

(DRAFT)
Delineation of Waters of the United States

Panorama Point Extension
Shasta County, CA

October 2006



Prepared for:

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DELINEATION OF WATERS OF THE UNITED STATES
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Introduction and Project Location

As requested, Gallaway Consulting, Inc. performed a delineation of Waters of the U.S. within a 188.6-acre survey area located within Shasta County, California (**Figure 1**). The proposed survey area is located within Section 36, Township 30 North, Range 4 West, of the “Cottonwood, CA” United States Geological Survey (USGS) 7.5-minute quadrangle. Surveys were conducted on September 14, 2006 by biologist Brooks Taylor and botanists Elena Alfieri and Shirley Innecken. The survey involved an examination of botanical resources, soils, hydrological features, and determination of wetland characteristics based on the United States Army Corps of Engineers (COE) Wetlands Delineation Manual (1987).

This report addresses the nature, jurisdictional status, and landscape position of the wetlands on the site; it does not provide information suitable for structural analysis of soils for construction purposes, flood plain delineation, or other purposes not expressly stated. Wetland acreages presented in this report should be considered preliminary, and subject to review and modification by the COE during the wetland delineation verification process.

Site Conditions

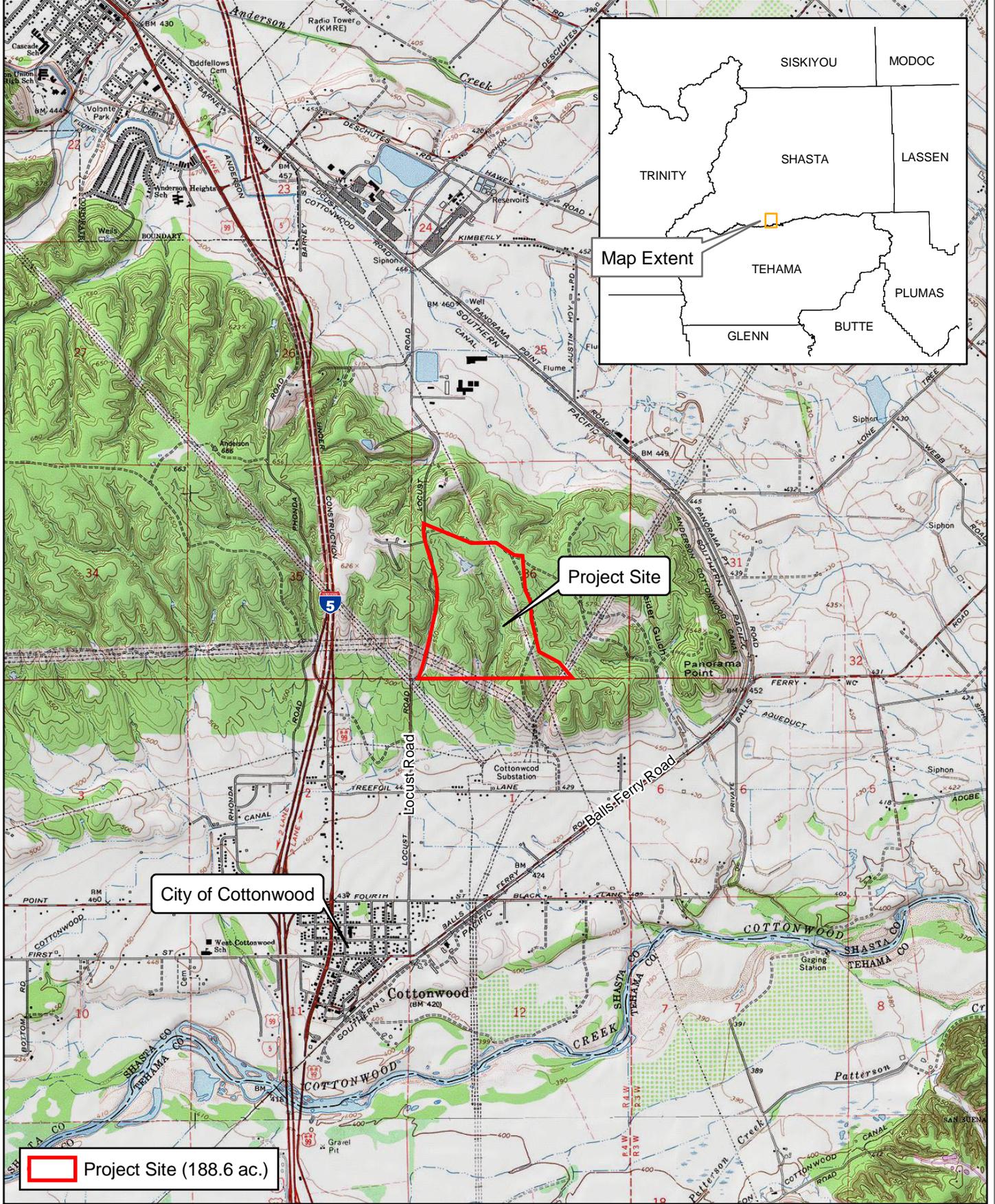
The project site is located within the Cascade Range Foothills Geographic Subdivision of the greater California Floristic Province (Hickman 1993). Topography is composed of sloping terrain with project elevation at approximately 450 to 600 feet above sea level. The site is surrounded by mixed rural development to the south and east and open savannah/woodland to the north and northwest. The habitat is characterized primarily by savannah/oak woodland, which contains annual grasslands and vernal pools. Intermittent and ephemeral drainages are found throughout the project site. A total of six soils map unit descriptions exist within the property. The average annual precipitation is approximately 25 inches and the average temperature ranges from 85° F to 35° F (Weather Underground, Inc 2006).

Survey Methodology

Many of the terms used throughout this report have specific meanings relating to the federal wetland delineation process. Term definitions are based on the COE 1987 delineation manual (Environmental Laboratory 1987). The terms defined below have

Panorama Point Extension

Location



Within Section 36 of
T30N, R4W Shasta County, CA.
Cottonwood USGS 7.5' Quad.
Map Date: Sept. 21, 2006.

0 0.25 0.5 Miles



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Figure 1.

specific meaning relating to the delineation of Waters of the U.S. as prescribed by Section 404 of the Clean Water Act (CWA).

Terminology

Atypical situation (significantly disturbed). In an atypical (significantly disturbed) situation, recent human activities or natural events have created conditions where positive indicators for hydrophytic vegetation, hydric soil, or wetland hydrology are not present or observable.

Ephemeral Stream. An ephemeral stream has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Growing season. The growing season is the portion of the year when soil temperatures are above biologic zero (41° F) as defined by soil taxonomy.

Hydric soil. Soil is hydric that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic (oxygen-depleted) conditions in its upper part (*i.e.*, within the shallow rooting zone of herbaceous plants).

Intermittent Stream. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Jurisdictional wetland. Sites that meet the definition of wetland provided below and that fall under COE regulations pursuant to Section 404 of the CWA are considered jurisdictional wetlands.

Man-induced Wetlands. A man-induced wetland is an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities.

Normal Circumstances. This term refers to the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed.

Other Waters of the United States. Other Waters of the U.S. are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4).

Perennial Stream. A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Plant indicator status categories:

Obligate wetland plants (OBL) – plants that occur almost always (estimated probability 99%) in wetlands under normal conditions, but which may also occur rarely (estimated probability 1%) in non-wetlands.

Facultative wetland plants (FACW) - plants that usually occur (estimated probability 67% to 99%) in wetlands under normal conditions, but also occur (estimated probability 1% to 33%) in non-wetlands.

Facultative plants (FAC) – Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands.

Facultative upland plants (FACU) – Plants that occur sometimes (estimated probability 1% to 33%) in wetlands, but occur more often (estimated probability 67% to 99%) in non-wetlands.

Obligate upland plants (UPL) – Plants that occur rarely (estimated probability 1%) in wetlands, but occur almost always (estimated probability 99%) in non-wetlands under natural conditions.

Ponded. Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

Problem area. Problem areas are those where one or more wetland parameters may be lacking because of normal seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events.

Waters of the United States. This is the encompassing term for areas under federal jurisdiction pursuant to Section 404 of the CWA. Waters of the U.S. are divided into “wetlands” and “Other Waters of the U.S.”

Wetland. Wetlands are defined as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3 [b], 40 CFR 230.3). To be considered under federal jurisdiction, a wetland must support positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology.

Determination of Hydrophytic Vegetation

The presence of hydrophytic vegetation was determined using the methods outlined in the COE 1989 manual (*Federal Interagency Committee for Wetland Delineation 1989*), a method approved by the COE for use in conjunction with the 1987 manual. Under this method, areas are considered to have positive indicators of hydrophytic vegetation if more than 50 percent of the dominant species are OBL, FACW, FAC (Reed 1988). Plant species were identifiable by flowering parts and fruits to the lowest taxonomy possible.

Determination of Hydric Soils

Soil survey information was reviewed for the survey area and representatives from Natural Resources Conservation Service (NRCS) in Chico, California were consulted on the local soil conditions. Information regarding local soil and series descriptions is provided in **Appendix A**.

Determination of Wetland Hydrology

Wetland hydrology was determined to be present if a site supported one or more of the following characteristics:

- Landscape position and surface topography (e.g. position of the site relative to an up-slope water source, location within a distinct wetland drainage pattern, and concave surface topography),
- Inundation or saturation for a long duration either inferred based on field indicators or observed during repeated site visits, and
- Residual evidence of ponding or flooding resulting in field indicators such as scour marks, sediment deposits, algal matting, and drift lines.

The presence of water or saturated soil for approximately 5 to 12.5 percent of the growing season typically creates anaerobic conditions in the soil, and these conditions affect the types of plants that can grow and the types of soils that develop (Environmental Laboratory 1987).

Due to the lack of precipitation events for more than two months, intermittent streams were differentiated from ephemeral streams using bed, bank and scour morphology as well as vegetation presence and absence. Streams that had cobbly stream beds with a distinct bank and sparse vegetation were determined to be intermittent, and streams that were more overgrown with vegetation with a less distinct bank and stream bed were determined to be ephemeral.

Determination of Ordinary High Water Mark

The lateral extent of non-tidal water bodies (i.e., intermittent streams, etc.) were based on the ordinary high water mark (OHWM), which is “the line on the shore established by the

fluctuations of water” (COE 2005). The OHWM was determined based on physical characteristics of the area, including scour, multiple observed flow events (from current and historical aerial photos), shelving, changes in the character of soil, presence of mature vegetation (i.e., trees with a diameter at breast height larger than 20 inches), deposition, and topography. Due to the wide extent of some floodplains, adjacent riparian areas characterized by hydric soils, hydrophytic vegetation, and hydrology may be included within the OHWM of a non-tidal water body.

Jurisdictional Boundary Determination and Acreage Calculation

The wetland-upland boundary was determined based on the presence or inference of positive indicators of all mandatory criteria. The site was traversed on foot to identify wetlands. Standard data sheets (**Appendix B**) were used to describe plants, soils, and hydrological characteristics. Gallaway Consulting, Inc. performed the field delineation, map, and acreage calculations (**Attachment A**). The spatial data obtained during the preparation of this wetland delineation was collected using a Trimble GeoXT Global Positioning System (GPS) Receiver on September 14, 2006. The maximum position dilution of precision (PDOP) during data collection was 7.5. No readings were taken with fewer than 5 satellites. Point data locations were recorded for 25 seconds at a rate of 1 position per second. Area and line data was recorded at a rate of 1 position per second while walking at a slow pace. All GPS data was differentially corrected for maximum accuracy using the nearest National Geodetic Survey’s Continuously Operating Reference Station (CORS).

Results

A total of 1.412 acres of pre-jurisdictional Waters of the U.S. were delineated within the survey area. The types of Waters of the U.S. identified in the survey area are distinguished as riparian habitat, vernal swales, seasonal wetlands, and Other Waters of the U.S., which includes ephemeral drainages, intermittent streams, ponds, and culverts routing flow of these features. A total of 0.062 acres of vernal pools occur on-site (**Table 1**). Additionally, 1.350 acres (17,197.5 linear feet) of Other Waters of the U.S. were delineated on-site, including 0.353 acre of ephemeral drainages (8,977.9 linear feet), 0.452 acres of intermittent drainages (8,140.9 linear feet), 0.004 acres of culverts and 0.541 acre of ponds (**Table 1**). These features are mapped at a 1” to 200” scale and are presented in Attachment A. Waters of the U.S. acreages presented in this report should be considered preliminary, subject to review and modification by the COE during the wetland delineation verification process. The wetlands, and the data of interpretation used to delineate their jurisdictional boundaries, are described below.

Table 1. Jurisdictional wetland totals delineated within the proposed Panorama Point Extension Survey Area, Shasta County, CA.

Label	Type	Average Width (ft.)	Length (ft.)	Area (ft. ²)	Acres
OW01	Ephemeral	1.5	332.6	498.9	0.011
OW02	Intermittent	4	589.5	2358.0	0.054
OW03	Ephemeral	1	255.3	255.3	0.006
OW04	Ephemeral	2	372.8	745.6	0.017
OW05	Ephemeral	1.5	326.3	489.5	0.011
OW06	Intermittent	4.5	489.2	2201.4	0.051
OW07	Intermittent	2.5	3463.2	8658.0	0.199
OW08	Ephemeral	2	273.3	546.6	0.013
OW09	Intermittent	2.5	390.7	976.8	0.022
OW10	Ephemeral	2	324.6	649.1	0.015
OW11	Ephemeral	1	160.5	160.5	0.004
OW12	Ephemeral	3	349.5	1048.5	0.024
OW13	Ephemeral	1.5	151.5	227.3	0.005
OW14	Ephemeral	1.5	127.9	191.9	0.004
OW15	Ephemeral	1.5	486.5	729.7	0.017
OW16	Ephemeral	2.5	573.0	1432.4	0.033
OW17	Ephemeral	1.5	252.9	379.4	0.009
OW18	Ephemeral	2	875.7	1751.5	0.040
OW19	Ephemeral	1.5	144.4	216.5	0.005
OW20	Intermittent	1.5	492.4	738.6	0.017
OW21	Intermittent	2.5	317.2	792.9	0.018
OW22	Ephemeral	1.5	386.6	579.9	0.013
OW23	Ephemeral	1	488.6	488.6	0.011
OW24	Ephemeral	1	345.0	345.0	0.008
OW25	Ephemeral	3	180.4	541.2	0.012
OW26	Intermittent	1	828.5	828.5	0.019
OW27	Ephemeral	1.5	633.1	949.7	0.022
OW28	Ephemeral	1	297.5	297.5	0.007
OW29	Ephemeral	2	805.0	1610.0	0.037
OW30	Intermittent	2	1216.6	2433.2	0.056
OW31	Ephemeral	1.5	469.3	703.9	0.016
OW32	Ephemeral	1.5	365.5	548.3	0.013
OW33	Culvert	3	17.1	51.3	0.001
OW34	Pond	n/a	n/a	23562.7	0.541
OW35	Intermittent	2	353.7	707.3	0.016
OW36	Culvert	1.5	42.2	63.2	0.001
OW37	Culvert	3	19.5	58.4	0.001
	Ephemeral Total =	n/a	8977.9	15386.9	0.353
	Intermittent Total =	n/a	8140.9	19694.6	0.452
	Pond Total =	n/a	n/a	23562.7	0.541
	Culvert Total =	n/a	78.7	172.9	0.004
	Total of All OWOTUS =	n/a	17197.5	58817.0	1.350
WF02	Vernal Pool	n/a	n/a	1112.5	0.026
WF03	Vernal Pool	n/a	n/a	358.7	0.008

Table 1: Continued

Label	Type	Average Width (ft.)	Length (ft.)	Area (ft.²)	Acres
WF04	Vernal Pool	n/a	n/a	85.5	0.002
WF05	Vernal Pool	n/a	n/a	Label	0.002
WF06	Vernal Pool	n/a	n/a	111.4	0.003
WF07	Vernal Pool	n/a	n/a	240.3	0.006
WF08	Vernal Pool	n/a	n/a	153.0	0.004
WF09	Vernal Pool	n/a	n/a	539.7	0.012
	Vernal Pool Total =	n/a	n/a	2690.6	0.062
	Total of All Wetland =	n/a	n/a	2690.6	0.062
	Total of All Features =	n/a	n/a	61507.7	1.412

Jurisdictional Features

Vernal Pools

Vernal features allow water to pond for a long enough period of time to support hydrophytic vegetation and hydric soils. Vernal pools are defined by the positive indication of three wetland parameters: hydrophytic vegetation specific to vernal pools, hydric soils, and hydrology (*i.e.*, ponding). All three parameters must be present to satisfy the vernal pool/swale definition.

Eight vernal pools were delineated within the survey area totaling 0.062 acres (**Attachment A**). Vernal pools supported positive indicators for all three wetland parameters. Vegetation was mostly dominated by *Plagiobothrys stipitatus* var. *mairanthus* (OBL), *Deschampsia danthoniodes* (FACW), *Psilocarphus brevisimus* (OBL), and other unidentifiable forbs. The pools were not inundated and soils were not saturated, but the vegetation present was hydric and there was clear evidence of drainage patterns in the wetland and oxidized root channels in the soil. Wetland boundaries were distinguished from upland boundaries by the presence of obligate plant species and the presence of mottling, shallow hardpan layer, and obvious reduced conditions within the soil layers. Field delineation data forms for the vernal pool features are provided in **Appendix B**.

Other Waters of the United States

Other Waters of the U.S. are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (*i.e.*, hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4). The above definition was applied while delineating all Other Waters of the U.S. on-site. Drainages exhibited an ordinary high water mark and contained bed, bank, and/or scour morphology.

A total of 1.350 acre (17,197.5 linear feet) of Other Waters of the U.S. were delineated on-site, including 0.353 acre of ephemeral drainages (8,977.9 linear feet), 0.452 acres of

intermittent drainages (8,140.9 linear feet), 0.004 acres of culverts, and 0.541 acre of ponds.

Ephemeral and Intermittent Streams

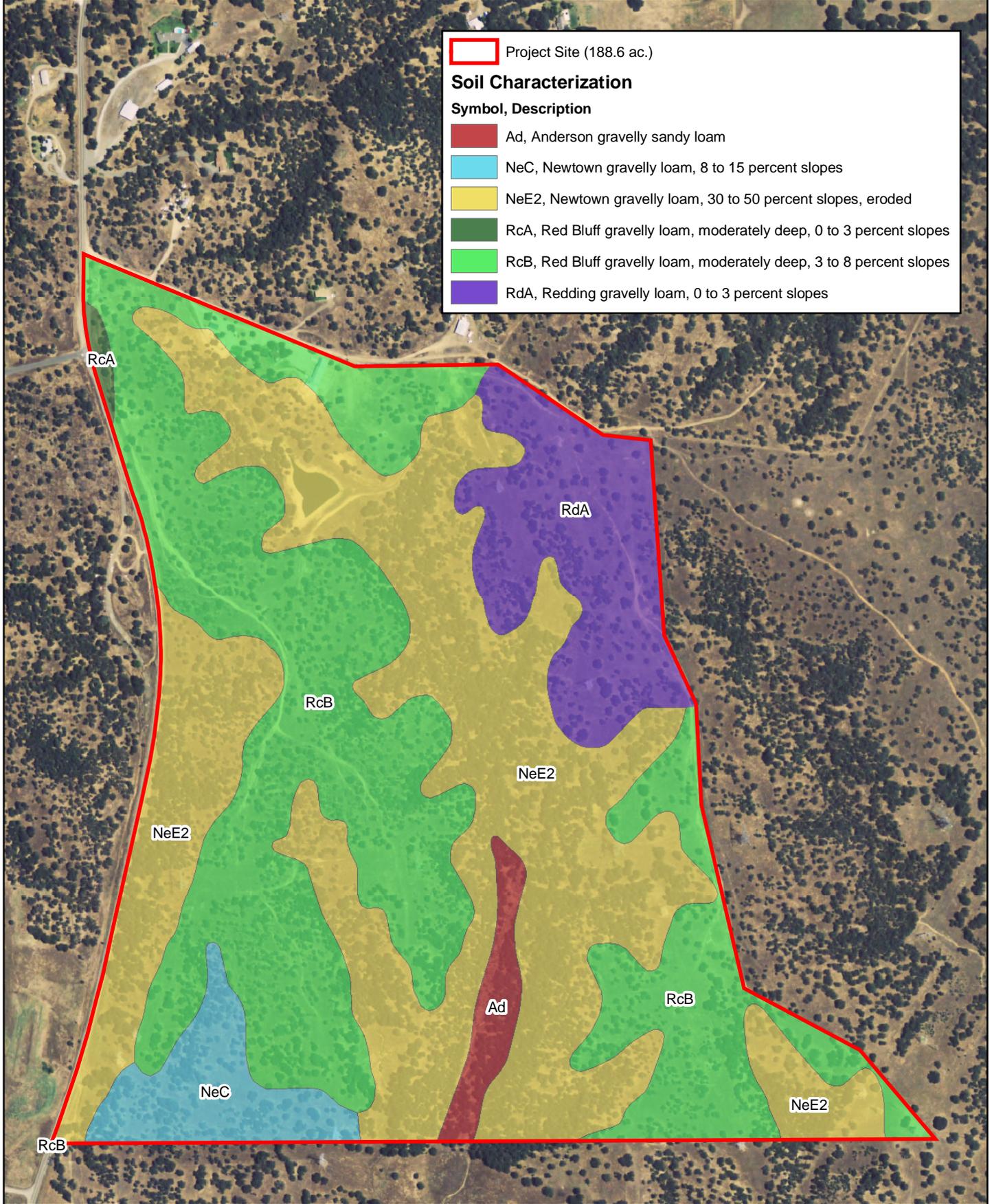
An ephemeral stream has flowing water for a short duration after precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source of water for the stream and runoff from rainfall is the primary source of water for stream flow. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

All streams and drainages were defined by obvious channels that were characterized by a distinct bank edge, contained obvious streambed (*i.e.*, river rock and sediment deposits), and contained indicators of the direction of flow (*i.e.*, folded vegetation and observable hydrology). Ephemeral and intermittent determinations were made on July 7, 2006 following a 5-week period of no rainfall; therefore, determinations were based on the bed composition and topography. All intermittent streams had an obvious cobbly bed and contained areas of isolated ponding and somewhat level terrain. Ephemeral streams lacked a cobbly bed and were located in steeper terrain, feeding into the intermittent drainages.

Soils

Based on information contained within the U.S. Department of Agriculture (USDA) Soil Conservation Service and Forest Service 1974 *Soil Survey of the Shasta County Area, California*, six soils map unit descriptions exist within the survey area (**Figure 2**). The majority of the site consists of the non-hydric soil types listed and described in **Table 2**.

When obligate plants and standing water were present, hydric soils were assumed. In areas with questionable upland/wetland distinction, soil pit samples were observed to determine the presence or absence of hydric soil indicators. Wetland boundaries were distinguished from upland boundaries by the presence of concretions, high organic streaking within the sandy soil layers, low-chroma color, reducing conditions, and/or oxidized root channels within the upper 12 inches of soil. Soils map unit descriptions are presented in **Appendix A** and wetland data sheets are presented in **Appendix B**. We observed saturated soils at depths ranging from 0-12 inches.



 Project Site (188.6 ac.)

Soil Characterization

Symbol, Description

-  Ad, Anderson gravelly sandy loam
-  NeC, Newtown gravelly loam, 8 to 15 percent slopes
-  NeE2, Newtown gravelly loam, 30 to 50 percent slopes, eroded
-  RcA, Red Bluff gravelly loam, moderately deep, 0 to 3 percent slopes
-  RcB, Red Bluff gravelly loam, moderately deep, 3 to 8 percent slopes
-  RdA, Redding gravelly loam, 0 to 3 percent slopes



Soil Characterization and
Aerial provided by USDA
Map Date: Sept. 29, 2006.



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Figure 2.

Table 2. Summary of soils map unit descriptions occurring within the Panorama Point Extension Survey Area, Shasta County, CA (USDA 1974).

Map Symbol	Soils Map Unit Description	Hydric Soil	Hydric Inclusions Present	Hydric Criteria*	Hydric Landforms
Ad	Anderson gravelly sandy loam	N	Y	4	Floodplains
NeC	Newtown gravelly loam, 8-15% slopes	N	N	n/a	n/a
NeE2	Newtown gravelly loam, 30-50% slopes	N	N	n/a	n/a
RcA	Red Bluff gravelly loam, moderately deep, 0-3% slopes	N	Y	3	Depression
RcB	Red Bluff gravelly loam, moderately deep, 3-8% slopes	N	Y	3	Depression
RdA	Redding gravelly loam, 0-3% slopes	N	Y	3	Depression

* Hydric Criteria Code:

3 – Soils that are frequently ponded for long or very long duration during the growing season.

4 – Soils that are frequently flooded for long or very long duration during the growing season.

Vegetation

The survey area is composed entirely of foothill grassland habitat with inclusions of wetlands and cobble drainageways. Wetland vegetation was present within intermittent drainages and vernal pools. Hydrophytic vegetation within vernal pools included *Plagiobothrys stipitatus* var. *mairanthus* (OBL), *Deschampsia danthoniodes* (FACW), *Psilocarphus brevisimus* (OBL). Upland vegetation within the survey area includes: *Centaurea solstitialis*, *Bromus hordeacous*, *Avena barbata*, *Taeniatherum caput-medusae*, and *Pinus sabiniana*, *Quercus douglasii*. All vegetation was identified by Elena Alfieri, and Shirley Innecken, botanists, at the time of survey or immediately following field surveys using the Jepson Manual Higher Plants of California (Hickman 1993).

Hydrology

Hydrology on-site consists of two unnamed intermittent drainages that flow north to south throughout the extent of the survey area as well as several smaller ephemeral and intermittent streams that form confluences with the main drainages. These drainages continue flowing south until they drain into the Anderson-Cottonwood Irrigation District Canal. There is one man-made pond which collects rain water in the northern portion of the survey area. There is no outflow from the pond.

Copies of field data sheets are presented in **Appendix B**. For further explanation of field notes please contact Jody Gallaway at (530) 343-8327.

Site Photos



OW34 Looking Northwest



Vernal Pool



Moundswales and Vernal Pool



Vernal Pool

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- Environmental Laboratory. 1987. U.S. Army Corps of Engineers wetlands delineation manual. (Technical Report Y-87-1). U.S. Army Waterways Experiment Station, Vicksburg, MS.
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Appendix A

**Pertinent Soil Information for the Panorama Point
Extension Survey Area in Shasta County, CA
(Available Hard Copy Only)**

Appendix B
Field Data Forms for the Panorama Point Extension
Survey Area in Shasta County, CA
(Available Hard Copy Only)

Attachment A
**Field Delineation Map for the Panorama Point
Extension Survey Area in Shasta County, CA**
(Available Hard Copy Only)

Attachment B
Electronic Copy of Document on CD