ENVIRONMENTAL ASSESSMENT

40-ACRE PROPERTY
PIT RIVER TRIBE

MARCH 2022

PREPARED FOR:

Pit River Tribe
36970 Park Avenue
Burney, CA 96013

PREPARED BY:

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APPENDICES

SECTION 1.0. INTRODUCTION

1.1 INTRODUCTION

The U.S. Department of the Interior, Bureau of Indian Affairs (BIA) is the federal agency that is charged with reviewing and approving tribal applications pursuant to 25 Code of Federal Regulations (CFR) Part 151 to take land into federal trust status. This Environmental Assessment (EA) has been prepared for the BIA to support the application of the Pit River Tribe (Tribe) for land to be placed into federal trust (Proposed Action). This land, known as the "40-Acre Property," consists of approximately 40.10 acres adjacent to the western boundary of the Montgomery Creek Rancheria Housing Project (Montgomery Project). The land is currently owned by the Tribe in fee simple status and is intended to be used for residential housing as a continuation of the Montgomery Project. The BIA will use this EA to determine if the Proposed Action would result in adverse effects to the environment.

This document has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] § 4321 et seq.), the Council on Environmental Quality (CEQ) Guidelines for Implementing NEPA (40 CFR Parts 1500-1508), and the BIA NEPA Guidebook (59 Indian Affairs Manual [IAM] 3-H). **Section 2.0** of this EA provides a detailed description of the Proposed Action and Project Alternatives. **Section 3.0** provides a description of the existing environmental conditions on and in the vicinity of the project site, an analysis of the potential environmental consequences associated with the Project Alternatives, and a discussion of impact avoidance and mitigation measures. Consistent with the requirements of NEPA, the BIA will review and analyze the environmental consequences associated with the Proposed Action and Project Alternatives, and either determine that a Finding of No Significant Impact (FONSI) is appropriate, request additional analysis, or request that an Environmental Impact Statement be prepared.

1.2 LOCATION AND SETTING

The trust acquisition parcel addressed in this EA is located east of State Route 299 (SR-299) in Shasta County (County), California, approximately 30 miles northeast of the City of Redding and approximately 14 miles west of the town of Burney (**Figures 1-1** and **1-2** of **Appendix A**). **Figure 1-3** of **Appendix A** shows an aerial photograph of the project site. The project site consists of one parcel, totaling approximately 40.10 acres, that is owned in fee simple by the Tribe and is identified by County Assessor's Parcel Number (APN) 029-520-004. The parcel is contiguous with the western border of the Montgomery Creek Rancheria (Rancheria).

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to provide increased long-term cultural security for the Tribe. The Proposed Action would help accomplish this goal through the development of Tribal housing that would allow expansion of the housing base that is currently inadequate for Tribal needs. The long-term survival of the Tribe is dependent upon its ability to provide housing, employment, and community and governmental services to its members on Tribal trust lands. The addition of new homes on the Rancheria offers the Tribe an opportunity to increase the available housing for its members, as well as provide employment opportunities during construction. Residential use has been identified as the top priority for land use on the Rancheria, and the Proposed Action would allow Tribal members the opportunity to move

onto the Rancheria and improve their housing situation. The Tribe desires to construct new homes in a way that both improves its members' quality of life and protects the environment.

1.4 OVERVIEW OF THE ENVIRONMENTAL REVIEW PROCESS

This EA is intended to satisfy the environmental review process of 59 IAM 3-H, 40 CFR § 1501.3, and 40 CFR § 1508.9. The EA has been released for a 30-day comment period. Comments will be considered by the BIA and either a FONSI will be prepared or additional environmental analysis will be conducted. After the NEPA process is complete, the BIA may issue a determination on the Tribe's fee-to-trust application.

1.5 REGULATORY REQUIREMENTS AND APPROVALS

The following direct and indirect federal approvals and actions may occur as a result of the Proposed Action:

- Transfer of the 40-Acre Property into federal trust status for the Tribe by the Secretary of the Interior;
- Consultation with the U.S. Fish & Wildlife Service (USFWS) under Section 7 of the federal Endangered Species Act, if endangered species may be impacted by the Proposed Action; and
- Consultation with the State Historic Preservation Office under Section 106 of the National Historic Preservation Act.

SECTION 2.0. PROPOSED ACTION AND ALTERNATIVES

The Project Alternatives are described in this section. This section also summarizes the protective measures and Best Management Practices (BMP) incorporated into each alternative to reduce potential adverse impacts to environmental resources.

2.1 SELECTION OF ALTERNATIVES FOR DETAILED EVALUATION

As discussed in **Section 1.3**, one of the purposes of the Proposed Action is to provide additional lands for Tribal housing. The alternatives to be evaluated in detail in this EA consist of:

- **Alternative A** (Proposed Project): 40-acre trust land acquisition and development of 32 Tribal homes on 0.69- to 1-acre lots.
- **Alternative B** (Reduced-Density Alternative): Identical trust land acquisition and development of 12 Tribal homes on 2- to 3-acre lots.
- **Alternative C** (No Action Alternative): The parcel would not be taken into trust by the BIA and no changes in land use would occur.

2.2 ALTERNATIVE A. PROPOSED PROJECT

The Proposed Action consists of placing one parcel totaling approximately 40.10 acres (Shasta County APN 029-520-004, referred to as the 40-Acre Property) into federal trust status. The parcel is undisturbed, with the exception of graded dirt and gravel access roads, and primarily consists of pine forest and chaparral. The consequences of the Proposed Action would include the development of Tribal housing on 29.42 acres of the 40-Acre Property; the remaining land on the parcel would be converted to residential roadways or left undisturbed.

LAND TRUST ACTION

The Proposed Action consists of the fee simple conveyance of the 40-Acre Property into federal trust status for the benefit of the Tribe. The land transfer would be in accordance with procedures set forth in 25 CFR § 151.3 and involves numerous steps. This land trust action would shift civil regulatory jurisdiction over the 40-Acre Property from the State of California (State) and County to the Tribe and the federal government; the State and County would continue to exercise criminal jurisdiction under 18 USC § 1162 and other federal laws pertaining to jurisdiction in Indian country.

RESIDENTIAL DEVELOPMENT

Under Alternative A, the Tribe would develop residential plots to provide Tribal housing as a continuation of the Montgomery Project. The layout of residential lots would be similar in size and design to those in the Montgomery Project and would result in the construction of residences on 32 single-family Tribal member allotments within the 40-Acre Property. Each residence would require approximately 2,500 square feet of grading.

The remainder (approximately 10 acres) of the 40-Acre Property would remain as open space and be dedicated to residential roadways or left undisturbed. Open space designated around the intermittent drainage would serve as a 50-foot setback to limit residential development across riparian habitats.

Several graded dirt and gravel access roads currently exist on the 40-Acre Property; however, the circulation network would be extended and improved upon with the development of Tribal housing. Road improvements would include the improvement of approximately 3,825 feet of existing roadway and the development of approximately 980 feet of new internal roadways connecting to Bakus Road and Windy Point Road. All roadways would be 30 feet wide to ensure adequate room for maneuverability and to enhance safety within the Rancheria.

All utility connections would be made to existing utility routes following the existing and new roadways, with the utilities installed either within the roadbed or shoulder. The proposed site plan for Alternative A is shown in **Figure 2-1** of **Appendix A**.

WATER SUPPLY AND WASTEWATER TREATMENT AND DISPOSAL

The project site does not have access to County water utilities. However, the project site would be supplied by the Rancheria's community public water system maintained by the Pit River Tribe Water Department (PRTWD). The system was updated to meet the needs of the adjacent Montgomery Project. The well and existing storage tank is located at the southeast corner of the Montgomery Project boundary, approximately 0.5 miles from the 40-Acre Property. To serve the Proposed Project, the existing storage tank would be upgraded to approximately 100,000 gallons (to serve the existing 10 plus the 32 new residences) and new distribution infrastructure would be developed. Furthermore, the PRTWD has developed a new well, with a pump station and treatment building currently being developed next to the new well, on the Rancheria to serve the Proposed Project.

The 40-Acre Property is not served by a central wastewater treatment system. As with the Montgomery Project, each residence would require a separate septic system to treat and dispose of wastewater.

GRADING AND DRAINAGE

Grading would be required for the development of associated access, roads, lot preparation (pad grading, utility connections, etc.), and other site improvements on the 40-Acre Property. The estimated grading demand for each house as an estimate would result in the addition of approximately 0.7 acres of impervious surfaces, or 1.75 percent of the 40-Acre Property. Although impermeable surfaces would result from the building and roadway development, water would continue to generally flow with the existing drainage patterns.

PROJECT CONSTRUCTION

The project components would be constructed after the 40-Acre Property is placed into federal trust. Construction of the Proposed Project would be phased as funding becomes available. For the purposes of analysis within this EA, development of the 32 homes is assumed to take approximately one year.

Construction Requirements

The following construction requirements would be included as part of the Proposed Project through contractual requirements to protect riparian habitats:

1. Temporary fencing shall be installed around the 50-foot setbacks that surround the riparian habitats as seen in **Figure 2-1** of Appendix A. Fencing shall be in place prior to the initiation of any construction activities and no encroachment into the fenced areas shall be permitted. Fencing shall remain in place until all construction activities have ceased.

The following construction requirements would be included as part of the Proposed Project through contractual requirements to minimize the risk of fire during construction:

1. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but not be limited to, vehicles, heavy equipment, and chainsaws.

During construction, staging areas, welding areas, or areas slated for development using spark-producing equipment would be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak.

The following construction requirements would be included as part of the Proposed Project through contractual requirements to reduce temporary construction emissions:

1. For any earth moving that is more than 100 feet from all property lines, watering shall be conducted as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
2. For all disturbed surface areas, dust suppression shall be applied in a sufficient quantity and frequency to maintain a stabilized surface; any areas that cannot be stabilized, as evidenced by wind driven dust, shall receive an application of water at least twice per day to at least 80 percent of the unstabilized area.
3. For all unpaved roads used for any construction vehicular traffic, the roads shall be watered as often as necessary to minimize dust or chemical stabilizer shall be applied to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
4. Track-out control shall be provided to minimize tracking of soil onto neighboring roadways.

The following dust suppression BMPs would be implemented by the Tribe to control the production of fugitive dust and prevent wind erosion of bare and stockpiled soils:

1. Exposed soil shall be sprayed with water or other suppressant at least twice a day or as needed.
2. Dust emissions during transport of fill material or soil shall be minimized by wetting down loads, ensuring adequate freeboard (space from the top of the material to the top of the truck bed) on trucks and/or covering loads.
3. Spills of transported material on public roads shall be romptly cleaned.
4. On-site traffic shall be restricted to reduce soil disturbance and the transport of material onto roadways.
5. Construction equipment and truck staging areas shall be located away from sensitive receptors, as practical and in consideration of potential effects on other resources.
6. Wheel washers shall be provided to remove particulate matter that would otherwise be carried offsite by vehicles to decrease deposition of particulate matter on area roadways.
7. Dirt, gravel, and debris piles shall be covered as needed to reduce dust and wind-blown debris.

The following BMPs would be implemented by the Tribe to reduce emissions of criteria air pollutants (CAP), greenhouse gases (GHG), and diesel particulate matter (DPM):

1. All diesel-powered equipment shall be properly maintained, and idling time shall be minimized to 5 minutes when construction equipment is not in use, unless per engine manufacturer's specifications or for safety reasons more time is required.
2. Engines shall be kept in good mechanical condition to minimize exhaust emissions.
3. The Tribe shall use Tier 4 construction equipment (with the exception of Tier 4 scrapers, which are not widely available), using a minimum of 90 percent of the equipment's total horsepower (hp).
4. All construction equipment with a hp rating of greater than 50 shall be equipped with diesel particulate filters, which would reduce approximately 85 percent of DPM.

2.3 ALTERNATIVE B. REDUCED-DENSITY ALTERNATIVE

Alternative B consists of the same components as the Proposed Action described in **Section 2.2**; however, the residential development would consist of 12, 2- to 3-acre allotments. Accordingly, 13 acres would remain as open space or residential roadways. Road improvements would include the improvement of approximately 3,289 feet of existing roadway and the development of approximately 980 feet of new internal roadways connecting to Bakus Road and Windy Point Road. All roadways would be 30 feet wide to ensure adequate room for maneuverability to enhance safety within the Rancheria. The open space around the intermittent drainage would serve as a 50-foot setback to limit residential development across riparian habitats. The proposed site plan for Alternative B is shown in **Figure 2-2** of **Appendix A**.

WATER SUPPLY AND WASTEWATER TREATMENT AND DISPOSAL

The project site does not have access to County water utilities; however, the Rancheria community public water system maintained by the PRTWD was updated to meet the needs of the adjacent Montgomery Project and is located at the southeast corner of the Montgomery Project boundary, approximately 0.5 miles from the 40-Acre Property. The 40-Acre Property is not served by a central wastewater treatment system. As with the Montgomery Project, each residence would require a separate septic system to treat and dispose of wastewater.

GRADING AND DRAINAGE

Grading would be required for the development of associated access, roads, lot preparation (pad grading, utility connections, etc.), and other site improvements on the 40-Acre Property. Although there would be an increase in impermeable surfaces as a result of building and roadway development as with the Proposed Project, water would continue to generally flow with the existing drainage patterns.

PROJECT CONSTRUCTION

As with the Proposed Project, the project components would not be constructed until after the 40-Acre Property is placed into federal trust. Construction of the Proposed Project would be phased as funding becomes available. For the purposes of analysis within this EA, development of the 12 homes is assumed to take approximately one year.

Construction Requirements

The same construction requirements described under the Proposed Project in **Section 2.2** would be implemented under Alternative B.

2.4 ALTERNATIVE C. NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the 40-Acre Property would not be placed in trust for the benefit of the Tribe and would not be developed as identified under the Proposed Project or Reduced-Density Alternative. Jurisdiction of the 40-Acre Property would remain within the County. Ultimately, the 40-Acre Property could be developed consistent with a zoning of limited residential (R-L) and mobile home (T) by the Tribe with the 40-Acre Property owned in fee. However, for the purposes of the environmental analysis in this EA, it is assumed that the 40-Acre Property would remain undeveloped, open space.

2.5 COMPARISON OF THE PROPOSED PROJECT AND THE PROJECT ALTERNATIVES

ALTERNATIVE A. PROPOSED PROJECT

The Proposed Project could result in mitigatable environmental impacts to land resources, water resources, air quality, biological resources, cultural resources, and hazardous materials.

ALTERNATIVE B. REDUCED-DENSITY ALTERNATIVE

As with the Proposed Project, development of Alternative B could result in mitigatable and reduced impacts to land resources, water resources, air quality, biological resources, cultural resources, and hazardous materials.

ALTERNATIVE C. NO-ACTION ALTERNATIVE

While the No-Action Alternative would not result in any of the environmental effects identified for the Proposed Project, this alternative would not meet the Tribe's objectives of providing additional lands for Tribal housing or reestablishing its traditional land base.

Of the project alternatives evaluated in **Section 3.0**, the Proposed Project (Alternative A) would best meet the Tribe's objectives by providing the Tribe with additional lands for Tribal housing, providing the desired quantity of housing allotments, and by re-establishing its traditional land base.

SECTION 3.0. AFFECTED ENVIRONMENT, IMPACTS, AND MITIGATION FOR THE ALTERNATIVES CONSIDERED

This section presents relevant information about existing resources and other values that may be affected by the Proposed Project and alternative, an analysis of potential impacts associated with the implementation of the alternatives, and mitigation to reduce identified adverse impacts. The following resources and issue areas are addressed:

- Land Resources
- Water Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Socioeconomic Conditions / Environmental Justice
- Transportation and Circulation
- Land Use and Agriculture
- Public Services
- Noise
- Hazardous Materials
- Visual Resources
- Growth-Inducing and Cumulative Impacts

3.1 LAND RESOURCES

3.1.1 TOPOGRAPHY

The topography of the project site is semi-level in the western portion and increases in the eastern and northern portions via occasionally steep inclines. Intermittent drainages cross the project site, most frequently flowing downstream to the southwest. There are a number of graded dirt and gravel access roads (besides Bakus Road) that cross the 40-Acre Property in every direction, in addition to two cleared (or formerly cleared) utility corridors that travel north-south. Slopes within the project site are varied; the western portion of the project site lies at approximately 2,000 feet above mean sea level (amsl) and the northern and eastern portions of the project site lie at approximately 2,200 feet amsl.

3.1.2 GEOLOGIC SETTING AND SEISMICITY

Seismicity is described as a combination of distribution, recurrence, and intensity of earthquakes over a period of time. The County is considered to be a seismically active region; the more active faults are found in the eastern and southern portions of the County, with older, less active faults in the western portion of the County. The project site, located in the eastern portion of the County, is located within a moderate to high seismicity zone (County, 2004a). The closest Alquist-Priolo zone to the project site is approximately 17 miles northeast and follows the Rocky Ledge fault (**Figure 3-1** of **Appendix A**). Historically, earthquake activity has not been a serious hazard in the County and it is unlikely to become a serious hazard in the future.

The County is at the southern end of the Cascade Range, an active volcanic chain that extends northward into British Columbia, Canada. As the recent history of Mount St. Helens indicates, the Cascade Range is young and active. The most recent volcanic activity in the County was in 1914–1917, when eruptions of Lassen Peak produced lava flows on the flank of the crater, numerous ash falls, and a large mudflow. As

with Lassen Peak, the danger from volcanic activity on Mount Shasta may not necessarily be from an eruption but from mudflows or the release of toxic gas and ash; most of the eastern half of the County is downwind from relatively active and explosive volcanoes (County, 2004a).

3.1.3 SOILS

Soils on the project site consist entirely of Kilarc very stony sandy clay loam and 10 to 30 percent slopes. Kilarc very stony sandy clay loam is residuum weathered from sedimentary rock that is found on mountain back slopes and shoulders in elevations ranging from 1,000 to 3,600 feet amsl (Natural Resources Conservation Service [NRCS], 2018). Kilarc very stony sandy clay loam is moderately well-drained with a very high runoff class rating. The project site soil map is presented in **Figure 3-2** in **Appendix A** and the NRCS Custom Soil Resource Report (Web Soil Survey) is presented in **Appendix B**.

3.1.4 MINERAL RESOURCES

Mining has been an important industry in the County since gold was discovered by P.B. Reading on Clear Creek in 1848. In addition to gold, there are 13 metallic minerals that have been historically mined in the County: cadmium, chromite, copper, iron, lead, manganese, molybdenite, platinum, pyrite, mercury, silver, tungsten, and zinc. Most metallic ores lie in the western portion of the County (County, 2004b).

Between 1874 and 1929, local coal reserves were in demand as an energy source for the County. Due to the extensive development of natural gas resources, coal usage had virtually ceased by 1929. The majority of coal deposits are located east of Redding in the Montgomery Creek Formation. The approximately 45 square-mile Montgomery Creek coal field has been estimated to contain 1,500 tons of coal per acre foot (AF), for a total of approximately 12 million tons of coal potentially available (County, 2004b); the Montgomery Creek Formation underlies the project site (Higginbotham, 1986).

3.1.5 IMPACTS TO LAND RESOURCES

Alternative A

TOPOGRAPHY

The Proposed Project would result in substantial, though focused, changes in the topography of the project site, as development would result in construction of 32 Tribal homes. The lack of level ground within the project site would require construction of level building pads and driveways, as well as a network of access roads and other supporting utility infrastructure. However, the topography has already been significantly altered due to previous grading. Furthermore, because of eroded soils and the presence of steep hills, areas of the County may be susceptible to landslides; within the project site, however, the erosion hazard is moderate and soils are moderately well drained. With the incorporation of appropriate building techniques and materials, no significant effects to, or resulting from, topography would occur as a result of the Proposed Project.

GEOLOGIC SETTING AND SEISMICITY

The project site is not located on any known active fault traces, thus the risk of fault rupture is low. There are regional seismic sources, which could produce strong ground shaking events. Adherence to the provisions of the Uniform Building Code and the use of appropriate building techniques and materials would reduce the potential risks due to the geologic setting and seismicity.

SOILS

During construction, soil disturbance from excavation and grading increases the risk of erosion from high winds and stormwater runoff. Based on the Proposed Project's site plan and estimated grading, implementation of the Proposed Project would disturb more than one acre of soil. Accordingly, implementation of the Proposed Project would require coverage under the U.S. Environmental Protection Agency (USEPA) Construction General Permit under the National Pollutant Discharge Elimination System (NPDES). To ensure significant effects to soil resources are avoided, erosion control measures would protect excavated soils from erosion.

MINERAL RESOURCES

The project site is currently in open space, is not being mined, and construction of housing would not result in a loss of economically viable aggregate rock or diminish the extraction of important ores or minerals. The Montgomery Creek coal fields underlie the project site; however, there are no plans to mine the area for coal. Construction of residences would not affect the coal deposits, which would remain intact for potential future exploitation.

MITIGATION

No mitigation measures or BMPs would be required for Alternative A to reduce land resource impacts related to topography, seismicity, and mineral resources, other than adherence to the provisions of the Uniform Building Code. Mitigation measures and BMPs would be required to reduce land resource impacts related to soil erosion, which are provided in **Section 3.2.4**. No significant adverse impacts to topography, seismicity, mineral resources, and soil erosion would occur due to implementation of the Proposed Project.

Alternative B

Under Alternative B, impacts to land resources related to topography, seismicity, and mineral resources would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to land resources related to soils would be reduced accordingly.

MITIGATION

No mitigation measures or BMPs would be required for Alternative B to reduce land resource impacts related to topography, seismicity, and mineral resources, other than adherence to the provisions of the Uniform Building Code. Mitigation measures and BMPs would be required to reduce land resource impacts related to soils, which are provided in **Section 3.2.4**. No significant adverse impacts to land resources related to topography, seismicity, soils, and mineral resources would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures or BMPs would be required for Alternative C.

3.2 WATER RESOURCES

The following section describes the existing surface water, drainage, flooding, water supply, groundwater, and water quality conditions in the area surrounding the project site.

3.2.1 SURFACE WATER, DRAINAGE, AND FLOODING

Watersheds and Hydrology

The 40-Acre Property is located in the Lower Pit River Watershed, which covers approximately 700 square miles in northeastern California and extends 40 miles southwest from Lake Britton to the confluence with Shasta Lake. Rainfall in the watershed averages 70 inches per year. Pit River is located approximately 2.2 miles west of the project site and is one of the three rivers that traverse the Cascade Range. Montgomery Creek flows into Pit River and flows in a general east-west direction north of the project site. Two intermittent streams flow into Willow Creek, which flows south of the project site and joins Montgomery Creek west of SR-299.

Daily average flow through Pit River within the Lower Pit River Watershed is approximately 3,000 cubic feet per second (cfs) and historically does not flow below 2,000 cfs during the summer season. Pit River flows are primarily regulated by operation of the 140,000 AF Lake Britton reservoir and a series of Pacific Gas & Electric (PG&E) reservoirs downstream.

Drainage

Slopes on the project site range from 10 to 30 percent, with lower elevations in the southwest portion and higher elevations in the northeast portion. Runoff is generated as sheet flow and follows the topography of the project site, generally flowing into the intermittent drainage within the project site.

Flooding

The Federal Emergency Management Agency (FEMA) is responsible for predicting the potential for flooding in most areas. FEMA routinely performs this responsibility by issuing and updating Flood Insurance Rate Maps (FIRM) that depict various levels of predicted inundation. According to FEMA FIRM Number 06089C1000G (**Figure 3-3** of **Appendix A**), the project site is located outside of the 100-year flood zone in Zone X or is located in another undetermined area with no digital data available. The adjacent existing Pit River Trust Land is located in Zone D, an area in which flood hazards are undetermined but possible (FEMA, 2011).

3.2.2 WATER SUPPLY AND GROUNDWATER

The County is located within the Sacramento River Hydrologic Region and contains several groundwater basins and subbasins (Department of Water Resources [DWR], 2018). Although the project site is not located within a groundwater basin itself, the closest groundwater basin to the project site includes the Dry Burney Creek Valley, Burney Creek Valley, Goose Valley, and the Redding groundwater basins. The Redding Groundwater Basin is comprised of six subbasins, including the Bowman, Rosewood, Anderson, Enterprise, Millville, and South Battle Creek subbasins. The closest groundwater basins, Dry Burney Creek Valley (5-049), is located approximately 11 miles southeast of the project site and has a surface area of approximately 3,080 acres (5 square miles). No known data is available regarding the storage capacity or well yields within the basin (DWR, 2004a). The Millville Subbasin of the Redding Groundwater Basin, located approximately 17 miles southwest of the project site, has a surface area of approximately 67,900 acres (106 square miles) with an estimated groundwater storage capacity of 5.5 million AF and well yields from 8 to 500 gallons per minute (gpm) (DWR, 2004b).

The project site would be serviced by the PRTWD and their two public water systems. Implementation of the Proposed Project would not significantly affect water supply operations in the region due to sufficient

capacity from a new well which is currently undergoing the permitting and review stage and upsizing the existing storage tank to approximately 100,000 gallons, as discussed in **Section 3.9.1**. The system is located upgradient and approximately 2,000 feet east of the project site and consists of one groundwater well, two water storage tanks, a 2-inch PVC water main and laterals, and several meters. There are two inactive wells within 5 miles of the project site with well depth data in the U.S. Geological Survey (USGS) Groundwater Site Inventory for California. The average depth of these wells is approximately 189 feet below ground surface (USGS, 2010).

3.2.3 WATER QUALITY

Surface Water

The Clean Water Act (CWA) (33 USC §§ 1251-1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The USEPA is delegated as the authoritative body under the CWA. Important sections of the CWA that pertain to the Proposed Action are as follows:

- *Sections 303* and *304* provide water quality standards, criteria, and guidelines. Section 303(d) requires states to identify impaired water bodies and develop total maximum daily loads (TMDL) for the contaminant(s) of concern.
- *Section 401* requires an applicant for any federal permit that proposes an activity that may result in a discharge to waters of the U.S. to obtain certification that discharge will comply with other provisions of the CWA.
- *Section 404* regulates the discharge of dredged and fill material into waters of the U.S. The U.S. Army Corps of Engineers (USACE) requires that a permit be obtained if a project proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the ordinary high-water mark (OHWM). The USACE has established a series of nationwide permits that authorize certain activities in waters.

ANTIDEGRADATION POLICY

The federal antidegradation policy (40 CFR Part 131.6) is designed to protect water quality and water resources. Complying with the anti-degradation provision of the CWA, the Central Valley Regional Water Quality Control Board (CVRWQCB) has established general water quality objectives for all inland surface waters under State jurisdiction to protect designated beneficial uses. The Water Quality Control Plan (Basin Plan) for the CVRWQCB outlines these surface water quality objectives.

The State Water Resources Control Board (SWRCB), in compliance with Section 303 of the CWA, has prepared a list of impaired water bodies in California. Impaired water bodies occur where industrial and technological waste limits or other legal mechanisms for pollution control are not enough to meet water quality standards. The list includes a priority schedule for the development of TMDLs for each contaminant or stressor impacting the water body. The Lower Eel River is listed on the 303(d) list for impairment of one or more beneficial uses due to aluminum, dissolved oxygen, sedimentation/siltation, and temperature.

Groundwater

The Basin Plan also specifies water quality objectives for groundwater in the north coast. In order to protect drinking water supplies, the USEPA, under the mandate of the Safe Drinking Water Act, defines National Primary Drinking Water Regulations (primary standards). These are legally enforceable

standards that apply to public water systems. Primary standards are established to protect human health by limiting the levels of contaminants in drinking water. The USEPA also defines National Secondary Drinking Water Regulations (secondary standards).

3.2.4 IMPACTS TO WATER RESOURCES

Alternative A

The Proposed Action would result in an increase in impervious surfaces from roadways and building pads. Utilizing the estimated grading demand for each house as an estimate, this would result in the addition of 0.7 acres of impervious surfaces, or 1.75 percent of the 40-Acre Property. While the roadways would be paved, the project site already contains 0.74 acres of impervious surfaces, or 1.85 percent of the 40-Acre Property, consisting primarily of Bakus Road located in the southern region of the project site, that would result in both increased peak flow and increased total discharge during wet weather events. However, the existing roadways are compacted graded dirt and gravel access roads. Depending upon the duration and intensity of a storm, this increased flow of water may result in increased erosion in other areas adjacent to the buildings and roadways. With the proposed construction of an additional 0.7 acres of impervious surfaces, future flows are expected to increase due to the added impervious surface area. Existing drainage features would be able to accommodate the increased runoff caused by the Proposed Action. These features include the intermittent drainage located in the southern portion of the project site.

The project site is located outside the FEMA 0.2 percent annual chance flood and would not contribute to an increase in off-site flows to a floodplain. Therefore, there would be no significant impact concerning floodplain management as a result of the Proposed Project.

WATER SUPPLY

The Proposed Action would result in an increase in water supply. Utilizing the estimated water demand for each house as an estimate, the projected average water demand of the Proposed Action is 16,000 gallons per day (gpd), or 575 acre-feet per year (AFY), and the peak day demand is 32,000 gpd, or 1,150 AFY. The neighboring system and groundwater well is suitable as a domestic water supply for the Proposed Action, as past test results indicate that the water supply is of sufficient quality and meets the Safe Drinking Water Act requirements and associated USEPA maximum contaminant levels. As discussed in **Section 3.9.1**, recent yield tests conducted by PRTWD have confirmed sufficient groundwater capacity to serve the proposed alternatives. It is anticipated that groundwater yields in the vicinity of the project site would meet the needs of the Proposed Action and therefore the Proposed Action would result in less-than-significant impacts on the local groundwater supply.

RESIDENTIAL WASTEWATER TREATMENT AND DISPOSAL

Each residence would generate approximately 350 gpd of wastewater. Individual systems consisting of a septic tank and leachfield would be used to serve the proposed residences. Individual, shallow subsurface leachfields would allow for dispersing effluent over the greatest area possible, which would minimize risks of groundwater mounding and surface ponding, as well as impact the smallest amount of area possible within the project site.

Primary treatment of wastewater would be provided by septic tanks, which allow time and space for heavy solids and light grease to separate from wastewater. Septic tanks would be sized to accommodate 1,500 gallons, which is more than the peak-day flow for 24 hours at an individual residence. Solids settle

to the bottom of the tank, where approximately 50 percent decompose, and 50 percent accumulate as sludge. Solids are pumped out every 3 to 5 years.

Water from the septic tank would be slowly released to a leachfield. Each leachfield would consist of 5 or 6, 50-foot trenches spaced approximately 10 feet center-to-center to accommodate approximately 250 to 300 feet of leachline, which are perforated pipes that disperse effluent into the soil. Trenches are covered and filled with stone or gravel to reduce surface water inflow. Microorganisms in the soil, through an aerobic process, decompose organic matter, solids, and nutrients in the effluent, thereby protecting water quality. Leachfields have the potential to affect water quality, as discussed below. A septic tank and leachfield system would qualify as a Class V injection well under the USEPA Underground Injection Control Program. This would require submission of an Inventory of Injection Wells form as the first step in the USEPA approval process. Wastewater effluent would be required to meet federal standards, and the leachfields would be setback from water sources. Impacts from wastewater under this alternative would be minimal with the mitigation included below.

WATER QUALITY

Construction

Construction activities under the Proposed Action would include ground-disturbing activities such as clearing and grubbing, grading, and excavation that could lead to erosion of topsoil. Erosion from construction sites can increase sediment discharge to surface waters during storm events, thereby degrading downstream water quality. Construction activities would also include the routine use of potentially hazardous construction materials such as concrete washings, oil, and grease that may spill onto the ground and dissolve in stormwater. Release of pollutants onsite may allow for pollutants to be carried offsite with stormwater to surface waters or to percolate to groundwater, which from construction activities and accidents are a potentially significant impact. Although water quality impacts from construction on the project site would be minimal, the Tribe is required to adhere to the provisions of the CWA. The Tribe would submit an application for the USEPA Construction General Permit under NPDES and adhere to all guidelines therein. As required, the Tribe would create and implement a Stormwater Pollution Prevention Plan (SWPPP) that would outline BMPs. The Notice of Intent for the Construction General Permit and the SWPPP would be formulated and enacted prior to construction activities. The SWPPP would also be kept onsite for the duration of all construction activities and maintained in accordance with the Construction General Permit.

Operation

The Proposed Project would utilize leachfields that could result in the contamination of water sources. Soils on the project site are moderately well drained due to the Kilarc very stony sandy clay loam present in the A-horizon. The neighboring system and groundwater well includes a 50-foot sanitary seal for protection of water quality and proposed leachlines would include appropriate setbacks from water sources. With mitigation measures, implementation of the proposed wastewater treatment systems would not adversely impact water quality.

Surface water runoff from residential areas could transport trash, debris, oil, sediments, and grease into adjoining surface waters, thereby affecting surface water quality. Increased runoff could create scouring and could impact riparian habitat. The Tribe would be required to adhere to the provisions of the CWA. To reduce the effects of increased surface runoff volume and entrained pollutants, BMPs and mitigation

measures have been included. With implementation, impacts to surface water quality during operation would be minimal.

MITIGATION

No significant adverse impacts associated with surface or groundwater hydrology or to water quality would occur downstream of the project site with implementation of the following mitigation measures:

- Prior to construction, a SWPPP shall be prepared and implemented as required by the USEPA to prevent erosion and prevent pollutants from entering surface and groundwater. Water quality control measures identified in the SWPPP shall include, but not be limited to, the following BMPs:
    - Major grading activities shall be scheduled during the dry season.
    - Erosion control blankets or jute netting shall be placed in rough-graded ditches and then hydroseeded.
    - Fiber rolls and straw wattles shall be installed throughout the construction site around the down-slope perimeter of the construction site.
    - All exposed soil areas shall be stabilized and re-seeded with appropriate native plant species. Stockpiles of unsuitable or excess soil shall be removed and disposed of at approved sites.
    - Hay or straw mulch and tackifier shall be used as temporary measure for stabilizing disturbed areas.
    - Landscaping shall be managed to minimize erosion and sedimentation according to the following practices:
        - Rock filter berms shall be placed across roadways.
        - Silt fencing shall be placed down-slope of exposed soil areas and around temporary soil stockpiles.
    - Catch basins, junction boxes, culverts, and outfall structures/energy dissipaters shall be used throughout grading.
    - Ingress/egress points to the project site shall be stabilized and graded.
    - Cleaning, fueling, maintenance, and repair of construction vehicles and equipment shall be performed offsite whenever possible.
    - The Contractor shall be responsible for all maintenance, inspection, and repair to all erosion and sediment control measures throughout the construction period and shall ensure that all other protective devices are maintained and repaired in good and effective condition.
- Existing drainage patterns shall not be significantly modified and drainage concentrations shall be avoided.
- Revegetated areas shall be properly maintained in order to ensure adequate establishment and growth.

Alternative B

Under Alternative B, impacts to water resources related to surface water, drainage, flooding, water supply and groundwater, and water quality would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to water resources would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts to water resources related to surface water, drainage, flooding, water supply and groundwater, and water quality would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.3 AIR QUALITY

3.3.1 REGULATORY CONTEXT

The federal Clean Air Act (CAA) was enacted for the purpose of protecting and enhancing the quality of air resources to benefit public health, welfare, and productivity. Basic components of the CAA and its amendments include national ambient air quality standards (NAAQS) for CAPs and development of state implementation plans (SIP) under 40 CFR Part 51to meet the NAAQS. The USEPA is the federal agency responsible for identifying CAPs, establishing the NAAQS, and approving and overseeing state air quality programs as they relate to the CAA.

The USEPA has identified six CAPs (ozone [O_3], carbon monoxide [CO], sulfur dioxide [SO_2], nitrogen dioxide, particulate matter [PM_{10} and $PM_{2.5}$], and lead) that are used as indicators of regional air quality. Regulation of air pollution is achieved through both the NAAQS and emission limits for individual sources of CAPs outlined in each SIP (40 CFR Part 51). For some CAPs, the USEPA has identified air quality standards expressed in more than one averaging time to address the typical exposures times.

The USEPA, in conjunction with the California Air Resource Board (CARB), identifies areas throughout California that meet the NAAQS. These areas are labeled either attainment or unclassifiable for each CAP that is compliant with the NAAQS. Areas that do not meet the NAAQS are labeled either nonattainment or maintenance for the CAP that is non-compliant with the NAAQS. The USEPA further classifies nonattainment areas according to the extent of non-compliance. There are five classes of nonattainment areas: maintenance (recently became compliant with the NAAQS); marginal (relatively easy to obtain levels below the NAAQS); serious, severe, and extreme (will be difficult to reach levels below NAAQS). The USEPA uses these classifications to design compliance requirements appropriate for the severity of the pollution for inclusion in the SIP and to set realistic deadlines for reaching those compliance goals.

Under 40 CFR Part 6, federal projects are required to show conformity with the applicable SIP. Conformity is outlined in 40 CFR Part 51 Subpart W, which requires any project that is located in an area where any CAP is nonattainment to show that the total project-related emissions of that particular CAP is less than the *de minimis* level provided in 40 CFR Part 51, Subpart W.

New source review (NSR) is a pre-construction air permitting program implemented under the CAA that applies in both attainment and nonattainment areas. The minor NSR program applies to both new minor

sources and minor modifications to both major and minor projects. NSR programs must comply with the standards and control strategies of the Tribal Implementation Plan (TIP) or SIP. If there is not an applicable TIP or SIP, the USEPA issues permits and implements the program. A minor new source permit would be required on Tribal trust land if stationary source allowable emissions of regulated pollutants would exceed the thresholds presented in 40 CFR 49.153, Table 1.

Climate Change

COUNCIL ON ENVIRONMENTAL QUALITY GREENHOUSE GAS GUIDANCE

On February 19, 2021, pursuant to Executive Order (EO) 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, the Council on Environmental Quality (CEQ) rescinded its 2019 *Draft National Environmental Policy Act (NEPA) Guidance on Consideration of Greenhouse Gas Emissions* and is reviewing, for revision and update, the 2016 *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (2016 GHG Guidance) (CEQ, 2016). In the interim, agencies should consider all available tools and resources while assessing GHG emissions and climate change effects of their proposed actions, including, as appropriate and relevant, the 2016 GHG Guidance.

To assess impacts, the 2016 GHG Guidance states that federal agencies should quantify direct and indirect emissions of the project alternatives, with the level of effort being proportionate to the scale of the emissions relevant to the NEPA review. The CEQ guidance advises federal lead agencies to consider: (1) the potential effects of a proposed action on climate change as indicated by assessing GHG emissions, and (2) the effects of climate change on a proposed action and its environmental impacts. The guidance does not propose a specific, quantitative threshold of significance; however, it states that agencies should consider the potential for mitigation measures to reduce or mitigate GHG emissions and climate change effects when those measures are reasonable and consistent with achieving the purpose and need for the proposed action. Examples of mitigation provided for in the guidance include, but are not limited to, enhanced energy efficiency design, lower GHG-emitting technology, carbon capture, carbon sequestration (e.g., restoration of forest, agricultural soils, and coastal habitat), and compensation. Accordingly, this EA includes a quantification of GHG emissions resulting from the project alternatives (in carbon dioxide equivalents [CO_2e]) and a discussion of reduction measures.

3.3.2 EXISTING AIR QUALITY CONDITIONS

The project site is located within the Sacramento Valley Air Basin (SVAB), which extends over 200 miles from Sacramento County in the south to Shasta County in the north. The climate of the SVAB is influenced by three major topographic units: coastal mountains to the west, the Cascade Range to the north, and the Sierra Nevada Mountains to the east. The project site is located in the foothills of the Cascade Range, where winters are wet and cool and summers are hot and dry. Although the area characterized by the project site is not densely populated, population within the entire SVAB has increased by approximately 51 percent between 1990 and 2010 (CARB, 2010).

3.3.3 REGIONAL AIR QUALITY

NAAQS Designations

The northern SVAB is in attainment or is unclassified for all CAPs under the current NAAQS designation.

Pollutants of Concern

Pollutants of concern are CAPs that are present in quantities exceeding the NAAQS in the applicable air basin or region and air pollutants that are not designated as CAPs, such as CAP precursors (nitrogen oxides [NOx] and reactive organic gases [ROG]), that can be temporarily present in high concentrations in a localized region of the SVAB. No CAPs exceed the NAAQS in the northern SVAB and no CAP precursors would be temporarily present in high concentration in the northern SVAB. Therefore, pollutants of concerns are not present in the northern SVAB.

Hazardous Air Pollutants

Hazardous air pollutants (HAP) are a group of pollutants of concern that are a specific group of airborne chemicals designated by the USEPA. Sources of HAPs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least 40 different HAPs. The most important, in terms of health risk, are DPM; benzene; formaldehyde; 1,3-butadiene; and acetaldehyde.

HAPs are less pervasive in the urban atmosphere than CAPs but are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are different types of HAPs, with varying degrees of toxicity. The USEPA currently lists over 188 HAPs. The majority of the estimated health risk from HAPs can be attributed to relatively few compounds, the most important being DPM (CARB, 2005). Diesel engines emit a complex mixture of air pollutants composed of gaseous and solid material. The visible emissions in diesel exhaust are particulate matter that includes carbon. Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances.

3.3.4 FEDERAL CLASS I AREAS

The project site is not located within or adjacent to a federal Class I area. However, there are three federal Class I areas in the vicinity of the project site, including the Thousand Lakes Wilderness (20 miles southeast), Lassen Volcanic National Park (35 miles southeast), and the Caribou Wilderness (35 miles southeast).

3.3.5 GREENHOUSE GASES

Primary sources of GHG emissions in the region include vehicles, trucks, airplanes, lumber mills, ships, canneries, and electricity generation facilities. However, many of these sources are not tabulated in the Greenhouse Gas Reporting Program (GHGRP) and there are many other sources of GHG emissions in the region. According to the most recent available data, the highest reported emissions within the County reported under the GHGRP is from the Lehigh Southwest Cement Co. production facility (USEPA, 2016). There are two regulated facilities under the GHGRP that emitted greater than 100,000 metric tons (MT) of CO_2e in the County in 2016, including the Lehigh Southwest Cement Co. production facility (192,858 MT CO_2e) and the Redding Power Plant (141,787 MT Co_2e). The Lehigh Southwest Cement Co. production facility is located approximately 21.8 miles southwest of the project site and accounts for approximately 44 percent of the total large facility GHG emissions in the County. The Redding Power Plant is located south approximately 34.4 miles southwest of the project site and accounts for approximately 32 percent of the total large facility GHG emissions in the County. Both facilities primarily emit carbon dioxide (USEPA, 2016).

3.3.6 SENSITIVE RECEPTORS

Sensitive receptors are facilities that house or attract children, the elderly, and people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors.

Typical of rural areas, the project site vicinity is characterized by very low-density residential uses. One single family residence is located approximately 300 feet east of the eastern boundary of the 40-Acre Property and another single-family residence is located approximately 400 feet south of the southern boundary of the 40-Acre-Property. These residences are the closest off-site sensitive receptors. Other residences within the Rancheria are located approximately 0.25 miles north of the 40-Acre-Property. The closest school (Cedar Creek Elementary School) is located approximately 2.8 miles south of the project site.

3.3.7 IMPACTS TO AIR QUALITY

Alternative A

Development and operation of the Proposed Project would emit CAPs, HAPs, and GHGs. This section presents the methodology used to assess the affected environment and to evaluate the potential air quality effects of the project alternatives.

If a federal action occurs in a location designated as attainment or unclassified, then the General Conformity Rule does not apply to the project. The conformity regulations do not apply because the County is designated attainment/unclassifiable for all NAAQSs. However, for the purposes of the NEPA review, the least stringent *de minimis* thresholds from the general conformity rule can be reviewed to identify significant long-term emissions increases. The least stringent *de minimis* thresholds in the rule are 100 tons per year for ozone precursors (ROG and NO_X), CO, and PM_{10} and $PM_{2.5}$.

CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS

No significance thresholds have been established by the County, CEQ, USEPA, or any other federal agency for climate change and GHG emissions. As discussed in **Section 3.3.1**, federal guidance on climate change is currently under review; however, agencies have been directed to consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions. Accordingly, reasonable alternatives and mitigation measures to reduce action-related GHG emissions or increase carbon sequestration in the same fashion are considered within this EA.

METHODOLOGY

Criteria Air Pollutants

Project-related air quality impacts fall into two categories: short-term impacts due to construction and long-term impacts due to project operation. Short-term construction activities would result in the generation of $PM_{2.5}$ and PM_{10} containing fugitive dust and ROG, NO_x, and CO from diesel-fired construction equipment. The only potential long-term impacts resulting from operation of the Proposed Project would stem from motor vehicle use to and from the rural residence, that would contribute to O_3, the significance of which is determined through the generation of ROG, NOx, and CO pollution.

Climate Change and Greenhouse Gas Emissions

Climate change is a global phenomenon attributable to the sum of all human activities and natural processes worldwide. The Proposed Project's impact on climate change is most appropriately addressed in terms of the incremental contribution to a global cumulative impact and is analyzed accordingly.

AIR QUALITY IMPACTS

Construction Emissions

Construction of the Proposed Project and associated facilities would generate CAPs through the utilization of construction machinery (primarily diesel operated), construction worker automobiles (primarily gasoline operated), and through physical land disturbance. Land clearing can generate fugitive dust, of which a fraction is PM_{10}. It is estimated that total construction time for all housing units would be spread out over the course of one year. This would generate a limited number of construction contractor trips, in addition to construction emissions.

The project site is in a region of attainment for all criteria pollutants under the NAAQS; the minimal duration and limited number of machines required for construction of the Proposed Project would not cause an exceedance of NAAQS or conflict with the implementation of California's SIP. The project site is within 100 kilometers (km) of three federal Class I areas as discussed in **Section 3.3.4**. Construction of the Proposed Project would not produce greater than 250 tons per year (tpy) of a regulated pollutant. Therefore, the Proposed Project is not classified as a major source under the Prevention of Significant Deterioration (PSD) program and no pre-construction review is required. BMPs would further minimize construction related emissions of CAPs and would also reduce DPM emissions from construction equipment by approximately 85 percent. Construction of the Proposed Project would not result in significant adverse effects associated with the regional air quality environment.

Operational Emissions

Operational impacts would primarily result from residential vehicle trips. Institute of Transportation Engineers (ITE) trip generation rates for single-family detached housing (ITE 210) were used to analyze emissions from vehicle trips.

Accordingly, as the project site is in a region of attainment for all criteria pollutants under the NAAQS, operation of the Proposed Project would not result in significant adverse effects associated with the regional air quality environment. Although the project site is within 100 km of three federal Class I areas, operation of the Proposed Project would not produce greater than 250 tpy of a regulated pollutant. The Proposed Project is therefore not classified as a major source under the PSD program and no pre-construction review is required. Furthermore, there would be no stationary sources associated with the Proposed Project that would require Tribal NSR. BMPs are provided below that would further reduce operational emissions.

MITIGATION

No mitigation measures are required for Alternative A. BMPs presented in **Section 2.2** are required for Alternative A.

Alternative B

Under Alternative B, impacts to air quality would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to air quality would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts to air quality would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.4 BIOLOGICAL RESOURCES

3.4.1 ENVIRONMENTAL SETTING

The project site is located within Township 32 North (T32N), Range 1 West (R1W), Section 1 of the Montgomery Creek, California USGS 7.5-minute topographic quadrangle, Mount Diablo Baseline Meridian. The centroid of the project site is 40° 49' 54.9" North, 121° 55' 28.5" West.

Methodology

A Biological Resources Letter Report (BRLR) was prepared for the Proposed Project and is included as **Appendix C**. The BRLR presents a summary of special-status species in the vicinity of the study area based on the USFWS Official Species List and California Native Plant Society and California Natural Diversity Database queries and provides a rationale as to whether the species has the potential to occur within the study area. The presence of species or their habitat was evaluated during field surveys. Analytical Environmental Services (AES) conducted a general biological survey and an informal delineation of the 40-Acre Property on April 2 and 3, 2018. The biological survey consisted of evaluating biological communities and documenting potential habitats for special-status species with the potential to occur within the study area. Photographs of the study area are presented in the BRLR. A summary of the results of the BRLR is provided below.

Results

HABITAT TYPES

Pine Forest

Approximately 21.54 acres of the 40-Acre Property are pine forest, which is characterized by trees that grow needles instead of leaves and cones instead of flowers (**Figure 3-4** of **Appendix A**). Vegetation within this habitat is characterized by species such as oak trees (*Quercus* spp.), ponderosa pines (*Pinus ponderosa*), lodgepole pines (*Pinus* spp.), and lupine (*Lupinus* spp.).

Chaparral

Approximately 17.45 acres of the 40-Acre Property are chaparral, which is characterized by shrubs and low growing vegetation (**Figure 3-4** of **Appendix A**). Vegetation within this habitat is characterized by species such as willow trees (*Salix* spp.), manzanita (*Arctostaphylos* spp.), soap bush (*Ceanothus* spp.), and poison oak (*Toxicodendron* spp.).

Non-Native Grassland

Approximately 0.10 acres of the 40-Acre Property are non-native grassland, which is characterized by a lack of woody vegetation (**Figure 3-4** of **Appendix A**). Vegetation within this habitat is characterized by species such as fennel (*Foeniculum* spp.) and redstem stork's bill (*Erodium cicutarium*).

Ruderal/Disturbed

Approximately 0.74 acres of the 40-Acre Property is Bakus Road, a graded dirt access road located immediately south of and within the southern portion of the 40-Acre Property (**Figure 3-4** of **Appendix A**). Bakus Road intersects SR-299 to the west of the 40-Acre Property, travels in an east-west direction, and provides access to the Montgomery Project located east of and adjacent to the 40-Acre Property.

Intermittent Stream

There is an approximately 2,212.11-linear foot intermittent stream system located in the southern portion of the 40-Acre Property (**Figure 3-4** of **Appendix A**). The intermittent stream originates from the hillslopes in the northeastern portion of the 40-Acre Property from overland sheet flow and flows southwest. Surface water intermittently flows through the stream that contains an OHWM, bed and bank, and other indicators of intermittently flowing water within the 40-Acre Property. Vegetation within this habitat is characterized by species such as sedges (*Carex* spp.).

Federally Listed Special-Status Species

For the purposes of this EA, federally listed special-status species include those plant and animal species that are listed as endangered or threatened, formally proposed for listing, or candidates for listing under the Endangered Species Act (ESA). Regionally occurring federally listed special-status species were evaluated for their potential to occur on the project site. The project site does not contain critical habitat for federally listed special-status species. The project site does not provide suitable habitat for any special-status species identified in background research (**Appendix C**). If "take" of a listed species is necessary to complete an otherwise lawful activity, consultation with the USFWS shall be initiated in accordance with Section 7 of the ESA.

MIGRATORY BIRDS AND BIRD OF PREY

The Migratory Bird Treaty Act of 1918 (16 USC §§ 703-712) protects migratory birds by making it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird (50 CFR 10), including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

Migratory birds and other birds of prey have the potential to nest within the trees within the pine forest and chaparral habitats located within and in the vicinity of the project site. No birds were observed nesting during the biological survey of the project site; however, they have the potential to nest within and in the vicinity of the project site.

3.4.2 IMPACTS TO BIOLOGICAL RESOURCES

Alternative A

The Proposed Project does not have the potential to have significant adverse impacts on suitable habitat required for any special-status species. The Proposed Action does have the potential to have significant adverse impacts on sensitive habitats such as potential wetlands or other potential waters of the U.S.

found within the 40-Acre Property. Grading and construction activities associated with the Proposed Project have the potential to result in the disturbance of nesting habitat for migratory birds and other birds of prey.

MITIGATION

Implementation of the following mitigation measures would ensure that the Proposed Project would avoid or minimize potential adverse impacts to biological resources.

Wetlands and Other Waters of the U.S.

- Prior to ground disturbance, a qualified biologist shall identify appropriate buffer zones around the intermittent stream system within the project site to assure avoidance during construction.
- Prior to construction within 50 feet of a buffer zone, a qualified biologist shall demarcate each buffer zone using appropriate materials such as high visibility construction fencing, which will not be removed until the completion of construction activities within 50 feet of the buffer zone.
- Staging areas shall be located away from the buffer zones. Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas.
- Should unavoidable impacts occur to wetland and waters of the U.S or state, including through direct disturbance or indirect impacts to water quality, the appropriate permits will be acquired and compensatory mitigation consisting of creating or enhancing waters of the U.S. shall be implemented at no less than a 1:1 ratio upon approval by the appropriate agency.

Migratory Birds

- If construction activities (e.g., building, grading, ground disturbance, removal of vegetation) are scheduled to occur during the general nesting season (February 15 - September 15), a preconstruction nesting bird survey shall be conducted by a qualified biologist throughout accessible areas of suitable habitat within 500 feet of proposed construction activity. The survey shall occur no more than 7 days prior to the scheduled onset of construction. If construction is delayed or halted for more than 7 days, another preconstruction survey for nesting bird species shall be conducted. If no nesting birds are detected during the preconstruction survey, no additional surveys or mitigation measures are required.
- If nesting bird species are observed within 500 feet of construction areas during the survey, appropriate "no construction" buffers shall be established. The size and scale of nesting bird buffers shall be determined by a qualified biologist and shall be dependent upon the species observed and the location of the nest. Buffers shall be established around active nest locations. The nesting bird buffers shall be completely avoided during construction activities. The buffers may be removed when the qualified wildlife biologist confirms that the nest(s) is no longer occupied and all birds have fledged.

Alternative B

Under Alternative B, impacts to biological resources would be similar to those under Alternative A; however, with the development of fewer Tribal homes, the impacts to biological resources would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts to biological resources would occur due to the implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.5 CULTURAL RESOURCES

AES conducted an archaeological survey of the 40-Acre Property on April 2 and 3, 2018. The archaeological study, included as **Appendix D** under a separately bound cover due to the sensitive nature of the material addressed, included a field survey and literature searches to identify and evaluate potential prehistoric and historic-period cultural resources within the project site. No prehistoric or historic-period cultural resources were identified as a result of the archaeological study.

3.5.1 CULTURAL RESOURCES SETTING

A records search request (I.C. file No. D15-151) was sent to the Northeast Information Center at Chico State University on November 4, 2015 for the Montgomery Project, and results were received November 9, 2015. The records search request was completed to identify any previously known or recorded cultural resources within the Area of Potential Effects (APE) (**Appendix D**). The records search request included a 0.5-mile wide buffer, which includes the 40-Acre Property, and for that reason, no new record search was undertaken for the Proposed Project. A search of historic maps, including the 1957 Burney, California USGS 15-minute topographic quadrangle and 1874 and 1883 Bureau of Land Management (BLM) General Land Office Plat maps (BLM, 2018), failed to uncover evidence of historic-era development in the APE within the 40-Acre Property. No structures appear on the historic maps viewed, though the precursor of SR-299 is depicted by the BLM. A search of the online land patent records also failed to identify any historic transactions for the 40-Acre Property (BLM, 2018). According to the records search request results, no cultural resources were previously recorded in the APE within the 40-Acre Property, though one resource has been identified within approximately a quarter-mile, CA-SHA-1045. CA-SHA-1045 is a scatter of flakes and occasional tools on a mid-slope bench next to a spring-fed meadow above Montgomery Creek.

Portions of the project site and a quarter-mile vicinity have been inventoried for cultural resources during the performance of seven cultural resource surveys.

Given the environmental setting and the archaeologically rich nature of the general area, it was anticipated that prehistoric sites, ranging from isolates to lithic debris scatters, might be encountered, particularly along alluvial flats associated with the intermittent drainage, during the archaeological survey. It was also considered that additional outlying historic-period domestic deposits related to homesteads and/or ranching activity might be encountered during the archaeological survey.

Field Survey

AES senior archaeologist Charlane Gross, RPA, conducted an archaeological survey of the APE within the 40-Acre Property on April 2 and 3, 2018. The project site was densely vegetated with pine forest and chaparral habitats and therefore parallel pedestrian transects were not used during the archaeological survey. Regional access was provided by SR-299, which is located immediately west of the project site and travels in an east-west direction. Local and direct access was provided by Windy Point Road, which

is located immediately north of the project site and travels in an east-west direction, and Bakus Road, which travels in an east-west direction and is located immediately south of and within the southern portion of the project site.

Native American Consultation

An email was sent to the Native American Heritage Commission on November 5, 2015, for the Montgomery Project, and results were received on November 24, 2015. The email requested a search of the Sacred Lands File and for a list of individuals who might have knowledge of cultural resources within the APE (**Appendix D**). It is anticipated that, as the federal lead agency, any necessary consultation would be conducted by the BIA.

3.5.2 EXISTING FIELD CONDITIONS

Recent and older evidence of bulldozer clearing was visible throughout the 40-Acre Property in the form of dirt, rock, and vegetation piles. The graded dirt and gravel access roads and bulldozer-cleared spaces offered almost the only access. Where bare dirt had not been exposed, spring grasses and weeds completely covered the ground surface, offering less than 1 percent visibility. The archaeological survey proceeded along the graded dirt and gravel access roads, broadening to include the cleared areas as they were encountered; in those locations, transects were spaced 10-15 meters apart. The only major exception consisted of the area within approximately 300 feet of SR-299, where there was less chaparral and more open space. Survey transects were spaced approximately 30 meters apart in that vicinity.

3.5.3 IMPACTS TO CULTURAL RESOURCES

Alternative A

No known cultural or historic resources exist on the project site. Accordingly, implementation of the Proposed Project would have no effect on known historic resources listed or eligible for listing on the National Register of Historic Places (NRHP). Construction of the Proposed Project could adversely impact previously undiscovered cultural or historic resources during earth-moving activities. This is a potentially significant effect and mitigation is provided to reduce the affect to less-than-significant levels by ensuring the integrity of discovered cultural or historic resources is protected. With implementation of the mitigation measures, cultural resources would not be significantly affected.

MITIGATION

The following mitigation measures shall be implemented to minimize impacts to cultural resources during construction:

- Any inadvertent discovery of archaeological resources shall be subject to Section 106 of the National Historic Preservation Act as amended (36 CFR § 800), the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC § 3001 et seq.), and the Archaeological Resources Protection Act of 1979 (16 USC § 470aa-mm). Specifically, procedures for post-review discoveries without prior planning pursuant to 36 CFR § 800.13 shall be followed. The purpose of the following mitigation measures is to minimize the potential adverse effect of construction activities to previously unknown archaeological or paleontological resources in the case of inadvertent discovery:
    - All work within 50 feet of the potential archaeological find shall be halted until a professional archaeologist, or paleontologist if the find is of a paleontological nature, can assess the significance of the find.

- If any archaeological find is determined to be significant by the archaeologist, or paleontologist as appropriate, then representatives of the Tribe shall meet with the archaeologist, or paleontologist, to determine the appropriate course of action, including the development of a Treatment Plan, if necessary.
- All significant cultural or paleontological materials recovered shall be subject to scientific analysis, professional curation, and a report prepared by the professional archaeologist, or paleontologist, according to current professional standards.

If human remains are discovered during ground-disturbing activities on Tribal lands, pursuant to NAGPRA, the Tribal Official and BIA representative shall be contacted immediately. No further disturbance shall occur until the Tribal Official and BIA representative have made the necessary findings as to the origin and disposition. If the remains are determined to be of Native American origin, the BIA representative shall notify a Most Likely Descendant (MLD). The MLD is responsible for recommending the appropriate disposition of the remains and any grave goods.

Alternative B

Under Alternative B, impacts to cultural resources would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to cultural resources would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts to cultural resources would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.6 SOCIOECONOMIC CONDITIONS/ENVIRONMENTAL JUSTICE

3.6.1 SHASTA COUNTY

The project site is located in Shasta County, which is comprised of unincorporated areas and the following cities: Anderson, Redding, and Shasta Lake.

Population

The County has an estimated population of approximately 179,228 people (U.S. Census Bureau, 2016a). Approximately 38 percent of this population resides in the unincorporated areas of the County. The City of Redding is the largest city within the County, with a population of approximately 91,320 people. The County experienced an approximately 1.3 percent increase in population between the years 2010 and 2016. The primary areas of growth in the County during the six-year timeframe include the cities of Anderson and Redding (percent growths of 2.5 percent and 2.2 percent, respectively). Population growth in the County and the surrounding communities is lower compared to growth of the State, which experienced an approximately 5.5 percent increase in population between the years 2010 and 2016.

Housing

There were an estimated 77,942 housing units in the County in 2016, approximately 10.6 percent of which were vacant (U.S. Census Bureau, 2016b).

Employment

The County has an estimated labor force of approximately 73,600 people, approximately 70,100 people of which are employed. The County unemployment rate is therefore approximately 4.90 percent (California Employment Development Department, 2018). Although the labor force has decreased since 2008, the unemployment rate in the County has decreased by almost 50 percent (California Employment Development Department, 2018).

3.6.2 PIT RIVER TRIBE

Statistics for the Tribe were obtained from the BIA's American Indian Population and Labor Force Estimate Report, 2005. The 2013 American Indian Population and Labor Force Estimate Report does not provide the socioeconomic statistics of the Tribe. Tribal enrollment was estimated to be 2,381 members in the 2005 American Indian Population and Labor Force Estimate Report.

3.6.3 ENVIRONMENTAL JUSTICE FOR MINORITY AND LOW-INCOME POPULATIONS

On February 11, 1994, President Clinton issued EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" and an accompanying Presidential Memorandum to focus federal attention on the environmental and human health conditions in minority communities and low-income communities. The EO, as amended, directs federal agencies to develop an Environmental Justice Strategy that identifies and addresses disproportionately high human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. Compliance with this EO has been incorporated into the NEPA compliance requirements of the BIA for the Proposed Action.

The County is approximately 22.3 percent minority. In the County, approximately 9.3 percent of the population is American Indian, including members of the Tribe.

3.6.4 SOCIOECONOMICS / ENVIRONMENTAL JUSTICE IMPACTS

Environmental Justice for Minority and Low-Income Populations

No adverse socioeconomic or environmental impacts to low-income and minority populations are anticipated to occur as a result of the projective alternatives; in fact, the effect on low-income and minority populations would be beneficial if the Tribe develops additional Tribal housing. The projected alternatives would have no negative effect with regards to socioeconomic or environmental conditions for adjacent and close-proximity residents.

Alternative A

With the implementation of Alternative A, any identified minority or low-income populations would not be subjected to disproportionately high or adverse socioeconomic or environmental conditions. The Proposed Project would result in beneficial impacts to an identified minority population (the Tribe). Development of the Proposed Project would not significantly impact the County's ability to provide governmental services due to the less than 0.7 percent in reduction in property tax revenue resulting from removal of the 40-Acre Property from the County's jurisdiction.

Construction of the Proposed Action would result in temporary employment opportunities. The anticipated increase in employment opportunities throughout the region could result in employment and wages for persons previously unemployed, that would increase the ability of the population to obtain health and safety services and would contribute to the alleviation of poverty among lower income households. However, a significant impact to the local unemployment rate would not be anticipated to occur.

MITIGATION

No mitigation measures and BMPs would be required for Alternative A.

Alternative B

Under Alternative B, socioeconomics/environmental justice impacts would be similar to those under Alternative A; however, with the development of less Tribal homes, socioeconomics/environmental justice impacts would be reduced accordingly.

MITIGATION

No mitigation measures and BMPs would be required for Alternative B.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for No-Action Alternative.

3.7 TRANSPORTATION AND CIRCULATION

3.7.1 ENVIRONMENTAL SETTING

Roadway System

A brief description of the key roadway in the vicinity of the project site is provided below.

STATE ROUTE 299

Within California, SR-299 is an approximately 306-mile minor arterial highway located in the northern portion of the State, originating along the coast in Arcata and terminating east of the Nevada state line. SR-299 varies between a two- and four-lane undivided highway with paved shoulders; within the project study area, SR-299 is two lanes. The average annual daily traffic on SR-299 in the vicinity of the project site (SR-299 at Terry Mill Road) was approximately 3,330 vehicles during a California Department of Transportation (Caltrans) traffic count taken during 2014, with average peak hour volumes of approximately 380-400 vehicles analyzed during that same year (Caltrans, 2014). SR-299 provides regional access to the project site and connects to Interstate 5 and the City of Redding to the west, as well as State Route 89 and the town of Burney to the east.

WINDY POINT ROAD

Windy Point Road is an east-west, private and rural roadway that runs along the northern portion of the project site. The roadway is composed primarily of asphalt and graded dirt and gravel, has a width of approximately 40 feet, and has little or no shoulder in most areas.

BAKUS ROAD

Bakus Road is an east-west, private and rural roadway that provides access to private residences within Shasta County APNs 029-530-012 and 029-530-013. The roadway is composed primarily of graded dirt and gravel, has a width of approximately 12 feet, and has little or no shoulder in most areas.

Existing Bicycle and Pedestrian System

Windy Point Road and Bakus Road provide no sidewalks to accommodate pedestrian activity. Observations of these roadways indicate that pedestrian activity is minimal. Further, no bike lanes are provided along SR-299 or the private roads, which all have relatively low traffic volumes. Observations of these roadways indicate that pedestrian and bicycle activities are minimal.

Transit Service

The Redding Area Bus Authority (RABA), which is operated by the County, provides bus transit service to residents throughout the County. The Burney Express transit route provides commuter service along SR-299 to residents between Redding and Burney. The closest bus stop in the vicinity of the project site is located the Montgomery Creek Library, approximately 0.6 miles north of the project site (City of Redding, 2018).

3.7.2 IMPACTS TO TRANSPORTATION AND CIRCULATION

Alternative A

The only trip generation resulting from the Proposed Project would be associated with trips during construction and residential vehicle trips upon completion of the housing development. Construction trips are projected to last one year; however, it is anticipated that construction would not occur every day and would be limited to a small crews. The housing development would increase regional trips by approximately 898 trips per a day or 9,362 trips per month, based on the ITE trip generation rate for single-family detached housing (ITE 210) and construction of 32 dwelling units. The housing development would increase the current baseline daily peak hour trips, which is approximately 380-400 for SR-299, by 89 daily peak hour trips.

INTERSECTION LEVELS OF SERVICE

Traffic generated by the Proposed Project would be limited to construction efforts during a maximum of one year of construction, as well as residential trips thereafter. It is not anticipated that the 32 additional housing units would have a significant impact to the level of service (LOS) at any nearby intersection. Table 5-5 in the Final Draft 2010 Regional Transportation Plan for the County does not predict SR-299 to operate at a LOS below C or D during year 2030 (Shasta County, 2010). Accordingly, trips generated during the construction period would be intermittent and would not result in long-term additions of traffic to the transportation network. Trips generated from the development of the Proposed Project would be primarily local residential trips within the Rancheria, are not anticipated to result in long-term significant additions of traffic to the roadway network and would not significantly affect area circulation.

BICYCLE AND PEDESTRIAN SYSTEM

As described in **Section 3.7.1**, Windy Point and Bakus Roads provide no sidewalks to accommodate pedestrian activity, nor are bike lanes provided along SR-299 or along the graded dirt and gravel access roads. Although the Proposed Project would result in an increase in population due to additional housing, the infrastructure within the area is not conducive to non-vehicular modes of transportation; therefore, the Proposed Project would not significantly affect pedestrian or bicycle traffic.

TRANSIT SERVICE

As described in **Section 3.7.1**, RABA provides interregional access by means of the Burney Express, a commuter bus service between Redding and Burney. The Proposed Project would result in 32 additional housing units and is anticipated to increase ridership; however, under the assumption that the majority of residents would use personal vehicles as their primary mode of transportation, no significant effect to public transit would occur.

MITIGATION

No mitigation measures and BMPs would be required for Alternative A to reduce impacts to transportation and circulation. No significant adverse impacts to transportation and circulation would occur due to implementation of the Proposed Project.

Alternative B

Under Alternative B, impacts to transportation and circulation would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to transportation and circulation would be reduced accordingly.

MITIGATION

No mitigation measures and BMPs would be required for Alternative B to reduce impacts to transportation and circulation. No significant adverse impacts to transportation and circulation would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.8 LAND USE AND AGRICULTURE

3.8.1 LAND USE

The 40-Acre Property, currently undeveloped, is characterized by pine forest and chaparral habitat. Uses on the Rancheria include a casino, the Tribal government center, and Tribal housing. Surrounding land uses include Tribal residences, private residences, agriculture, and undeveloped parcels. Land use activities in the unincorporated areas of the county are regulated by the Shasta County General Plan (County, 2004c), applicable area/specific plans, and the Shasta County Zoning Plan and Subdivision Ordinance. The County designated land uses including zoning are presented in **Figures 3-5** and **3-6** of **Appendix A**.

The project site has a land use designation of rural residential B (RB) and is zoned limited residential (R-L) and mobile home (T). The parcels to the west of the project site are zoned Timberland (TL). Other than this pine forest habitat, the immediately surrounding properties have a land use designation of rural residential and are zoned limited residential. The land use designation of rural residential is characterized by remoteness and provides limited urban services. The maximum residential density for land not exceeding a 30 percent slope, as is the case with the project site, is one dwelling unit per five acres (County, 2018).

3.8.2 AGRICULTURE

The 40-Acre Property, currently undeveloped, is characterized by pine forest and chaparral habitats. No agricultural crops are currently cultivated on the project site. The Farmland Mapping and Monitoring Program classifies the parcel as other land, land not included in any other mapping category, such as low-density rural developments, brush, nonagricultural lands, etc. (California Department of Conservation [CDOC], 2017a).

Williamson Act Provisions

Under the provisions of the Williamson Act (California Land Conservation Act 1965, Section 51200), landowners contract with the County to maintain agricultural or open space use of their lands in return for a reduced property tax assessment. Withdrawal involves a 10-year period of tax adjustment to full market value before protected open space can be converted to urban uses. Consequently, land under a Williamson Act Contract can be in either a non-renewal status or a renewal status. Lands with a non-renewal status indicate the owner has withdrawn from the Williamson Act Contract and is waiting for a period of tax adjustment for the land to reach its full market value for tax purposes. The project site is not under an active Williamson Act Contract (CDOC, 2017b).

Farmland Protection Policy Act

The goal of the Farmland Protection Policy Act (FPPA) is to minimize the extent that federal actions and programs result in the conversion of agricultural lands to non-agricultural uses. Pursuant to the FPPA, the Farmland Conversion Rating Form (Form AD 1006) is used to determine the value of the farmland under consideration and the level of protection such land should receive. However, the Proposed Project would not convert any farmland.

3.8.3 IMPACTS TO LAND USE AND AGRICULTURE

Alternative A

Alternative A includes placing approximately 40.10 acres of undisturbed land into federal trust status for the benefit of the Tribe, and the subsequent development of 32 Tribal homes on 0.69- to 1-acre lots as a continuation of the Montgomery Project. Approximately 10 acres would be preserved as open space scattered throughout the 40-Acre Property, including a 50-foot setback around the intermittent drainage that runs through the middle of the 40-Acre Property. Development of the 40-Acre Property would be consistent with the County's existing land use designation of RB, zoning of R-L, and compatible with surrounding land uses. However, once the federal government acquires the 40-Acre Property in trust for the Tribe, the parcel would no longer be subject to county land use regulations but rather civil regulatory jurisdiction of the Tribe and the federal government. Alternative A would result in less-than-significant impacts associated with land use conflicts.

AGRICULTURE

There are no agricultural operations on or in the vicinity of the 40-Acre Property. There is no prime farmland, unique farmland, or land of statewide or local importance within the project site (CDOC, 2017a). The project site is not under a Williamson Act contract. Alternative A would have no impact on agriculture and farmland in the vicinity of the 40-Acre Property.

Alternative B

Under Alternative B, impacts to land use and agriculture would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to land use and agriculture would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts to land use and agriculture would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.9 PUBLIC SERVICES

3.9.1 WATER SUPPLY

The project site does not have access to County water utilities; however, the Montgomery Creek Rancheria community public water system maintained by the PRTWD was updated to meet the needs of the adjacent Montgomery Project, and is located at the southeast corner of the Montgomery Project boundary, approximately 0.5 miles from the 40-Acre Property. The PRTWD currently operates two community public water systems, including XL Reservation and Montgomery Creek Rancheria, that provide drinking water to surrounding communities and aid in fire prevention. The Rancheria water system consists of one well with a capacity of 25 gpm and a 30,000-gallon storage tank. In support of the Proposed Project, the PRTWD developed a new well and pump and treatment house. The new well pump tests indicated adequate supply (minimal level drop after testing) with a capacity of 400 gpm. The Indian Health Service is currently in the process of approving the new well. Additionally, to serve the Proposed Project, the existing 30,000-gallon storage tank would be upgraded to approximately 100,000 gallons and new distribution infrastructure would be developed.

3.9.2 WASTEWATER SERVICE

The 40-Acre Property is not served by a central wastewater treatment system. As with the Montgomery Project, each residence would require a separate septic system to treat and dispose of wastewater.

3.9.3 SOLID WASTE

Funded from a grant from the U.S. Department of Agriculture (USDA) and USEPA, the Tribe has developed a solid waste and recycling collection program, Pit River Solid Waste and Recycling (Pit River Tribe, 2018). A solid waste coordinator and technician service the Tribal homes and businesses, and the Tribe owns their own collection vehicles and bins. Refuse can be disposed of at the Round Mountain Station operated by Shasta County Public Works, approximately 4 miles southwest of the Rancheria. The Round Mountain Station has a maximum annual capacity of 4,999 tons while accepting an average of 999 tpy (CalRecycle, 2018).

3.9.4 ELECTRICITY, NATURAL GAS, AND TELECOMMUNICATIONS

PG&E supplies electricity to existing homes and businesses in the vicinity of the project site. The closest natural gas line is approximately 12 miles to the east of the project site. American Telephone and Telegraph (AT&T) provides all current telephone service and also controls the telephone lines and would be responsible for any underground or overhead extensions necessary to serve the Proposed Project. Satellite television is available to the project site from various television services.

3.9.5 LAW ENFORCEMENT

The Shasta County Sheriff's Department (SCSD) provides law enforcement services throughout the County. The service area includes approximately 3,800 square miles of unincorporated area of the County. The main patrol operations station is located in Redding. The Burney station serves the Intermountain Area, including the project site. The SCSD includes administrative, operations, and corrections divisions. The operations division includes patrol units, criminal investigation, and court services. The SCSD also includes a Special Enforcement Team, boating unit, SWAT, and a drug enforcement unit. The SCSD provides primary law enforcement, while California Highway Patrol provides traffic and supplemental law enforcement services to the project site. The County jail is the detention facility for persons arrested in unincorporated areas, including the project site. The expected response time for this portion of the County is estimated at 30 to 40 minutes. The SCSD is staffed by 90 sworn deputies, 35 of whom are assigned to patrol. There are approximately 33 patrol vehicles, plus specialized vehicles such as four-wheel drive and other off-road vehicles used in drug enforcement activities (Barnhart, 2018).

3.9.6 FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

The project site is located in an area of very high wildfire threat (California Department of Forestry and Fire Protection [CAL FIRE], 2007). The Shasta County Fire Department and CAL FIRE provide fire suppression and emergency medical services to the Montgomery Creek region. Montgomery Creek Volunteer Station (Station 71) and a local CAL FIRE station (Station 75) are the closest stations to the project site. Station 71 is located at 29876 Highway 299 East, Montgomery Creek, CA. It is staffed by eight volunteers. The local CAL FIRE station is located at 31385 Highway 299 East, Montgomery Creek, CA. It is only open during the fire season and has an average of three to four firefighters on duty. It maintains the most resources in the fire season from late May to early October (Zanotelli, 2018).

Some staff is trained to the Advanced Life Support Emergency Medical Training Level and Station 71 regularly responds to medical emergency calls. In 2017, the local departments responded to 259 calls for service, including 212 for medical aid and 37 for vegetation, structural, and other fires. Station 71 maintains one Type II engine, one Type III engine, one water tender (up to 3,000 gallons), and one rescue engine. The local CAL FIRE station has one Type III engine. The approximate response time to the project site vicinity is 5–10 minutes (Zanotelli, 2018).

Emergency medical services are overseen and authorized by the Sierra-Sacramento Valley Emergency Medical Services Agency (S-SV EMS Agency). The S-SV EMS Agency is a regional multi-county Joint Powers Agency and is designated as the local emergency medical services (EMS) agency for the County (S-SV EMS Agency, 2018). Ambulance services and EMS are dispatched through 911 and available from the Burney Ambulance Service and the Burney Annex of Mayers Memorial Hospital. The local

CAL FIRE and Station 71 provide backup EMS. The closest hospital emergency room is Shasta Regional Medical Center Emergency Room located at 1100 Butte Street, Redding, CA.

3.9.7 IMPACTS TO PUBLIC SERVICES

Alternative A

WATER SUPPLY

The Proposed Project would not draw on municipal water supplies. As discussed in **Section 3.9.1**, the 40-Acre Property would be serviced by the PRTWD and the public water system. With the development of the new well and installation of additional storage as a component of the Proposed Project, implementation of the Proposed Project would not significantly affect water supply operations in the region.

WASTEWATER SERVICE

The Proposed Project would require each residence to have a separate septic system to treat and dispose of wastewater. Therefore, the Proposed Project would have no adverse effect on municipal wastewater systems and would not significantly affect wastewater conveyance or treatment operations in the region.

SOLID WASTE

As described in **Section 3.9.3**, solid waste is managed by the Pit River Solid Waste and Recycling program and disposed of at the Round Mountain Station. The Proposed Project would not significantly add to the landfill's daily capacity and would not significantly affect solid waste operations in the region.

ELECTRICITY, NATURAL GAS, AND TELECOMMUNICATIONS

Electrical, natural gas, and telephone infrastructure facilities are currently located near the project site and would be extended, at the expense of the Tribe, from the Montgomery Project located directly east of the 40-Acre Property. No adverse utility service impacts would occur.

LAW ENFORCEMENT

Under Public Law 280, 18 USC § 1162, the State of California and other local law enforcement agencies have criminal enforcement authority on Tribal lands. The 40-Acre Property would receive general public safety and law enforcement services from the SCSD. Alternative A has the potential to increase the number of calls for service placed to the SCSD; however, a limited amount of new residential development should not affect the County's ability to maintain the current level of service. No significant effects to law enforcement services would occur.

FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

Construction-related impacts include the potential fire threat associated with equipment and vehicles coming into contact with wildland areas. Construction vehicles and equipment such as welders, torches, and grinders may accidentally spark and ignite vegetation or building materials, however the increased risk of fire during the construction of the proposed facilities would be minimal. Standard construction and operational measures, as presented in **Section 2.2,** have been incorporated into the project description to prevent fire from construction. With these measures, construction of the Proposed Project would not have a significant effect on fire protection services.

Increased residential use has the potential to result in wildfire generation associated with property maintenance and recreation. A firebreak plan would be developed for the residential development and the

plan will be stored at the Pit River Tribal Housing Office. Therefore, with the implementation of mitigation measures, operation of the Proposed Project would not significantly increase wildfire impacts.

Increased emergency calls to 911 as a result of the Proposed Project may result in delays in response times or result in the need for ambulances or fire protection services to be dispatched from more distant locations. The small-scale development of 32 residences under Alternative A would not require new medical facilities or fire protection facilities. Multiple ambulance companies provide EMS to the Montgomery Creek area, with supplemental aid from CAL FIRE and Station 71; therefore, it is not expected that increased demand for emergency medical services would create a significant effect.

No significant adverse impacts due to wildfire during operation would occur on the project site with implementation of the following mitigation measures:

- A firebreak plan shall be developed that includes general firebreak locations within the residential development and provides appropriate vegetation clearing parameters.
- Firebreaks shall be inspected on a biannual basis, and maintenance shall be conducted where feasible.

Alternative B

Under Alternative B, impacts to public services would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to public services would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts to public services would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.10 NOISE

3.10.1 AMBIENT NOISE SETTING

The Federal Highway Administration (FHWA) provides construction noise level thresholds in its 2006 Construction Noise Handbook. Based on the residential sensitive receptors in the project site vicinity, a construction noise threshold of 78 A-weighted decibels (dBA) would apply. Additionally, the FHWA establishes Noise Abatement Criteria (NAC) for various land uses that have been categorized based upon activity and sensitivity to noise. Land uses are categorized on the basis of their sensitivity to noise. The FHWA NAC is based on peak traffic hour noise levels. Sensitive receptors in the vicinity of the project site include residential and commercial land uses; thus, Category B, 67 dBA Leq noise standards would apply to operations.

3.10.2 SENSITIVE RECEPTORS

Refer to **Section 3.3.6** for a discussion of the closest off-site sensitive receptors.

3.10.3 EXISTING NOISE SOURCES

The noise environment surrounding the project site is influenced primarily by vehicle noise on SR-299. The majority of traffic along SR-299 is generated by recreational trips between Redding and the McArthur-Burney Falls Memorial State Park (Burney State Park). Between April and October, Burney State Park experiences high visitation and on holidays and all summer weekends during this time, the park would fill to capacity (California Department of Parks and Recreation, 2018). Other noise sources include those generated from the occasional construction and maintenance of SR-299, as well as residential trips to rural communities within the Rancheria, Round Mountain, and Burney. The estimated ambient noise level in the vicinity of the project site is approximately 40 dBA Leq, which is the typical

average noise level for areas with rural and outer suburban areas with little traffic (The Engineering Toolbox, 2018).

3.10.4 NOISE IMPACTS

Alternative A

CONSTRUCTION NOISE

Site preparation and grading associated with the Proposed Project would temporarily generate noise levels above background levels. The closest sensitive receptors that would be exposed to noise during project construction are the residences located surrounding the project site, as described in **Section 3.3.6**. Construction noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment.

Construction noise impacts would be temporary and intermittent. At 50 feet from the source, the loudest piece of equipment would exceed the off-site allowable daytime noise level of 80 dBA. Sources of noise attenuate (lessen) at a rate of 6 dBA per doubling of distance from the source, depending upon environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.) (Caltrans, 2009). At approximately 300 feet, the location of the closest residence, the loudest equipment noise would attenuate to 51 dBA. The majority, if not all, noise sources would be greater than 300 feet from the sensitive receptor located adjacent to the northern boundary of the project site. Impacts to noise sensitive receptors could be significantly reduced by limiting the hours of construction activities, locating noise emitting stationary equipment on the western portion of the project site closest to SR-299, and requiring construction equipment over 50 hp to be equipped with noise reducing mufflers. Therefore, with the implementation of mitigation measures, construction noise would not significantly affect the closest sensitive receptors.

No significant adverse impacts due to noise during construction would occur on the project site with implementation of the following mitigation measures:

- Construction activities shall only occur between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday and 9:00 a.m. and 5:00 p.m. on Saturday. No construction activities shall occur on any Sunday.
- Where feasible, stationary construction equipment shall be located on the western portion of the project site.
- All construction equipment over 50 hp shall be equipped with noise-reducing mufflers.

OPERATIONAL NOISE

The primary source of noise in the area generated by the Proposed Project would occur from residential vehicle traffic. Noise generated from this traffic would not impact surrounding residences. There would be no significant increase in traffic on SR-299, Windy Point Road, or Bakus Road. Therefore, implementation of the Proposed Project would not significantly affect the ambient noise environment.

Alternative B

Under Alternative B, noise impacts would be similar to those under Alternative A; however, with the development of less Tribal homes, noise impacts would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse noise impacts would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.11 HAZARDOUS MATERIALS

3.11.1 ENVIRONMENTAL SETTING

The principal agencies regulating the generation, transportation, and disposal of hazardous materials are the USEPA and the U.S. Department of Transportation (USDOT). A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. A site may be listed on a hazardous materials database while still being compliant with federal, state, and local laws. A hazardous material is defined in Title 22 of the California Code of Regulations (CCR) as:

> *A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed* (CCR, Title 22, Section 66260.10).

The (SWRCB GeoTracker database, the California Department of Toxic Substances Control (DTSC) EnviroStor database, and the USEPA Enforcement and Compliance History Online (ECHO) provided search and documentation of local hazardous materials. These regulatory agency databases were searched for records of known storage tank sites and known sites of hazardous materials generation, storage, and/or contamination, as well as for locations of past and current hazardous materials involvement and storage, use, and disposal violations. These regulatory agency databases are only as accurate as the data and date the data entered into the regulatory agency-maintained database was last updated. If not reported to the appropriate regulatory agency, installation of underground storage tanks or hazardous materials releases would not be listed on the regulatory agency databases searched.

The 40-Acre Property is not listed on the GeoTracker, EnviroStor, or ECHO databases. During the field survey, there was no visible evidence of hazardous materials releases observed within the 40-Acre Property. No Recognized Environmental Conditions, which refers to the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products within a property into structures or into the ground, groundwater, or surface water, were identified on or

in the immediate vicinity of the 40-Acre Property that would be likely to pose a significant impact to the environmental integrity of the 40-Acre Property.

3.11.2 IMPACTS DUE TO HAZARDOUS MATERIALS

Alternative A

Incidents associated with hazardous materials that would be most likely to occur during construction include the incidental release of fuels, oil, and grease during the operation of construction equipment, as well as accidental releases associated with handling and transferring hazardous material-containing substances. Typical construction management practices limit the incidence of such accidental releases. In addition, the CWA requires that stormwater management BMPs be implemented during construction in accordance with a SWPPP. The SWPPP would further ensure that incidental releases of hazardous materials would not migrate offsite during a storm event.

Although no hazardous materials issues are known to be associated with the 40-Acre Property currently, the possibility exists that undiscovered contaminated soil and/or groundwater is present on the project site due to the migration of hazardous materials from off-site properties or unknown hazardous materials dumping. This could pose a risk to human health and/or the environment.

No significant adverse impacts due to hazardous materials during construction would occur on the project site with implementation of the following mitigation measures:

- Potentially hazardous materials, including fuels, shall be stored away from drainages and secondary containment shall be provided for all hazardous materials during construction.
- A spill prevention and countermeasure plan shall be developed which shall identify proper storage, collection, and disposal measures for potential pollutants (such as fuel storage tanks) used onsite, as well as the proper procedures for cleaning up and reporting of any spills.
- Vehicles and equipment used during construction shall be provided proper and timely maintenance to reduce potential for mechanical breakdowns leading to a spill of materials into water bodies. Maintenance and fueling shall be conducted in an area that meets the criteria set forth in the spill prevention plan.
- A hazardous materials storage and disposal plan shall be prepared that contains an inventory of hazardous materials stored and used onsite, maintains an emergency response plan for a release and disposal of unused hazardous materials, and provides provisions specifying employee training in safety and emergency response procedures.

During operation of Alternative A, small quantities of cleaning materials, solvents, pesticides, herbicides, fuels, and paints would be stored and used throughout the proposed facilities. These materials are common to most residential operations and do not pose any unusual or substantial threat to public health and safety, even if stored or used improperly, because of the relatively small quantities involved. Therefore, with proper handling and storage, operation of Alternative A would not result in significant adverse effects associated with hazardous materials.

Alternative B

Under Alternative B, impacts due to hazardous materials would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts due to hazardous materials would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts due to hazardous materials would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.12 VISUAL RESOURCES

The visual characteristics of the project site are typical of rural County areas, which feature forest, agriculture, foothills, and mountains. The surrounding scenery is dominated by pine forest and chaparral habitats and separated by rivers, intermittent streams, and other riparian habitats. There are no existing structures on the project site; only graded dirt and gravel access roads that weave through the otherwise undisturbed landscape.

The project site is not completely visible from SR-299, as the corridor along SR-299 and the project site is heavily forested and the topography of the project site limits the viewshed from SR-299. The density of the vegetation throughout the 40-Acre Property is visible in **Figure 2-1** of **Appendix A**. The project site can also be viewed from Windy Point Road to the north of the project site; however, similar to the viewshed from SR-299, the topography and forested nature of the area limits views both onto and out of the project site, thereby limiting complete view of either the project site, or in turn, from the project site towards neighboring land uses.

3.12.1 IMPACTS TO VISUAL RESOURCES

Alternative A

Development of the project site would be consistent with the existing facilities on the Rancheria and would complement existing rural residential development in the project site. In addition, the Proposed Project would leave natural areas surrounding the intermittent drainage that runs through the middle of the project site undisturbed in order to blend with the nearby rural uses. The Proposed Project would not result in any significant effects to scenic resources.

The Proposed Project would not generate any new significant light sources. The project site is not visible from SR-299, as vegetation currently shields views. Some vegetation would be removed during project development for housing and roadway construction, as well as fire prevention; however, topography of the project site would limit light pollution from residential sources. Implementation of the Proposed Project would not significantly affect visual resources.

Alternative B

Under Alternative B, impacts to visual resources would be similar to those under Alternative A; however, with the development of less Tribal homes, the impacts to visual resources would be reduced accordingly.

MITIGATION

Under Alternative B, mitigation measures and BMPs would be similar to those provided under Alternative A. No significant adverse impacts to visual resources would occur due to implementation of the Reduced-Density Alternative.

Alternative C

Under the No Action Alternative, the project site would remain undeveloped and would continue to remain in the current state.

MITIGATION

No mitigation measures and BMPs would be required for Alternative C.

3.13 GROWTH-INDUCING AND CUMULATIVE IMPACTS

3.13.1 GROWTH-INDUCING IMPACTS

Under NEPA, growth-inducing impacts of a Proposed Project must be analyzed (40 CFR § 1508.8[b]). Growth-inducing impacts are defined as effects that foster economic or population growth, either directly or indirectly. Direct growth-inducing impacts could result, for example, if a project included the construction of a new residential development. Indirect growth-inducing impacts could result, for example, if a project established substantial new permanent employment opportunities (e.g., new commercial, industrial, or governmental enterprises) or if it removed obstacles to population growth (e.g., expansion of a wastewater treatment plant to increase the service availability).

The Proposed Project would develop residential plots to provide Tribal housing as a continuation of the Montgomery Project. Implementation of the Proposed Project would provide new services to the region; however, the Proposed Project would not result in additional growth to the region, outside the forecasted growth in the Shasta County General Plan.

Analyses of the adequacy of local infrastructure and services are included in the discussion of environmental consequences for the Proposed Project. No significant impacts that are unable to be mitigated have been identified as a result from the Proposed Project. No indirect growth-inducing are expected, as no substantial new permanent employment opportunities would be created. Direct growth-inducing effects would be less than significant for the Proposed Project with mitigation measures and BMPs.

3.12.2 CUMULATIVE IMPACTS

When considered in conjunction with the Proposed Project, no specific development projects are known to have been approved in the vicinity that would cause cumulative impacts. The following analysis is based on the cumulative impacts associated with future development projects that may be approved in the vicinity of the project site.

Land Resources

The Proposed Project and other off-site cumulative projects that may be approved in the vicinity of the project site would be required to implement measures consistent with local permitting requirements for construction to address any regional topographic, geologic, seismic, soil, or mineral hazards. It is anticipated that other off-site cumulative projects would follow appropriate permitting procedures. The Proposed Project would comply with federal and Tribal requirements for the protection of land resources

and therefore implementation of the Proposed Project would not result in cumulatively considerable impacts to land resources.

Water Resources

The Proposed Project and other off-site cumulative projects that may be approved in the vicinity of the project site would be required to comply with the CWA, and with California requirements for off-Reservation projects as it relates to stormwater and point-source discharges. Compliance with the USEPA's stormwater pollution prevention requirements and State water quality standards would prevent the Proposed Project and other off-site cumulative projects from causing cumulatively-significant impacts to stormwater. It is anticipated that the Proposed Project and other off-site cumulatively projects would comply with CWA, California, and USEPA requirements, as well as applicable local laws.

It is anticipated that groundwater yields in the vicinity of the project site would meet the needs of the Proposed Project and other off-site cumulative projects. The Proposed Project would use a relatively small increment of the available groundwater; therefore, no cumulative impact associated with groundwater availability would occur.

The Proposed Project would comply with federal and Tribal requirements for the protection of water resources and therefore implementation of the Proposed Project would not result in cumulatively considerable impacts to water resources.

Air Quality

CRITERIA AIR POLLUTANTS

Cumulative impacts to the air basin are addressed within the guidelines of the CAA and the General Conformity Rule. The Conformity Review requires the lead agency to compare estimated emissions attributable to the federal action to the applicable general conformity *de minimis* threshold(s) for all CAPs for which the applicable air basin or region is in nonattainment for the applicable NAAQS. The project site is located in the northern portion of the SVAB and the northern SVAB is in attainment or is unclassified for all CAPs under the current NAAQS designation.

The emissions that would result from the Proposed Project would be minimal, as few pieces of construction equipment would be utilized over the duration of one year or less. When emission estimate(s) are below applicable *de minimis* threshold(s), then a General Conformity Determination is not required under the CAA (40 CFR Part 93). The Proposed Project would not reach the *de minimis* levels required for federal conformity and would not result in changing the basin's air quality designation. Given that the area is in attainment for CAPs and emissions would not significantly affect air quality, there is no potential for significant cumulative affects to air quality. The recommended BMPs related to dust, CAPs, and DPM emissions included in **Section 3.3.7** would further reduce cumulative impacts to regional air quality.

CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS

Consistent with interim CEQ guidance, this EA includes a quantification of GHG emissions resulting from the project alternatives and discussion of reduction measures. Using the CARB 2014 emissions factors (EMFAC 2014) to calculate the average yearly CO_2e emissions from residential vehicle trips, it was determined that approximately 756 tons CO_2e would be generated in the region. Based on experience with assessing similar projects, direct CO_2e emissions would not result in changing the basin's air quality

designation or exacerbate climate change, and levels would be commensurate with the level of impact from CAP emissions. Therefore, implementation of the Proposed Project would not cause a significant affect to global climate change. BMPs are provided in **Section 3.3.7** that would further reduce GHG emissions of the Proposed Project.

Impacts from climate change such as severe drought, sea level rise, and shifting weather patterns would not significantly impact the trust acquisition and Proposed Project. As the project site is located in a very high wildfire threat area (**Section 3.10.6**), impacts as a result of severe drought and shifting weather patterns may be considered significant. Measures would be taken to create fire buffer zones around proposed residential building (**Section 3.3.7**). With elevations ranging from approximately 2,000 to 2,200 feet amsl, sea level rise does not pose an apparent threat to the Proposed Project. Accordingly, impacts from climate change would not significantly impact the Proposed Project.

Biological Resources

The Proposed Project and other off-site cumulative projects that may be approved in the vicinity of the project site would be required to comply with CWA and the federal ESA, as well as applicable provisions of federal, State, and local laws. The Proposed Project would comply with federal and Tribal requirements for the protection of biological resources and therefore implementation of the Proposed Project would not result in cumulatively-considerable impacts to biological resources.

Cultural Resources

Cumulative effects on cultural resources typically occur when sites that contain cultural resources are disturbed by development. As these cultural resources are destroyed or displaced, important information is lost and connections to past events, people, and culture is diminished. As discussed in **Section 3.5**, no cultural sites were identified within or adjacent to the project site. **Appendix D** indicates that the project site has been readily reviewed for cultural resources, reducing the potential for disturbance of cultural resources. However, the Proposed Project may impact previously unknown cultural resources, as these sites may be buried with no surface manifestation. Significant cumulative impacts to unknown cultural resources could occur if sites continued to be lost, damaged, or destroyed without appropriate recordation or data recovery. The Proposed Project and other off-site cumulative projects that may be approved in the vicinity of the project site would be required to comply with the NRHP, NEPA, and the California Environmental Quality Act, as well as applicable provisions of federal, State, and local laws. The Proposed Project would comply with federal and Tribal requirements for the protection of cultural resources and therefore implementation of the Proposed Project would not result in cumulatively considerable impacts to cultural resources.

Socioeconomic Conditions/Environmental Justice

The Proposed Project, when considered in combination with other off-site cumulative projects that may be approved in the vicinity of the project site, would not lead to a significant cumulative impact on socioeconomic conditions/environmental justice. Cumulative impacts to designated minority or low-income groups would be less than significant.

Transportation and Circulation

The Proposed Project, when considered in combination with other off-site cumulative projects that may be approved in the vicinity of the project site, would not lead to a significant cumulative impact on transportation and circulation. The Proposed Project would not adversely affect the existing roadway,

bicycle, and pedestrian systems, or existing transit services. Implementation of the Proposed Project would not result in cumulatively nconsiderable impacts to transportation and circulation.

Land Use and Agriculture

If taken into federal trust, the project site would not be subject to County land use jurisdiction. The project site is currently located adjacent to the western boundary of the Montgomery Project, and development of Tribal housing would not disrupt neighboring land uses or prohibit ingress or egress to neighboring parcels; therefore, the Proposed Project would not result in changes to local land use patterns. Implementation of the Proposed Project would not result in cumulatively considerable impacts to land use.

There is no prime farmland, unique farmland, or land of statewide or local importance within the project site and therefore the Proposed Project would not result in the conversion of farmland. There are no agricultural resources in the vicinity of the project site and no agricultural operations currently occurring on the project site. Implementation of the Proposed Project would not result in cumulatively considerable impacts to agriculture.

Public Services

The Proposed Project would not increase demands on solid waste facilities, electricity, natural gas, and telecommunication utilities, law enforcement, fire protection, or EMS providers. The project site would rely on the Tribe's local water systems and installation of septic tanks and therefore would not impact water supply and wastewater services. Implementation of the Proposed Project would not result in a significant cumulative effect to public services.

Noise

The Proposed Project would temporarily increase noise levels due to increased traffic and operational activities. However, the Proposed Project would not generate a level of traffic that would exceed acceptable outdoor noise levels. Some evening traffic may occur, but the noise generated due to such evening traffic would be insignificant. Therefore, increased noise would not result in an adverse effect to surrounding residences because the majority of traffic would occur during normal business hours. No other off-site cumulative projects are expected to be approved in the vicinity of the project site that would contribute substantially to the long-term cumulative noise environment.

Hazardous Materials

The Proposed Project and other off-site cumulative projects that may be approved in the vicinity of the project site would be required to comply with applicable provisions of federal, State, and local laws. The Proposed Project would comply with federal and Tribal requirements regarding hazardous materials and therefore implementation of the Proposed Project would not result in cumulatively-considerable impacts due to hazardous materials.

Visual Resources

Development of the project site would be consistent with the Montgomery Project located directly east of the 40-Acre Property. Any future development in the vicinity of the project site would be subject to planned land use designations and would follow applicable design, landscaping, sign, and lighting ordinances. Implementation of the Proposed Project would not result in cumulatively considerable impacts to visual resources.

SECTION 4.0. CONSULTATION, COORDINATION, AND LIST OF PREPARERS

4.1 FEDERAL AGENCIES

BIA (Lead Federal Agency)

Felix Kitto
Dan Hall
Chad Broussard
Jay Hinshaw

USDA-NRCS

4.2 PREPARERS OF EA

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	Sam Schoevaars
	Bryn Kirk
	Glenn Mayfield
	Dana Hirschberg

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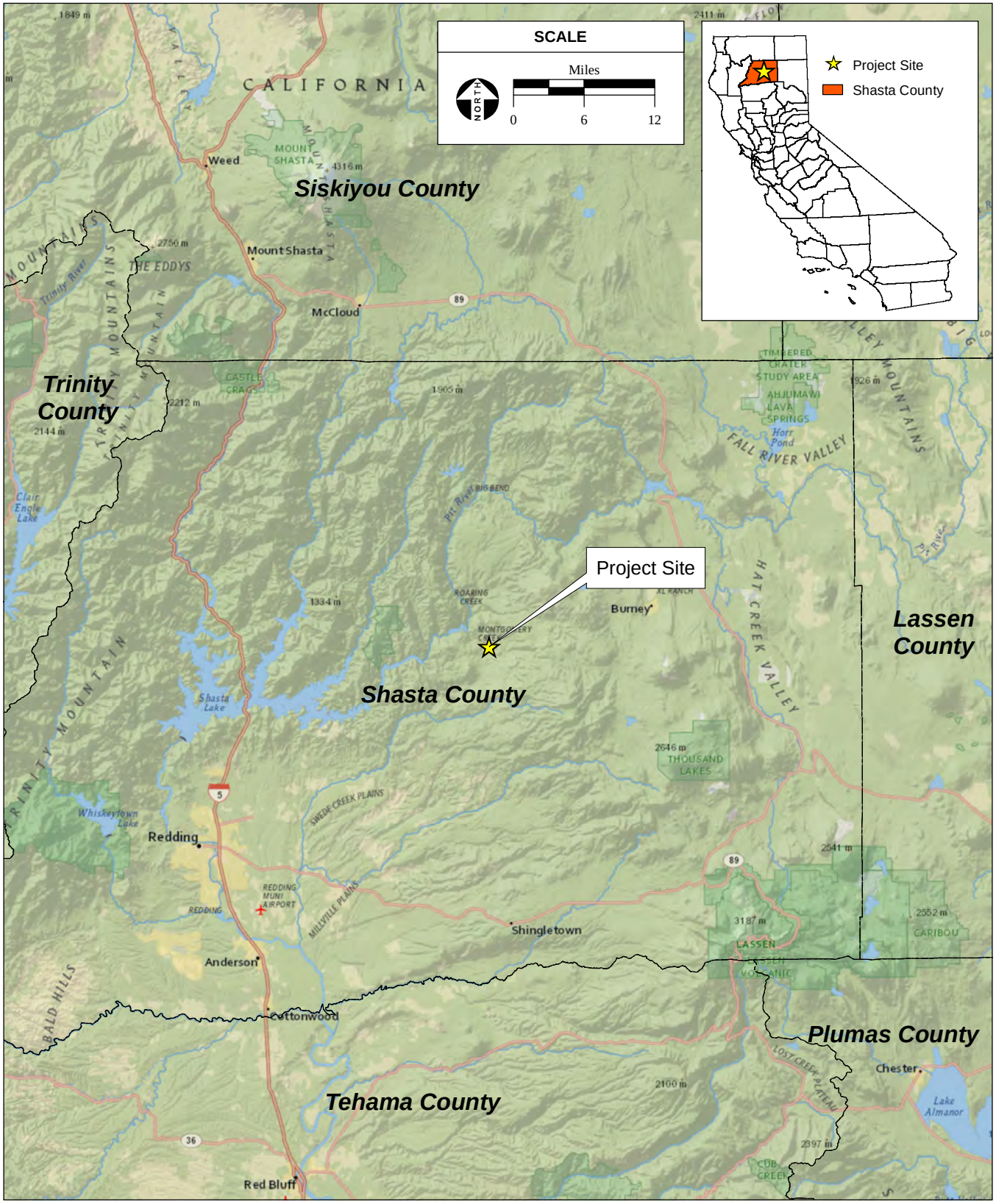
APPENDICES

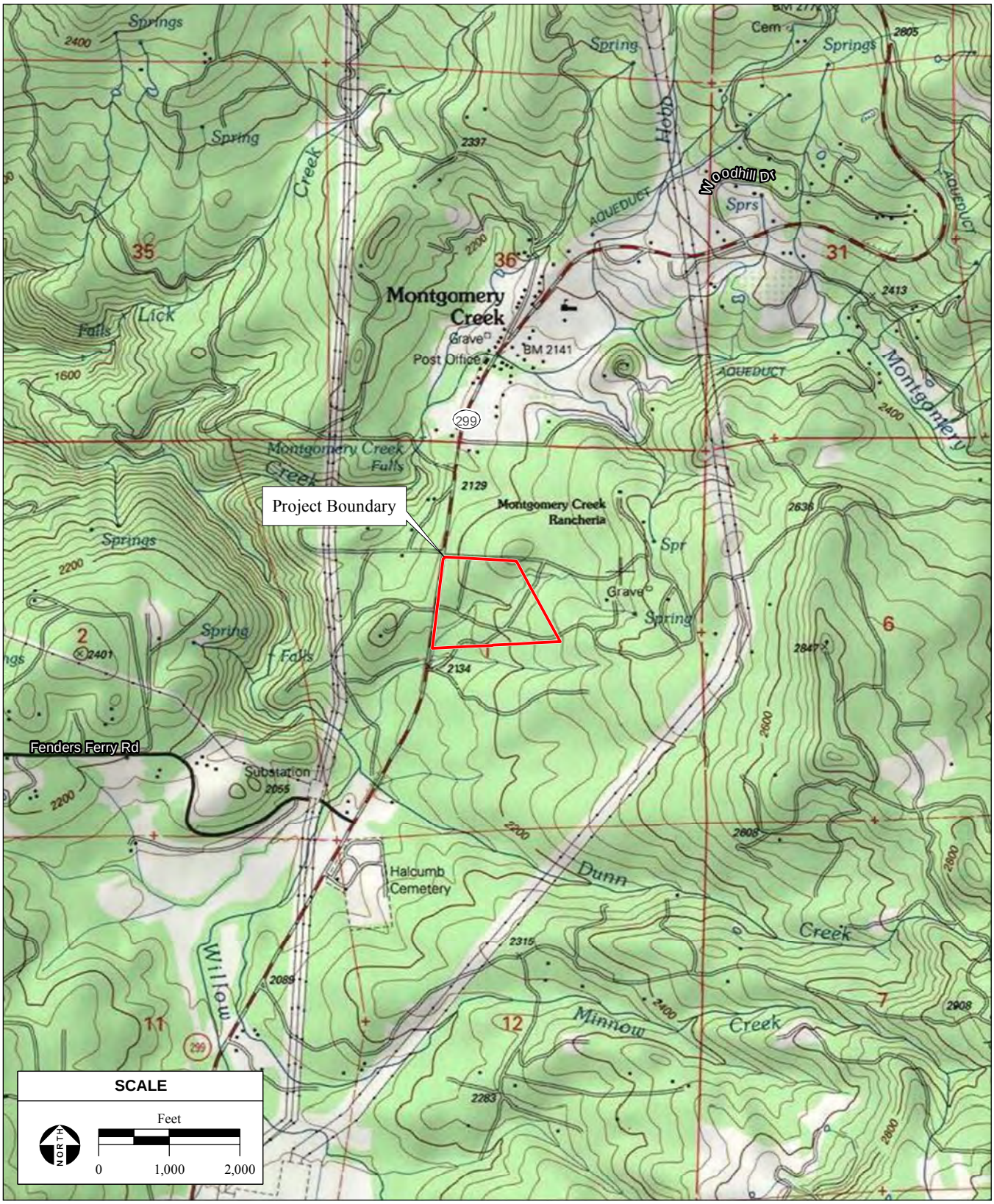
APPENDIX A

FIGURES



SOURCE: NatGeo 2017; AES, 4/10/2018

Figure 1-1
Regional Location

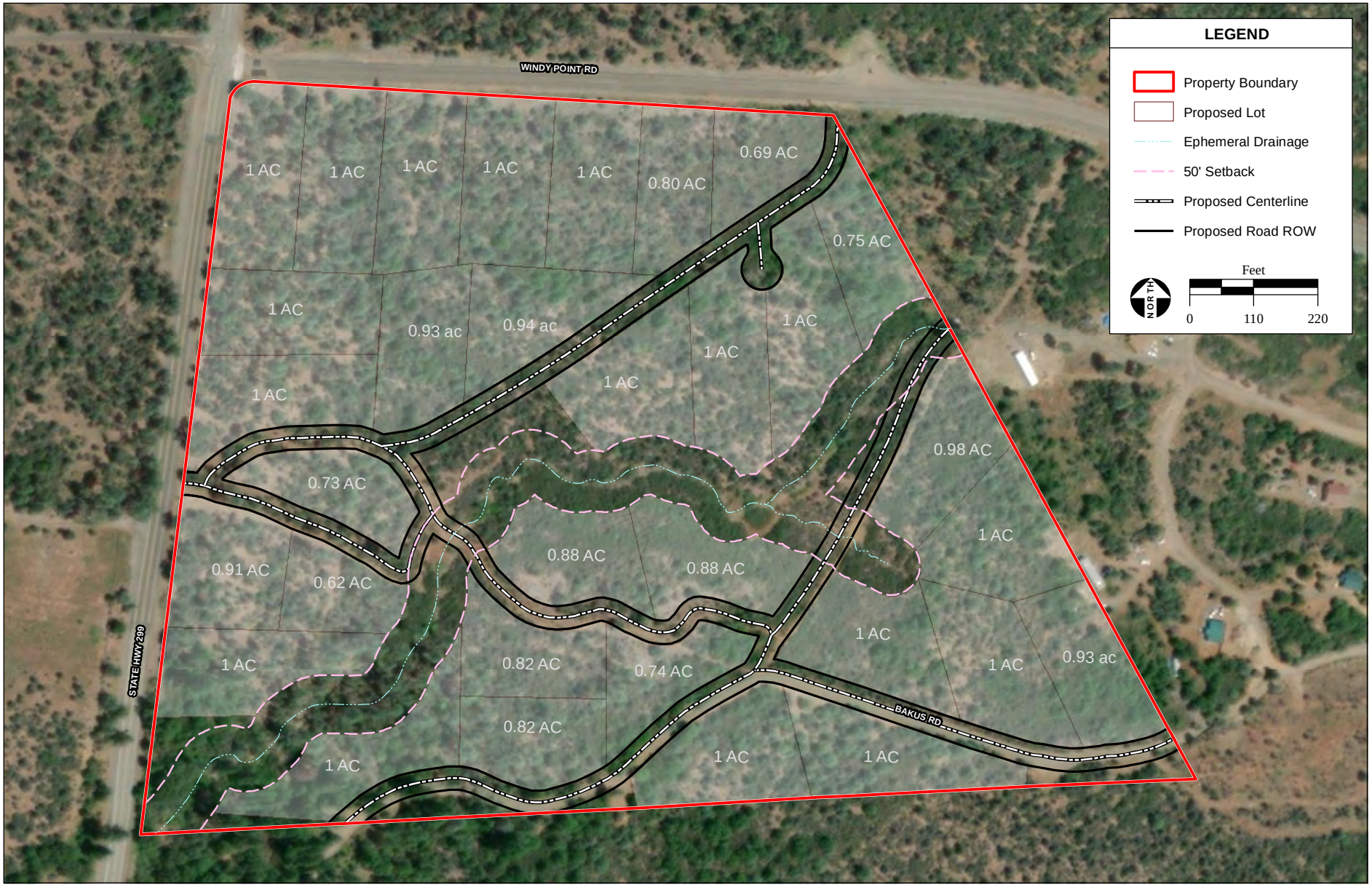


SOURCE: "Montgomery Creek, CA" USGS 7.5 Minute Topographic Quadrangle, T34N, R1W, Section 1, Mt. Diablo Baseline & Meridian; ESRI Data, 2015; Shasta County GIS, 9/2017; AES, 4/12/2018

Figure 1-2
Site and Vicinity

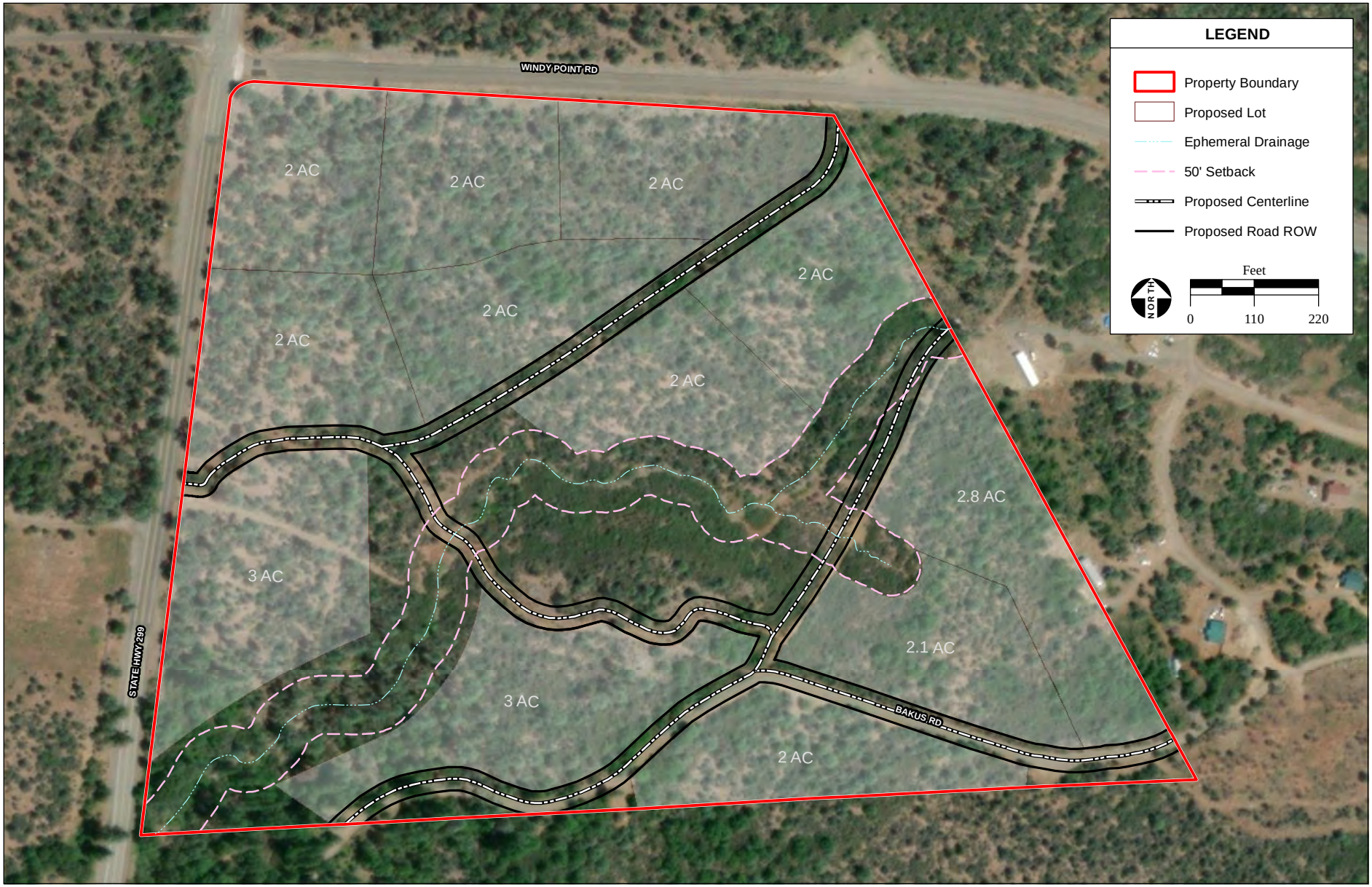
SOURCE: Shasta County GIS, 9/2017; DigitalGlobe Aerial Photograph, 3/26/2016 ; AES, 3/17/2020

Figure 1-3
Aerial Photograph



SOURCE: Shasta County GIS, 9/2017; Vivid Maxar Aerial Photograph, 6/27/2020; AES, 7/30/2021

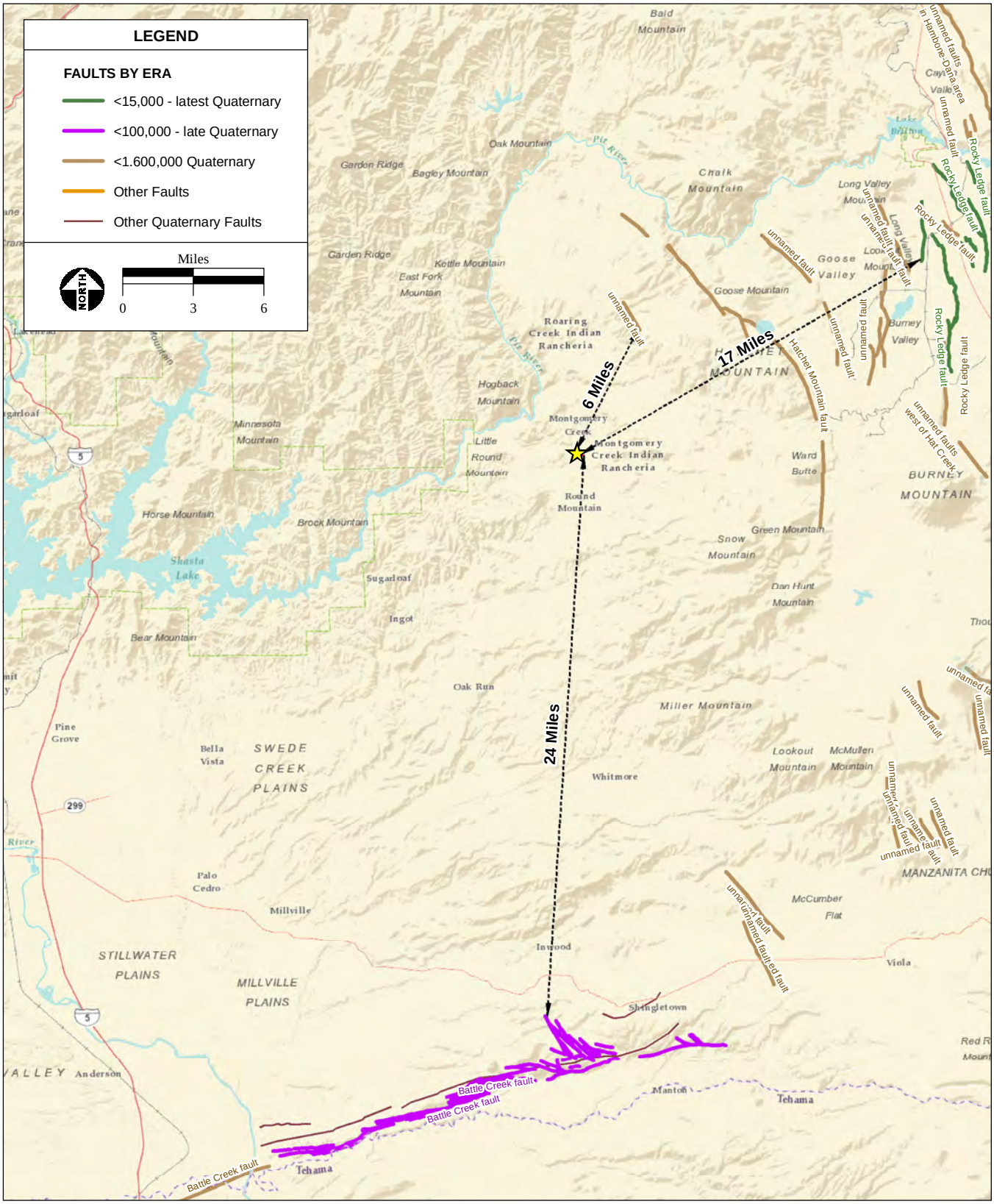
Figure 2-1
Proposed Site Plan



SOURCE: Shasta County GIS, 9/2017; Vivid Maxar Aerial Photograph, 6/27/2020; AES, 7/30/2021

Figure 2-2

Proposed Site Plan - Alternative B

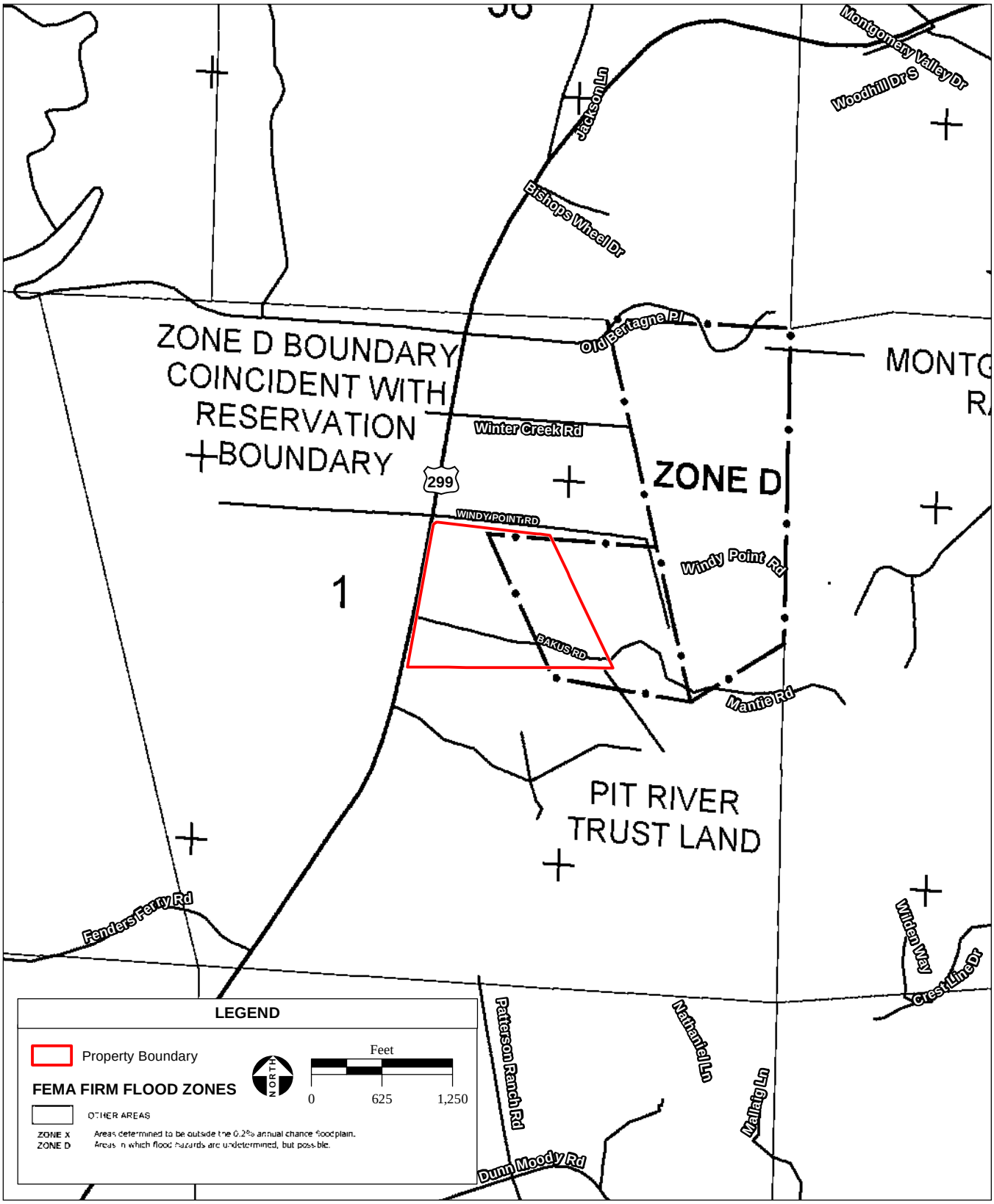


SOURCE: USGS Earthquake Hazards Program, 2017;AES, 5/17/2018

Figure 3-1
Regional Fault Map

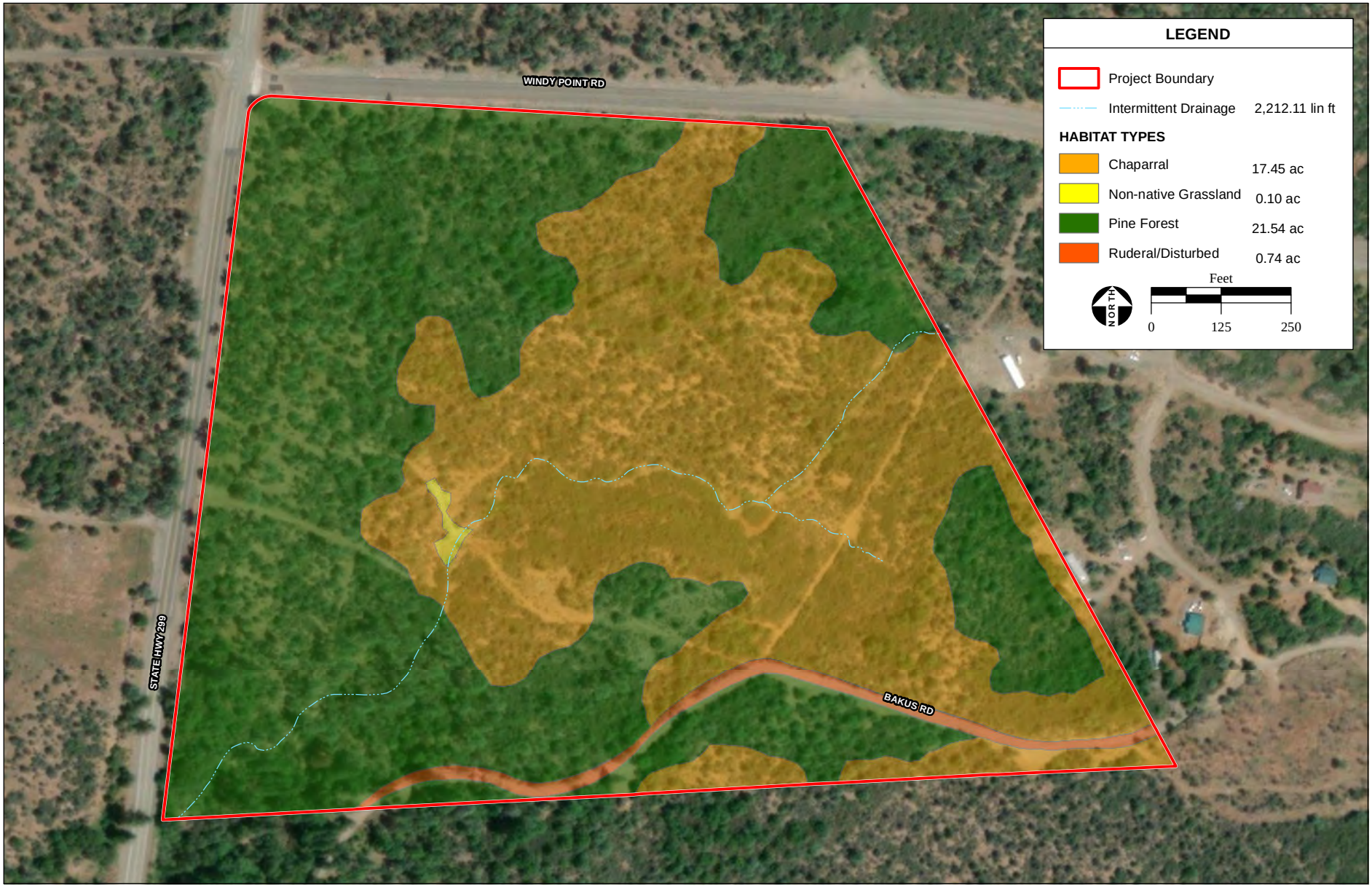
SOURCE: USDA NRCS SSURGO Soil Survey Data for Shasta County Area, 7/9/2014; Vivid Maxar Aerial Photograph, 6/27/2020; AES, 7/30/2021

Figure 3-2
Soil Types



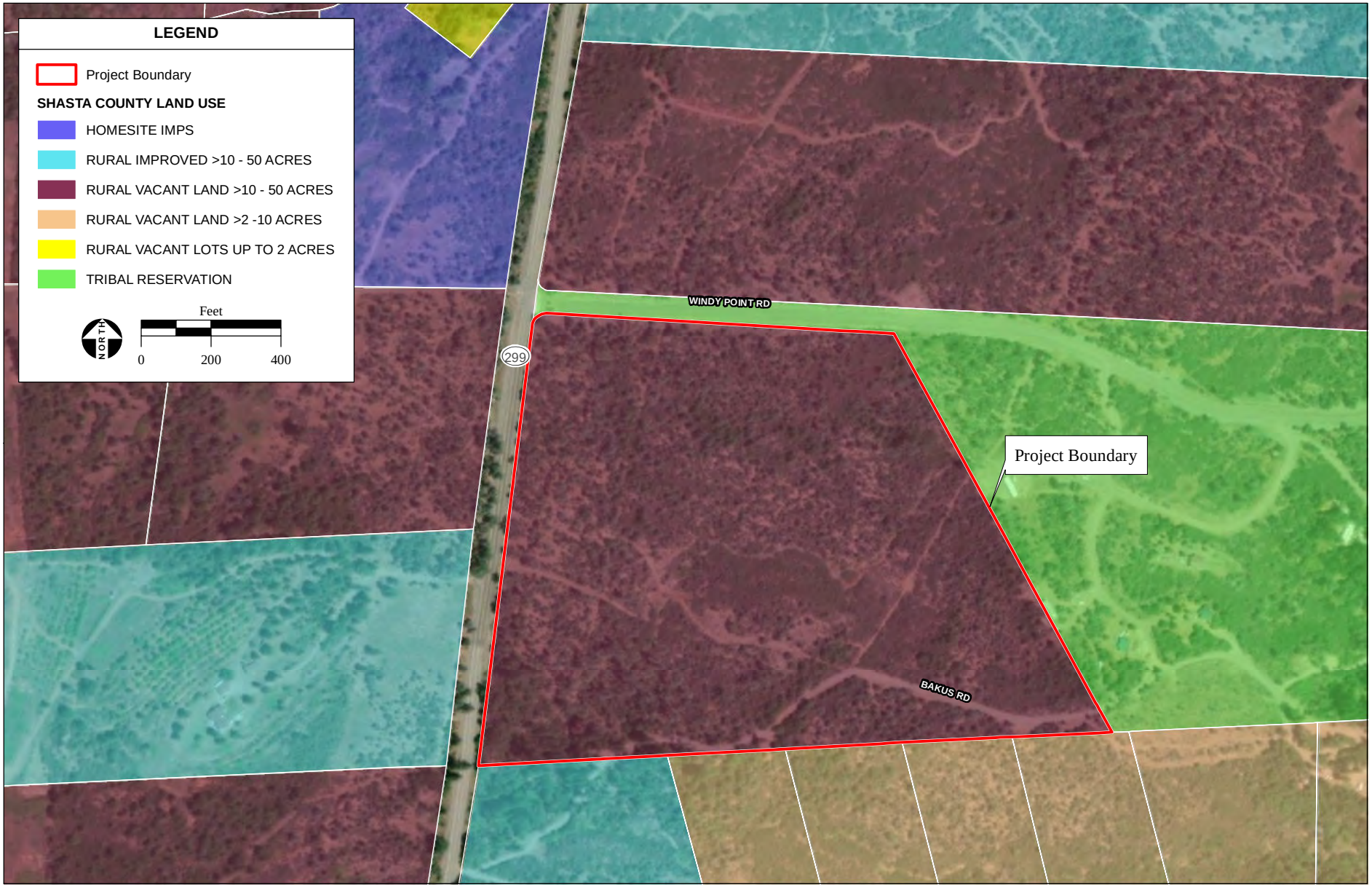
SOURCE: FEMA FIRM, effective 3/17/2011; DigitalGlobe Aerial Photograph, 3/26/2016 ; AES, 7/30/2021

Figure 3-3
FEMA Flood Zone



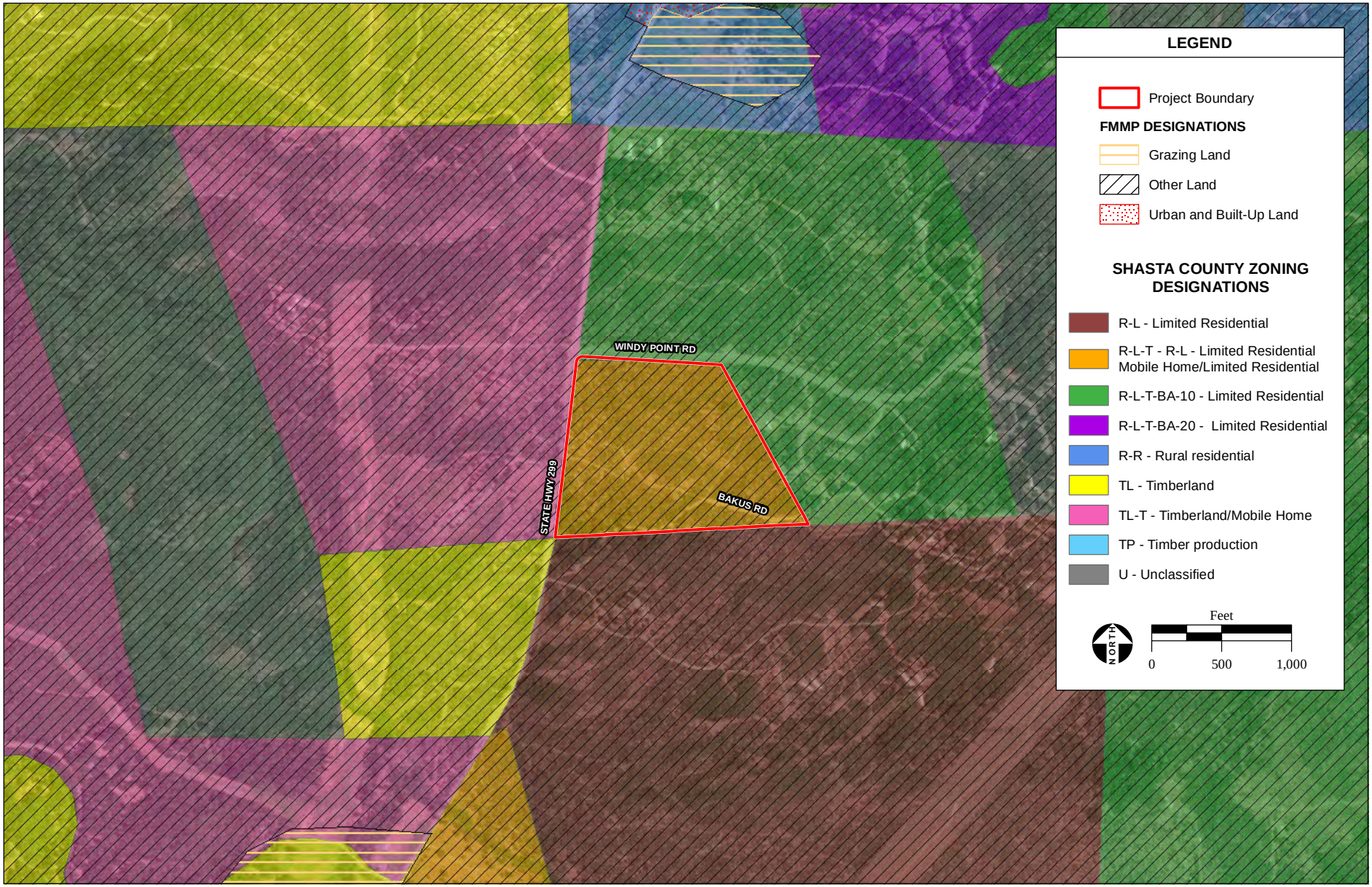
SOURCE: Shasta County GIS, 9/2017; Vivid Maxar Aerial Photograph, 6/27/2020; AES, 7/30/2021

Figure 3-4
Habitat Types



SOURCE: Shasta County Assesor, 9/2017; Vivid Maxar Aerial Photograph, 6/27/2020; AES, 7/30/2021

Figure 3-5
Existing Land Use



SOURCE: Shasta County GIS, 9/2017; CA Dept of Interior Farmland Mapping & Monitoring Plan, 2016;
Vivid Maxar Aerial Photograph, 6/27/2020; AES, 7/30/2021

Figure 3-6
Zoning & Agricultural Resources

APPENDIX B

SOIL RESOURCES REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Shasta County Area, California

Pit River 40-acre EA

May 3, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	39.7	100.0%
Totals for Area of Interest		**39.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Shasta County Area, California

KID—Kilarc very stony sandy clay loam, 10 to 30 percent slopes

Map Unit Setting

National map unit symbol: hfpy
Elevation: 1,000 to 3,600 feet
Mean annual precipitation: 30 to 65 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 120 to 225 days
Farmland classification: Not prime farmland

Map Unit Composition

Kilarc and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kilarc

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 9 inches: very stony sandy clay loam
H2 - 9 to 22 inches: clay
H3 - 22 to 44 inches: clay loam
H4 - 44 to 48 inches: weathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Percent of area covered with surface fragments: 5.0 percent
Depth to restrictive feature: About 9 inches to abrupt textural change; 44 to 48 inches to paralithic bedrock
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: FINE LOAMY (R022XC058CA)
Hydric soil rating: No

Minor Components

Parrish

Percent of map unit: 5 percent
Hydric soil rating: No

Sites

Percent of map unit: 5 percent
Hydric soil rating: No

Supan

Percent of map unit: 3 percent
Hydric soil rating: No

Inks

Percent of map unit: 2 percent
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

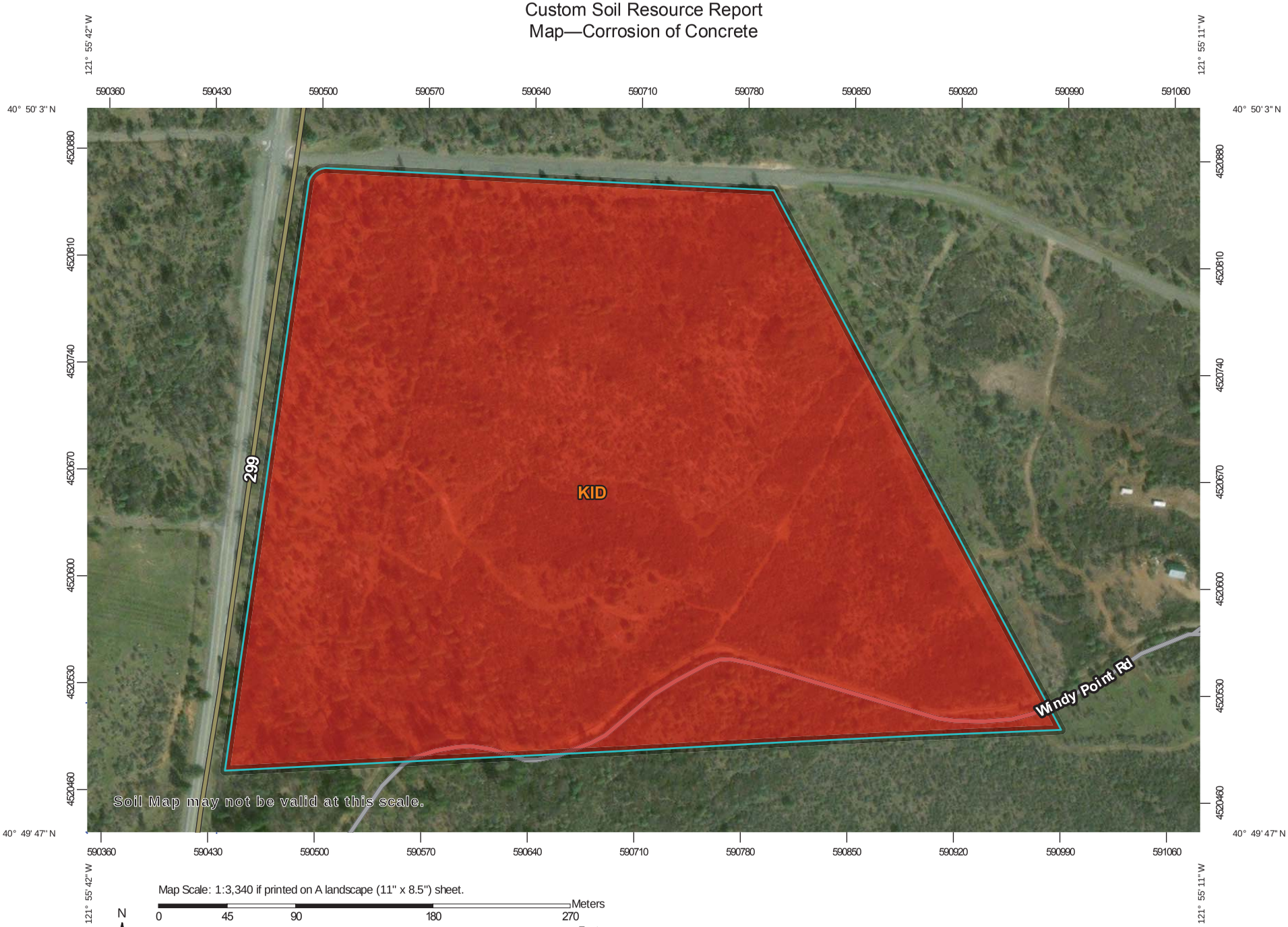
Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Corrosion of Concrete

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report
Map—Corrosion of Concrete



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Moderate

Low

Not rated or not available

Soil Rating Lines

High

Moderate

Low

Not rated or not available

Soil Rating Points

High

Moderate

Low

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Table—Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	High	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Corrosion of Concrete

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

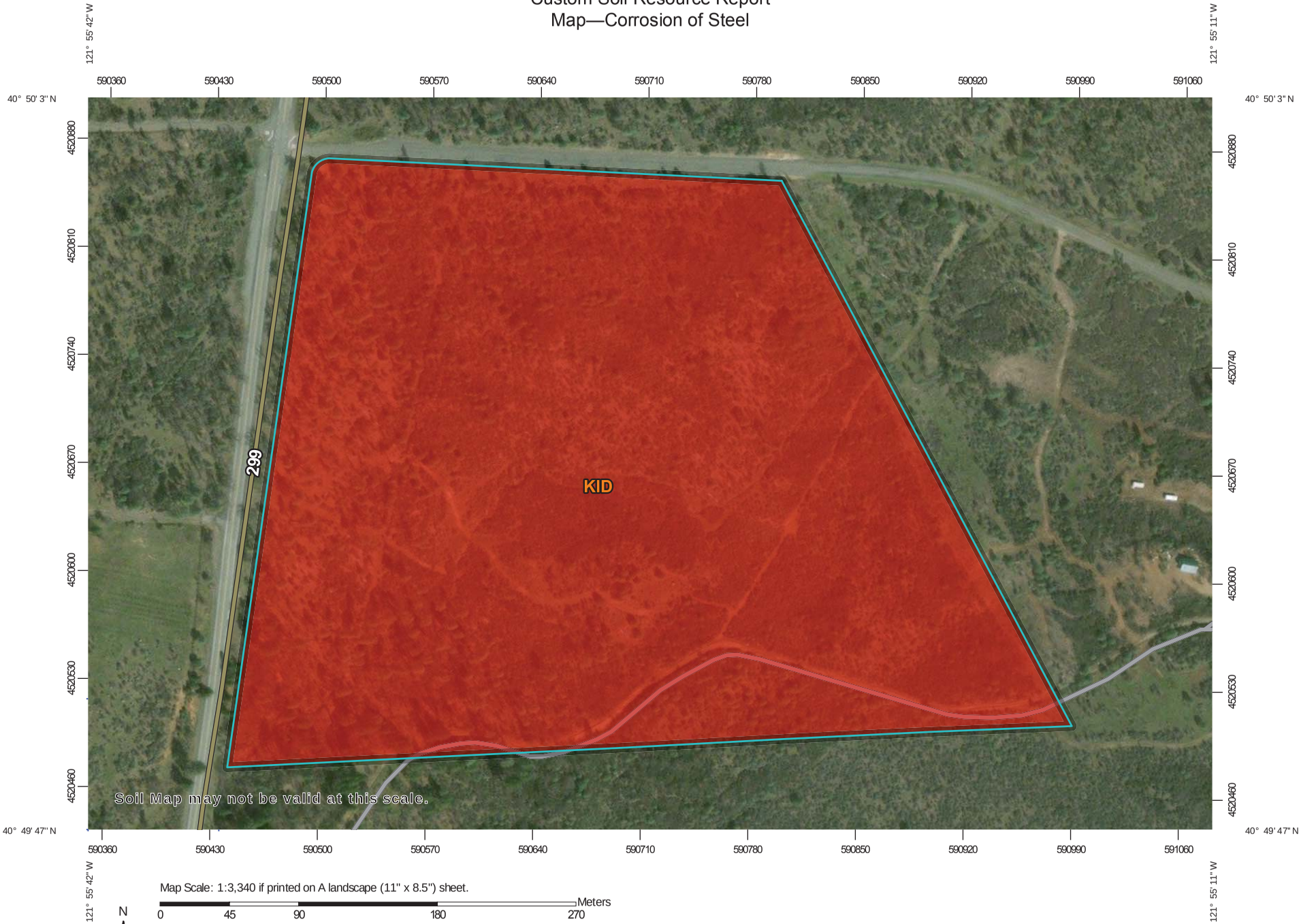
The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Corrosion of Steel

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report
Map—Corrosion of Steel



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Table—Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	High	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Corrosion of Steel

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

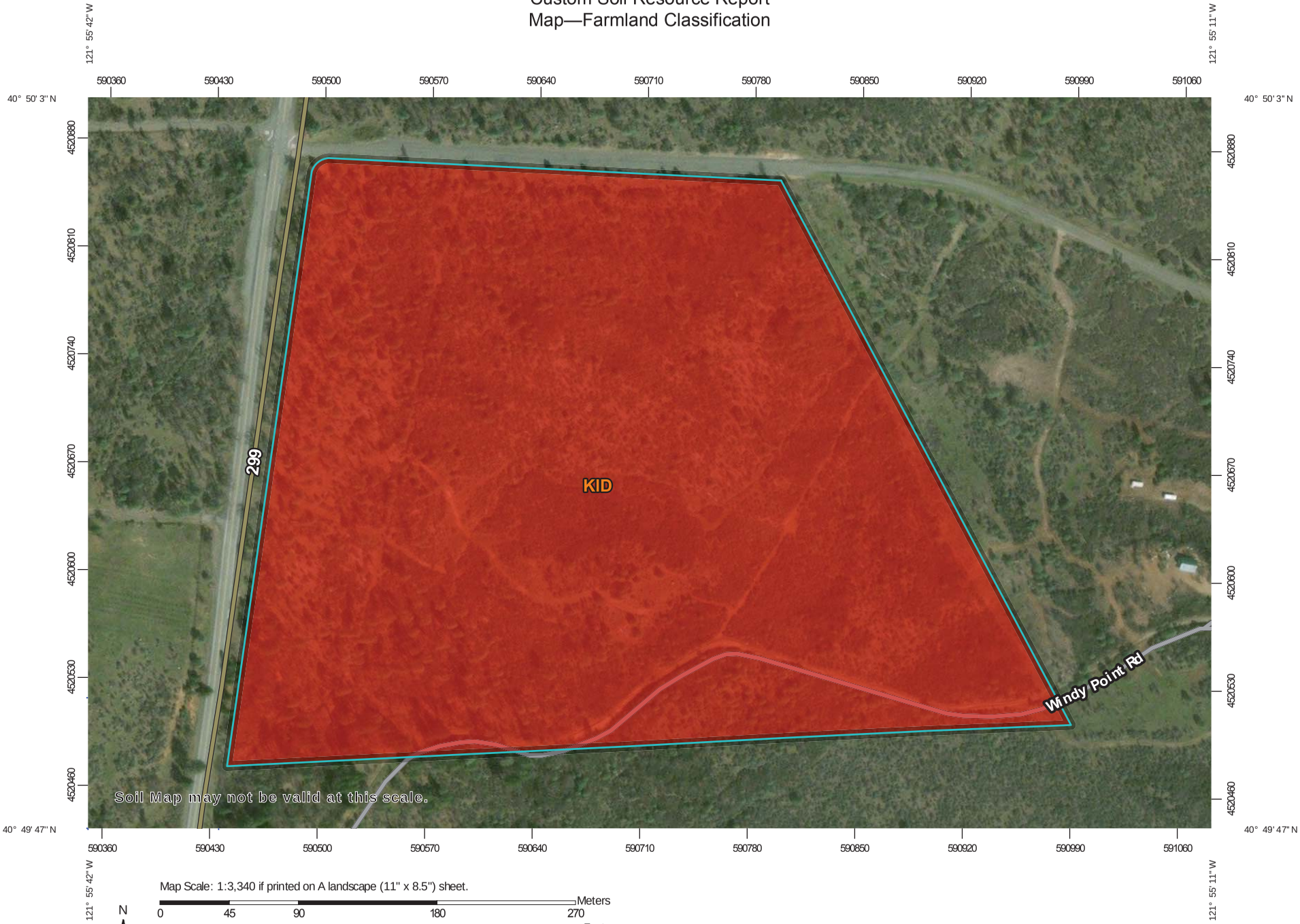
Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Custom Soil Resource Report
Map—Farmland Classification



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	Not prime farmland	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Farmland Classification

Aggregation Method: No Aggregation Necessary

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The majority of soil attributes are associated with a component of a map unit, and such an attribute has to be aggregated to the map unit level before a thematic map can be rendered. Map units, however, also have their own attributes. An attribute of a map unit does not have to be aggregated in order to render a corresponding thematic map. Therefore, the "aggregation method" for any attribute of a map unit is referred to as "No Aggregation Necessary".

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid

trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Off-Road, Off-Trail)

Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Off-Road, Off-Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	Moderate	Kilarc (85%)	Slope/erodibility (0.50)	39.7	100.0%
Totals for Area of Interest					**39.7**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Moderate	39.7	100.0%
Totals for Area of Interest	**39.7**	**100.0%**

Rating Options—Erosion Hazard (Off-Road, Off-Trail)

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Water Management

Water Management interpretations are tools for evaluating the potential of the soil in the application of various water management practices. Example interpretations include pond reservoir area, embankments, dikes, levees, and excavated ponds.

Irrigation, General

This interpretation evaluates a soil's limitation(s) for installation and use of irrigation systems. This interpretation is for non-specific irrigation methods and is intended to provide initial planning information. If the type of irrigation system has been determined, additional interpretations provide more specific information. This interpretation does not apply if the crop planned for irrigation is rice or other crops (such as cranberries) with unique plant physiological characteristics. The ratings are for soils in their natural condition and do not consider present land use.

Irrigation systems are used to provide supplemental water to crops, orchards, vineyards, and vegetables in areas where natural precipitation will not support desired production of crops being grown.

The soil properties and qualities important in design and management of irrigation systems are sodium adsorption ratio, depth to high water table, available water holding capacity, saturated hydraulic conductivity (Ksat), slope, calcium carbonate content, ponding, and flooding. Soil properties and qualities that influence installation are stones, depth to bedrock or cemented pan, and depth to a high water table. The properties and qualities that affect performance of the irrigation system are depth to bedrock or to a cemented pan, the sodium adsorption ratio, salinity, and soil reaction.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the interpretation. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot

be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms indicate the extent to which the soils are limited by the soil features that affect the soil interpretation. Verbal soil rating classes are based on the highest numerical rating for the most limiting soil feature(s) considered in the rating process. "Not limited" (numerical value for the most restrictive feature = 0.00) indicates that the soil has no limiting features for the specified use. "Somewhat limited" (numerical value for the most restrictive feature =.01 to .99) indicates that the soil has limiting features for the specified use that can be overcome with proper planning, design, installation, and management. The effort required to overcome a soil limitation increases as the numerical rating increases. "Very limited" (numerical value for the most restrictive feature = 1.00) indicates that the soil has one or more very limiting features that can only be overcome with special planning, major soil modification, special design, or significant management practices.

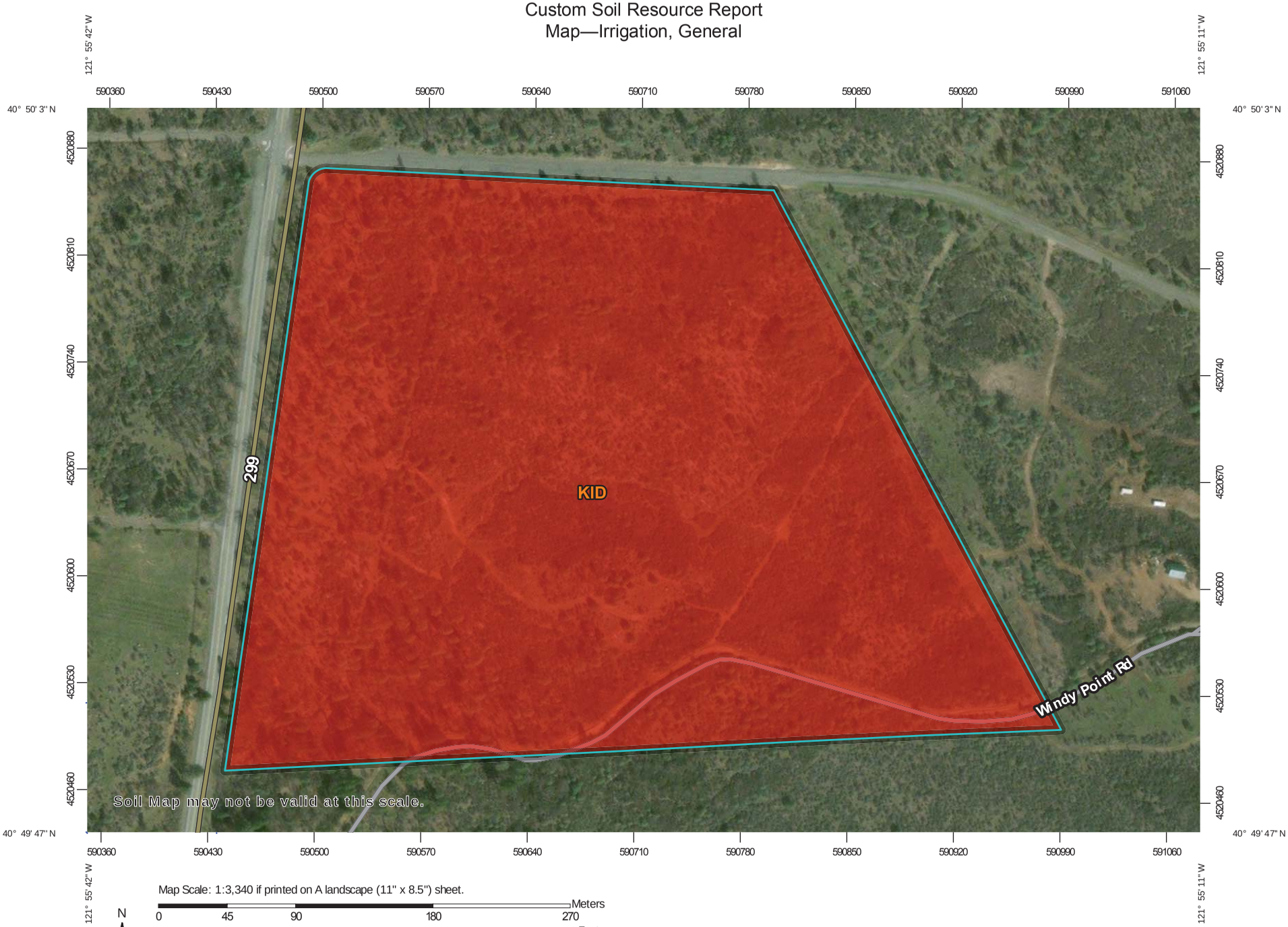
Lesser soil restrictive features have a lower numerical value than the maximum used to rate the soil, and they are identified to provide the user with additional information about soil limitations for the specific use. Lesser soil restrictive features also need to be considered in planning, design, installation, and management.

The results of this interpretation are not designed or intended to be used in a regulatory manner.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Irrigation, General



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

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Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Irrigation, General

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	Very limited	Kilarc (85%)	Slope (1.00)	39.7	100.0%
				Large surface stones (1.00)		
				Too acid (0.44)		
				Depth to soft bedrock (0.29)		
Totals for Area of Interest					**39.7**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	39.7	100.0%
Totals for Area of Interest	**39.7**	**100.0%**

Rating Options—Irrigation, General

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by

this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

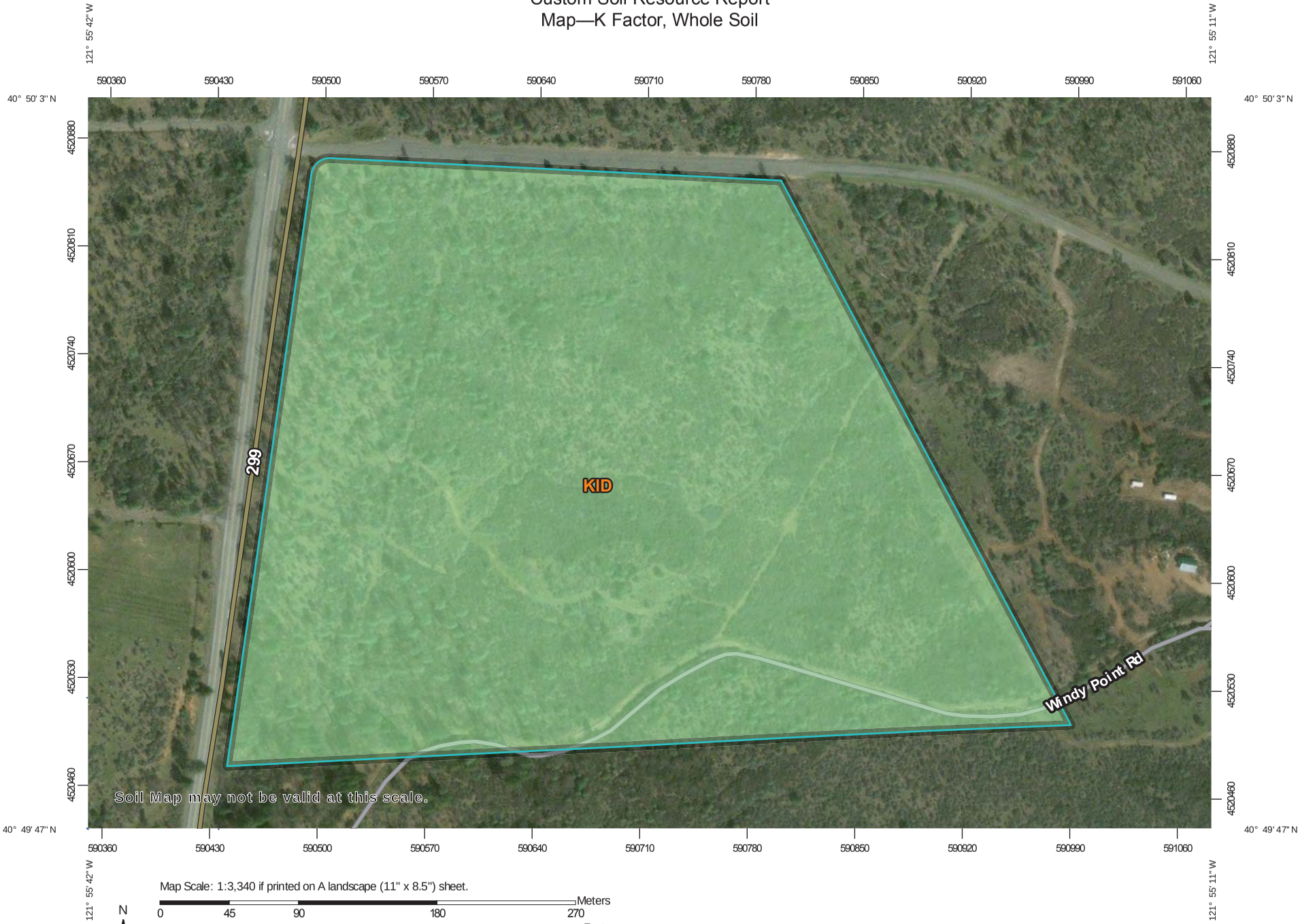
Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

K Factor, Whole Soil

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Custom Soil Resource Report
Map—K Factor, Whole Soil



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- .02
- .05
- .10
- .15
- .17
- .20
- .24
- .28
- .32
- .37
- .43
- .49
- .55
- .64
- Not rated or not available

Soil Rating Lines
- .02
- .05
- .10
- .15
- .17
- .20
- .24
- .28
- .32
- .37
- .43
- .49
- .55
- .64
- Not rated or not available

Soil Rating Points
- .02
- .05
- .10
- .15
- .17
- .20
- .24
- .28
- .32
- .37
- .43
- .49
- .55
- .64
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 12, Sep 14, 2017

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Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—K Factor, Whole Soil

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	.28	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—K Factor, Whole Soil

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

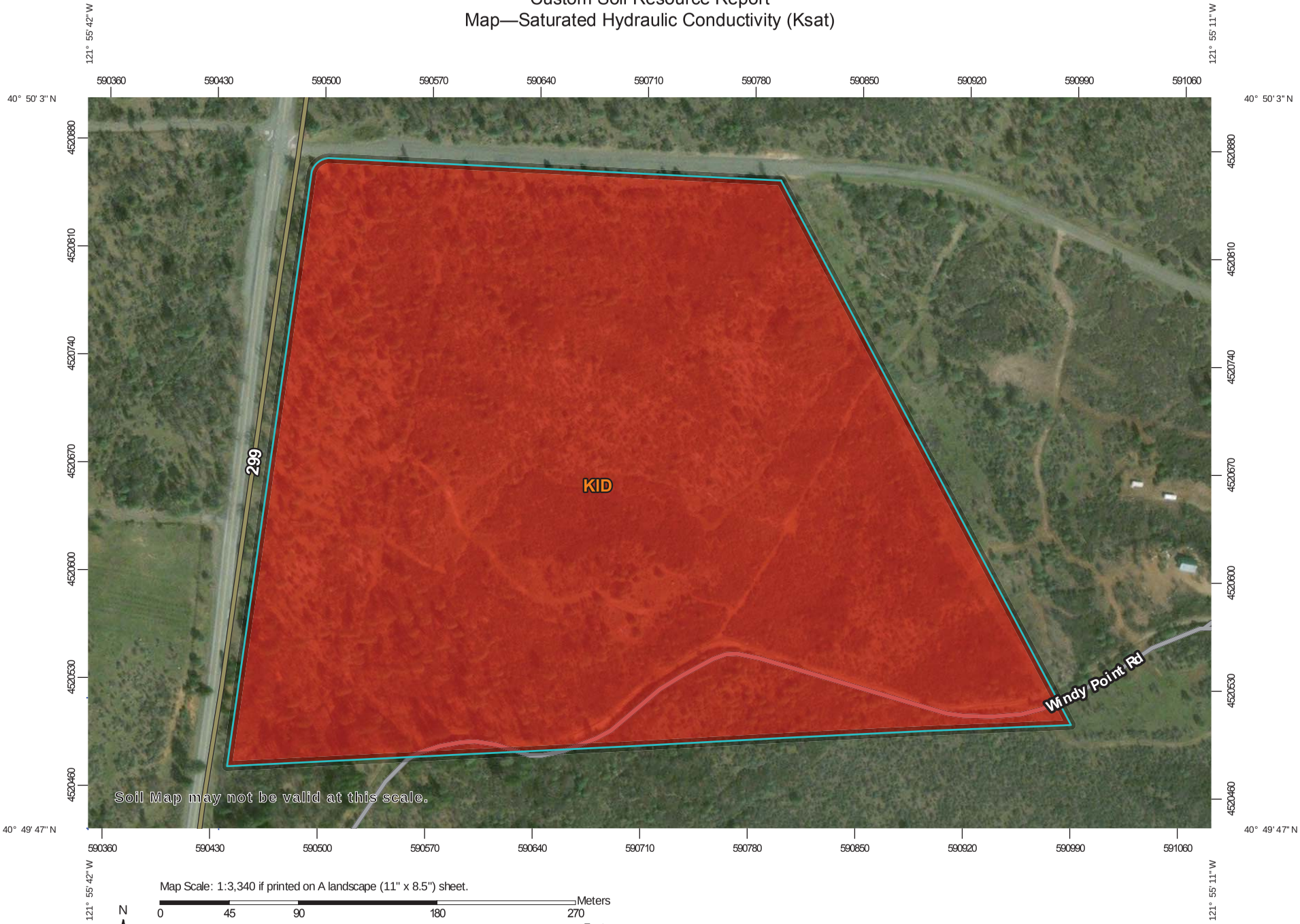
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat)



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 3.4035

Not rated or not available

Soil Rating Lines

= 3.4035

Not rated or not available

Soil Rating Points

= 3.4035

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	3.4035	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

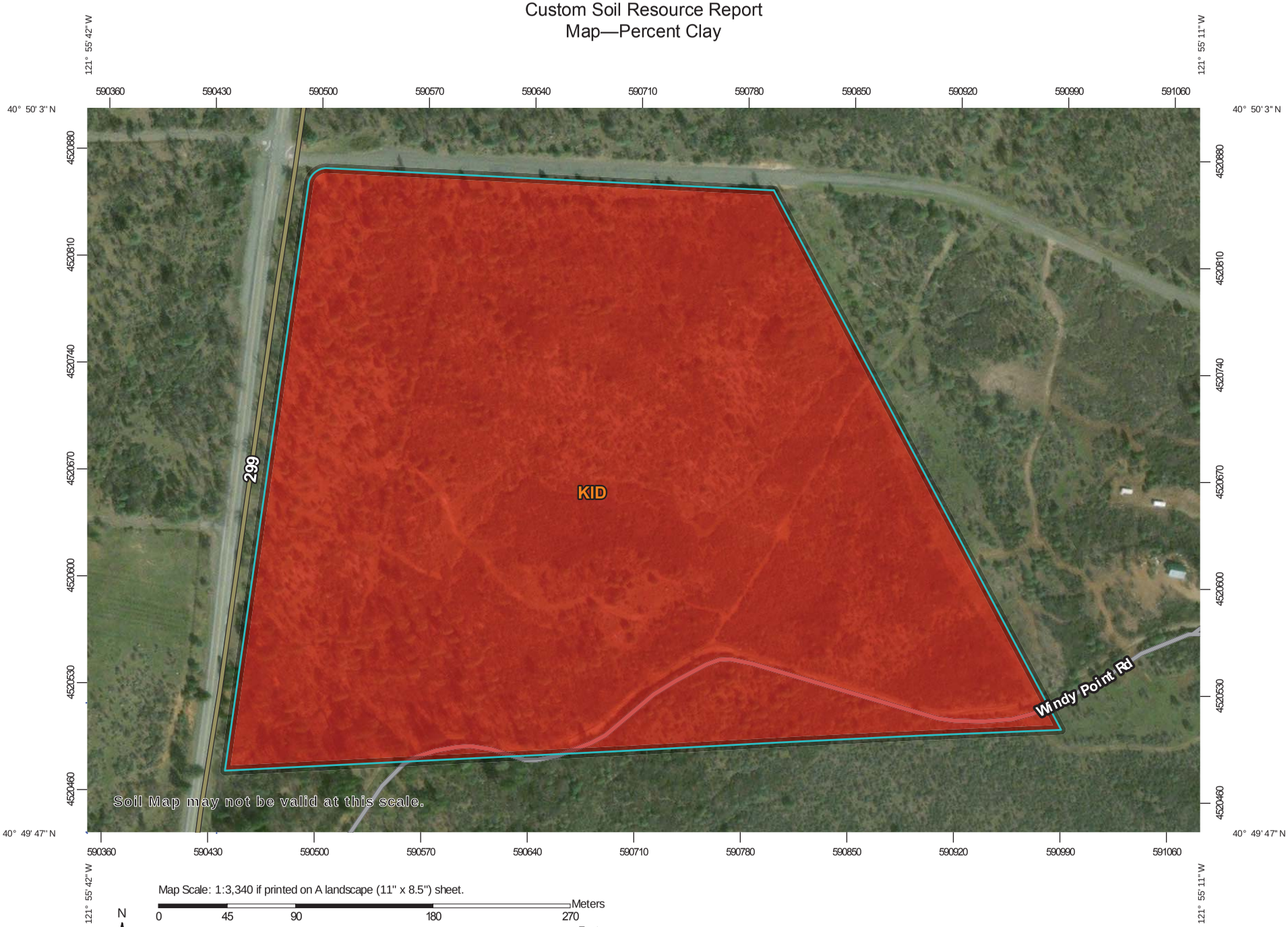
Percent Clay

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Most of the material is in one of three groups of clay minerals or a mixture of these clay minerals. The groups are kaolinite, smectite, and hydrous mica, the best known member of which is illite.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Percent Clay



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 36.9

Not rated or not available

Soil Rating Lines

= 36.9

Not rated or not available

Soil Rating Points

= 36.9

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Table—Percent Clay

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	36.9	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Percent Clay

Units of Measure: percent

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Linear Extensibility

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Linear Extensibility

Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Low (0 - 3)
- Moderate (3 - 6)
- High (6 - 9)
- Very High (9 - 30)
- Not rated or not available

Soil Rating Lines
- Low (0 - 3)
- Moderate (3 - 6)
- High (6 - 9)
- Very High (9 - 30)
- Not rated or not available

Soil Rating Points
- Low (0 - 3)
- Moderate (3 - 6)
- High (6 - 9)
- Very High (9 - 30)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Linear Extensibility

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	6.3	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Linear Extensibility

Units of Measure: percent

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

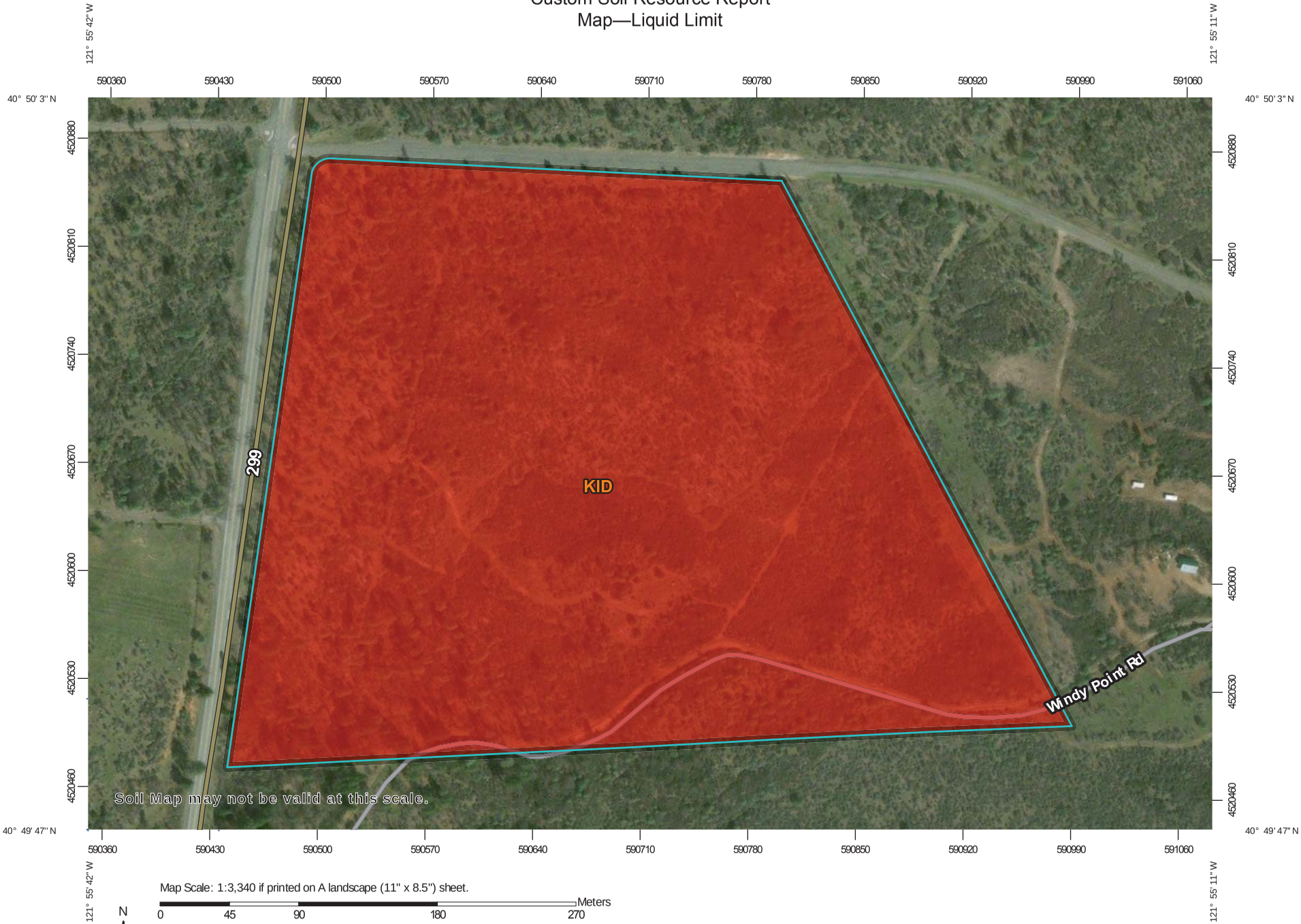
Liquid Limit

Liquid limit (LL) is one of the standard Atterberg limits used to indicate the plasticity characteristics of a soil. It is the water content, on a percent by weight basis, of the soil (passing #40 sieve) at which the soil changes from a plastic to a liquid state. Generally, the amount of clay- and silt-size particles, the organic matter content, and the type of minerals determine the liquid limit. Soils that have a high liquid limit have the capacity to hold a lot of water while maintaining a plastic or semisolid state.

Liquid limit is used in classifying soils in the Unified and AASHTO classification systems.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Liquid Limit



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 43.4

Not rated or not available

Soil Rating Lines

= 43.4

Not rated or not available

Soil Rating Points

= 43.4

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

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Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

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Table—Liquid Limit

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	43.4	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Liquid Limit

Units of Measure: percent

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

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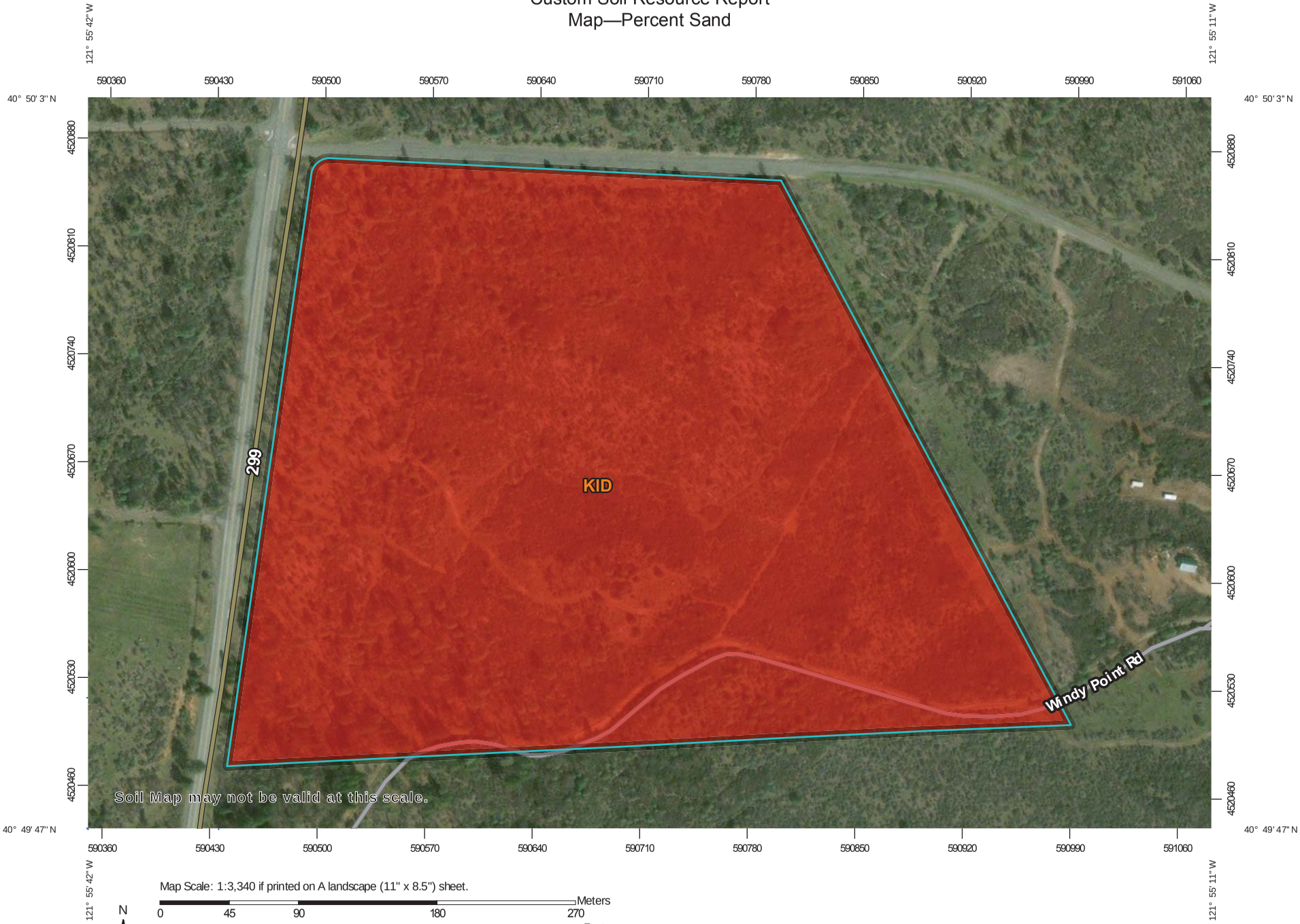
Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Percent Sand

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the database, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Percent Sand



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 35.4

Not rated or not available

Soil Rating Lines

= 35.4

Not rated or not available

Soil Rating Points

= 35.4

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

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Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

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Table—Percent Sand

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	35.4	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Percent Sand

Units of Measure: percent

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

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The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

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Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

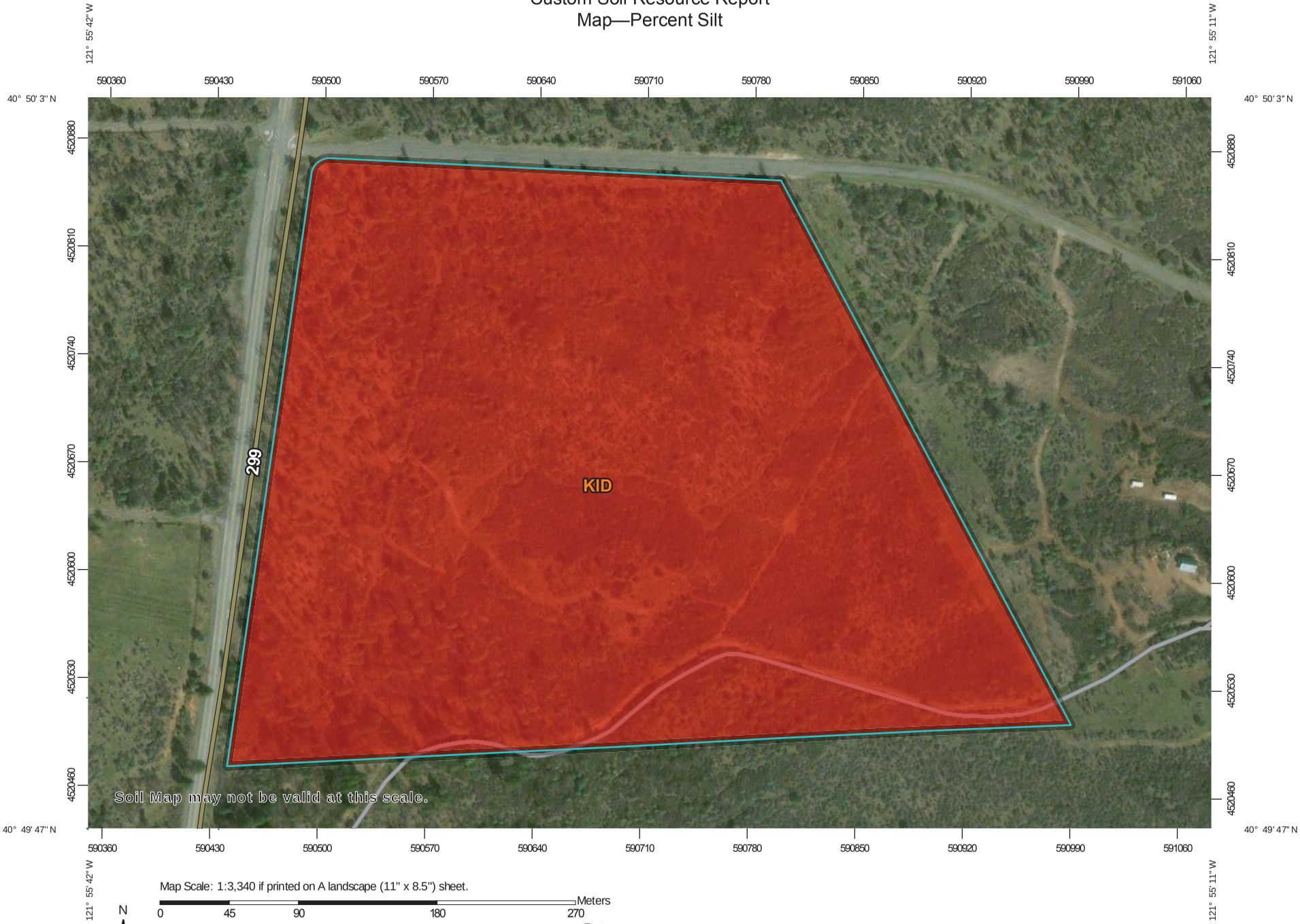
Percent Silt

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the database, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Percent Silt



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 27.7

Not rated or not available

Soil Rating Lines

= 27.7

Not rated or not available

Soil Rating Points

= 27.7

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Percent Silt

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	27.7	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Percent Silt

Units of Measure: percent

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Plasticity Index

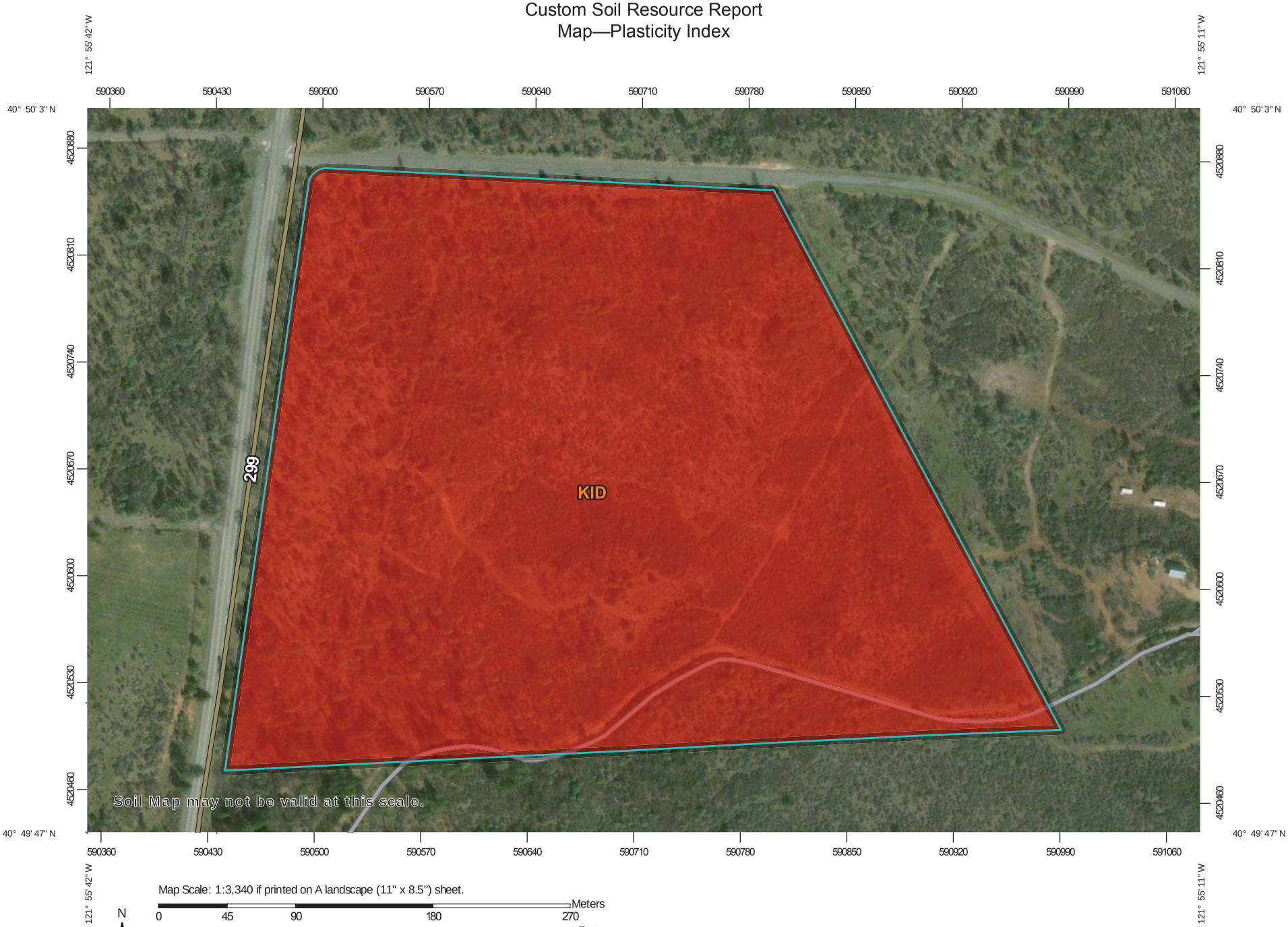
Plasticity index (PI) is one of the standard Atterberg limits used to indicate the plasticity characteristics of a soil. It is defined as the numerical difference between the liquid limit and plastic limit of the soil. It is the range of water content in which a soil exhibits the characteristics of a plastic solid.

The plastic limit is the water content that corresponds to an arbitrary limit between the plastic and semisolid states of a soil. The liquid limit is the water content, on a percent by weight basis, of the soil (passing #40 sieve) at which the soil changes from a plastic to a liquid state.

Soils that have a high plasticity index have a wide range of moisture content in which the soil performs as a plastic material. Highly and moderately plastic clays have large PI values. Plasticity index is used in classifying soils in the Unified and AASHTO classification systems.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Plasticity Index



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 22.1

Not rated or not available

Soil Rating Lines

= 22.1

Not rated or not available

Soil Rating Points

= 22.1

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Plasticity Index

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	22.1	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Plasticity Index

Units of Measure: percent

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Depth to Any Soil Restrictive Layer

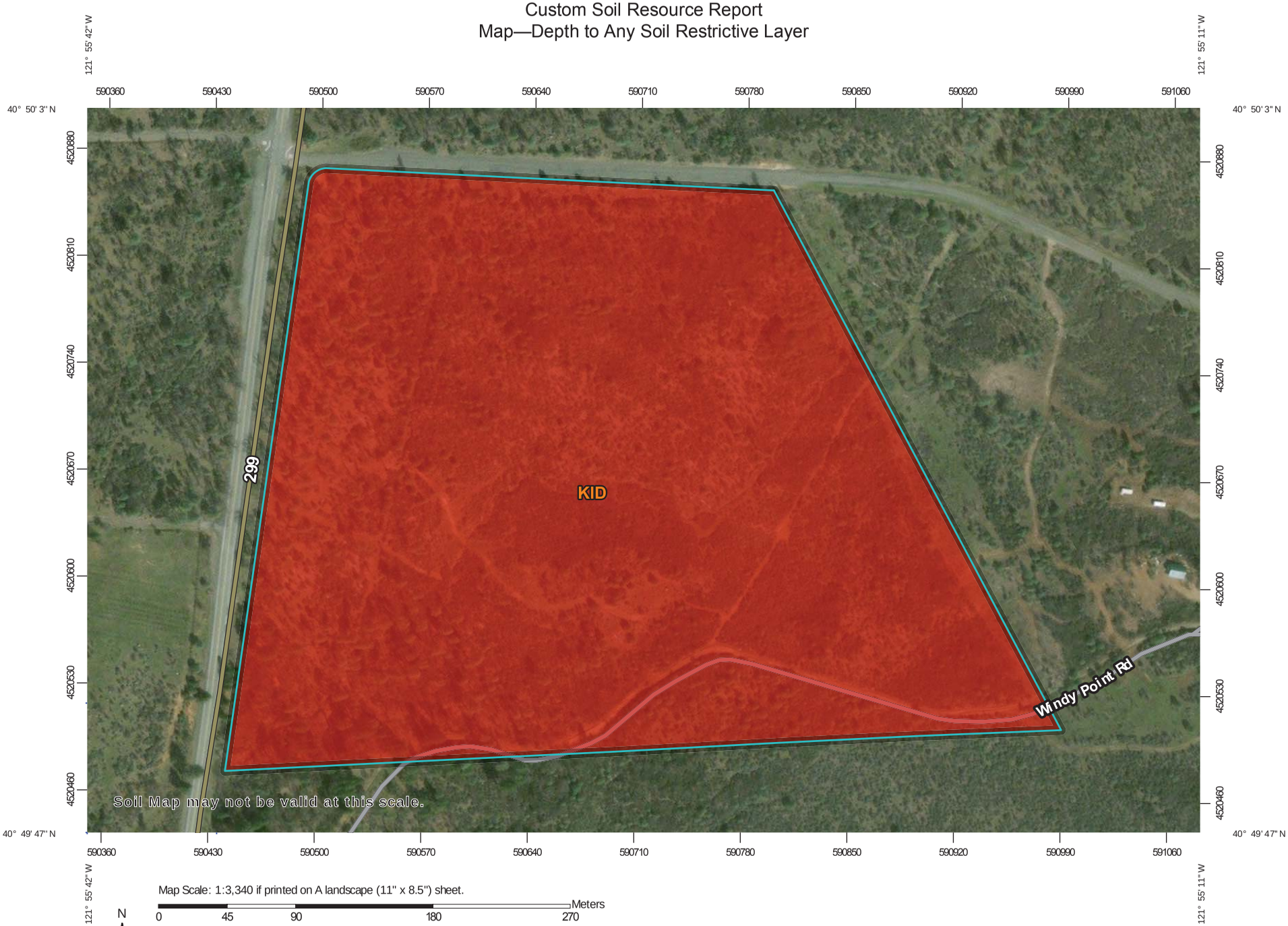
A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "> 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A

"representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Any Soil Restrictive Layer

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	23	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer

Units of Measure: centimeters

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Drainage Class

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Custom Soil Resource Report
Map—Drainage Class

Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

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Table—Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	Moderately well drained	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Drainage Class

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

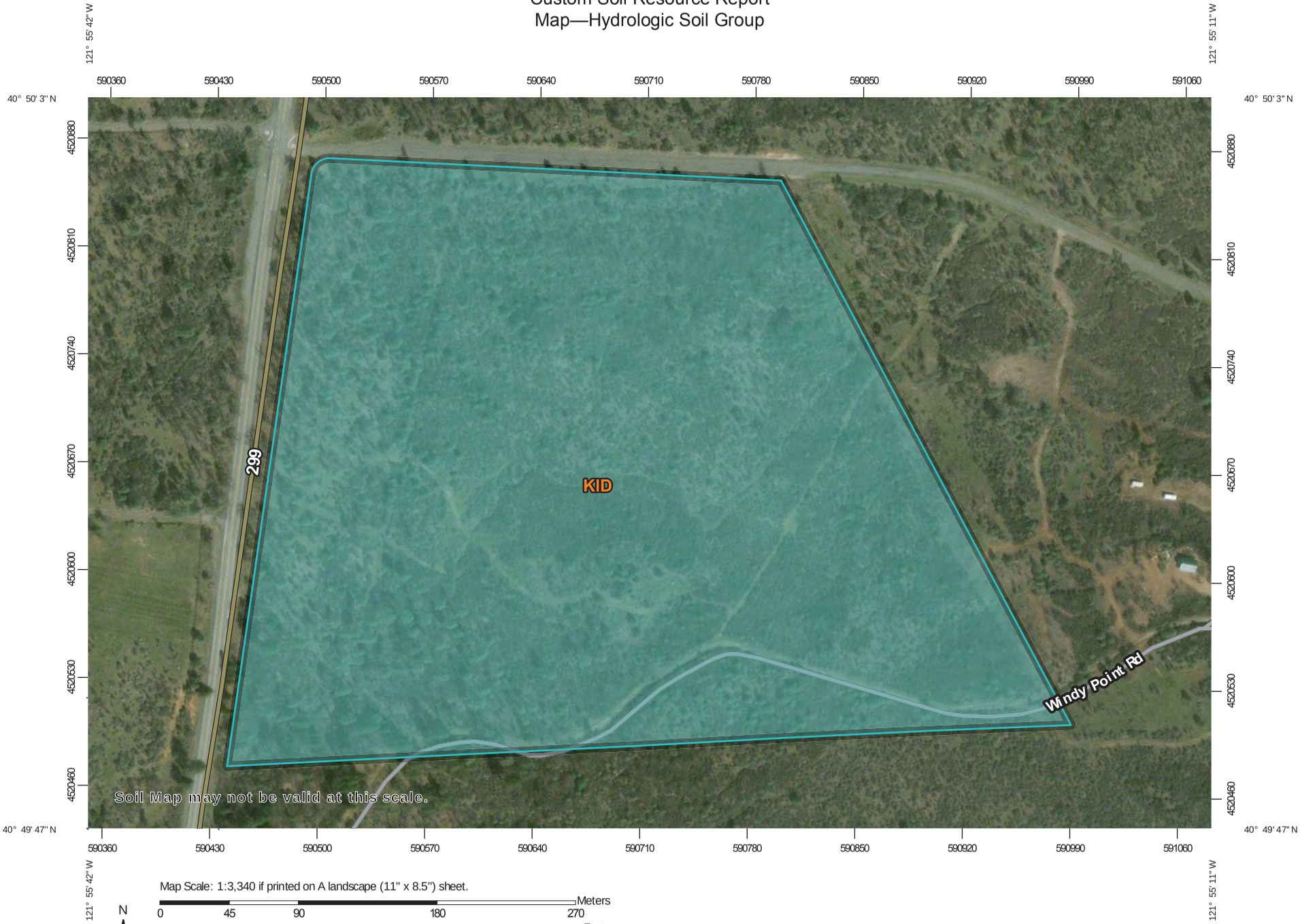
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	C	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Water Features

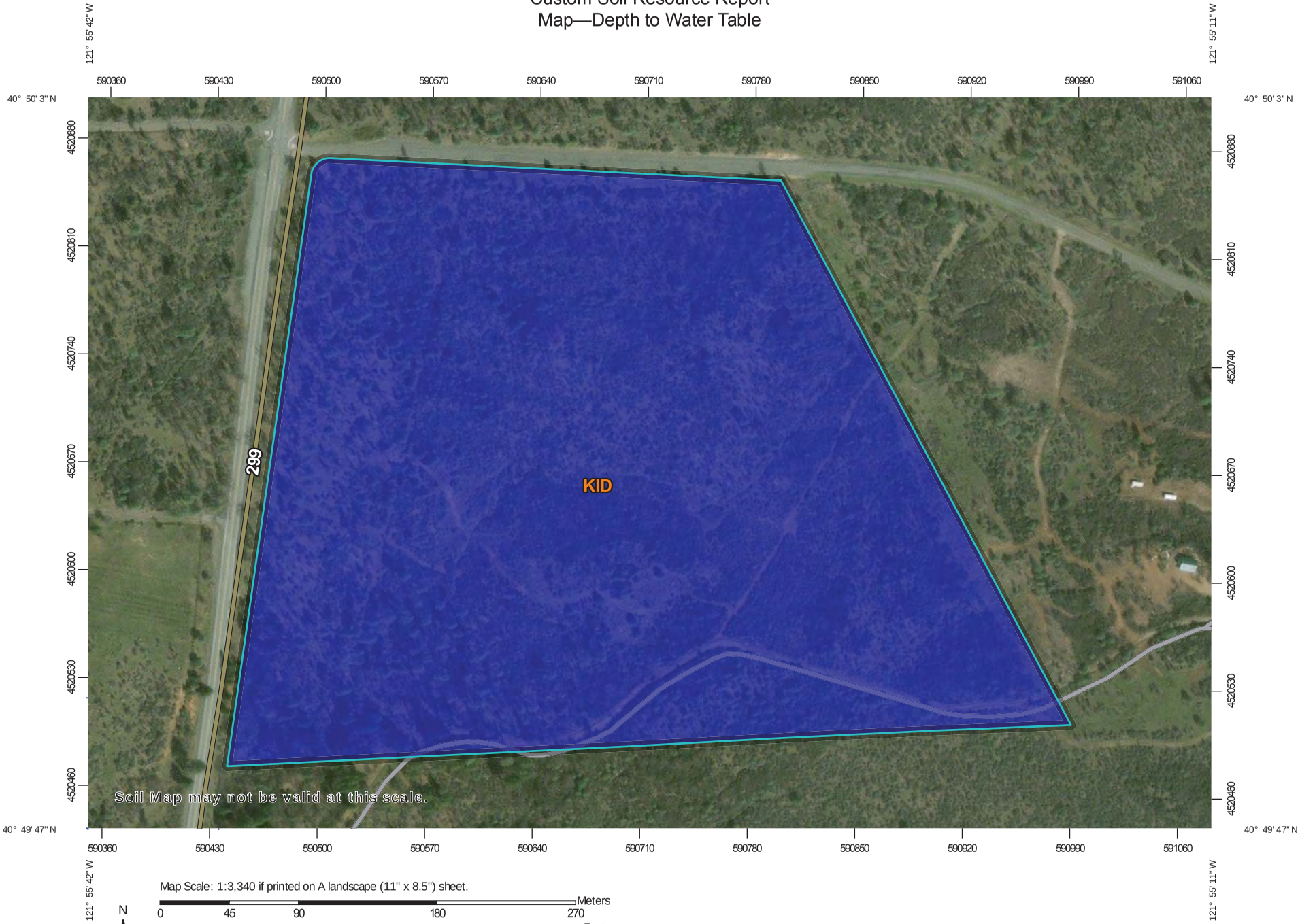
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Water Table



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	>200	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Beginning Month: January

Ending Month: December

Flooding Frequency Class

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

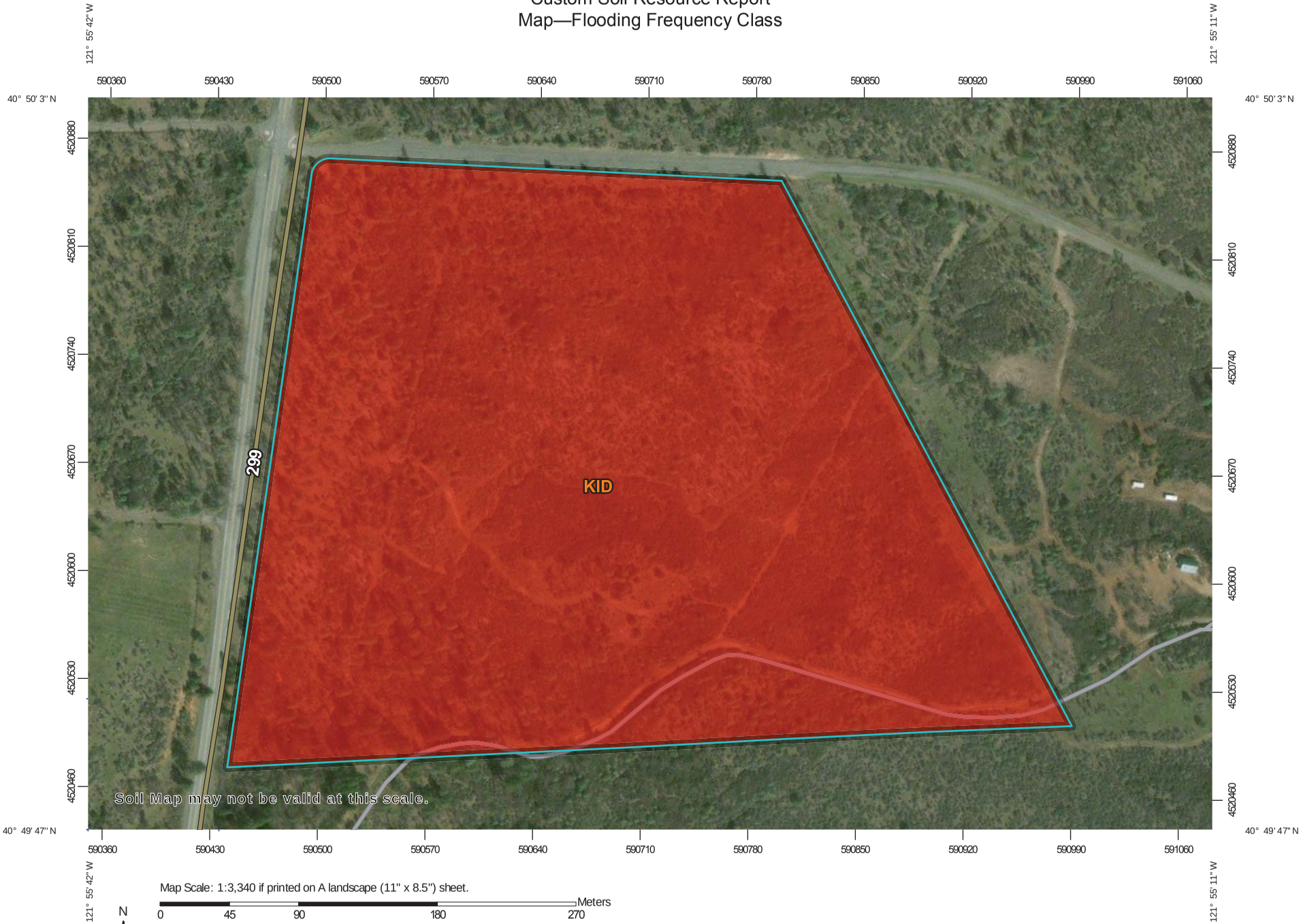
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Custom Soil Resource Report
Map—Flooding Frequency Class



Map Scale: 1:3,340 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent
- Not rated or not available

Soil Rating Lines
- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent
- Not rated or not available

Soil Rating Points
- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 12, Sep 14, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 7, 2012—Aug 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Flooding Frequency Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	None	39.7	100.0%
Totals for Area of Interest			**39.7**	**100.0%**

Rating Options—Flooding Frequency Class

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: More Frequent

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Beginning Month: January

Ending Month: December

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Chemical Properties

This folder contains a collection of tabular reports that present soil chemical properties. The reports (tables) include all selected map units and components for each map unit. Soil chemical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil chemical properties include pH, cation exchange capacity, calcium carbonate, gypsum, and electrical conductivity.

Chemical Soil Properties

This table shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. It is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced saturated hydraulic conductivity and aeration, and a general degradation of soil structure.

Chemical Soil Properties–Shasta County Area, California								
Map symbol and soil name	**Depth**	**Cation-exchange capacity**	**Effective cation-exchange capacity**	**Soil reaction**	**Calcium carbonate**	**Gypsum**	**Salinity**	**Sodium adsorption ratio**
	In	*meq/100g*	*meq/100g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
KlD—Kilarc very stony sandy clay loam, 10 to 30 percent slopes								
Kilarc	0-9	10-20	—	5.6-6.5	0	0	0	0
	9-22	—	25-35	3.5-5.0	0	0	0	0
	22-44	—	15-25	3.5-5.0	0	0	0	0
	44-48	—	—	—	—	—	—	—
Parrish	—	—	—	—	—	—	—	—
Sites	—	—	—	—	—	—	—	—
Supan	—	—	—	—	—	—	—	—
Inks	—	—	—	—	—	—	—	—

Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear

extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Physical Soil Properties–Shasta County Area, California														
Map symbol and soil name	**Depth**	**Sand**	**Silt**	**Clay**	**Moist bulk density**	**Saturated hydraulic conductivity**	**Available water capacity**	**Linear extensibility**	**Organic matter**	**Erosion factors**			**Wind erodibility group**	**Wind erodibility index**
										Kw	**Kf**	**T**		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
KlD—Kilarc very stony sandy clay loam, 10 to 30 percent slopes														
Kilarc	0-9	-60-	-18-	20-23- 25	1.50-1.60-1.70	4.00-9.00-14.00	0.10-0.13-0.15	0.0- 1.5- 2.9	1.0- 2.0-3.0	.10	.20	4	6	48
	9-22	-22-	-28-	40-50- 60	1.25-1.35-1.45	0.42-0.91-1.40	0.14-0.15-0.16	6.0- 7.5- 8.9	0.5- 0.8-1.0	.24	.24			
	22-44	-33-	-32-	30-35- 40	1.50-1.60-1.70	1.40-2.70-4.00	0.16-0.18-0.19	6.0- 7.5- 8.9	0.0- 0.3-0.5	.28	.28			
	44-48	—	—	—	—	1.40-2.70-4.00	-0.00-0.00	—	—					

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–Shasta County Area, California			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
KID—Kilarc very stony sandy clay loam, 10 to 30 percent slopes			
Kilarc	85	Very high	C
Parrish	5	—	—
Sites	5	—	—
Supan	3	—	—
Inks	2	—	—

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. The kind of water table, apparent or perched, is given if a seasonal high water table exists in the soil. A water table is perched if free water is restricted from moving downward in the soil by a restrictive feature, in most cases a hardpan; there is a dry layer of soil underneath a wet layer. A water table is apparent if free water is present in all horizons from its upper boundary to below 2 meters or to the depth of observation. The water table kind listed is for the first major component in the map unit.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Map unit symbol and soil name	Hydrologic group	Surface runoff	Most likely months	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*		*Ft*				
KID—Kilarc very stony sandy clay loam, 10 to 30 percent slopes											
Kilarc	C	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Parrish			Jan-Dec	—	—	—	—	—	—	—	
Sites			Jan-Dec	—	—	—	—	—	—	—	
Supan			Jan-Dec	—	—	—	—	—	—	—	
Inks			Jan-Dec	—	—	—	—	—	—	—	

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APPENDIX C

BIOLOGICAL RESOURCES LETTER REPORT

ANALYTICAL ENVIRONMENTAL SERVICES
1801 7TH STREET, SUITE 100
SACRAMENTO, CA 95811
(916) 447-3479 | FAX (916) 447-1665

BIOLOGICAL MEMORANDUM

To:	Pit River Tribe 36970 Park Avenue Burney, CA 96013
From:	David Pfuhler, Biologist Analytical Environmental Services 1801 7th Street, Suite 100 Sacramento, CA 95811
Project:	Pit River Tribe 40-Acre Property Fee-To-Trust
Date:	1/13/2022

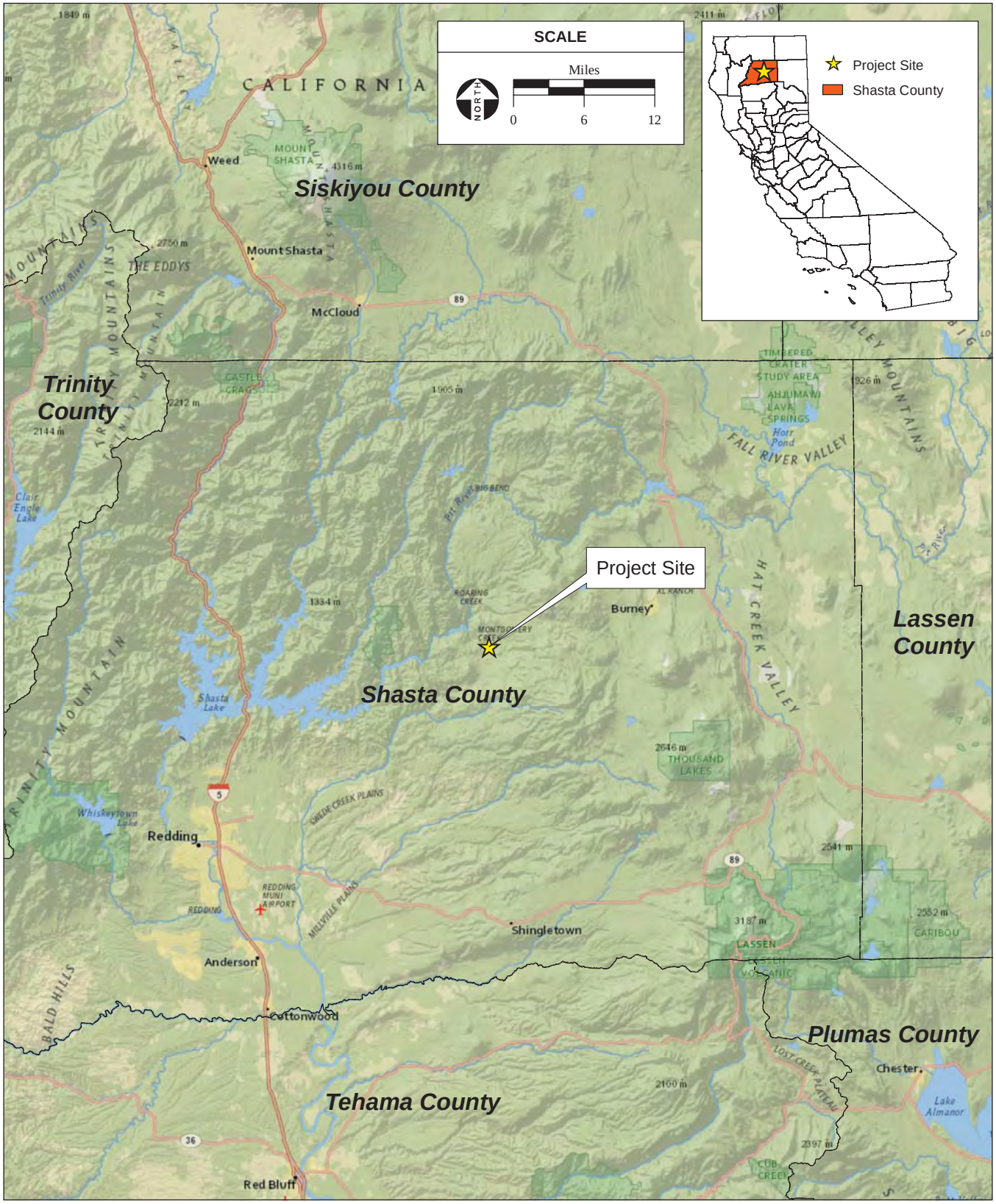
1.0 INTRODUCTION

This technical memorandum has been prepared to describe the survey methodologies and present the results of the April 2 and 3, 2018 biological site assessment conducted by Analytical Environmental Services staff of the Pit River Tribe (Tribe's) Montgomery Creek Rancheria 40-Acre Property (Subject Property). This technical memorandum assesses the potential for jurisdictional wetland areas and waters of the U.S., habitats, and the potential for federally listed special-status species to occur within and in the vicinity of the Subject Property. This technical memorandum also assesses the potential biological impacts resulting from transferring the Subject Property into trust and provides recommendations, if needed, regarding avoiding impacts to biological resources.

The Proposed Action consists of the Bureau of Indian Affairs (BIA) taking the Subject Property, adjacent to the western boundary of the Montgomery Creek Rancheria Housing Project and owned by the Tribe in fee simple status, into federal trust status. The Tribe intends to develop additional housing and associated infrastructure within the Subject Property for the Montgomery Creek Rancheria Housing Project.

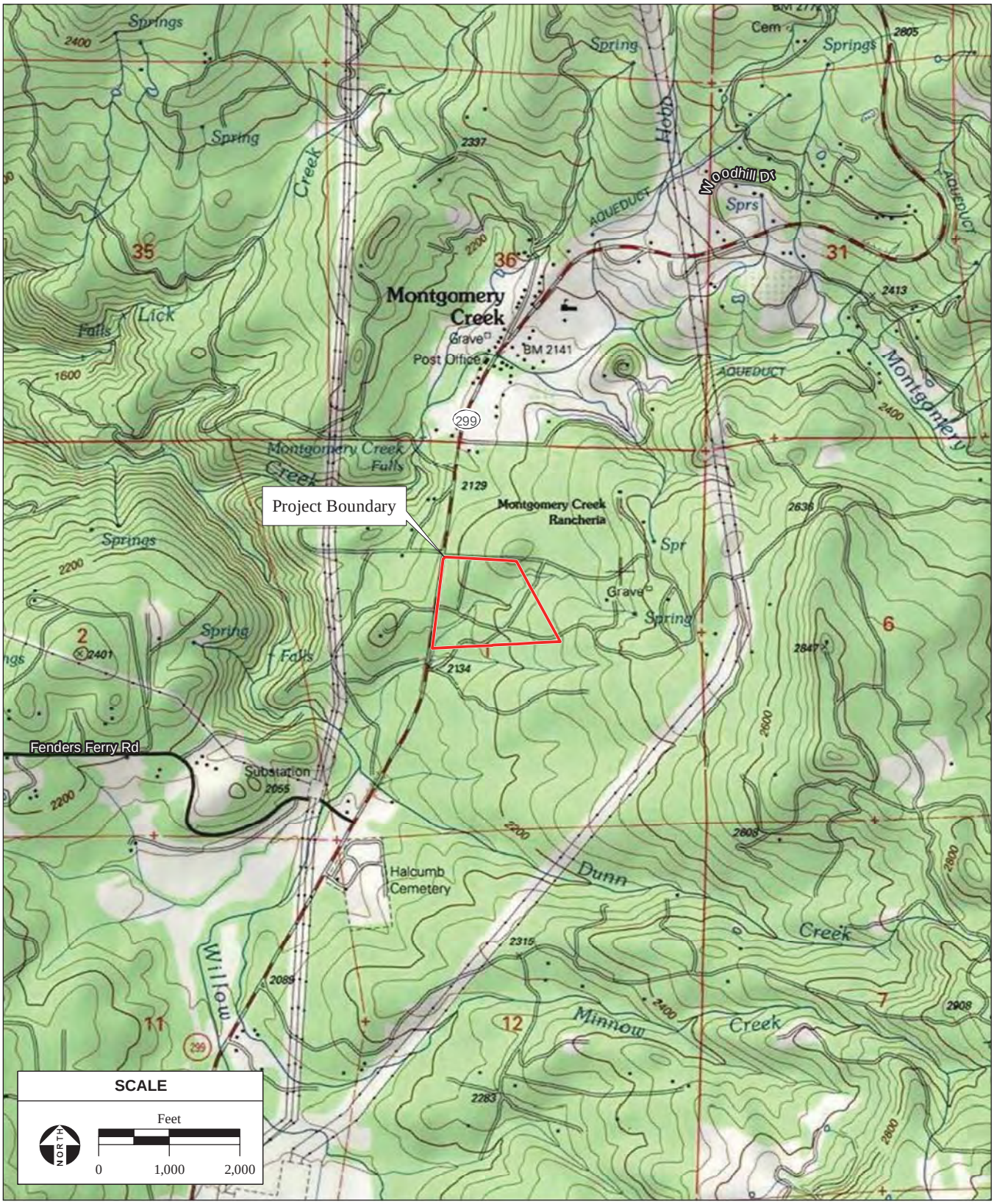
1.1 SITE DESCRIPTION

The Subject Property is located in Montgomery Creek, California (**Figure 1, Figure 2,** and **Figure 3**). The Subject Property consists of one parcel (Shasta County APN 029-520-004) totaling approximately 40.10 acres. The Subject Property is mostly undeveloped, with the exception of a graded dirt access road (Bakus Road) in the southern portion of the Subject Property. The Subject Property, located at approximately 2,208 feet above mean sea level (amsl), is relatively rolling in nature, with slopes over 30 percent and a high point along the Subject Property's southeastern boundary.



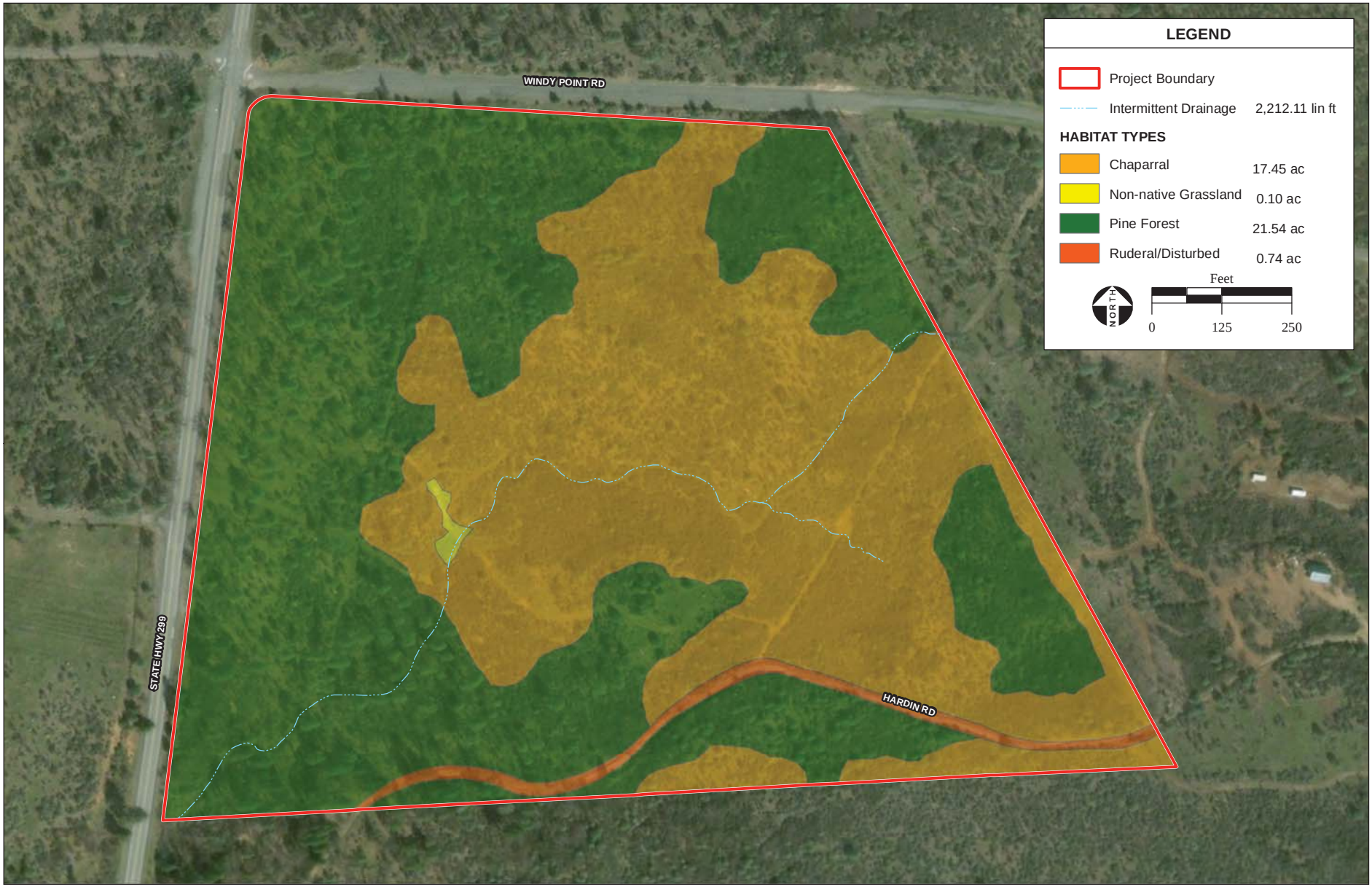
SOURCE: NatGeo 2017; AES, 5/30/2018

Figure 1
Regional Location



SOURCE: "Montgomery Creek, CA" USGS 7.5 Minute Topographic Quadrangle, T34N, R1W, Section 1, Mt. Diablo Baseline & Meridian; ESRI Data, 2015; Shasta County GIS, 9/2017; AES, 5/30/2018

Figure 2
Site and Vicinity



SOURCE: Shasta County GIS, 9/2017; DigitalGlobe Aerial Photograph, 3/26/2016 ; AES, 5/31/2018

Figure 4
Habitat Types

Regional access to the Subject Property is provided by State Route 299 (SR-299), which is located immediately west of the Subject Property and travels in an east-west direction. Local and direct access to the Subject Property is provided by Windy Point Road, which is located immediately north of the Subject Property and travels in an east-west direction, and Bakus Road, which travels in an east-west direction and is located immediately south of and within the southern portion of the Subject Property.

The Subject Property is mostly undeveloped, with the exception of a graded dirt access road (Bakus Road) in the southern portion of the Subject Property. The Subject Property, located at approximately 2,208 feet above mean sea level (amsl), is relatively rolling in nature, with slopes over 30 percent and a high point along the Subject Property's southeastern boundary.

2.0 METHODOLOGY

The following information was obtained and reviewed:

- Aerial photographs of the Property and surrounding area;
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) list, updated December 6, 2021 (USFWS, 2021a; **Attachment A**);
- USFWS National Wetlands Inventory (NWI) map of wetland features, updated December 7, 2021 (USFWS, 2021b; **Attachment A**);
- USFWS Critical Habitat for Threatened and Endangered Species Mapper, updated December 8, 2021 (USFWS, 2021c); and
- Natural Resources Conservation Service (NRCS) custom soils report, updated December 7, 2021 (**Attachment B**).

AES biologist Kaili Brande conducted a survey of the Subject Property on April 2 and 3, 2018. The objective of the survey was to identify habitat types within the Subject Property and to determine if any special-status species or any sensitive habitats such as critical habitat, potential wetlands, or other potential waters of the U.S. have the potential to occur within the Subject Property. The Subject Property and habitats immediately adjacent to the Subject Property were visually observed to the extent possible without trespassing for the aforementioned species and habitats. The survey consisted of a pedestrian survey with meandering transects through the entire Subject Property.

Data was collected via a Trimble Geo XH hand-held GPS receiver. Survey goals consisted of identifying habitat types, sensitive habitats, wetlands, and waters of the U.S, and special-status species. Sensitive habitats include those that are designated by CDFW, considered by local experts to be communities of limited distribution, or likely to be waters of the U.S. or State by the appropriate regulatory agencies. Habitat requirements of special-status species were compared to habitats observed, which were determined based on aerial photographs, ground-truthing, and background data review.

3.0 ENVIRONMENTAL SETTING

3.1 Soil Types

Surface waters within the Subject Property drain southwest towards Willow Creek located west of the Subject Property. The depth to groundwater is approximately 20 feet below ground surface (bgs) with a southwest groundwater gradient. Groundwater level estimates and/or gradients vary due to seasonal

fluctuations in precipitation, local usage demands, geology, underground structures, and/or dewatering operations.

The dominant soil within the Subject Property is Kilarc very stony sandy clay loam, 10 to 30 percent slopes (approximately 100 percent of the total area), which is moderately well drained and has a moderately low to moderately high infiltration rate (NRCS, 2021).

The majority of the Subject Property is located within Flood Zone X, which is identified by the FEMA as an area determined to be outside the 0.2 percent annual chance flood (FEMA, 2011).

3.2 Habitat Types

Habitat types identified on the Property are shown in **Figure 4**. An intermittent stream bisects the property and flows to the southwest. The NWI classifies this intermittent stream as riverine, intermittent, streambed, and seasonally flooded habitat (USFWS, 2021b). Habitats observed on the Project Site during the site visit include pine forest, chaparral, non-native grassland, ruderal/disturbed, and an intermittent stream (**Figure 4**). These habitats are discussed in detail below.

Pine Forest

Approximately 21.54 acres of the Subject Property are pine forest, which is characterized by trees that grow needles instead of leaves and cones instead of flowers (**Figure 4**). Vegetation within this habitat is characterized by species such as oak trees (*Quercus spp*.), ponderosa pines (*Pinus ponderosa*), lodgepole pines (*Pinus spp*.), and lupine (*Lupinus spp*.).

Chaparral

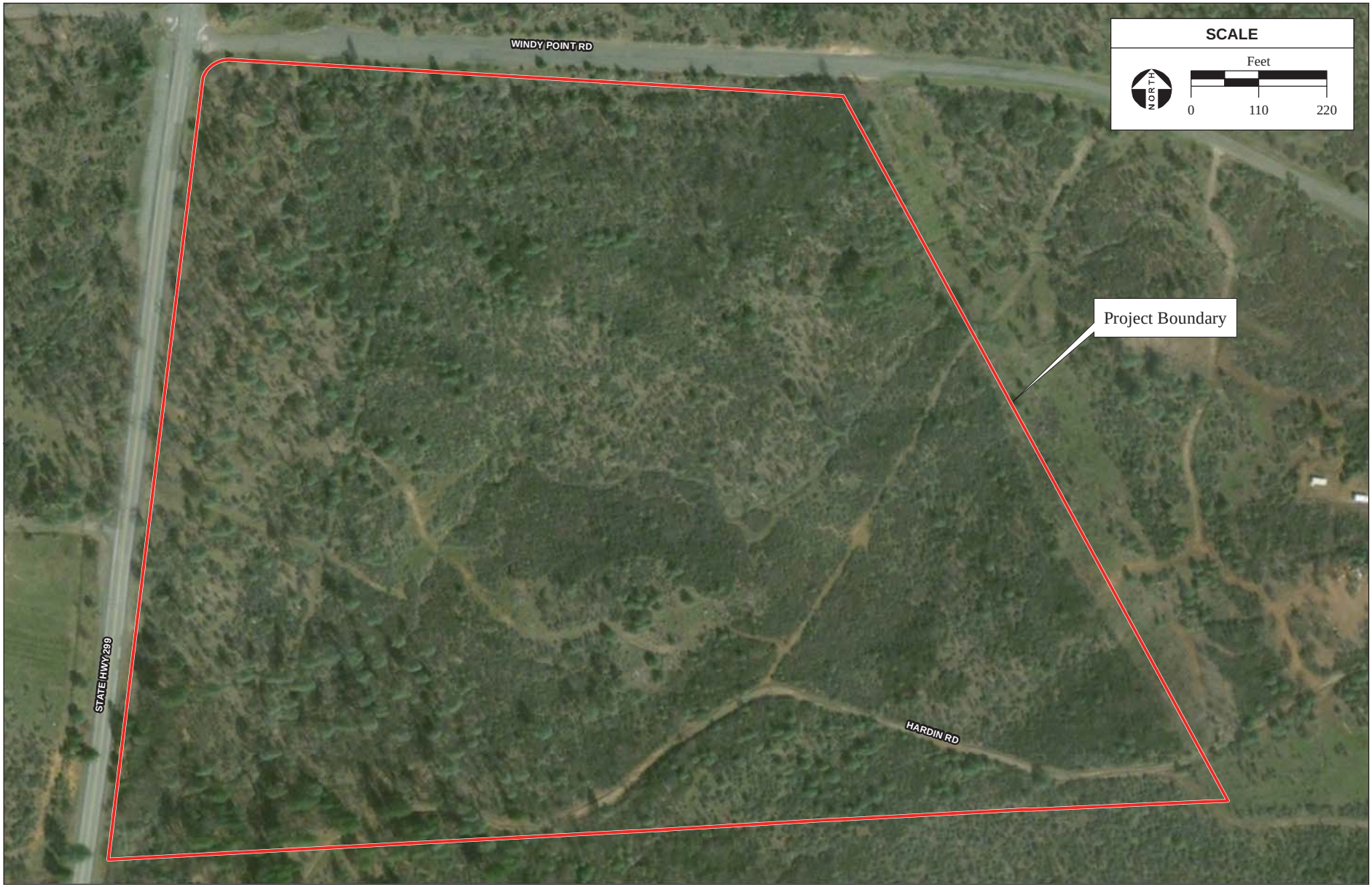
Approximately 17.45 acres of the Subject Property are chaparral, which is characterized by shrubs and low growing vegetation (**Figure 4**). Vegetation within this habitat is characterized by species such as willow trees (*Salix spp.*), manzanita (*Arctostaphylos spp.*), soap bush (*Ceanothus spp.*), and poison oak (*Toxicodendron spp*.).

Non-Native Grassland

Approximately 0.10 acres of the Subject Property are non-native grassland, which is characterized by a lack of woody vegetation (**Figure 4**). Vegetation within this habitat is characterized by species such as fennel (*Foeniculum spp*.) and redstem stork's bill (*Erodium cicutarium*).

Ruderal/Disturbed

Approximately 0.74 acres of the Subject Property is Bakus Road, a graded dirt access road located immediately south of and within the southern portion of the Subject Property (**Figure 4**). Bakus Road intersects SR-299 to the west of the Subject Property, travels in an east-west direction, and provides access to the Montgomery Creek Rancheria Housing Project located east of and adjacent to the Subject Property.



SOURCE: Shasta County GIS, 9/2017; DigitalGlobe Aerial Photograph, 3/26/2016 ; AES, 5/30/2018

Figure 3
Aerial Photograph

Intermittent Stream

There is an approximately 2,212.11-linear foot intermittent stream system located in the southern portion of the Subject Property (Figure 4). The intermittent stream originates from the hillslopes in the northeastern portion of the Subject Property from overland sheet flow and drains southwest. Surface water intermittently flows through the stream that contains an ordinary high water mark, bed and bank, and other indicators of intermittently flowing water within the Subject Property. Vegetation within this habitat is characterized by species such as sedges (Carex spp.).

3.3 Special-Status Species

Desktop review of available literature review of federally listed special status species determined one one bird, one amphibian, one insect, one fish, and one crustacean have the potential to occur in the vicinity of the Subject Property:

- Northern Spotted Owl (*Strix occidentalis caurina*) (FT)
- California Red-legged Frog (*Rana draytonii*) (FT)
- Delta Smelt (*Hypomesus transpacificus*) (FT)
- Monarch Butterfly (*Danaus plexippus*) (FC)
- Shasta Crayfish (*Pacifastacus fortis*) (FE)

No individuals of these five special-status species were observed. Based on the site-specific habitats and special-status species habitat requirements for each species that may occur within the vicinity of the Property, the Property does not contain suitable habitat to support any special-status animal species. Species with no potential to occur on the Property were ruled out based on lack of suitable habitat, soils, elevation, necessary substrate, and negative results during the survey if it coincided with the identifiable bloom period for plant species. Special-status species were not observed during the survey.

3.4 Wildlife Movement

Wildlife movement is unrestricted across the property. The Property contains an intermittent stream which may further encourage wildlife movement across the property. State Route 299 borders the property to the west. Surrounding land use is of similar composition to the property and provides similar habitat structure.

3.5 Critical Habitat

No designated critical habitat for any of the species listed above, as determined by the USFWS in accordance with the Endangered Species Act, occurs on the Property (**Attachment A**).

4.0 RESULTS AND RECOMENDATIONS

4.1 Sensitive Habitat

Habitat types within the Property include pine forest, chaparral, non-native grasslands, ruderal/disturbed, and an intermittent stream. The area of impact is spread across the entirety of the property. Sparse riparian habitat occurs along the intermittent stream that bisects the property. The intermittent stream and habitat associated with it are intended to be avoided. A 50-foot buffer extending from the dripline of riparian vegetation or from the top of the stream banks will be incorporated into the design of the project. Additionally, a stormwater pollution prevention plan (SWPPP) will be necessary, and would include best management practices to reduce erosion,

sedimentation, and contamination that could indirectly impact the sensitive habitats during construction. Standard precautions would be employed by the construction contractor to prevent the accidental release of fuel, oil, lubricant, or other hazardous materials associated with construction activities into potentially jurisdictional features.

Project design intends to avoid impacts to the stream and associated habitats to the greatest extent feasible, however, should potential impacts to these habitats be unavoidable, permitting and additional mitigation may be necessary. Sections 401 and 404 of the Clean Water Act (CWA) afford protection to wetlands and waters of the U.S. from direct disturbance and indirect impacts to water quality. The Regional Water Quality Control Board (RWQCB) may require a CWA Section 401 permit.

Projects that involve working in wetlands and navigable waters of the U.S., including the discharge of dredged or fill material, must first obtain authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA. Should potential impacts to wetlands and waters be determined unavoidable, such permits from the USACE, RWQCB, CDFW, and/or other agencies may be required. **Measure 1** is recommended to reduce impacts to wetlands and waters of the U.S.

Measure 1

- Prior to ground disturbance, a qualified biologist shall identify appropriate buffer zones around the intermittent stream system within the project site to assure avoidance during construction.
- Prior to construction within 50 feet of a buffer zone, a qualified biologist shall demarcate each buffer zone using appropriate materials such as high visibility construction fencing, which will not be removed until the completion of construction activities within 50 feet of the buffer zone.
- Staging areas shall be located away from the buffer zones. Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas.
    - Should unavoidable impacts occur to wetland and waters of the U.S or state, including through direct disturbance or indirect impacts to water quality, the appropriate permits will be acquired and compensatory mitigation consisting of creating or enhancing waters of the U.S. shall be implemented at no less than a 1:1 ratio upon approval by the appropriate agency.

4.2 Nesting Migratory Birds

Migratory birds and their nests are protected from "take" by the Migratory Bird Treaty Act (16 U.SC. 703-711), which makes it unlawful to "…pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess or any part, nest, or egg of any such bird…" (50 CFR 10). Potentially occurring nesting migratory birds (including white-tailed kite, song sparrow, and tri-colored blackbird included in **Table 1** and **Attachment A**) within 500 feet of the project site could be affected if vegetation removal or loud noise-producing activities associated with construction occur during the general nesting season (February 15 through September 15). **Measure 2** is recommended to reduce potential impacts to nesting migratory birds.

Measure 2

- If construction activities (e.g., building, grading, ground disturbance, removal of vegetation) are scheduled to occur during the general nesting season (February 15 - September 15), a preconstruction nesting bird survey shall be conducted by a qualified biologist throughout accessible areas of suitable habitat within 500 feet of proposed construction activity. The survey shall occur no more than 7 days prior to the scheduled onset of construction. If

construction is delayed or halted for more than 7 days, another preconstruction survey for nesting bird species shall be conducted. If no nesting birds are detected during the preconstruction survey, no additional surveys or mitigation measures are required.

- If nesting bird species are observed within 500 feet of construction areas during the survey, appropriate "no construction" buffers shall be established. The size and scale of nesting bird buffers shall be determined by a qualified biologist and shall be dependent upon the species observed and the location of the nest. Buffers shall be established around active nest locations. The nesting bird buffers shall be completely avoided during construction activities. The buffers may be removed when the qualified wildlife biologist confirms that the nest(s) is no longer occupied and all birds have fledged.

4.3 Special-status Species

Based on survey observations and site characteristics, the Property does not contain suitable habitat to support any special-status animal species.

4.4 Wildlife Movement

- The intermittent stream system on the Property and associated riparian vegetation may foster wildlife movement, however, the Proposed Project would include a buffer around the riparian habitat and thus would not significantly impede potential wildlife movement. There would be a less-than-significant impact.

5.0 CONCLUSION

- The Property contains an intermittent stream that flows from east to the southwest but does not contain suitable habitat to support any special-status animal species. Should ground disturbance need to occur in the areas of the Property that contain potential waters of the United States, additional surveys would be necessary to address potentially occurring special-status species (USFWS, 2017). Should impacts to waters of the U.S. be determined unavoidable, permits and compensatory mitigation would be required by the USACE and RWQCB. Additionally, should construction occur during the nesting season (February 15 - September 15), a preconstruction nesting bird survey would be required by the USFWS.

6.0 REFERENCES

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ATTACHMENTS

ATTACHMENT A

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: December 06, 2021
Consultation Code: 08ESMF00-2022-SLI-0518
Event Code: 08ESMF00-2022-E-01533
Project Name: Pit River Tribe FTT

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to

utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2022-SLI-0518
Event Code: Some(08ESMF00-2022-E-01533)
Project Name: Pit River Tribe FTT
Project Type: Guidance
Project Description: FTT
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.832032299999995,-121.92449256435356,14z

Counties: Shasta County, California

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

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

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

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

---

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

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina*	Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/1123

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii*	Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/2891

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/321

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

Crustaceans

NAME	STATUS
Shasta Crayfish *Pacifastacus fortis*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/8284

Critical habitats

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

ATTACHMENT B

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Shasta County Area, California

December 7, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,280 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Shasta County Area, California
Survey Area Data: Version 16, Sep 6, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 8, 2019—Jun 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KID	Kilarc very stony sandy clay loam, 10 to 30 percent slopes	40.9	100.0%
Totals for Area of Interest		**40.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Shasta County Area, California

KID—Kilarc very stony sandy clay loam, 10 to 30 percent slopes

Map Unit Setting

National map unit symbol: hfpy
Elevation: 1,000 to 3,600 feet
Mean annual precipitation: 30 to 65 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 120 to 225 days
Farmland classification: Not prime farmland

Map Unit Composition

Kilarc and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kilarc

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 9 inches: very stony sandy clay loam
H2 - 9 to 22 inches: clay
H3 - 22 to 44 inches: clay loam
H4 - 44 to 48 inches: weathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: More than 80 inches; 44 to 48 inches to paralithic bedrock
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F022BG201CA - Mesic Ash-Influenced Mountains
Hydric soil rating: No

Minor Components

Parrish

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Sites

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Supan

Percent of map unit: 3 percent
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Mountaintop
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Inks

Percent of map unit: 2 percent
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

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APPENDIX D

CULTURAL RESOURCES STUDY (CONFIDENTIAL-BOUND UNDER SEPARATE COVER)