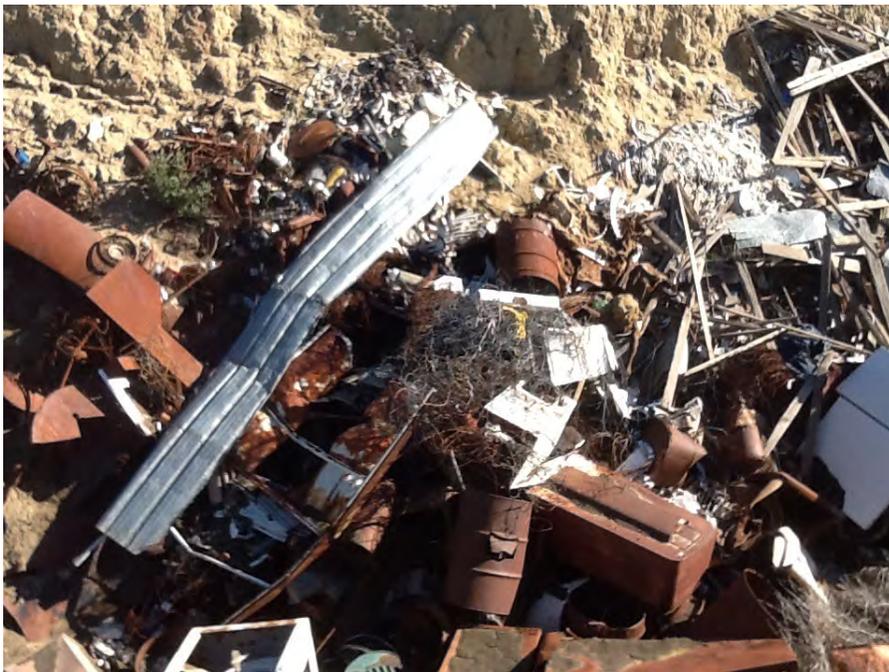


Figure 175: Photo trash a-d Map figure 5 Trash Removal Area 4



Figure 176: Photo trash a-d Map figure 5 Trash Removal Area 4



Figure 177: Photo 20a Downstream Old cattle dam possible removal for restoration. Four channels converge into primary, GIS does not show connectivity



Figure 178: Photo 20b Facing east. Potential enhancement where drainage can be corrected and prevent drainage flow down the existing road and have water flow across



Figure 179: Photo 20c Potential enhancement to remove road (exclude access)



Figure 180: Photo 20c Potential enhancement to remove road (exclude access)



Figure 181: Photo 22a Downstream



Figure 182: Photo 20b Facing east. Potential enhancement where drainage can be corrected and prevent drainage flow down the existing road and have water flow across



Figure 183: Photo 20c Potential enhancement to remove road (exclude access)



Figure 184: Photo 158 Downstream. Potential head cut tire washout. Restoration?



Figure 185: Photo 80 Silver creek channel to verify tamarisk infestation



Figure 186: Photo 81 Panoche creek downstream of road crossing looking downstream



Figure 187: Photo 66 Enhancement trash removal (tank in channel)



Figure 188: Photo 179 Downstream



Figure 189: Photo 46 Downstream



Figure 190: Photo 186 Old trash washed down



Figure 191: Photo 118 Man-made channel to divert flow with trash looking downstream

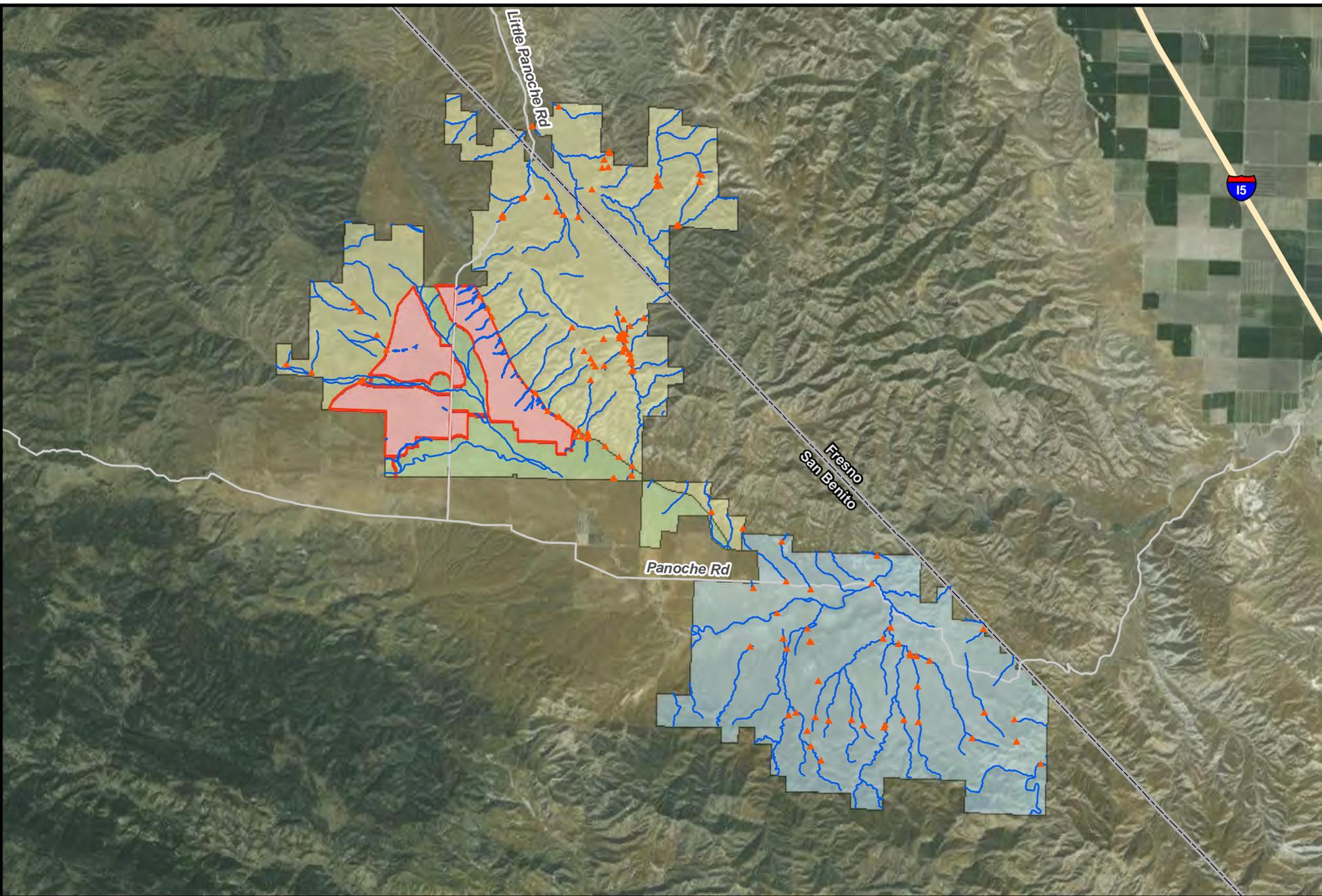


Figure 192: Photo 119 Man-made channel with trash looking up stream



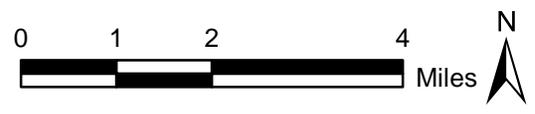
Figure 193: Photo 201 Downstream

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LEGEND

-  Photo Location
-  Drainage
-  Streets
-  County Boundary
-  Project Area
-  Silver Creek Ranch
-  Valley Floor
-  Valadeao Ranch



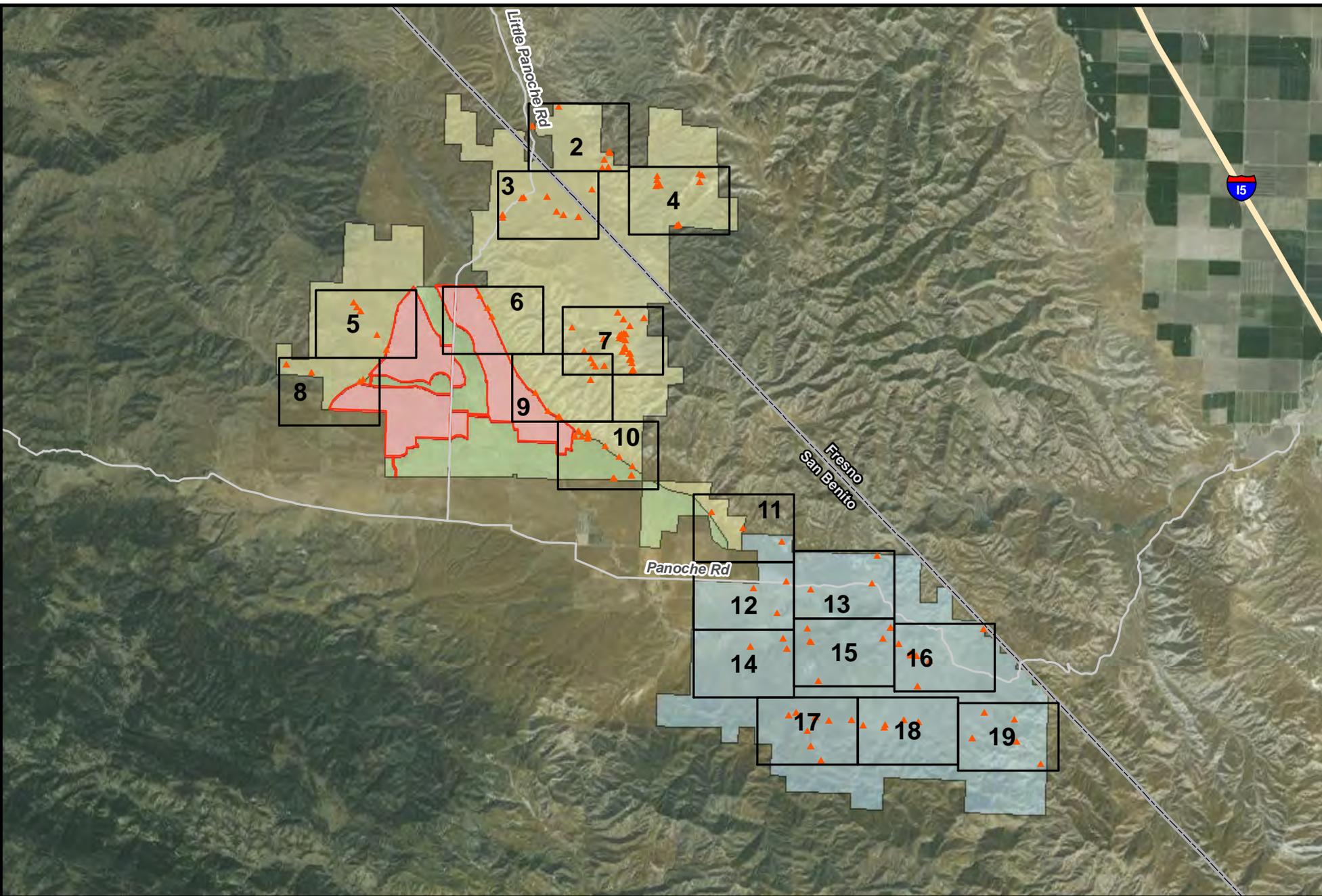
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**PHOTO LOCATIONS
AND DRAINAGE
OVERVIEW**

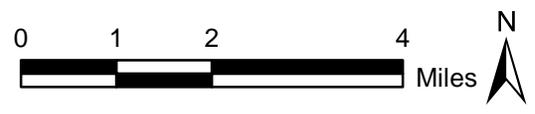
Issued: January 30, 2015

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LEGEND

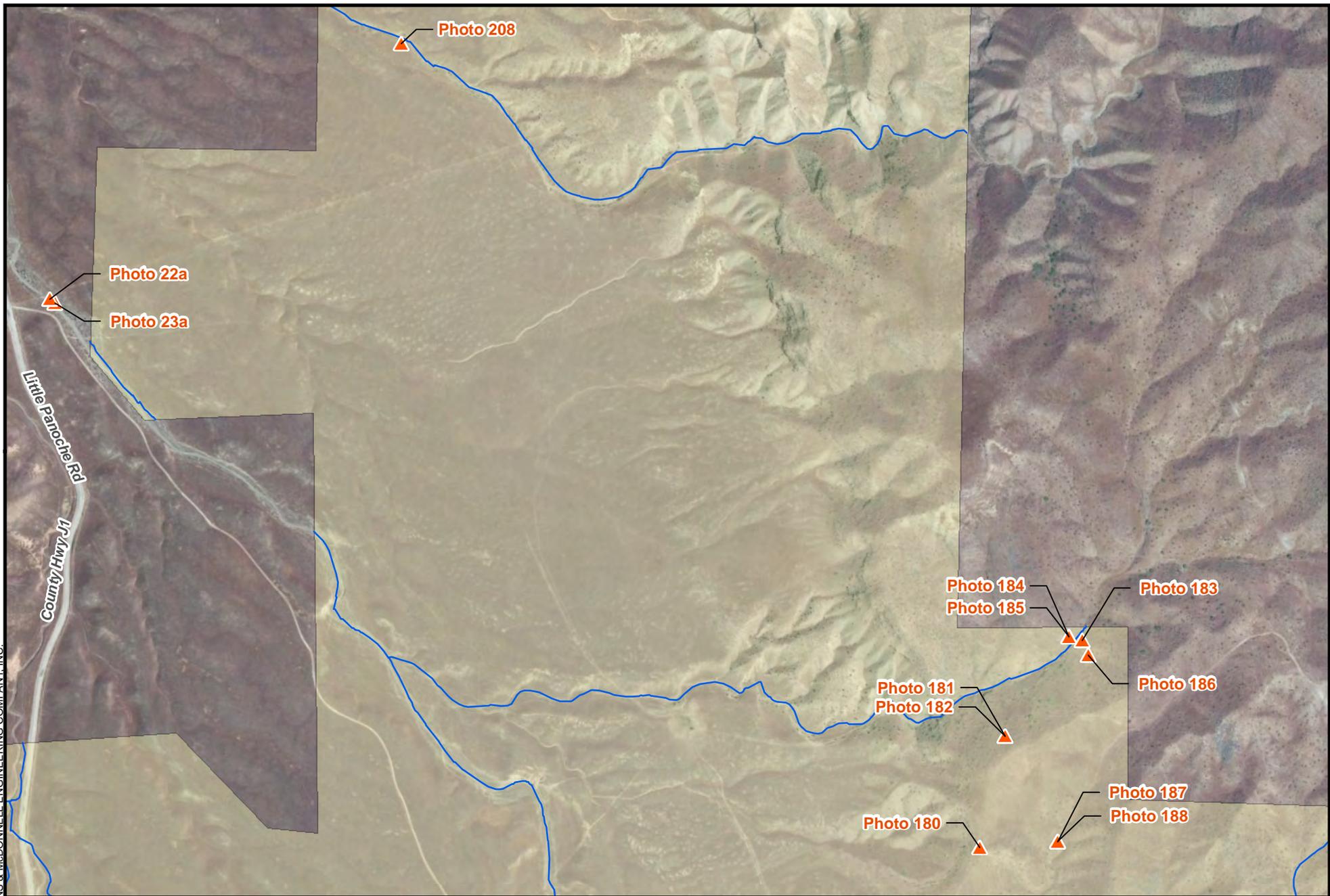
- Photo Location
- Project Area
- Silver Creek Ranch
- Valley Floor
- Valadeao Ranch
- Streets
- County Boundary



Source: ESRI and Burns & McDonnell Engineering.



**PHOTO LOCATIONS
INDEX MAP**



LEGEND

- ▲ Photo Location
- Silver Creek Ranch
- Project Area
- Valley Floor
- Valadeao Ranch

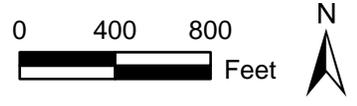
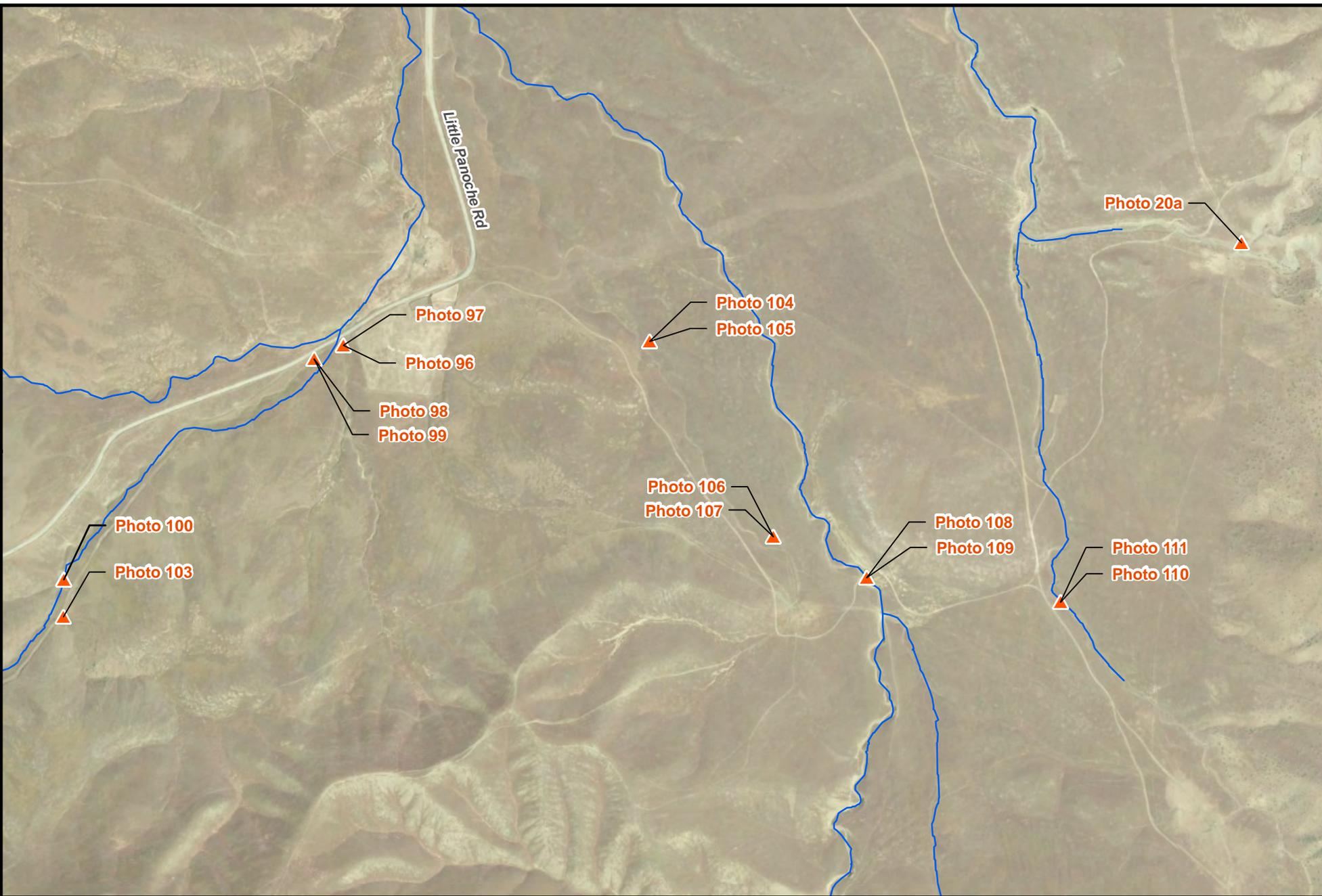


PHOTO LOCATIONS

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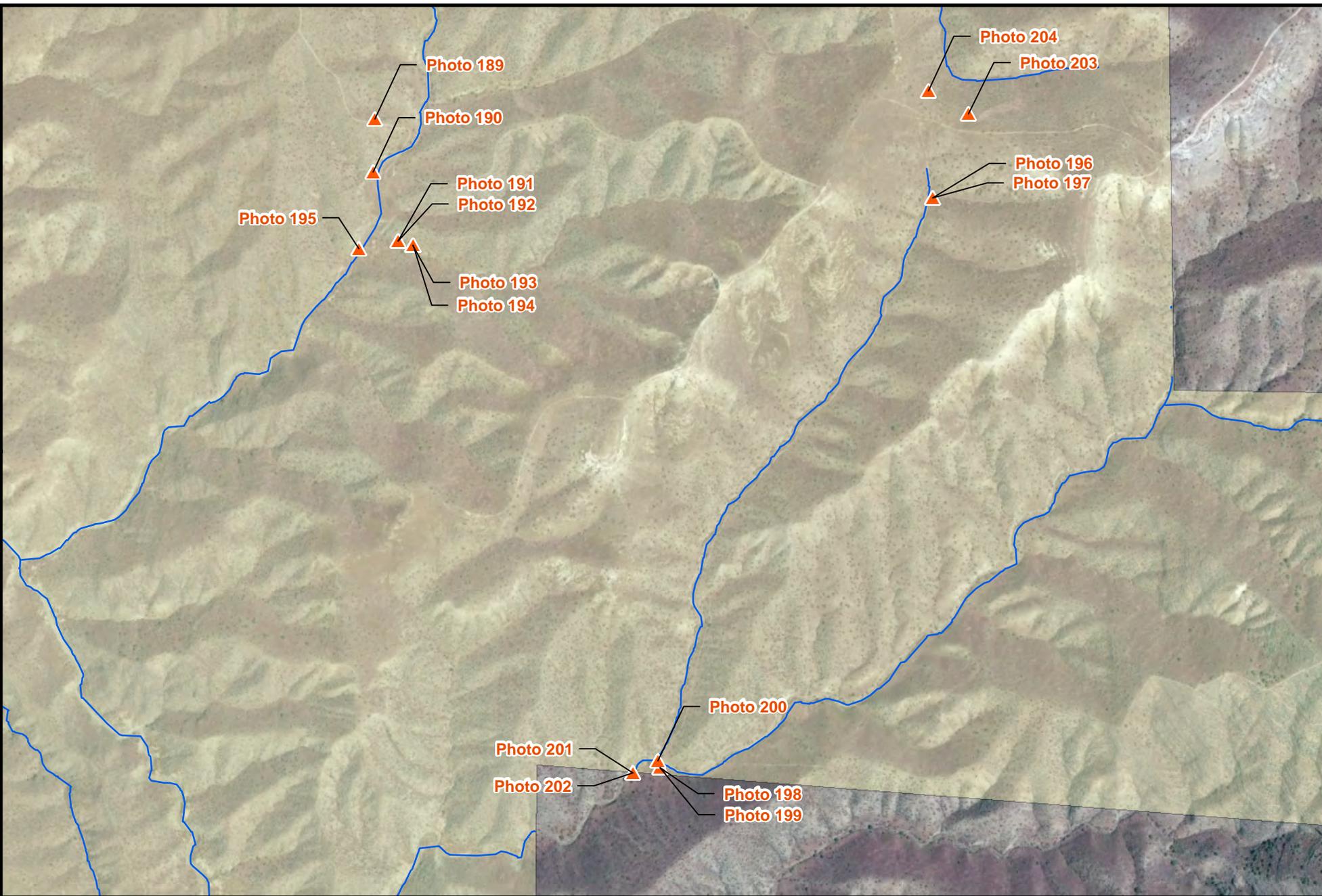
LEGEND

-  Photo Location
-  Silver Creek Ranch
-  Project Area
-  Valley Floor
-  Valadeao Ranch



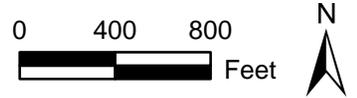
PHOTO LOCATIONS

Path: G:\ESP\Paroche\ValleySolar\0258\Records\GIS_Figures_Photos\Maps and Data 2015-01-28 submission\MXD\Photo Locations.mxd
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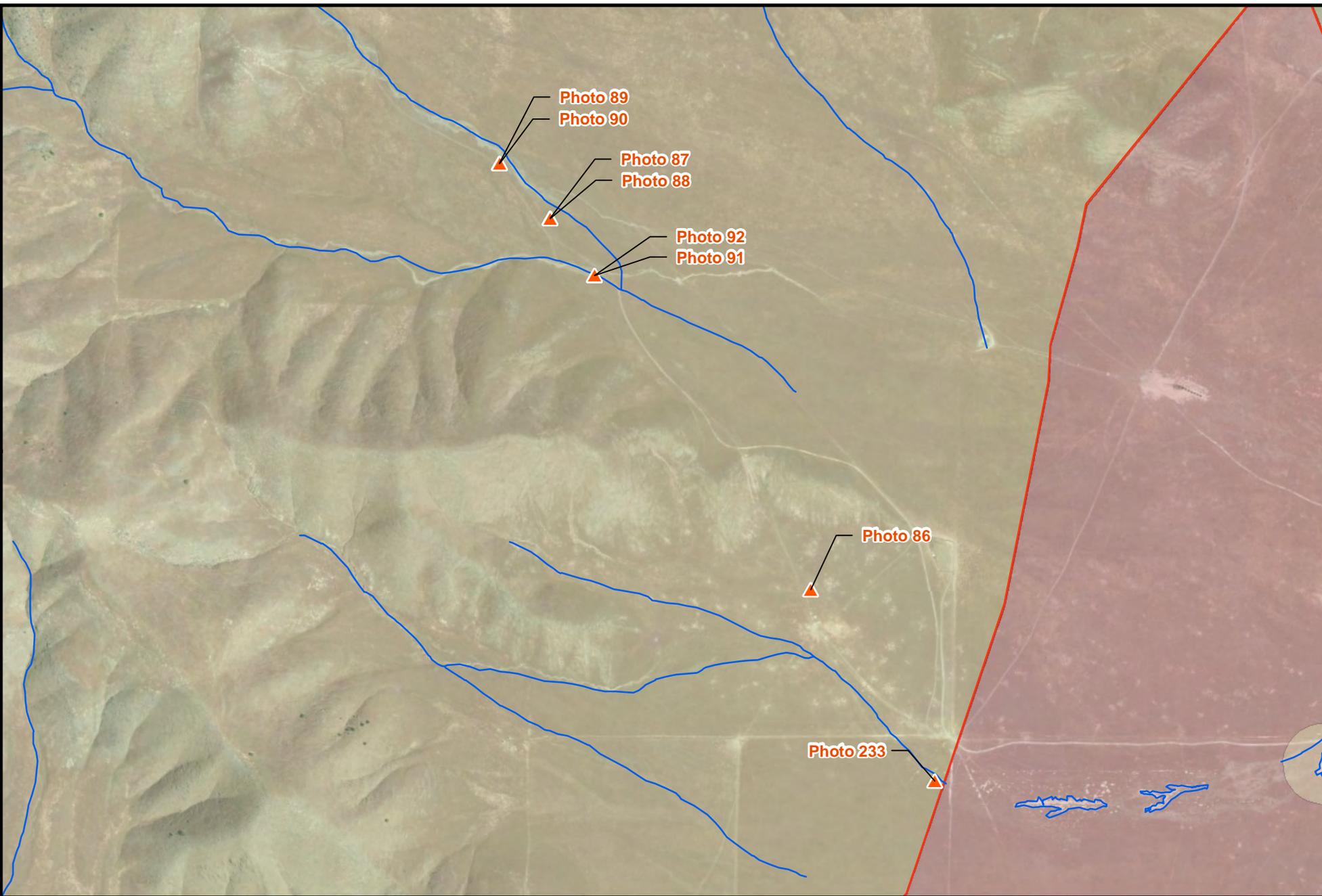
-  Photo Location
-  Silver Creek Ranch
-  Project Area
-  Valley Floor
-  Valadeao Ranch



Source: ESRI and Burns & McDonnell Engineering.



PHOTO LOCATIONS



LEGEND

- ▲ Photo Location
- Silver Creek Ranch
- Project Area
- Valley Floor
- Valadeao Ranch

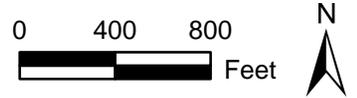
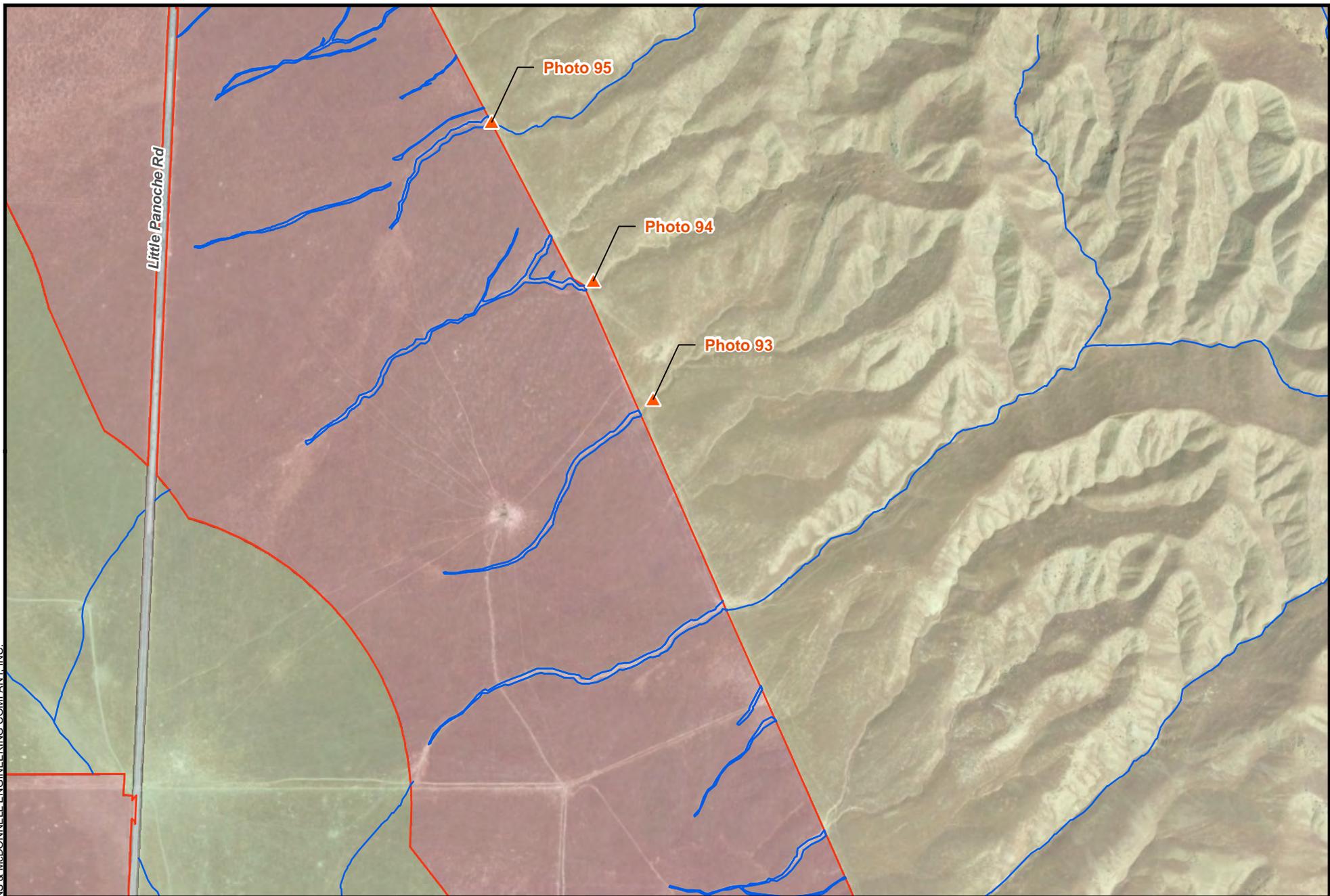
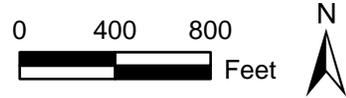


PHOTO LOCATIONS



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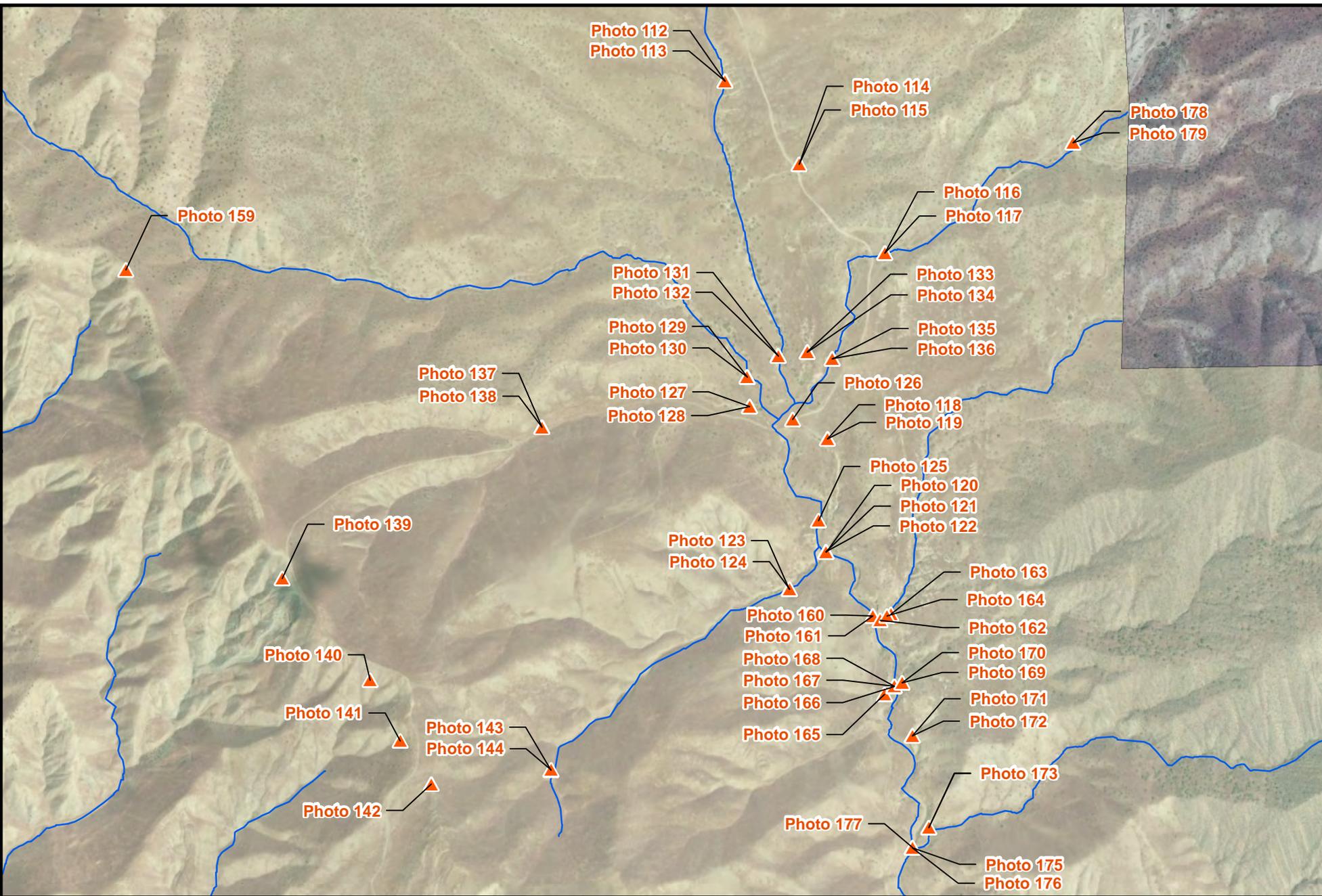
- ▲ Photo Location
- Silver Creek Ranch
- Project Area
- Valley Floor
- Valadeao Ranch



Source: ESRI and Burns & McDonnell Engineering.



PHOTO LOCATIONS



LEGEND

Photo Location	Silver Creek Ranch
Project Area	Valley Floor
	Valadeao Ranch



0 400 800 Feet

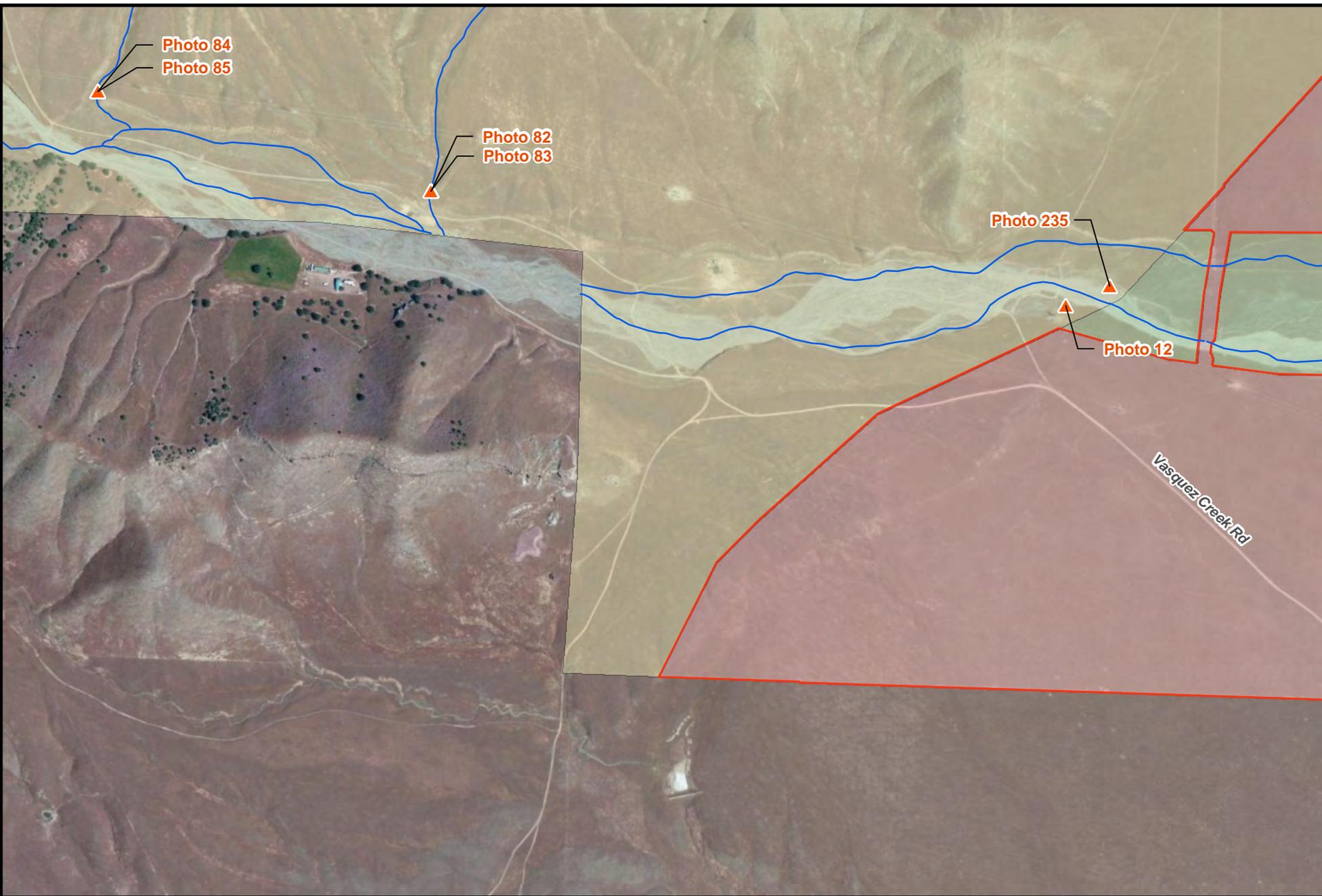
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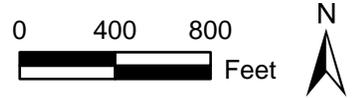
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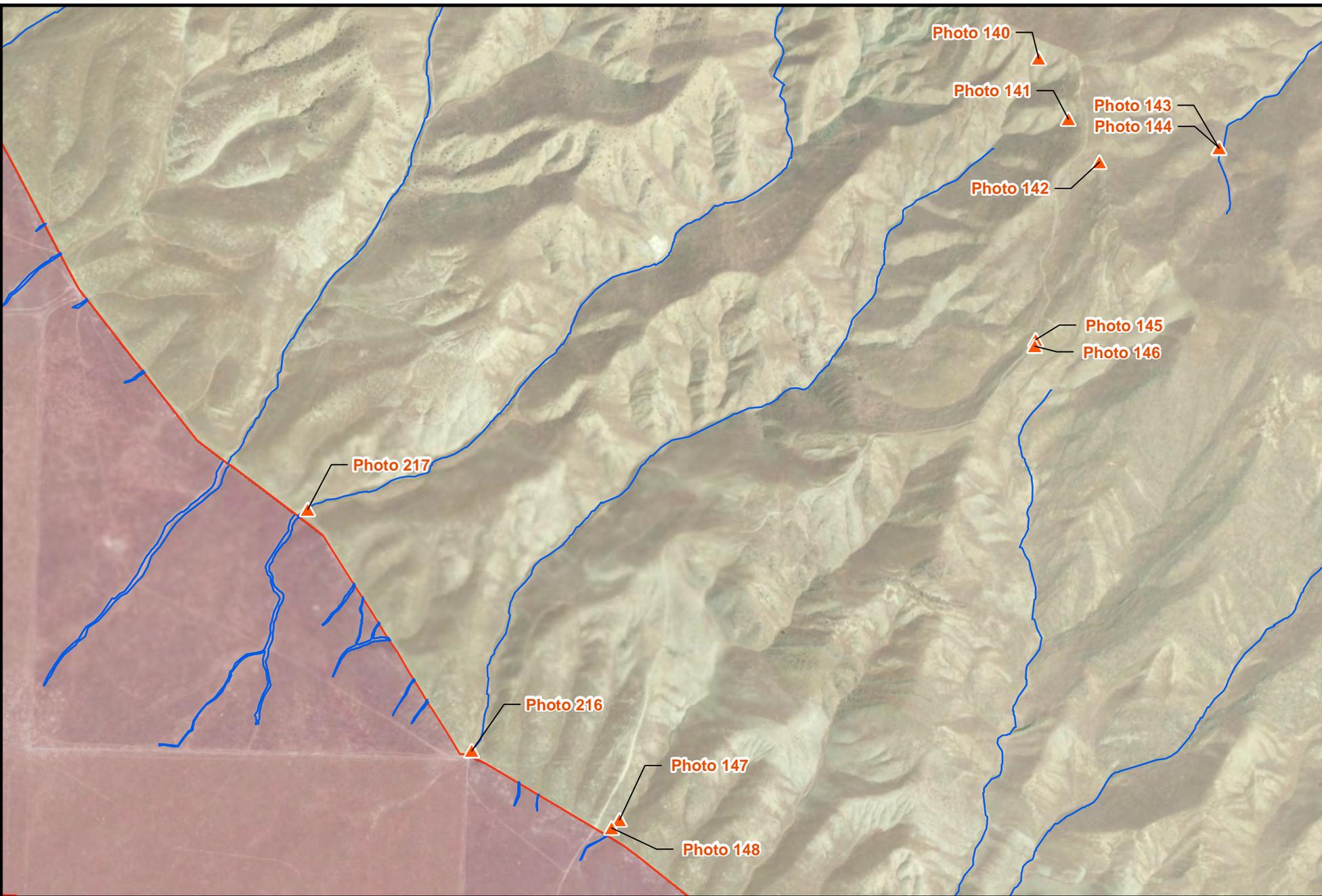
-  Photo Location
-  Silver Creek Ranch
-  Valley Floor
-  Valadeao Ranch
-  Project Area



Source: ESRI and Burns & McDonnell Engineering.



PHOTO LOCATIONS



LEGEND

- ▲ Photo Location
- Silver Creek Ranch
- Project Area
- Valley Floor
- Valadeao Ranch

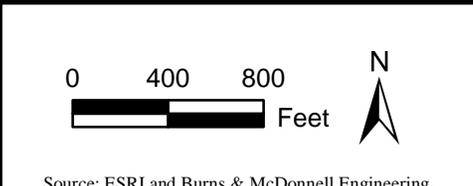
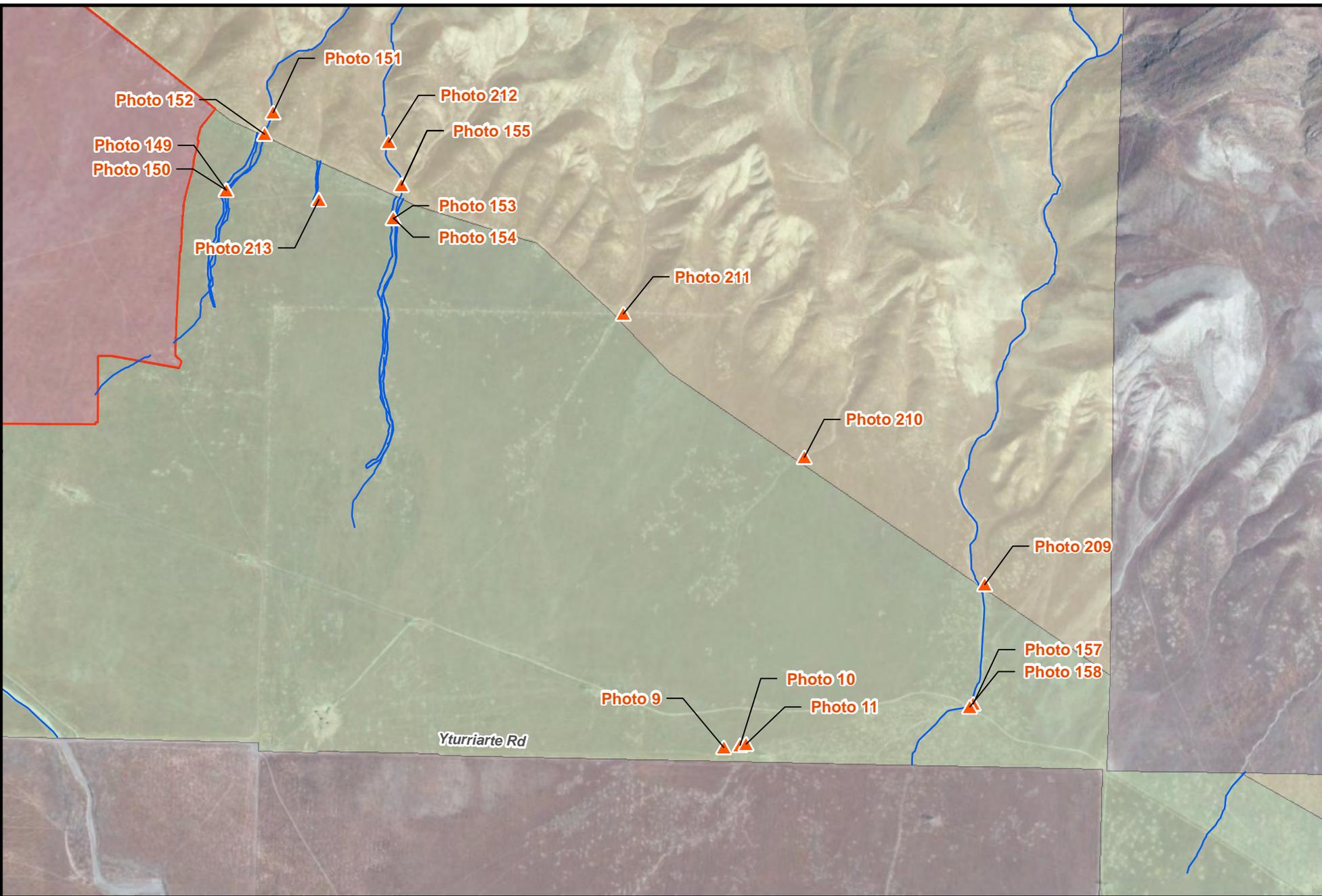


PHOTO LOCATIONS

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LEGEND

Photo Location	Silver Creek Ranch
Project Area	Valley Floor
	Valadeao Ranch



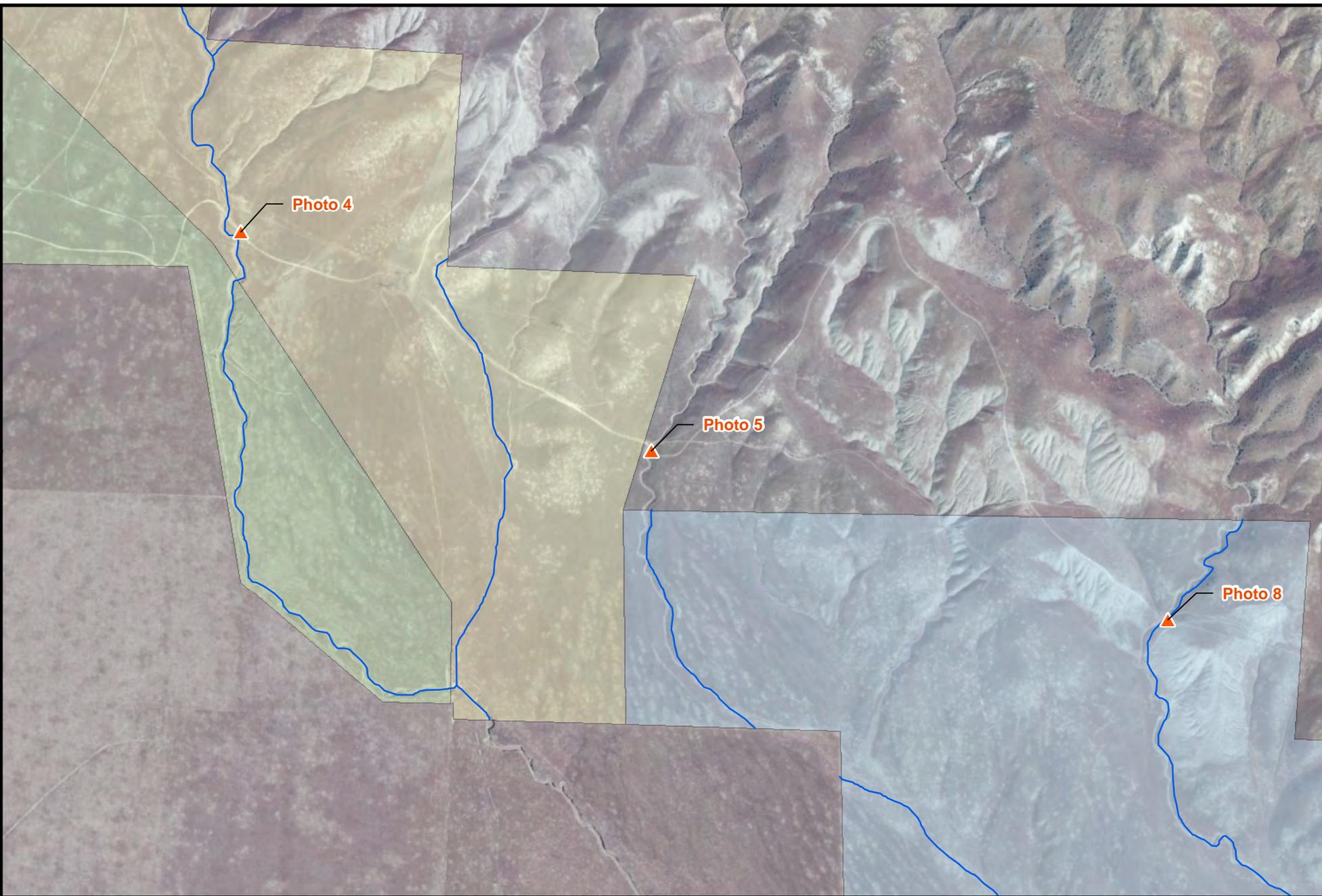
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Source: ESRI and Burns & McDonnell Engineering.



PHOTO LOCATIONS

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LEGEND

-  Photo Location
-  Silver Creek Ranch
-  Project Area
-  Valley Floor
-  Valadeao Ranch

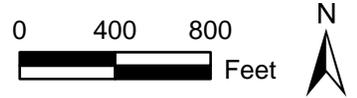
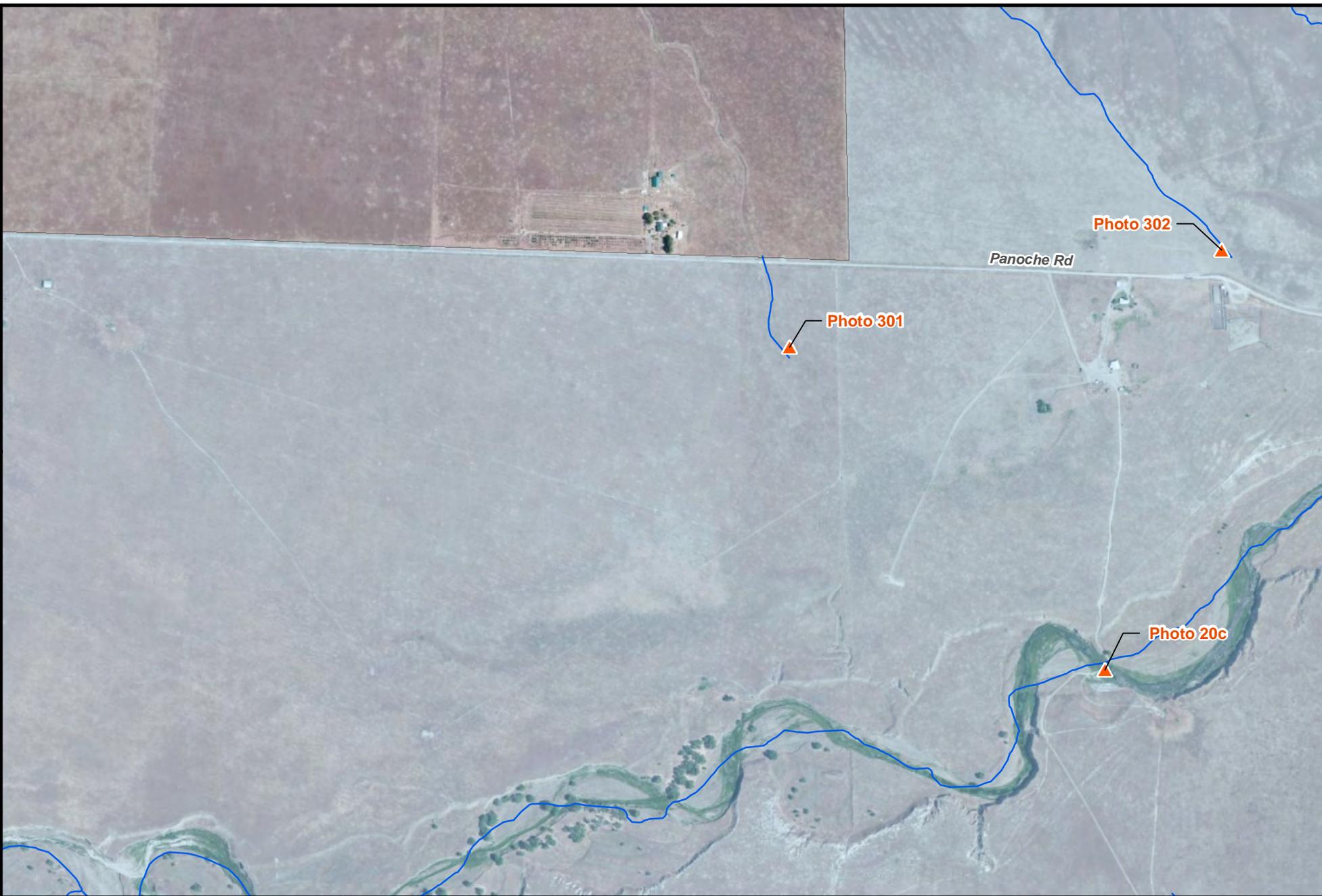


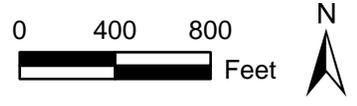
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LEGEND

- ▲ Photo Location
- Project Area
- Silver Creek Ranch
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- Valadeao Ranch

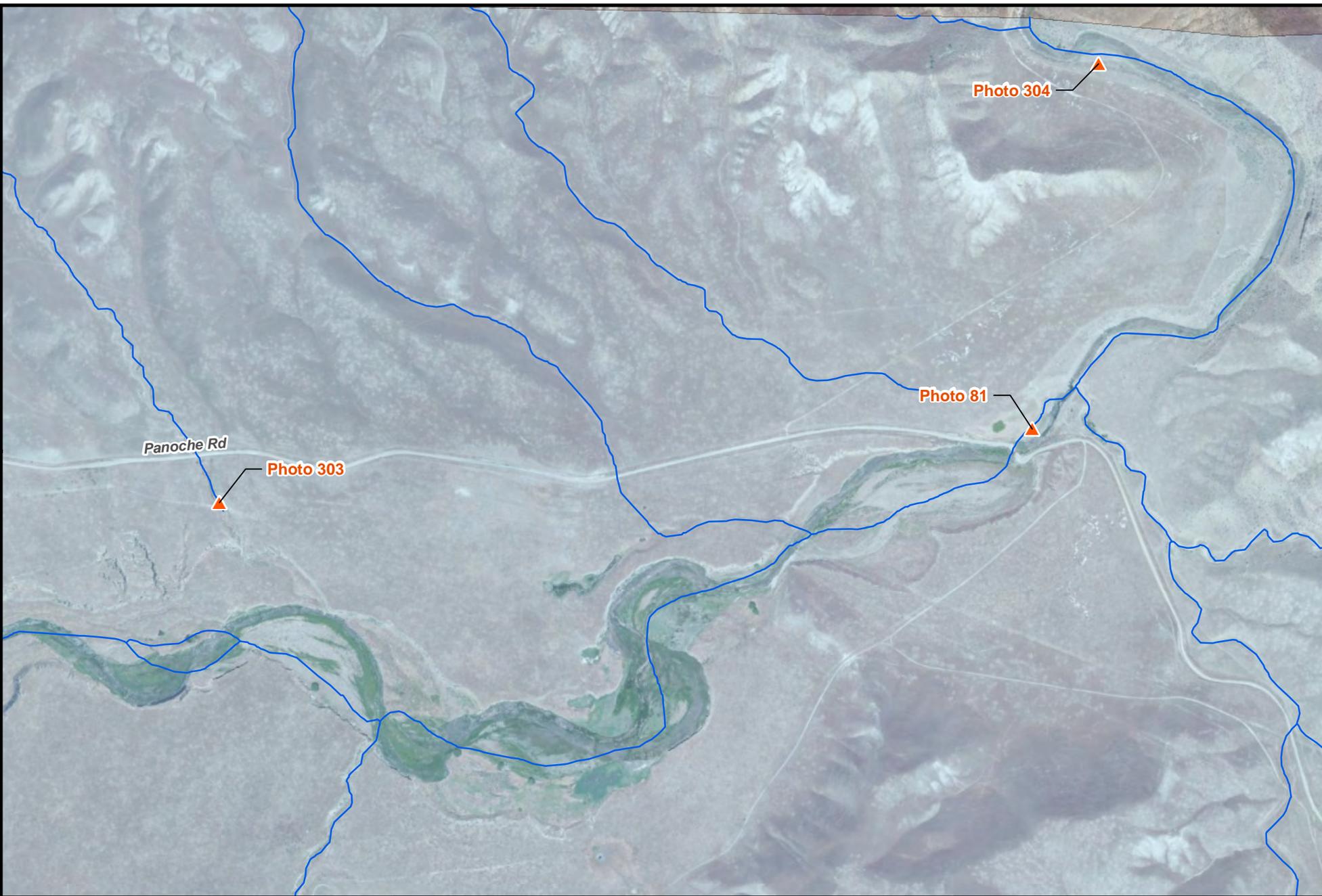


Source: ESRI and Burns & McDonnell Engineering.



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LEGEND

-  Photo Location
-  Silver Creek Ranch
-  Project Area
-  Valley Floor
-  Valadeao Ranch

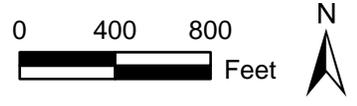
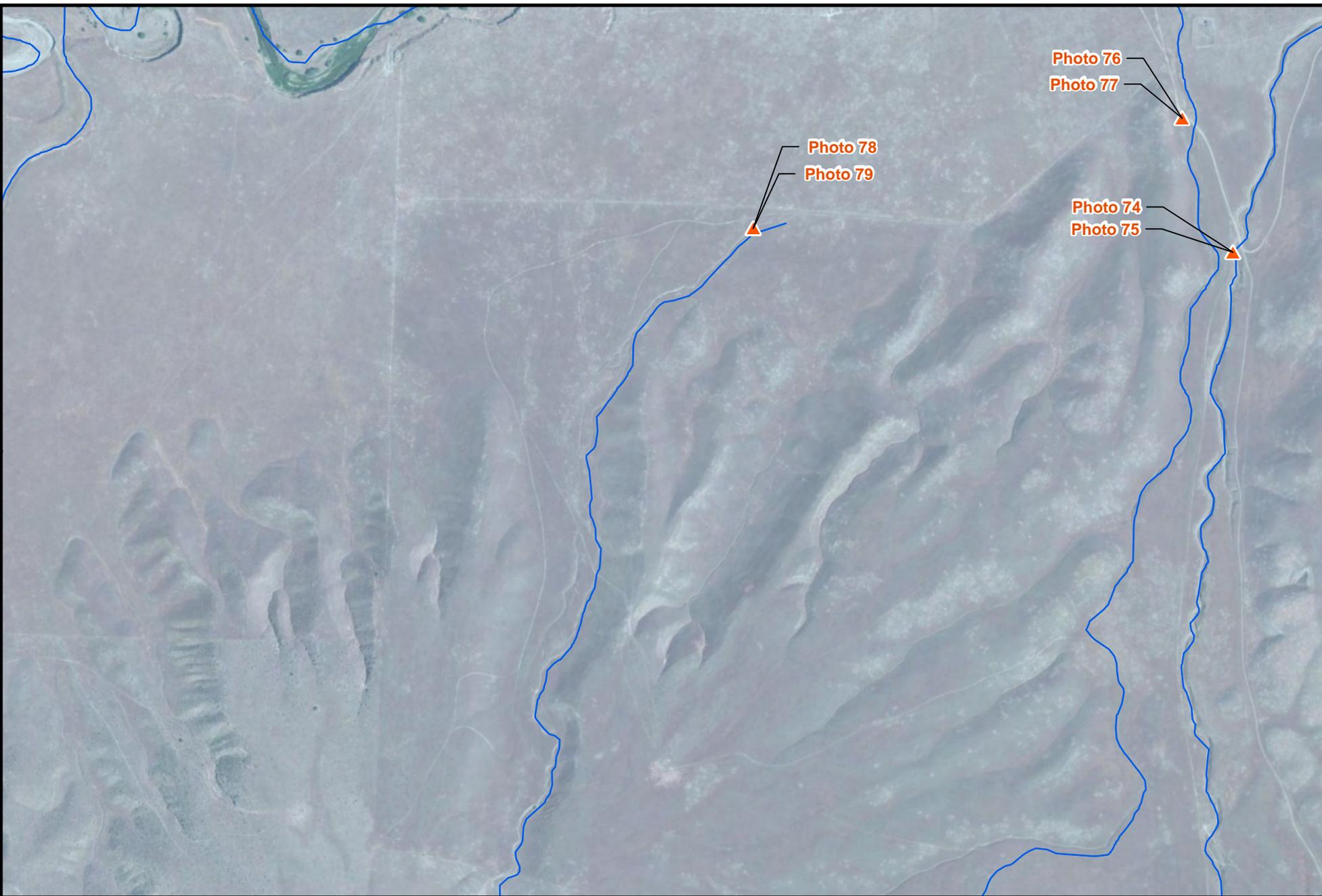


PHOTO LOCATIONS



LEGEND

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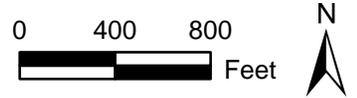
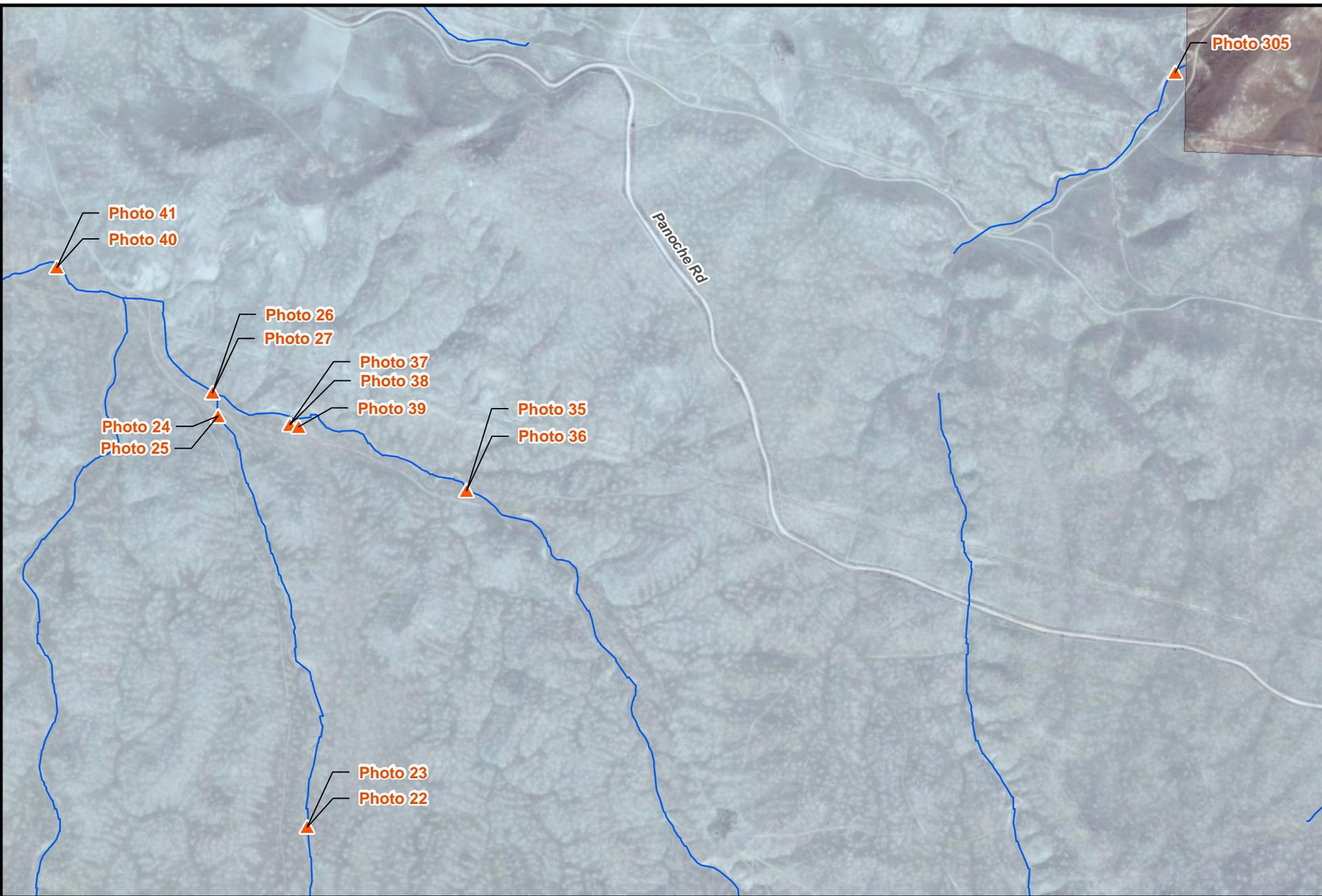


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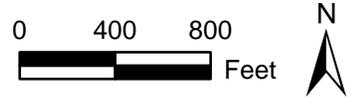
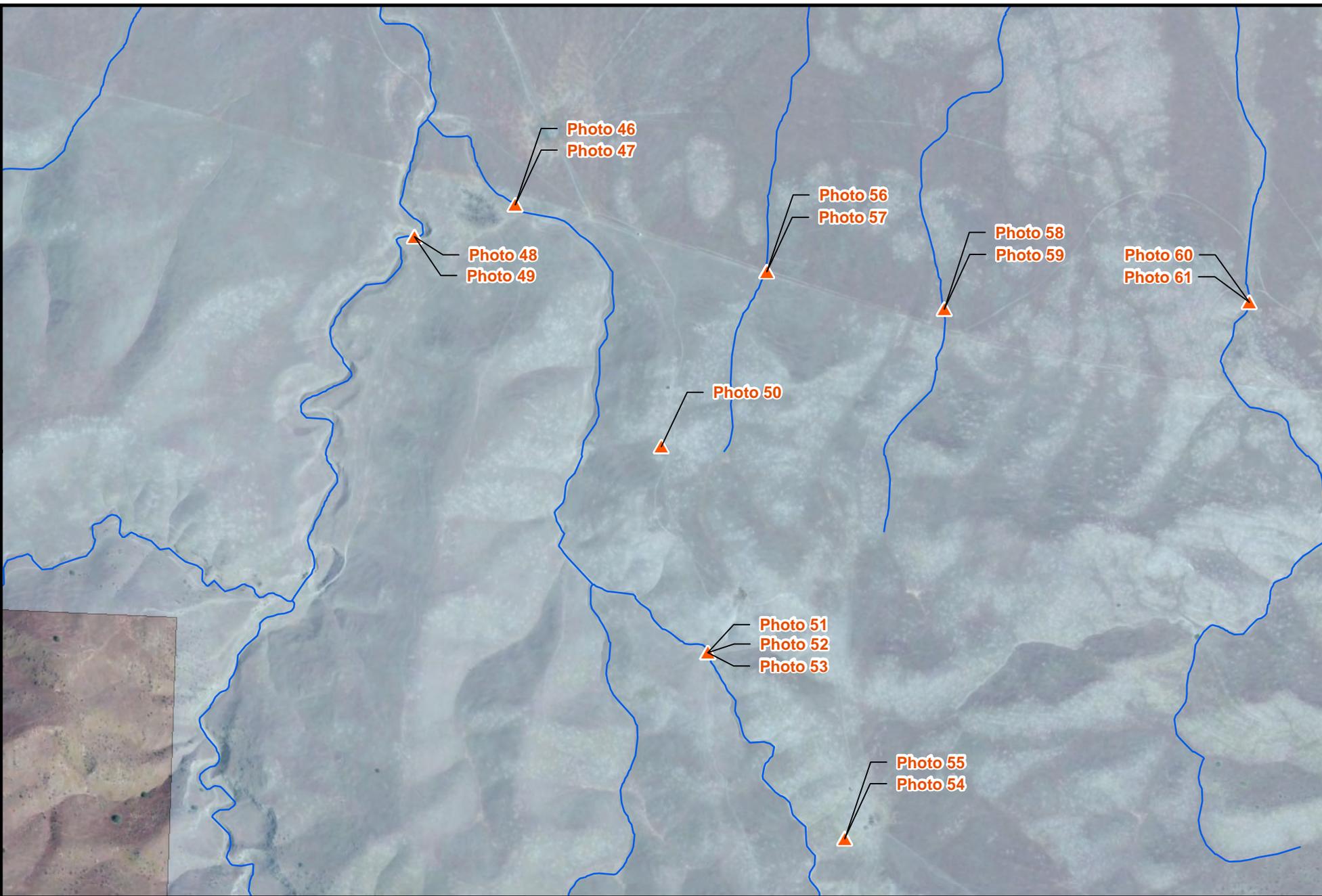


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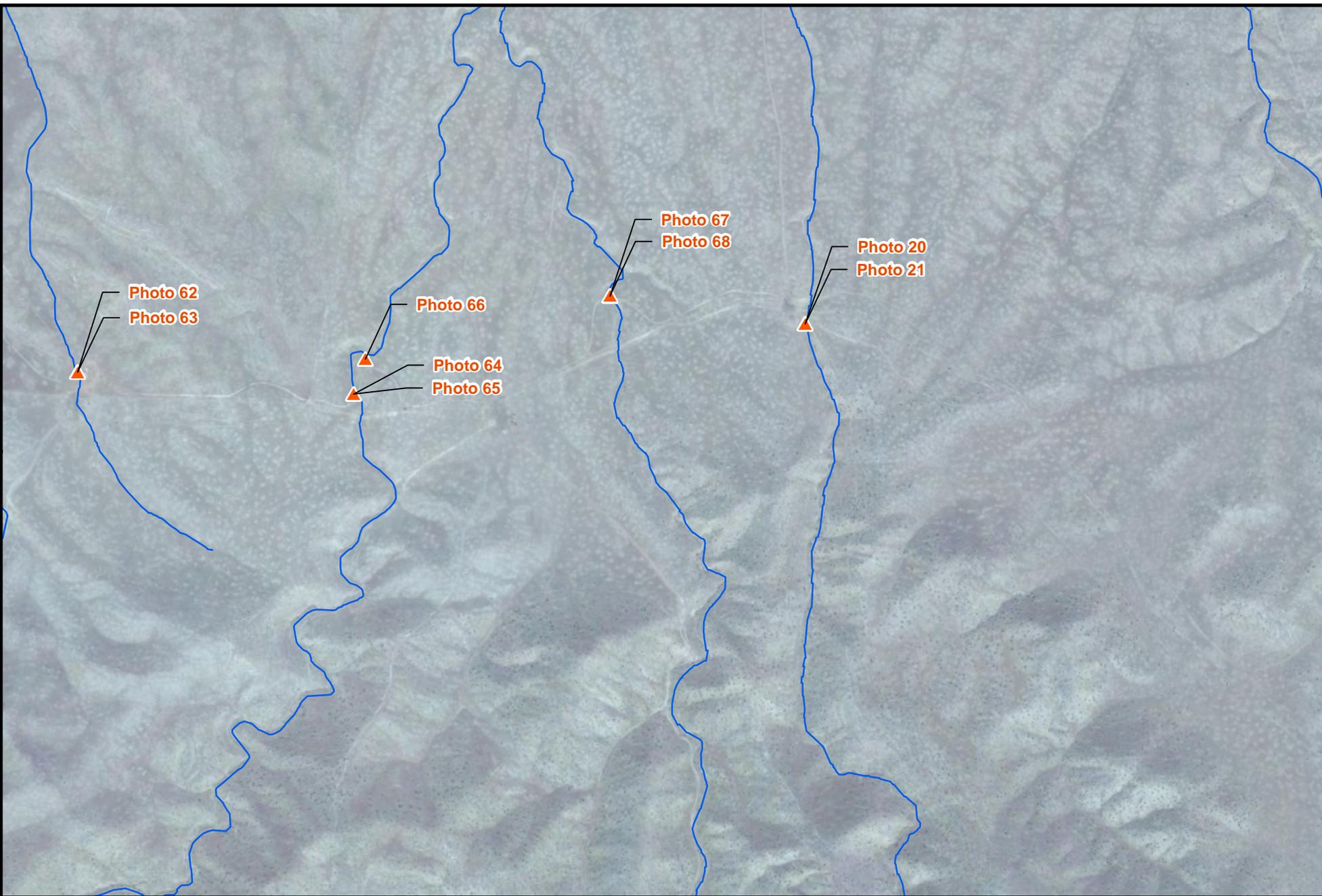


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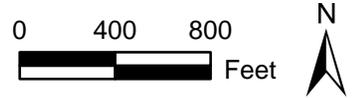


PHOTO LOCATIONS



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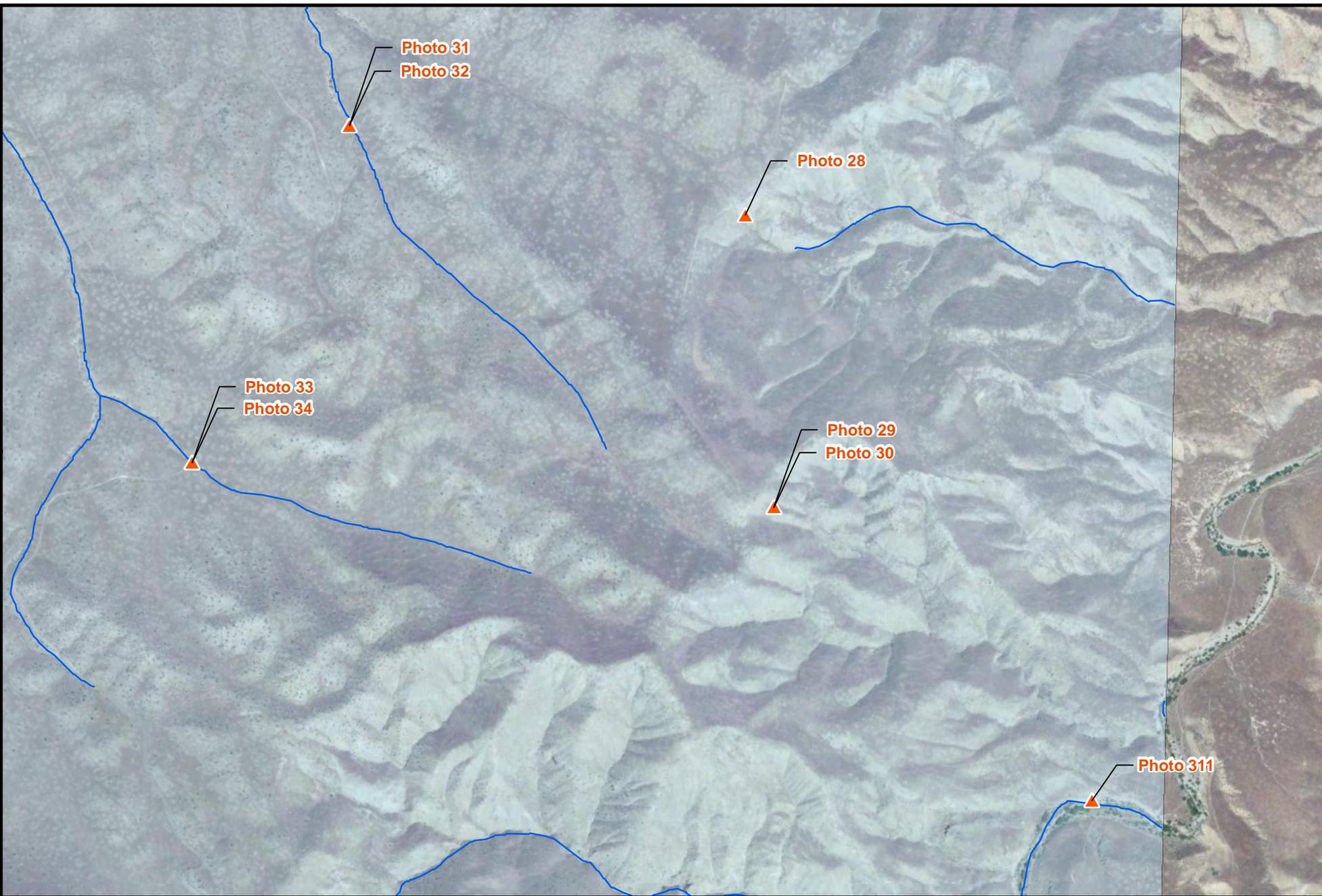
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