INITIAL STUDY AND
MITIGATED NEGATIVE DECLARATION

BH FARMING LLC
NO-NAME CREEK DAM PROJECT

Prepared for

BH Farming LLC

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

JANUARY 2012

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INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

1.0 INTRODUCTION

1.1 BACKGROUND

Project Title: No-Name Creek Dam Project
Application to Appropriate Water

Applicant: BH Farming LLC
Attn: Charles Crain
10660 Bryne Avenue
Los Molinos, California 96055

Draft General Plan Designation: Valley Floor Agriculture

Zoning: Exclusive Agriculture

1.2 INTRODUCTION

BH Farming LLC is the owner of a private walnut and almond farm located approximately eight miles southwest of the town of Corning off of Interstate-5 in Tehama County, California. The general site location is shown on Figure 1. The proposed project includes the construction of a 2,000 acre-foot (af) reservoir on an unnamed intermittent stream (No-Name Creek) tributary to Burch Creek which is tributary to the Sacramento River. BH Farming filed Application 31771 with the Division of Water Rights requesting a combined diversion to storage of up to 2,000 acre-feet (af) annually from both No-Name Creek and Burch Creek. The proposed season of diversion is from November 1 of each year through April 30 of the succeeding year. The stored water will be used for irrigation, stockwatering, frost protection, recreation, and wildlife enhancement.

The farm is the proposed place of use for the water rights requested with Application 31771. Water will either be diverted to storage at the new reservoir's dam on No-Name Creek or pumped from Burch Creek during high-flow events to offstream storage in the reservoir. During certain periods in the spring and fall, when there is flow in Burch Creek to which riparian rights would attach, riparian water will be directly diverted and applied to the orchards. Application of riparian water to the orchards will occur within 30 days of diversion.

The reservoir site consists of 128 acres and will store approximately 2,000 af of water, of which approximately 500 af will be obtained from No-Name Creek and approximately 1,500 af will be pumped from Burch Creek. The proposed project is located within Sections 5 and 6, Township 23 North, Range 4 West, Mount Diablo Base and Meridian, in the Henleyville U.S. Geological Survey (USGS) 7.5 minute quadrangle, as shown on Figure 2. The water will be used for irrigation and frost protection. Recreation and wildlife habitat enhancement will also be purposes of use of water stored in the reservoir.

1.3 PROJECT DESCRIPTION

BH Farming grows walnuts and almonds. The proposed No-Name Creek Dam Project would supply an additional source of water to better irrigate and protect against frost for the growing walnut and almond farm, replacing dependence on groundwater pumping from wells. This will result in lower fuel use, recovery of groundwater supplies, enhancement of wetland habitat, and a secure source of agricultural and fire-suppression water.

Major components of the project consist of:

- Construction of a 45-foot-high dam along with a spillway and outlet works.
- Development of a reservoir with a storage capacity of approximately 2,000 af.
- Construction of a diversion structure on Burch Creek and placement of a pump works to divert high flows to the reservoir. During the spring and fall, when Burch Creek is flowing and irrigation is actively occurring within the place of use, riparian water may be diverted for use.
- Construction of a pump station and pipeline to transfer water from the sump to the reservoir area.
- Construction of a water-supply pipeline to connect stored water to the existing orchard delivery system.
- Planting of riparian and upland species to improve and increase wildlife habitat.
- Development of buffer strips between orchard blocks as a way to use tailwater and increase wildlife habitat.

The project is located in the Burch Creek Watershed (see Figure 3). The place of use is defined as the BH Farming ownership in the area. This is identified by the parcels shown in Table 1 and on Figure 4.

The place of use is generally fully developed to orchards. Areas not developed to walnut orchards are developed to improve dry land pasture. The improved dry land pasture is disked and drilled with a forage seed mix annually to improve the feed for cattle.

Any additional development to orchards will be limited to the gentle sloping terrain near the proposed reservoir project. No significant environmental effects are likely from the development of additional orchard area due to the limited size of the acres that could be developed. A search of the CNDDB was conducted for the project area (see the Biological Characterization Report in Appendix B), and no species of concern were identified in the upland area that could be converted to orchards. One isolated occurrence of Valley Needle Grass grassland was identified east of the project site off of the Crain property. Slopes that may be converted to orchard must be gently sloping with grade no less than 15 percent. Erosion potential of soils in the area is moderate to low. Significant grading is not required for orchard construction, and no permit would be required. Generally, soils are ripped, irrigation lines installed, and the site disked and planted on a natural contour. Preservation of site soils is required for agricultural sustainability, and new orchards are accompanied by cover crops for the first 5 to 8 years to minimize soil loss. Vegetative buffers and cover cropping are used to protect watercourses from sediment that may be moved by storm events.

Table 1 BH FARMING OWNERSHIP			
APN	**Owner**	**Mailing Address**	**Acres**
061-330-05	BH Farming Inc.	PO Box 38, Tehama, CA 96090	640.00
061-330-09	BH Farming Inc.	PO Box 38, Tehama, CA 96090	320.00
061-330-11	BH Farming Inc.	PO Box 38, Tehama, CA 96090	640.00
061-330-19	BH Farming Inc.	PO Box 38, Tehama, CA 96090	639.25
061-340-22	CAM Land Co.	10660 Bryne Avenue, Los Molinos, CA 96055	162.67
061-340-24	CAM Land Co.	10660 Bryne Avenue, Los Molinos, CA 96055	170.00
085-090-02	BH Farming Inc.	PO Box 38, Tehama, CA 96090	323.66
085-090-03	BH Farming Inc.	PO Box 38, Tehama, CA 96090	504.38
085-090-10	BH Farming Inc.	PO Box 38, Tehama, CA 96090	81.50
085-090-16	BH Farming Inc.	PO Box 38, Tehama, CA 96090	193.73
085-090-18	BH Farming Inc.	PO Box 38, Tehama, CA 96090	8.27
085-090-19	BH Farming Inc.	PO Box 38, Tehama, CA 96090	0.40
085-090-21	BH Farming Inc.	PO Box 38, Tehama, CA 96090	61.40
085-090-23	BH Farming Inc.	PO Box 38, Tehama, CA 96090	145.46
085-090-25	BH Farming Inc.	PO Box 38, Tehama, CA 96090	132.64

The sources of water for storage in the reservoir will be storm/winter flows from No-Name Creek, which is approximately one mile in length, located within the project area, and from peak winter storm flows pumped from Burch Creek. This project includes two points of diversion (POD). POD 1 will be the onstream diversion to storage from No-Name Creek. POD 2 will be the diversion to offstream storage from Burch Creek.

Dam facilities will include a spillway and outlet works, resulting in a 2,000-af-capacity reservoir. The inundation area of the watershed controlled by the dam drains approximately 800 acres. Average runoff for the proposed diversion season at POD 1 was calculated to be approximately 528 af. Average runoff for Burch Creek for the season of diversion at POD 2 was calculated to be approximately 11,190 af (see the Water Availability Analysis (WAA) in Appendix C).

As proposed, the project design incorporates components that will improve and increase wildlife habitat within the project area. Among these features are plantings of native species within the storage reservoir's riparian zone. The reservoir inundation area currently contains non-native annual grasses. The project site is located adjacent to the floodplain of Burch Creek. Wildlife corridors will develop between the natural floodplain of Burch Creek and the reservoir with the help of riparian plantings. The locations of plantings will be largely based upon the estimated inundation period at various reservoir elevations in order to maximize water availability. Wildlife Conservation Board funding would be used by the Tehama County Resource Conservation District for three years of biological monitoring to assess the effectiveness of the proposed habitat improvement project. The project area is adjacent to the applicant's orchard plantings. Because the land is currently used for cattle grazing and limited wildlife habitat, no use conflicts exist. Once established, the reservoir plantings are expected to improve habitat conditions for deer, small mammals, and resident and migratory bird species.

1.4 PROPOSED DIVERSION

The proposed location of POD 1 is on No-Name Creek. The proposed location of POD 2 is on Burch Creek, approximately 11 miles upstream from the upper limit of anadromy and 22 miles from the confluence of Burch Creek and the Sacramento River. The confluence of No-

Name Creek with Burch Creek is approximately 1,000 feet downstream of POD 2. Burch Creek is a seasonal stream. Flows do not typically begin until late November or early December when storms saturate the ground and create flow within the channel. Flows within Burch Creek normally cease by early April or May for the remainder of the water year. During the rainy season, flows in Burch Creek are flashy, ranging from zero (0) cubic feet per second (cfs) to more than 800 cfs.

The pumps planned for use at POD 2 can operate economically only when sufficient water is available for several consecutive days. The water will be diverted into a nearby holding basin and pumped from the basin into the new reservoir on No-Name Creek. The pumps will not operate at any other times as the cost of pumping outweighs the benefit of capturing only marginal volumes of water. Flows that exceed the capacity of the pumps will remain in Burch Creek. Pumps will be sized to divert up to 40 cfs; all flows greater than 40 cfs will be bypassed.

The lower eight miles of Burch Creek are designated as Critical Habitat for Central Valley steelhead (FR 70:52627) and spring-run Chinook salmon (FR 70:52590). Tributaries such as Burch Creek are also known to provide neonatal refuge for anadromous salmonids native to the Sacramento River (Maslin et al. 1999). This habitat is important when conditions in the Sacramento River are unfavorable due to high velocity or turbidity caused by releases from upstream dams for flood control or from storm events. The upper limit of anadromy in Burch Creek is near the railroad crossing at Kirkwood Road. Above this point, the aquatic system includes mainly warm-water species that tend to be more tolerant of water quality conditions, including higher temperatures and lower dissolved oxygen levels.

The majority of the water in Burch Creek at the point of anadromy enters the channel below POD 2 and the confluence of No-Name Creek and Burch Creek and will not be affected by the project. Several tributaries to Burch Creek contribute flow below the diversions, including (proceeding downstream) Parker Creek, Houghton Creek, Brannin Creek, Rice Creek, and Sour Grass Creek (shown on Figure 5). The proposed 2,000-af diversion from both POD 1 and POD 2 accounts for less than 4 percent of the water in Burch Creek at the upper limit of anadromy as previously defined. During wet years, this percentage may drop to as low as 1 percent (see Table 2, page 7).

1.5 REGULATORY HISTORY

BH Farming submitted Application No. 31771 in March 2009. The State Water Resources Control Board (State Water Board) entered into a Memorandum of Understanding with BH Farming and VESTRA to conduct a Water Availability Analysis (WAA) and CEQA documentation in January 2010. The Preliminary WAA Work Plan was approved by State Water Board staff via email on March 25, 2010. The WAA and Initial Study were submitted in July 2010. State Water Board staff comments were received on the WAA/Initial Study on October 18, 2010, and the WAA was revised and resubmitted in November 2010.

Additional correspondence was received from State Water Board staff and California Department of Fish and Game (CDFG) staff. State Water Board staff requested that BH Farming provide additional documentation to address the proposed unspecified bypass request in the permit allocation. BH Farming agreed to provide the following:

- Detailed description of the flashiness of the system, including daily flow diagrams
- Detailed description of habitat along the stream channel
- Photographs of Burch Creek at key locations
- Detailed description of proposed bypass flow at POD 2
- Discussion of bypass flow measurement alternatives

BH Farming also agreed to reduce the proposed maximum rate of diversion to offstream storage at POD 2 from 60 cfs (as originally requested in Application No. 31771) to 40 cfs to provide a greater upper-end daily bypass. Additional information on responses to previous comments is included in Appendix A.

1.6 FLOW INFORMATION

Burch Creek receives minor flow from snowmelt. The flow in the creek is dominated by peak storm events, resulting in intense variability. Water normally flows in the channel from late November to early May. During an average year, flows in Burch Creek vary between no flow during dry periods (which may occur intermittently during the winter) to greater than 350 cfs following storm events. In wet years, average daily flows can exceed 800 cfs.

For the purpose of the WAA and for the daily flow simulations presented herein for Burch Creek, the area-ratio method was used based on data from Elder Creek (years of record 1949-2009), as discussed in the WAA. Calculated Burch Creek flows were compared with the actual flow measurements at the proposed POD 2 taken by BH Farming owners over the last 8 years, and the results are comparable, especially during January, February, and March.

Because flows in Burch Creek are directly correlated to precipitation events, flows are variable by year and month. The west-side tributaries similar to Burch Creek have immediate response to storms; significant daily variation in flow; wide, braided channels; limited riparian vegetation; and large volumes of bedload movement.

State Water Board staff requested BH Farming follow the *Policy for Maintenance of In-Stream Flows in Northern California Streams* (Policy), which recommends a bypass flow equal to or greater than the median February flow on Class II coastal streams above the upper limit of anadromy. It was later determined that the Policy does not apply to Burch Creek because it is a seasonal inland Class II stream, and the proposed diversion is located approximately 11 miles above the upper limit of anadromy. Because of the Policy's emphasis on median flow, the following analysis addresses median flow variables relative to a bypass calculation.

Prior to evaluating median flows in Burch Creek, it is important to note that Burch Creek is a seasonal stream that flows primarily during the rainy season. Stream flow commences in the late fall in response to the first major precipitation event and generally continues into May. The channel is usually dry between June and November, and it is not unusual for a portion of the channel to go dry between December and May, depending on rainfall.

To illustrate the monthly flow variability in Burch Creek, monthly median flows during the proposed diversion season are shown on Figure 6. These data are based on estimated daily flows for Burch Creek derived using the area-ratio method and daily Elder Creek flow data collected between 1948 and 2009. As shown, annual February median flows range between less than 1 cfs and 175 cfs (see Figure 7), with a median of approximately 20 cfs; and annual

November median flows range between 0.1 cfs and 6.4 cfs, with a median of approximately 0.6 cfs. For comparison, February median flows ranged between 9 cfs during the 10-year period between 1985 and 1994) and 33 cfs during the 10-year period between 1991 and 2000.

To address the annual, monthly, and daily flow variability observed in Burch Creek, a proposed bypass should consider both low- and high-flow conditions. As mentioned, low- and no-flow conditions are common during the first portion of the proposed diversion season. High-flow conditions, often increasing by several orders of magnitude over a 24-hour period, are common during the second portion of the proposed diversion season. It is important to maintain both of these conditions when establishing bypass flows.

The estimated average monthly bypass in Burch Creek for each year is also presented in Table 2. As shown in the table, the average monthly bypass flow varies significantly with the distribution of precipitation and storm events; however, significant bypass flows in excess of 75 percent of the total flows are provided.

1.7 PROPOSED BYPASS FLOW

Because of the flashy nature of Burch Creek flows, BH Farming proposes to divert from POD 2 only during the peak runoff season from November to April, capturing a small percentage of the peaking storm events. BH Farming proposes a passive bypass flow at POD 2 of 1 cfs. To maintain the low- and high-flow conditions characteristic of Burch Creek, BH Farming proposes to establish a minimum bypass flow and an upper diversion limit that achieves an average daily bypass of at least 10 cfs at POD 2 during the proposed diversion season and normal rainfall year. As shown in Table 2, a minimum bypass of 1 cfs and a maximum diversion to offstream storage rate of 40 cfs achieve this goal. To monitor compliance with this condition, the proposed diversion structure at POD 2 will be designed with a maximum capacity of 40 cfs, and, whenever water is being diverted, 1 cfs will be bypassed through passive design in the diversion structure.

Burch Creek flows, diversion, and bypass results (assuming a minimum bypass of 1 cfs and upper diversion limit of 40 cfs), based on estimated daily flows for Burch Creek derived using the area-ratio method and daily Elder Creek flow data for three average (1970, 1981, and 1992), one wet (1995) and one dry (2007) years are summarized in Table 2. As shown, the average daily bypass during the proposed diversion season in years of average precipitation varies between 10 cfs (1981) and 24 cfs (1970). In contrast, the average daily bypass during the proposed diversion season in the dry and wet years varies between 2 cfs (2007) and 52 cfs (1995).

Average monthly bypass flows in Burch Creek at POD 2 are included in Table 2. In a normal year, 75 percent of the total flow at POD 2 will be bypassed. In most years, the reservoir will be filled in early February.

The minimum bypass flows at POD 2 will be provided either through the use of a passive flow system, such as an appropriately-sized bypass pipe remaining in the channel, or will be bypassed out of a pump intake system. The actual diversion structure has not yet been designed; however, it is assumed the structure will divert the Burch Creek flow into a cistern for pumping. The diversion structure will allow for the passage of all peak flows over 40 cfs and a minimum bypass of 1 cfs. The proposed dam structure will impound the surface flow of the No Name Creek drainage (POD 1). No Name Creek is an ephemeral swale that flows only during significant

storm events. No bypass flow is proposed for POD 1. The contribution of No Name Creek to Burch Creek was included in the flow calculations and bypass developed for POD 2, Burch Creek.

As outlined in the WAA and in Table 2, the proposed total 2,000-af diversion from the Burch Creek watershed from both PODs accounts for less than an average of 4 percent of the water in Burch Creek at the upper limit of anadromy. This percentage varies annually with the intensity of precipitation and storm events.

Table 2
BURCH CREEK MONTHLY FLOW SUMMARY FOR POD 2

1970 (average year, annual precipitation = 22.13 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**	**% POD 2**	**% POA**
Red Bluff Precipitation	monthly (inches)	0.62	6.5	8.4	1.53	2.32	0.07	3.2		
Unimpaired Burch Creek Flow	monthly avg (cfs)[1]	1	28	142	33	31	8	41		
Proposed Diversion POD 2	monthly avg (cfs)[2]	0	15	27 [4]	26	23	6	16		
Total Estimated Bypass	monthly avg (cfs)[3]	1	13	115	7	8	2	**24**	**14**	**2.6**
1981 (average year, annual precipitation = 20.86 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	0.42	2.62	5.48	1.87	4.87	1.71	2.8		
Unimpaired Burch Creek Flow	monthly avg (cfs)[1]	1	12	48	28	26	13	21		
Proposed Diversion POD 2	monthly avg (cfs)[2]	0	5	12	19	19 [4]	11	11		
Total Estimated Bypass	monthly avg (cfs)[3]	1	7	36	9	7	2	**10**	**27**	**5.0**
1992 (average year, annual precipitation = 21.35 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	0.7	3.9	2.8	7.8	3.4	1.2	3.3		
Unimpaired Burch Creek Flow	monthly avg (cfs)[1]	1	3	6	55	53	23	24		
Proposed Diversion POD 2	monthly avg (cfs)[2]	0	2	5	23 [4]	29	20	13		
Total Estimated Bypass	monthly avg (cfs)[3]	1	1	2	32	24	3	**11**	**23**	**4.3**
1995 (wet year, annual precipitation = 45.90 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	5.0	4.2	21.5	1	10.2	2.1	7.3		
Unimpaired Burch Creek Flow	monthly avg (cfs)[1]	1	3	193	58	142	40	73		
Proposed Diversion POD 2	monthly avg (cfs)[2]	0	2	32 [4]	29	33	29	21		
Total Estimated Bypass	monthly avg (cfs)[3]	1	1	160	29	109	11	**52**	**8**	**1.5**
2007 (dry year, annual precipitation = 13.95 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	0.4	2.8	7	2.1	0.1	0.1	2.1		
Unimpaired Burch Creek Flow	monthly avg (cfs)[1]	2	7	3	20	11	4	8		
Proposed Diversion POD 2	monthly avg (cfs)[2]	1	5	2	13	9	3 [4]	6		
Total Estimated Bypass	monthly avg (cfs)[3]	1	2	1	7	2	1	**2**	**20**	**13**

Notes:
[1] Monthly unimpaired flow volume in Burch Creek expressed in cubic feet divided by seconds per month
[2] Proposed monthly diversion volume from Burch Creek expressed in cubic feet divided by seconds per month
[3] Monthly bypass volume around proposed diversion expressed in cubic feet divided by seconds per month, estimated by taking volume below 1 cfs and above 40 cfs and total flow of 1,500 a-ft are removed
[4] Once the 2,000 acre-feet diversion is realized (determined here by cumulative estimation of average a-ft/day x days), no additional water will be diverted to storage and the remaining flows are bypassed; this generally occurs in February of an average year.

Assumptions:
Daily Burch Creek flows estimated using area-ratio method and Elder Creek watershed as baseline
40 cfs maximum diversion capacity
System will be designed to bypass a minimum of 1 cfs when water is being diverted from Burch Creek

1.8 PROJECT BACKGROUND AND ENVIRONMENTAL SETTING

1.8.1 Vegetation

The vegetation communities found in the project area are classified primarily as annual grasslands. An element of agricultural influence is created by irrigation and farming activities associated with adjacent walnut and almond orchards. A riparian community is present near the project area, concentrated on the banks of Burch Creek. For the purposes of this environmental analysis, the vegetation communities were identified using the CALVEG database (U.S. Forest Service) and the California Natural Diversity Database (CNDDB) and are described by the standards in the *Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995).

The two vegetation types identified using the CALVEG database are California annual grasses and forbs and orchard agriculture. Annual grasslands are the most dominant vegetation community occurring within the project area. Agriculture land in the project area consists of almond and walnut orchards. In addition, the CNDDB identified valley needlegrass grassland as occurring along the southern bank of Burch Creek, and reconnaissance-level field surveys identified the riparian area along Burch Creek as Fremont cottonwood series. These vegetation communities are described below and shown on Figure 8.

Annual Grasses and Forbs
Annual grassland habitat occurs across most of California, especially in the lower elevation foothills, much like the area surrounding the project site. This habitat has a moderate to dense herbaceous layer composed mostly of annual grasses and forbs. Common species of northern California foothill grasslands include: Cheatgrass (*Bromus tectorum*), ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), and soft chess (*Bromus hordeaceus*).

These annual grasslands are generally made up of introduced annual grasses and both native and introduced forbs. They exist in elevations below blue oak (*Quercus douglasii*) woodlands, where soil conditions do not favor hardwood growth, or as openings in blue oak woodlands.

Valley Needlegrass Grassland (as defined by Holland, 1986)
Valley needlegrass grassland (most likely nodding needlegrass (*Nasella cernua*) series or purple needlegrass (*Nasella pulchra*) series as defined by Sawyer and Keeler-Wolf, 1995) has become rare due to the encroachment of non-native annual grasses and agricultural conversion. As shown on Figure 8, the CNDDB has a record of a small area of this grassland approximately ½ mile away from the study area. The grassland will not be impacted by project activities.

Orchard Agriculture
Cropland within the place of use on BH Farming property includes walnut and almond orchards. These orchards provide habitat and forage for numerous wildlife species including, but not limited to, songbirds, reptiles, amphibians, raptors, and an array of mammals. In terms of forage, orchards are good for most of these wildlife species although, as a general rule, too much human activity occurs within the orchards coinciding with nut production for favorable nesting habitat to occur (UCANR, 2001).

Fremont Cottonwood
The Fremont cottonwood series riparian zone can occur in areas along agricultural ditches and drainages but is confined to Burch Creek within the study area. The riparian corridor is

composed of winter deciduous trees and shrubs including, but not limited to, cottonwoods (*Populus* spp.) and willows (*Salix* spp.). The understory includes grasses, sedges, rushes (*Juncus* spp.), and numerous other woody plants including, but not limited to, wild grape (*Vitis californica*), wild rose (*Rosa californica*), Himalayan blackberry (*Rubus armeniacus*), and poison oak (*Toxicodendron diversilobum*). Blue elderberry shrubs (*Sambucus mexicana*) occur in the Burch Creek riparian corridor below the project area. These shrubs are relatively abundant throughout the riparian area along Burch Creek and potentially provide habitat for the federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*); however, no elderberry shrubs occur within the project area.

1.8.2 Soils

As defined in the Tehama County Soil Survey, the project area includes 11 different soil types as shown on Figure 9. These include:

Altamont Clay, 3 to 10 Percent Slopes
The Altamont series consists of deep, well-drained soils that formed in material weathered from fine-grained sandstone and shale. These soils are on gently sloping to very steep uplands.

Arbuckle Gravelly Loam, Clayey Substratum
This soil is found along narrow drainageways in low foothills. It is channeled by meandering, intermittent streams and usually adjoins the sloping to steep foothills through which the streams flow.

Corning Gravelly Loam, 3 to 8 Percent Slopes
This soil type has an uneven surface because of small drainage ways that cut through many of the areas. Most of the short drainageways are cut by gullies, which generally can be crossed with equipment used for cultivation. Sheet erosion is generally slight to moderate.

Cortina Complex
The Cortina series consists of very deep, somewhat excessively drained soils on alluvial fans and floodplains. These soils formed in gravelly alluvium from mixed rock sources. Slope ranges from 0 to 15 percent.

Cortina Gravelly Fine Sandy Loam
This deep soil, derived from metamorphic and sedimentary rock, occurs on level to gently sloping summits and is somewhat excessively drained.

Maywood Loam, 0 to 3 Percent Slopes
The Maywood series consists of deep, well-drained soils formed on floodplains. These soils formed in alluvium derived from mixed-rock sources. Slope ranges from 0 to 5 percent.

Nacimiento Silty Clay Loam, 10 to 30 Percent Slopes
Moderately sloping to strongly sloping, found on the low foothills. The surface of the soil is smooth and well drained. Runoff is medium, and permeability is slow. The available water-holding capacity and fertility are moderate. Erosion hazard is moderate.

Nacimiento-Newville Complex, 10 to 30 Percent Slopes
This soil type consists of Nacimiento silty clay loam, 10 to 30 percent slopes, and Newville gravelly loam, 10 to 30 percent slopes.

Nacimiento-Altamont Complex, 3 to 10 Percent Slopes
This soil type consists of Nacimiento silty clay loam, 3 to 10 percent slopes, and Altamont clay, terrace, 3 to 10 percent slopes.

Newville Gravelly Loam, 3 to 10 Percent Slopes
This soil is less steep. Runoff is slow to medium. The erosion hazard is slight to moderate.

Riverwash
Riverwash is composed of gravelly alluvium occurring in drainages, typically on relatively flat ground with excessive draining capabilities; however, this soil type is often inundated with in-channel water.

1.8.3 Geology

The project area is located within the Great Valley geomorphic province. The predominant geologic unit in this area is the Upper Pliocene Nonmarine, which characteristically contains formed, rounded hills with moderate relief. It is composed of fluvial sedimentary deposits of semi-consolidated pale green, gray, and tan sands; tuffaceous sands; silts; and clays with minor discontinuous gravel lenses and lenses of pebble and cobble conglomerates.

The Great Valley Province is a sedimentary basin approximately 400 miles long by 50 miles wide, located throughout the central portion of California. In the watershed, the province is characterized by a thick deposit of moderately deformed Jurassic and Cretaceous marine sedimentary layers that consist of detrital materials derived from uplifted basement rocks of the Klamath Mountain and Coast Range Provinces. Great Valley rocks consist primarily of mudstone, shale, and sandstone and occur mostly along the west side of the central valley. These units yield an abundance of suspended sediment but relatively little gravel to drainages.

The faults in the area are the Willows, Corning, and the Red Bluff faults. The Willows Fault system is a northwest-trending, steeply east-dipping reverse fault (eastside-up movement). The fault system lies just west of the Orland Buttes and extends northwest near the town of Red Bank. Fault activity is noted as occurring between approximately 60 and 53 million years ago. The Corning Fault is oriented roughly north-south along the Interstate 5 corridor. The fault has been identified from Red Bluff south through Orland, where it turns in a southwesterly direction before intersecting the Paskenta Fault Zone southwest of Artois. The Corning Fault is a reverse fault, dipping steeply to the east and passing west of the Corning domes and the Green Wood anticline. The youngest deposits deformed by the Corning Fault are noted as gravels of the Red Bluff Formation. The Red Bluff Fault extends in a northeasterly direction through Red Bluff. The fault is a subsurface structure interpreted as showing approximately 450 feet of vertical offset (southside down) from seismic-reflection data. These inactive faults typically present no particular geologic or seismic hazards.

1.8.4 Topography

The topography of the project site is characteristic of the valley floor conditions found in the Lower Tehama West Watershed. This region is relatively flat compared to the steeper, more vegetated western foothills of the area. Steady rolling hills supporting introduced annual grasslands with sparse trees represent this area. Elevations within the project area range from 440 to 480 feet above mean sea level. The USGS topographic map of the project area was shown on Figure 2 from the Henleyville 7.5 minute quadrangle.

1.8.5 Climate

The Mediterranean climate of this area is characterized by warm to hot, dry summers and cool, wet winters. Temperature ranges differ from lower elevations to the high elevations of the mountains to the west. Average monthly precipitation in Corning varies between 0.06 inches in July to 4.3 inches in January. Average monthly temperatures range between a low of 35 degrees Fahrenheit (F) in January to 95 degrees F in July. In the Corning area, the first frost typically occurs during the first week of December and the last frost occurs during the first week of March. There are approximately 275 frost-free days per year. Figure 10 presents the average minimum and maximum temperatures, by month, for the Corning weather station for the period of record between 1952 and 2003. Average monthly precipitation at the Corning station is shown on Figure 11. Average annual precipitation at the Corning station is 21.11 inches.

1.8.6 Biological Resources

Database searches for potentially occurring special-status plant and wildlife species were conducted using the CNDDB and the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS). The U.S. Fish and Wildlife Service (USFWS) was consulted in generating a list of special-status species that may occur within the project area or may be impacted by project activities. The CNDDB and CNPS were reviewed for records of special-status plant and wildlife species occurrence within the Henleyville 7.5 minute quadrangle and eight surrounding quadrangles. The CNDDB and CNPS are limited to reported sightings and are not comprehensive lists of special-status plant and wildlife species that may occur in a particular area. The USFWS list is county-based and includes sensitive plant and animal species that may be impacted by project activities based on regional data.

For the purpose of this study, state and federally listed plants and animals that could potentially occur in the project area are included. This includes Federally Endangered, Federally Threatened, California Endangered, California Threatened, California Fully Protected, California Protected, and California Species of Special Concern listed within the CNDDB or included on the CNPS lists 1 and 2 and USFWS species list. Figure 12 presents CNDDB occurrences within a 2-mile radius of the study site. A Biological Characterization Report is included as Appendix B.

Initial Assessments

Initial reconnaissance-level biological surveys were performed in May and June 2008 by qualified biologists acceptable to the Deputy Director for Water Rights. During the field surveys, the study area was traversed by walking to identify the site-specific potential for special-status plant and animal species and/or habitats to occur in the area. Potentially occurring special-status

species, determined through database searches, and suitable habitats were surveyed for within and near the proposed project area. Surveys included documentation of observed plant and wildlife species. Binoculars were used to observe occurring fauna.

Aquatic habitats within and near the project area, including No-Name Creek and the associated intermittent drainages of No-Name Creek, Burch Creek, agriculture ponds, and adjacent upland habitats, were investigated using the visual-encounter survey method. Biologists slowly walked the length of the ditch, visually searching the aquatic and nearby upland habitats for ichthyological and herpetological species with potential to occur within or near the proposed project area.

Flora: The special-status floristic species identified as potentially occurring within the project boundaries based on the database searches for the project vicinity are listed in Table 3. Plant species with low to high potential for occurrence within the project area are described below. Species with no potential for occurrence based on site-specific habitat availability are not discussed further.

Adobe-Lily *(Fritillaria pluriflora). Federal Status: none; State Status: none; CNPS Status: List 1B.2* This rare lily inhabits open grasslands with adobe soils in foothill woodlands or chaparral (UCANR, 2001). The adobe lily is threatened by grazing, development, mining, non-native plants, and horticultural collection (CNPS). It flowers in late winter or in early spring when clay soils are saturated. It has a short stature and a uniformly pinkish-purple flower. The range of adobe-lily includes the coast range foothills, the Sierra Nevadas (below 2300 feet elevation), and southern Oregon (UCANR, 2001). The study site has moderately clayey soils and grassland habitats. Initial surveys were conducted after the blooming season; however, only marginal habitat occurs onsite and occurrence is unlikely.

Ahart's Paronychia (*Paronychia ahartii*). Federal Status: none; State Status: none; CNPS Status: List 1B.1 Ahart's paronychia is a California endemic annual herb species typically found along vernal pool edges and rocky terraces in cismontane woodlands and valley and foothill grasslands. It is threatened primarily by habitat loss but may also be affected by grazing, vehicles, and trampling. Its range has only been documented to include Butte, Shasta, and Tehama Counties (CNPS). It is a short plant, growing to a maximum height of 1 inch with a 1/32-inch taproot (Flora of North America). This species, although known to occur within rocky outcrops or sites with low competition, is associated with vernal pools. Marginal habitat for Ahart's paronychia occurs on the study site. The potential for this species to occur onsite is low.

Brown Fox Sedge (*Carex vulpinoidea*). *Federal Status: none; State Status: none; CNPS Status: List 2.2* Brown fox sedge is a perennial herb found in riparian areas, marshes, and sometimes in roadside ditches. It is primarily threatened by development (CNPS). It is distributed throughout North America (UCANR). Marginal habitat occurs on the study site due to the lack of suitable perennial water source. No brown fox sedge plants were observed during field surveys.

Table 3 POTENTIALLY OCCURRING SPECIAL-STATUS FLORA				
Common/Scientific Names	**Status Fed/State/CNPS**	**Distribution**	**Preferred Habitats**	**Potential for Occurrence Within Project Area**
Adobe-lily (*Fritillaria pluriflora)*	--/--/1B.2	Coastal range foothills, Sierra Nevadas, and southern Oregon	Open grasslands in adobe soils	Marginal habitat on study site; unlikely occurrence
Ahart's paronychia (*Paronychia ahartii)*	--/--/1B.1	Butte, Shasta and Tehama Counties	Cismontane woodlands, valley and foothill grasslands, vernal pool edges	Marginal habitat on study site; low potential for occurrence
Baker's navarretia (*Navarretia leucocephala bakeri)*	--/--/1B.1	Inner north coast range and western Sacramento Valley	Vernal pools within grasslands, montane coniferous forests and low-elevation coniferous forests	No potential for occurrence
Boggs Lake hedge-hyssop (*Gratiola heterosepala)*	--/CE/1B.2	Interior North Coast Ranges, central Sierra Nevada foothills, Sacramento Valley, Modoc Plateau, and southern Oregon	Vernal pools, reservoir edges, and other muddy clay soils	No potential for occurrence
Brown fox sedge (*Carex vulpinoidea)*	--/--/2.2	Distributed throughout North America	Riparian areas, marshes and sometimes in road side ditches	Marginal habitat on study site; low potential for occurrence
Butte County meadowfoam *(Limnanthes flocossa ssp. californica)*	FE/CE/1B.1	Endemic to 25 mile strip along foothills of Butte County	Vernal swales and margins of vernal pools	No potential for occurrence
Desert cymopterus *(Cymopterus deserticola)*	--/--/1B.2	Endemic to southern California; one historic occurrence in western Tehama County	Deep, loose, well drained, fine to coarse sandy soils of alluvial fans and basins between 2060 and 3060 foot elevation within western Mohave Desert	No potential for occurrence
Dwarf downingia (*Downingia pusilla)*	--/--/2.2	Sacramento Valley and foothills of central coastal range	Vernal pools	No potential for occurrence
Greene's tuctoria (*Tuctoria greenei)*	FE/CR/1B.1	Central Valley; population in Modoc Plateau	Vernal pools within grasslands	No potential for occurrence
Hairy Orcutt grass (*Orcuttia pilosa)*	FE/CE/1B.1	Endemic to Central Valley	Vernal pools within grasslands	No potential for occurrence
Henderson's bent grass *(Agrostis hendersonii)*	--/--/3.2	Central Valley and northern California	Vernal pools within grasslands	No potential for occurrence

Table 3
POTENTIALLY OCCURRING SPECIAL-STATUS FLORA

Common/Scientific Names	Status Fed/State/CNPS	Distribution	Preferred Habitats	Potential for Occurrence Within Project Area
Hoover's spurge (*Chamaesyce hooveri)*	FT/--/1B.2	Endemic to Central Valley	Vernal pools	No potential for occurrence
Jepson's milk vetch *(Astragalus rattanii var. jepsonianus)*	--/--/1B.2	Coastal range from Napa to Tehama County	Chaparral, cismontane woodland, and valley and foothill grassland	Suitable habitat onsite; low potential for occurrence
Legenere (*Legenere limosa)*	--/--/1B.1	North Coast Ranges, southern Sacramento Valley, northern San Joaquin Valley, and San Francisco Bay Area	Vernal pools, vernal marshes, lakes, ponds, sloughs	No potential for occurrence
Red Bluff dwarf rush (*Juncus leiospermus)*	--/--/1B.1	Cascade Range and northern Sacramento Valley (Shasta, Tehama, and Butte Counties)	Edges of vernal pools in valley grasslands, chaparral and foothill woodlands	No potential for occurrence
Silky cryptantha *(Cryptantha crinita)*	--/--/1B.2	Northern Sacramento Valley (Shasta and Tehama Counties	Sand and gravel deposits along seasonal drainages, generally below 300 meters	Suitable habitat onsite; low potential for occurrence
Slender Orcutt grass (*Orcuttia tenuis)*	FT/CE/1B.2	Cascades, Sierra Nevada foothills, inner North Coast Ranges, and Modoc Plateau	Vernal pools and other moist areas with clay soils in valley grasslands, coniferous forests or sagebrush scrub	No potential for occurrence
Stony creek spurge (*Chamaesyce ocellata)*	--/--/1B.2	Glenn and Tehama Counties	Chaparral and valley and foothill grasslands	Suitable habitat onsite; moderate potential for occurrence

Status definitions:
Federal
FE = Listed as endangered under the Federal Endangered Species Act
FT = Listed as threatened under the Federal Endangered Species Act
-- = No listing
State
CE = Listed as endangered under the California Endangered Species Act
CT = Listed as threatened under the California Endangered Species Act
CR = Listed as rare in California
-- = No listing
CNPS
1B = List 1B species: Rare, threatened, or endangered in California and elsewhere
2 = List 2 species: Rare, threatened, or endangered in California, but more common elsewhere
3 = List 3 species: Plants about which more information is needed to determine their status
Threat Code Extensions
.1 = Seriously endangered in California (over 80 percent of occurrences threatened; high degree and immediacy of threat)
.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)

Jepson's Milk Vetch *(Astragalus rattanii* var. *jepsonianus). Federal status: none; State status: none; CNPS status: 1B.2* Jepson's milk vetch is an annual herb endemic to California that grows within annual grassland and foothills woodland. Its known range is within the coastal mountains from Napa County to Tehama County, generally between elevations of 400 to 600 meters. Although there is suitable habitat within the project site for the species, the potential for occurrence is low due to the project area being slightly out of the species' normal elevation range.

Silky Cryptantha *(Cryptantha crinita). Federal status: none; State status: none; CNPS status: List 1B.2* Silky cryptantha is a California endemic annual herb that inhabits sand and gravel deposits of seasonal streams or overflow channels of perennial waterways in the Northern Sacramento Valley, generally below 1000 meters in elevation (CNPS). Although there is suitable habitat onsite, there is low potential for occurrence as the project area is outside the current range of the species. The nearest known occurrences are over 30 miles to the north and northeast, along Singer Creek and Dibble Creek, respectively (CNDDB).

Stony Creek Spurge *(Chamaesyce ocellata). Federal Status: none; State Status: none; CNPS Status: List 1B.2* Stony Creek spurge is an annual herb that inhabits chaparral and valley and foothill grasslands. It is primarily threatened by recreational activities, vehicles, and trampling. The herb has been documented in Glenn and Tehama Counties but may inhabit other California counties as well. It is a prostrate plant with small, cream-colored flowers (CNPS). Suitable habitat for Stony Creek spurge does occur on the study site; however, no plants were observed during initial surveys.

Fauna: The special-status wildlife species that were identified as possibly occurring within the project boundaries based on database searches for the project vicinity are listed in Table 4. Wildlife species with low to high potential for occurrence within the project area are described below. Species with no potential for occurrence based on site-specific habitat assessment are not discussed further.

California Red-legged Frog *(Rana draytonii). Federal Status: Threatened; California Species of Special Concern* This species occurs in California and northwestern Baja, Mexico, and requires cool, slow-moving water in pond or marsh habitats with emergent and submergent vegetation. Habitats with the highest densities of frogs are deep-water pools (at least 2-½ feet deep) with dense stands of overhanging willows and a fringe of tulles or cattails. Although they can occur in ephemeral streams or ponds, it is unlikely that populations can be maintained in ephemeral streams in which all surface water disappears (Jennings and Hayes, 1994). Threats include introduced predators such as bullfrogs and brown trout (*Salmo trutta*), pollutants, and habitat loss. Habitat on the project site is highly marginally due to the lack of a perennial water source. No breeding habitat occurs within the project area.

Burrowing Owl (Athene cunicularia). Federal Status: none; State Status: Species of Concern The burrowing owl is a relatively small owl with a rounded head, chocolate in color with white streaking or spotting. They have a white throat patch, long and rounded wings, and a short tail, both of which are brown with buff-white barring. Juveniles are similarly colored to adults but are unstreaked to lightly streaked. Their breeding range extends from Mexico to Canada and scattered across the western United

States. They have been observed in families or breeding colonies and use mammal burrows, rock cavities, or manmade, burrow-like structures (i.e. old culverts) for nesting. They prefer open to sparsely vegetated areas for foraging. They are known to occur throughout the Central Valley into the grasslands and blue oak woodlands of the lower foothills.

Long-eared Owl *(Asio otus). Federal Status: none; State Status: Species of Concern* Long-eared owl populations are primarily threatened by loss of crucial nesting and roosting habitat that includes dense vegetation in riparian corridors and tree groves that occur adjacent to grasslands. Long-eared owls occur in the far north of North America, including Canada and the western half of the United States. Long-eared owl range in California is restricted to the eastern part of the state, including the Sierra Nevadas (Birds of North America). The orchards adjacent to grassland areas could provide foraging habitat for the long-eared owl; therefore, the species could be found on the project site but would not be negatively impacted by project activities as they would move elsewhere to forage.

Swainson's Hawk (*Buteo swainsoni). Federal Status: none; California Status: Threatened* Swainson's hawks forage in open stands of grass-dominated vegetation, sparse shrublands, and open woodlands. It is also often observed foraging in open-row crop areas. Threats to this species seem to be centralized in the southern hemisphere part of their range, where shooting of raptors still occurs and highly toxic pesticides are still in use. The only breeding range of Swainson's hawks occurs in North America; its wintering range is in South America. Swainson's hawks breed in the western states, southern Canada and northern Mexico. In California, their range is restricted to far northeastern California, the Sacramento and San Joaquin Valleys, and the valleys of the Sierra Nevadas (Birds of North America). Suitable foraging habitat occurs within the study area. The nearest CNDDB recorded observation is 5 miles from the project site.

Yellow Warbler *(Dendroica petechia). Federal Status: none; California Species of Special Concern* The yellow warbler inhabits wet, deciduous habitats, especially riparian areas in California. They are found throughout much of the northern portion of North America during the breeding season, and they winter in Central and South America. Yellow warbler populations are threatened by habitat loss in the northern part of their range (Birds of North America). Marginally suitable habitat exists on the study site for yellow warblers due to a lack of dense riparian vegetation along Burch Creek.

White-tailed Kite *(Elanus leucurus). Federal Status: None; California Status: Fully Protected* The white-tailed kite is found primarily in the western half of the Pacific Coast states and in parts of Mexico and South America. These populations are all year-round residents; no migration between southern and northern areas occurs. This species seems to be expanding its range, and some sightings have occurred in other states in the United States. It uses a multitude of habitats including cropland/hedgerow, grassland/herbaceous, savannah, woodland-hardwood savannah, open woodland, marshes, and partially cleared lands and cultivated fields, mostly in lowland situations. Threats to this species include loss of habitat. Marginal habitat exists within the project area for this species due to a lack of dense riparian vegetation along Burch Creek. None were observed during wildlife surveys.

Table 4 POTENTIALLY OCCURRING SPECIAL-STATUS FAUNA				
Common/Scientific Names	**Status Fed/State**	**Distribution**	**Preferred Habitat**	**Potential for Occurrence Within Project Area**
AMPHIBIANS				
California red-legged frog *(Rana draytonii)*	FT/CSC	Coastal areas of California from Point Arena south and Central Valley foothills	Permanent and semipermanent aquatic habitats (i.e. creeks, coldwater ponds) with emergent and submergent vegetation and riparian species along edges; may aestivate in rodent burrows or cracks during dry periods. May disperse across upland areas.	Low potential within Burch Creek. Drainage does not support permanent water flow or emergent vegetation used by the species.
Western spadefoot *(Spea hammondii)*	--/CSC	California Central Valley	Use large vernal pools for breeding and foraging. Use burrows and cracks in uplands for aestivation.	None. No vernal pool habitat present within the project area.
BIRDS				
Migratory Birds	MBTA/--	Throughout North America		High potential for nesting of some species within Burch Creek riparian corridor
Tricolored blackbird *(Agelaius tricolor)*	--/CSC	Central Valley and northeastern corner of California, small populations Oregon and Nevada	Nest near fresh water in adjacent vegetation, especially marshes. Forage in grasslands and croplands. Found in large colonies.	None; no suitable nesting habitat within or adjacent to project area.
Long-eared owl *(Asio otus)*	--/CSC	Breeds in northern Canada south to northeastern states and south as far as Baja in the West. Winters in southern Canada south through western states as far south as parts of Mexico.	Nest in dense vegetation adjacent to foraging habitat in open grasslands, shrublands and forests.	Moderate potential for foraging within project area. Limited nesting potential associated with Burch Creek riparian corridor.
Burrowing owl *(Athene cunicularia)*	--/CSC	Throughout North America	Dry grasslands and deserts, open ponderosa pine and juniper forests.	Moderate foraging potential; potentially suitable nesting habitat within project area
Swainson's hawk *(Buteo swainsoni)*	--/CT	Throughout western U.S. during the summer	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, grain fields, and vegetable crops.	Moderate potential for nesting within Burch Creek riparian corridor. Nearest observation 5 miles from project area.
Western yellow-billed cuckoo *(Coccyzus americanus occidentalis)*	FC/CE	Western U.S.	Wide, dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging.	None; no suitable habitat present within project area due to lack of dense riparian habitat within Burch Creek corridor.

Table 4 POTENTIALLY OCCURRING SPECIAL-STATUS FAUNA				
Common/Scientific Names	**Status Fed/State**	**Distribution**	**Preferred Habitat**	**Potential for Occurrence Within Project Area**
Yellow warbler *(Dendroica petechia)*	--/CSC	Throughout North America	Wet, deciduous habitats, primarily riparian.	Low potential due to lack of dense riparian habitat within Burch Creek corridor.
White-tailed kite *(Elanus leucurus)*	--/FP	Western Oregon, Central Coast and Central Valley of California	Low foothills or valleys with valley or live oak, riparian areas, marshes near open grasslands for foraging.	Low potential due to lack of dense riparian habitat within Burch Creek corridor.
Yellow-breasted chat *Icteria virens*	--/CSC	Throughout most of U.S. during the summer	Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines.	Low potential due to lack of dense riparian habitat within Burch Creek corridor.
Bank swallow *Riparia riparia*	--/CT	Northern parts of North America during breeding, southern and South America during non-breeding	Riparian corridors. Nest in cavities dug into riverbanks or loose, sandy cliffs.	None. No suitable nesting habitat present with project area.
Northern spotted owl *Strix occidentalis ssp. caurina*	FT/CSC	Western states and Mexico, ssp. Caurina: British Columbia south through Coast Ranges and Cascades to Northern California east to the Pit River	Forests with complex structure, high canopy closure, large trees for nesting. Younger stands often used for foraging.	None. No suitable nesting or foraging habitat present with project area.
FISH (*Status designations are specific to ESUs/DPS of project location)				
Green sturgeon *Acipenser medirostris*	FT/--	Pacific coast (including major rivers) of Mexico, U.S., and Canada.	Nearshore oceanic waters, bays, estuaries. Spawn in large, turbulent, freshwater river mainstems.	None. No suitable habitat within project area.
Central Valley steelhead *Oncorhynchus mykiss*	*FT/--	Sacramento and San Joaquin river systems	Class I watercourses for spawning and rearing habitat	None. No suitable habitat within project area.
Central Valley winter-run Chinook salmon *Oncorhynchus tshawytscha*	FE/CE	Sacramento and San Joaquin river systems	Class I watercourses for spawning and rearing habitat	None. No suitable habitat within project area.
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytscha*	FT/CT	Sacramento and San Joaquin river systems	Class I watercourses for spawning and rearing habitat	None. No suitable habitat within project area.
INVERTEBRATES				
Vernal pool fairy shrimp *(Branchinecta lynchi)*	FT/--	California Central Valley and southern Oregon	Vernal pools	None. No vernal pool habitat within project area.
Conservancy fairy shrimp *Branchinecta conserviato*	FE/--	California Central Valley	Vernal pools	None. No vernal pool habitat within project area.

Table 4 POTENTIALLY OCCURRING SPECIAL-STATUS FAUNA				
Common/Scientific Names	**Status Fed/State**	**Distribution**	**Preferred Habitat**	**Potential for Occurrence Within Project Area**
Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*	FT/--	Endemic to the Central Valley of California	Only found in blue elderberry shrubs. Reliant on blue elderberry shrubs for all stages of life.	Elderberry shrubs do not occur within the project boundaries.
Vernal pool tadpole shrimp *(Lepidurus packardi)*	FE/--	California Central Valley	Vernal pools	None. No vernal pool habitat within project area.
MAMMALS				
Pallid bat *(Antrozous pallidus)*	FS/CSC	Western North America	Riparian habitats, arid deserts and grasslands near water. Rock crevices, hollow trees, caves and mines for roosting.	Low potential due to lack of quality roosting sites.
Fisher *Martes pennanti*	Candidate/ CSC	Klamath, Cascade, North Coast and Sierra Nevada mountain ranges	Intermediate- to old-growth forests with high canopy closure and cavities for denning.	None. No suitable habitat within project area.
American badger *(Taxidae taxus)*	--/CSC	North America except eastern and southern states of the U.S.	Open forests, shrublands, and grasslands with friable soils.	None. No suitable habitat within project area.
REPTILES				
Western pond turtle *(Actinemys marmorata marmorata)*	--/CSC	Portions of Washington, Oregon and California	Slow-moving streams, ponds. Requires year-round water. Lay eggs in uplands near water.	Low potential within Burch Creek. Drainage does not support permanent water flow required by the species.
Giant garter snake (*Thamnophis gigas*)	FT/CT	Endemic to most of the Central Valley historically from Butte County south to Kern County with a gap in the middle. Currently more restricted.	Sloughs, marshes, irrigation ditches and rice fields. Requires year-round water.	None. No suitable habitat within or adjacent to project area.

Status Definitions:

Federal
FE = listed as endangered under the federal Endangered Species Act.
FT = listed as threatened under the federal Endangered Species Act
FC = candidate for listing under the federal Endangered Species Act
-- = no listing.

California
CE = listed as endangered under the California Endangered Species Act.
CT = listed as threatened under the California Endangered Species Act
CSC = listed as a species of special concern by CDFG
-- = no listing.

Yellow-breasted Chat *(Icteria virens). Federal Status: none; California Species of Special Concern* This species prefers second-growth, shrubby old pastures, thickets, bushy areas, scrub, woodland undergrowth, and fence rows, including low wet places near streams, pond edges, or swamps, thickets with a few tall trees and early successional stages of forest regeneration. Yellow-breasted chats commonly nest in bushes, brier tangles, vines, and low trees, generally in dense vegetation. The species breeding range includes the eastern United States and scattered populations in the western states. It migrates to coastal Mexico and Central America during the winter. Threats to this species include loss and degradation of riparian habitats and parasitism by brown-headed cowbirds. Marginal habitat for this species exists onsite due to a lack of dense riparian vegetation along Burch Creek. None were observed during wildlife surveys.

Pallid Bat *(Antrozous pallidus). Federal Status: none; California Species of Special Concern* Pallid bats occur throughout most of western North America. This bat is found in riparian habitats and is also associated with arid deserts and grasslands and often near rocky outcrops and water. This species will roost in a variety of habitats including rock crevices, hollow trees, caves, and mines. These bats are sensitive to roost disturbance. Marginal habitat occurs on the project site for this species due to a lack of quality roosting sites.

Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus). Federal Status: Threatened; California: none* Due to the presence of elderberry shrubs (*Sambucus* spp.) along Burch Creek below the project area, the valley elderberry longhorn beetle was included in this study. The male beetles are very noticeable with their vibrant red wing covers and antennae as long as their bodies, while the females have black wing covers and shorter antennae. The beetle is endemic to California's Great Central Valley. Elderberry shrubs in the Central Valley are associated with riparian areas. Much of the riparian habitat in the central valley has been converted for agricultural uses. This habitat loss is the primary cause of the decline of the longhorn beetle (Essig Museum of Entomology). The project has been designed to avoid elderberry shrubs; therefore, there will be no impacts to this species or its habitat.

Western Pond Turtle *(Actinemys marmorata). Federal Status: Sensitive; California Species of Special Concern* The western pond turtle lives in slow-moving rivers, streams, and ponds and occasionally has been observed in seasonally flowing streams. Loss of habitat is the primary threat concern. These turtles spend most of their lives in the water but lay their eggs in adjacent uplands (CaliforniaHerps.com). They range throughout the western states including California, Nevada, Oregon, and Washington as well as British Columbia (NatureServe). The streams on the project site are seasonal and fast moving during the wet season, so habitat suitability is only marginal for this species. None were observed during surveys.

Observed Fauna and Flora: No special-status plant or wildlife species were observed within or surrounding the proposed project area during reconnaissance-level surveys. Species observed during field surveys are listed in Table 5.

Table 5 OBSERVED FAUNA/FLORA		
Species	**No. Observed**	**Comments**
Fauna		
Common garter snake (*Thamnophis sirtalis*)	1	Terrestrial
Red-tailed hawk (*Buteo jamaicensis*)	2	Soaring/foraging
Sharp-shinned hawk (*Accipiter striatus)*	1	Soaring/foraging
Western fence lizards (*Sceloporus occidentalis*)	5	Terrestrial
Flora		
Almond tree (*Prunus* spp.)		
Elderberry (*Sambucus* sp.) (occurs outside the proposed project boundaries)		
Arroyo willow *(Salix lasiolepis)*		
Walnut trees (*Juglans* spp.)		
Yellow star thistle *(Centaurea solstitialis)*		
Rushes *(Juncus* spp.*)*		
Cheatgrass (*Bromus tectorum*)		
Ripgut brome (*Bromus diandrus*)		
Dandelion (*Taraxacum* spp.)		
Red brome/ foxtail brome (*Bromus rubens*)		
Medusahead (*Taeniatherum caput-medusae*)		
Aster (*Aster* sp.)		
Crested dogstail grass (*Cynosurus cristatus*)		
Black oak (*Quercus kelloggii*)		

Salmonid Assessment

Burch Creek, a seasonally flowing tributary to the Sacramento River, is a convergence of multiple intermittent streams. Approximately 1.4 miles north of Kirkwood is the confluence of Burch, Hall, and Brannin Creeks (7 miles from the Sacramento River). Rice Creek, which includes the tributaries of Sour Grass, Moore, and Gay Creeks, converges with Burch Creek approximately 2.6 miles east of Kirkwood (3 miles from the Sacramento River). In its upper reaches, Burch Creek receives water from Houghton and Parker Creeks (below project) and Sehorn, Jackson Spring, and Elmore Creeks (above project).

Intermittent creeks on the west side of the northern Sacramento Valley can be characterized as flashy drainages with discontinuous flows dependent upon winter storm events. Habitat along these creeks is typical of washes, with patches or segments of riparian habitat interspersed with annual grassland and denuded banks. Many of the west-side drainages are infested with non-native *Arundo donax* and *Tamarix* spp., which have established on open sand and gravel bars created by high-water events.

Burch Creek and Rice Creek are listed as critical habitat for Central Valley spring-run Chinook salmon from the Sacramento River to Kirkwood Road. The critical habitat designation continues on Rice Creek to Kirkwood Road. The drainage likely provides neonatal rearing habitat near the main-stem Sacramento for spring- and fall-run Chinook, especially in high-water years. Unlikely spawning potential exists for late-fall and winter-run Chinook. Juvenile Chinook have been observed in Rice Creek up to Kirkwood Road, approximately 5.5 stream-miles from the Sacramento River (Maslin et al., 1999).

Burch and Rice Creeks may provide limited spawning habitat for steelhead (December to April), although this is more likely in high-water years. The drainage does not provide sufficient flow late enough into the season to provide rearing habitat for steelhead unless seasonally used by juveniles coming out of the mainstem of the Sacramento River.

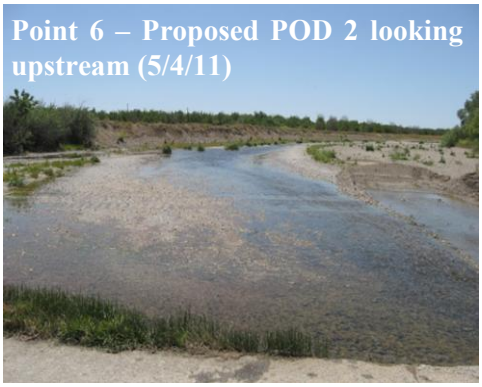
Flood control mechanisms (dams) on major North State rivers provide for slow release of flood waters, which extends periods of high water in the Sacramento River; therefore, intermittent stream habitat is more critical for juveniles in high-water years due to extended siltation and high velocity of the mainstem of the Sacramento River. During low-water years, when the Sacramento River provides relatively improved rearing habitat, water flow in Burch Creek is less important.

At the request of State Water Board staff, BH Farming conducted aquatic habitat assessments along Burch Creek during April and May 2011. The purpose of the field investigation was to physically examine publically accessible reaches of Burch Creek for the presence and habitat of anadromous salmonids and to estimate the potential impacts of the proposed diversion to the species.

Burch Creek is an intermittent stream that is primarily influenced by peak flows that occur briefly after storms. At proposed POD 2, these periodic "flashy" flow events have created a wide, heavily braided channel that is devoid of riparian vegetation, has poorly defined banks, and is in generally poor condition. The substrate is homogenous, consisting of small pebbles and sand with no large boulders, pools, or diversity. The substrate is unconsolidated and quite mobile at high flows.

Point 6 – Proposed POD 2 crossing (5/4/11)

From November until late spring, flow is intermittent. Surface water recedes underground beneath the substrate during rainless periods. The watershed area draining above both PODs is estimated at 16,000 acres with an intermittent daily flow in Burch Creek of 0 cfs to in excess of 800 cfs.


Point 6 – Proposed POD 2 looking upstream (5/4/11)

The Burch Creek crossing of the Northern Pacific railroad tracks at Kirkwood Road is considered the upstream limit for anadromy. From the proposed PODs downstream to this point, Burch Creek passes through 8 to 9 miles of agricultural rangeland and 2 to 3 miles of areas of urban and residential development. This reach includes the segment that passes south of the town of Corning. Here, urbanization abuts the narrow and heavily impacted riparian zone. The area of the watershed that accounts for flow and habitat is in excess of 95,000 acres.

As with the upper portions of the stream, Burch Creek continues to be a wide, heavily braided channel. Vegetation, where it exists, is generally non-native and consists of *Arundo donax*,

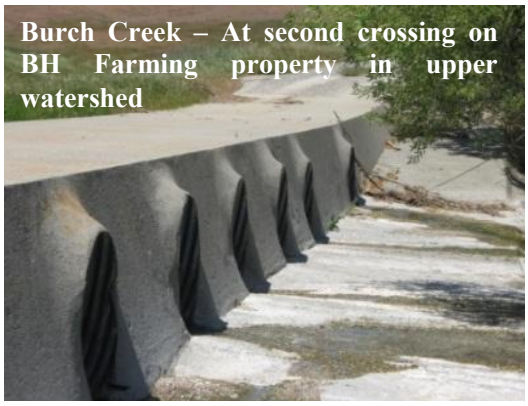
Tamarix spp., Himalayan blackberry (*Rubus armeniacus*), walnut (*Juglans regia*), and other introduced species. The banks become somewhat more defined and are often downcut and eroded. The substrate remains homogenous, consisting of small pebbles and sand with no large boulders, few pools, and limited diversity. The substrate remains unconsolidated and mobile at high flows.

For most of the year, flow is intermittent. Surface water recedes underground beneath the substrate during rainless periods. Livestock have access to the creek in many places, and there is evidence of grazing along the channel banks and within the channel zone, especially in the vicinity of and above Black Butte Road.

Low water crossings occur on Burch Creek that likely serve as fish passage barriers below the proposed PODs. The crossing shown on the right is on BH Farming property, approximately 1 mile below the PODs. A small school of juvenile suckers and numerous tadpoles were observed in a pool below the crossing. No fish were observed above this structure.

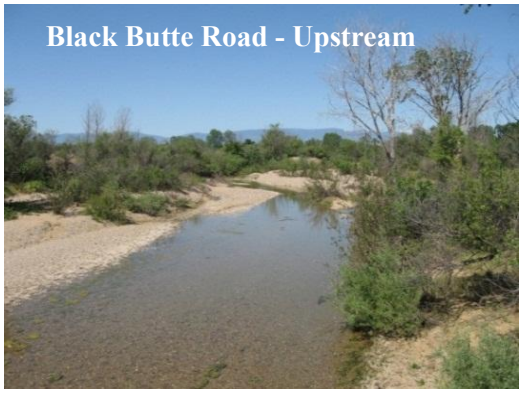
Burch Creek – Leaving BH Farming property

A school of 10 to 14 adult suckers was noted during the April survey at the Black Butte Road location; however, no fish were observed during the May survey. Photographs of areas of the stream reach from the proposed POD to the Kirkwood Bridge are shown below.

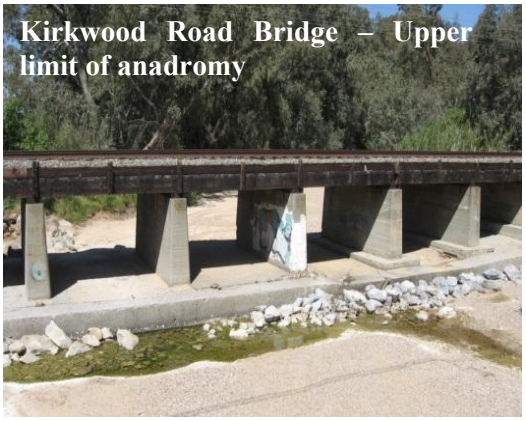

Burch Creek – At second crossing on BH Farming property in upper watershed

Burch Creek – Upstream from second crossing on BH Farming property

Rawson Road - Upstream


Black Butte Road - Upstream

Downstream from Kirkwood Road, Burch Creek is designated as Critical Habitat for Central Valley steelhead. Approximately 5 miles below Kirkwood Road, Rice Creek joins Burch Creek, and the combined flows of these creeks join the Sacramento River approximately 4 miles downstream. Anadromous salmonids are reported to possibly use these lower reaches of Burch Creek and Rice Creek as neonatal rearing and refuge habitat. Spawning habitat is marginal due to the lack of suitable stable flows that would allow for maturation of eggs and the lack of a gravel substrate. Further, the lack of water depth and instream vegetation limits available food resources. The lack of instream cover, or complex channel margins, severely reduces the value of these tributaries as functional habitat for adult salmonids. The intense and variable nature of the flows also reduces Burch Creek's value for habitat for any aquatic organism.


Kirkwood Road Bridge – Upper limit of anadromy

Below the upper limit of anadromy, the channel of Burch Creek continues through private property primarily dedicated to agricultural uses. No rooted aquatic vegetation is present within the channel. Along the creek banks, riparian vegetation is sparse in most places and, where it exists, is comprised of mainly non-native tree and shrub species lining the channel banks (*Tamarix* spp., *Arundo donax, Eucalyptus* spp.). The Kirkwood Road rail bridge may also serve as a fish barrier during low flows. Livestock have access to the creek in many places, and there is evidence of grazing along the channel banks and within the channel zone.

Burch Creek is similar to many of the intermittent creeks on the west side of the northern Sacramento Valley which are characterized as having flashy drainages with discontinuous flows dependent upon winter storm events with little or no snowmelt runoff. Habitat along these creeks is typical of washes, with patches or segments of riparian interspersed with annual grassland and denuded banks. Infestations of *Arundo donax* and *Tamarix* spp. have established on open sand and gravel bars created by high-water events and can remove large volumes of water from the substrate through transpiration and lower the natural water table.

Burch Creek does not flow year round at proposed POD 2 (approximately 22 miles upstream of its Sacramento River confluence) and likely supports only transient populations of fish during wet years. In its upper reaches, Burch Creek is a seasonally flowing tributary to the Sacramento River formed by a convergence of multiple intermittent streams. Approximately 1.4 miles south of the Kirkwood Bridge, Burch, Hall, and Brannin Creeks converge 7 miles from the Sacramento River. Rice Creek, including the tributaries of Sour Grass, Moore, and Gay Creeks, joins Burch Creek approximately 2.6 miles downstream (3 miles from the Sacramento River).

With respect to fish habitat between the lowest and uppermost reaches surveyed, substrate is comprised of sand-sized material and pea gravel less than 10 mm in diameter. All areas lack the complexity generally associated with salmonid habitat. Few areas provide undercut banks, cobbles greater than 15 cm in diameter, or rooted aquatic vegetation. Large woody debris is virtually non-existent. Vegetation is sparse in most places and, where it exists, is comprised of mainly non-native tree and shrub species lining and inhabiting the channel banks.

Fish were not observed at most locations. Two large (30-cm) suckers *(Catostomus* spp.) were observed near Hall Road, and a group of roughly 12 to 15 similar fish were observed just upstream from Black Butte Road. Additionally, several unidentified (non-salmonid, likely *Cyprinidae*) small (7- to 8-cm) fish were observed along the vegetated banks near Black Butte Road. A single adult bullfrog was also observed in this location. Above Black Butte Road, a small school of juvenile suckers were observed in a pool below the BH Farming crossing. One sculpin *(Cottus* spp.) was observed in a turbulent area below the concrete bridge footing at the railroad crossing at Kirkwood Road.

1.8.7 Hydrology

Scattered ephemeral and intermittent streams with occasional high flows best summarize the hydrology of the project area and vicinity, with a few large reservoirs used for agricultural and fire applications. Two streams (Burch Creek and No-Name Creek) will be involved in the proposed dam project.

No-Name Creek will be dammed for this project. The creek conveys water seasonally and is normally dry by April. The general hydrogeological characteristics of the creek are summarized by intermittent, high-flow events causing scouring of the creek path. No-Name Creek flows immediately after large storm events and goes dry shortly afterward. No tree or shrub stratum are located within the creek area.

When completed, the dam and reservoir will capture surface water runoff from the approximate 800 acre (1.2 square miles) watershed of No-Name Creek. In contrast, the Burch Creek Watershed encompasses approximately 94,500 acres (148 square miles). Because official data are not available for Burch Creek, Burch Creek was modeled using the area-ratio method and data from Elder Creek (see WAA). The WAA completed for the proposed project is included as Appendix C.

Based on the Water Resource Integrated Modeling System (WRIMS) database as of 30 March 2010, no entitlements of recorded water rights exist above the proposed Burch Creek PODs. One recorded water right exists on Burch Creek below the PODs: License No. 10115 for 0.625 cfs between April 1 and October 31, not to exceed 37 acre-feet per month or 186 af per year.

1.9 REGULATORY ENVIRONMENT

The State Water Board is the lead agency under CEQA with the primary authority for project approval. In addition, the following responsible and trustee agencies may have jurisdiction over parts of or the entire proposed project:

- USFWS – Federal Endangered Species Act compliance
- National Marine Fisheries Service – Federal Endangered Species Act compliance
- CDFG – California Endangered Species Act compliance and/or Streambed Alteration Agreement
- Central Valley RWQCB or State Water Board – Section 401 Water Quality Certification
- U.S. Army Corps of Engineers – Section 404 Permit

2.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Geology /Soils
☐ Hazards & Hazardous Materials	☒ Hydrology / Water Quality	☐ Land Use / Planning
☐ Mineral Resources	☐ Noise	☐ Population / Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities / Service Systems	☐ Mandatory Findings of Significance	

3.0 DETERMINATION (TO BE COMPLETED BY THE LEAD AGENCY)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Katherine Mrowka for Phil Crader 12-29-11

Signature Date

Signature Date

4.0 EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
    a) Earlier Analysis Used. Identify and state where they are available for review.
    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion. See Section 5.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
    a) The significance criteria or threshold, if any, used to evaluate each question; and
    b) The mitigation measure identified, if any, to reduce the impact too less than significance.

4.1 AESTHETICS

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion

In general, the project area contains scenic resources characteristic of western Tehama County, including gently rolling hills and agricultural lands. The existing agricultural use of the project site is consistent with the rural aesthetic quality of the area. The project area does not contain scenic vistas or scenic resources including trees, rock outcroppings, or historic buildings. The project area is not located adjacent to a state highway.

The proposed project does not involve the construction of new structures, sources of light, or glare. The project would result in the continued agricultural use of the project site, consistent with the rural setting of the area. No aesthetic impact will occur as a result of the proposed project.

4.2 AGRICULTURE RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland.

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature that could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

Discussion

The project area is zoned as Exclusive Agriculture, and the Draft Tehama County General Plan has identified the land use within the project area as Valley Floor Agriculture. Agriculture and agricultural production are valued land uses in Tehama County. Under the proposed project, the site would continue to be used for agricultural purposes. No impacts would occur to agricultural resources as a result of the proposed project.

The area to be converted to reservoir is not classified as prime farmland or farmland of statewide importance as shown on Figure 13. The site is on Williamson Act lands. The proposed use of water supply reservoir is consistent with the Williamson Act.

The construction of the reservoir will convert a small acreage (approximately 100 acres) of annual grassland to water. This is not determined to be significant given the expansive areas of grassland in this portion of the county.

The project will enhance and improve the agriculture in the area by providing additional sources of water to allow for orchard expansion.

4.3 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
f) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
g) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	☐	☐	☐	☒

Discussion

The walnut and almond orchards in the project area are currently served by diesel pumps. The diesel pumps pull water from 200 feet below the ground surface for much of the year, consuming in excess of 80,000 gallons of diesel fuel. The provision of water from this project will reduce the amount of diesel fuel used and the associated emissions by 50 to 80 percent, depending upon the yield of the reservoir. The approximate 30-foot lift from Burch Creek will be powered by either an electric- or a diesel-powered pump, but the reduction in greenhouse gas emissions will be substantial regardless of which power source is chosen. If the cost of variable-frequency drive pump units continues to decrease, the alternative of having an electrical supply extended 500 to 700 yards to the pumping location is preferred over use of a diesel pump.

The project site is located in the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges reach heights in excess of 6,000 feet with peaks rising much higher. This provides a substantial physical barrier to locally created pollution, as well as that transported northward on prevailing winds from the Sacramento metropolitan area.

The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a potential for air pollution problems. This is due to relatively stable atmospheric conditions that act to suppress vertical air movement. Extremely stable atmospheric conditions referred to as "inversions" act as barriers to pollutants. In valley locations under 1,000 feet elevation, such as the Northern Sacramento Valley, a "lid" is created under which pollutants are trapped. Dust and other pollutants can become trapped within these inversion layers and not disperse until atmospheric conditions become unstable. This situation creates concentrations of pollutants at or near the ground surface and as a result poses significant health risks for plants, animals, and people. Common pollutants in the region are summarized in Table 6.

The two pollutants that may be generated during short-term construction activities associated with the dam include:

- Particulate matter (dust)
- Diesel exhaust particulate matter (DEPM)

Ambient Air Quality Standards

At the federal level, the U.S. EPA has been charged with implementing national air quality programs. The U.S. EPA air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was signed into law in 1970. Congress substantially amended the CAA in 1977 and again in 1990. The CAA required EPA to establish the national ambient air quality standards (NAAQS) and to also establish deadlines for their attainment. Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect public welfare from non-health-related adverse effects, such as visibility restrictions.

The CAA Amendments of 1990 made major changes in deadlines for attaining NAAQS and in the actions required of areas of the nation that exceed these standards. Under the CAA, state and local agencies in areas that exceed the NAAQS are required to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by EPA. States may also establish their own standards, provided that state standards are at least as stringent as the NAAQS. California has established California ambient air quality standards (CAAQS) pursuant to California Health and Safety Code Section 39606(b) and its predecessor statutes. The NAAQS and CAAQS are presented in Table 7, Summary of Ambient Air Quality Standards.

The CAA requires states to develop an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures that California

will use to attain the NAAQS. EPA approved the California SIP in September 1996. The SIP became effective on February 7, 1997. Pursuant to the recently adopted SIP, the State of California will strive for compliance with federal ozone standards by the year 2010. This will be accomplished using a combination of performance standards and market-based programs that will speed the introduction of cleaner technology and expand compliance flexibility (ARB, 2006).

Table 6
CRITERIA AIR POLLUTANTS
SUMMARY OF COMMON SOURCES AND EFFECTS

Pollutant	Description	Sources	Health Effects	Welfare Effects
Carbon Monoxide	Colorless, odorless gas	Motor vehicle exhaust, indoor sources include kerosene heaters and wood-burning stoves	Headaches, reduced mental alertness, heart attack, cardiovascular diseases, impaired fetal development and death	Contributes to the formation of smog
Sulfur Dioxide	Colorless gas that dissolves in water vapor to form an acid, and interacts with other gases and particulates in the air	Coal-fired power plants, petroleum refineries, manufacture of sulfuric acid and smelting of ores containing sulfur	Eye irritation, wheezing, chest tightness, shortness of breath, and lung damage	Contributes to formation of acid rain, impairs visibility, plant photosynthesis, degrades water quality, results in aesthetic damage to buildings
Nitrogen Dioxide	Reddish brown, highly reactive gas	Motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels	Susceptibility to respiratory infections, irritation of lung and respiratory symptoms (e.g., cough, chest pain, difficulty breathing	Contributes to formation of smog, acid rain, degrades water quality, contributes to global warming, impairs visibility
Ozone	Gaseous pollutant when it is formed in the troposphere	Vehicle exhaust, certain other fumes formed from combination of reactive organic gases and oxides of nitrogen in presence of sunlight	Eye and throat irritation, coughing, respiratory tract problems, asthma, and lung damage	Plant and ecosystem damage
Lead	Metallic element	Metal refineries, lead smelters, battery manufacturers, iron/ steel producers, and leaded fuels by racing and aircraft industries	Anemia, high blood pressure, brain and kidney damage, and neurological disorders, cancer and a lowered IQ	Affects plants, animals, and aquatic ecosystems
Particulate Matter	Very small particles of dust, soot, or other matter, including tiny droplets of liquids	Diesel engines, power plants, industries, windblown dust and wood stoves	Eye irritation, asthma, bronchitis, lung damage, cancer, heavy metal poisoning, and cardiovascular effects	Impairs visibility, impairs plant photosynthesis, and results in atmospheric deposition and aesthetic damage to buildings

Source: ARB 2005; EPA 2005

Attainment Status Designations

An attainment designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A non-attainment designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation(s) was caused by an exceptional event, as defined in the criteria.

All Northern Sacramento Valley air districts have been designated as non-attainment areas for the state standards for PM_{10}. All of Northern Sacramento Valley air districts, with the exception of Colusa and Glenn Counties, have been designated as non-attainment areas for the state standard of ozone. This classification has since been amended, with Butte County reverting back to non-attainment for ozone. The non-attainment transitional designation is made by operation of law if, during a single calendar year, the state standard is not exceeded more than three times at any monitoring location within the district. Tehama County is currently non-classified for ozone (in attainment) and non-attainment for PM_{10}. No monitoring is completed in Tehama County for $PM_{2.5}$.

Table 7
SUMMARY OF AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards [a, d]	National Standards [b, d]	
			Primary [e]	Secondary [f]
Ozone (O_c)	1-hour	0.09 ppm (180 μg/m³)	--	Same as Primary
	8-hour	0.070 ppm (137 μg/m³) [c]	0.08 ppm (157 μg/ m³)	
Particulate Matter (PM_{10})	AAM	20 μg/m³	50 μg/m³ [f]	Same as Primary
	24-hour	50 μg/m³	150 μg/m³	--
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 μg/m³	15 μg/m³	Same as Primary
	24-hour	No Standard	65 μg/m³	--
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8-hour	9 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
	8-hour Lake Tahoe	6 ppm (7 mg/m³)	--	
Nitrogen Dioxide (NO_2)	AAM	--	0.053 ppm (100 μg/m³)	Same as Primary
	1-hour	0.25 ppm (470 μg/m³)	--	
Sulfur Dioxide (SO_2)	AAM	--	0.03 ppm (80 μg/m³)	--
	24-hour	0.04 ppm (105 μg/m³)	0.14 ppm (365 μg/m³)	--
	3-hour	--	--	0.5 ppm (1,300 μg/m³)
	1-hour	0.25 ppm (655 μg/m³)	--	--
Lead	30-day Average	1.5 μg/m³	--	--
	Calendar Quarter	--	1.5 μg/m³	Same as Primary
Sulfates	24-hour	25 μg/m³	No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 μg/m³)		
Vinyl Chloride	24-hour	0.01 ppm (26 μg/m³)		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per km, visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is < 70%		

a) California standards for O_3, CO (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, PM (PM_{10} and $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.
b) National standards (other than O_3, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of daily concentrations, average over three years, are equal to or less than the standard.
c) This concentration was approved by the Air Resources Board on April 28, 2005, and was expected to become effective in early 2006.
d) Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees C and a reference pressure of 760 ton.
e) The levels of air quality necessary to protect the public health.
f) The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
AAM = Annual Arithmetic Mean
μg/m³ = Micrograms per Cubic Meter
mg/m³ = Milligrams per Cubic Meter
ppm = Parts per Million

Source: ARB 2006; EPA 2006(a)

Thresholds of Significance

The AQMD is developing air quality thresholds for determination of impact significance for projects subject to CEQA review. Until the Tehama County thresholds are adopted, Tehama County uses thresholds developed by adjoining Shasta County. Thresholds of significance are summarized in Table 8.

Table 8
THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS OF CONCERN

Pollutants	Tehama County Air Quality Thresholds (lbs/day)		
	Level "A" Thresholds	Level "B" Thresholds	Level "C" Thresholds
NOx	≤ 25	> 25	> 137
ROG	≤ 25	> 25	> 137
PM_{10}	≤ 80	> 80	> 137
Level of Significance	Potentially Significant	Potentially Significant	Significant
Environmental Document	ND* or MND	MND or EIR	EIR

*ND – Negative Declaration, MND – Mitigated Negative Declaration, EIR – Environmental Impact Report

Apply Standard Mitigation Measures (SMM) to all projects based on potential air quality impacts. For projects that fall within Level "A" thresholds a ND or MND will need to be prepared.

Apply SMM and appropriate Best Available Mitigation Measures (BAMM) when a project exceeds Level "B" thresholds. The appropriate type and number of BAMM applied to a project will be based on the unique characteristics of the project. If all feasible mitigation measures are incorporated and emissions can be reduced to below Level "B" thresholds, then an MND should be prepared. If incorporated, and emissions still exceed Level "B" thresholds, then an EIR should be prepared.

Apply SMM, and BAMM when a project exceeds Level "C" thresholds. An EIR will need to be prepared. Dependent upon the level and scope of air quality impacts and ability of mitigation measures to reduce project emissions, off-site mitigation measures may be required to reduce the overall air quality impacts to a level of insignificance.

Source: Planning & Permitting Air Quality Handbook, Tehama County APCD (December 2009)

In addition to the listed thresholds, the proposed project would have a significant impact on air quality if it would:

- Violate any ambient air quality standards; or
- Substantially contribute to an existing or projected violation of an ambient air quality standard; or
- Expose sensitive receptors (i.e., individuals with respiratory disease, the young, the elderly) to substantial pollutant concentrations; or
- Expose members of the public to frequent objectionable odors; or if
- Toxic air contaminants (TACs) would exceed or contribute to an exceedance of the action level for cancer risk (10 in 1 million) or a hazard index risk level of one or higher for the maximally exposed individual.

The operation of the reservoir involves the storage of water and irrigation of orchard crops. No impacts to air quality from reservoir operations will occur. The construction of the dam and pipeline will result in short-term air impacts, specifically the increase in PM_{10} particulates and limited local increases in DEPMs from equipment emissions.

Construction activities are a source of short-term emissions that may have a substantial, temporary impact on local air quality. Short-term increases in emissions of regional criteria pollutants and their precursors are typically greatest during initial site preparation (e.g. land clearing, ground excavation, etc.), as this phase usually entails greater soil disturbance and the greater use of diesel-powered mobile equipment than other phases. Construction-generated emissions generally vary substantially from day to day, depending on the level of activity, the specific operations, and weather conditions.

Project construction activities will not generate substantial amounts of greenhouse gas emissions. Construction is anticipated to occur within a short work window. Changes in natural carbon cycles at the site associated with equipment use and vegetation impacts will be insignificant due to the small scale and temporary nature of the project. A reduction in diesel-powered groundwater pumping and the establishment of riparian corridors adjacent to the reservoir will provide an overall net benefit, reducing greenhouse gas emissions and increasing carbon storage onsite.

The project will not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The measures listed in item C (above) will be implemented to reduce project-related emissions.

Mitigation Measures (MM)

MM1: The applicant shall submit a construction dust mitigation plan to the AQMD for review and approval. The plan shall be deemed adequate and approved by the AQMD for mitigating onsite emissions of fugitive PM_{10} before implementation of the proposed project. This plan shall specify the methods used to control dust and particulate matter, demonstrate the availability of needed equipment and personnel, and identify a responsible individual who can authorize the implementation of additional measures, if needed. Dust control measures shall include county-recommended Best Available Mitigation Measures (BAMM), including, but not limited to, the following:

1. All disturbed areas, including storage piles, that are not being actively used shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.
2. Alternatives to open burning of vegetative material on the project site shall be used by the project applicant unless otherwise deemed infeasible by the AQMD. Among suitable alternatives are chipping, mulching, or conversion to biomass fuel.
3. Applicant shall be responsible for ensuring that all adequate dust control measures are implemented in a timely and effective manner during all phases of project development and construction.
4. All material excavated, stockpiled, or graded shall be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering shall occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day.
5. All onsite, unpaved roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
6. Onsite vehicle speeds on unpaved surfaces shall be limited to 15 mph.

7. All land clearing, grading, earth moving, or excavation activities on the project site shall be suspended when winds are expected to exceed 20 mph.
8. All inactive portions of the development site shall be seeded and watered until a suitable grass cover is established. Seeding shall be with an approved seed mix.
9. The applicant shall be responsible for applying Department of Public Works-approved nontoxic soil stabilizers (according to manufacturers' specifications) to all inactive construction areas (previously graded areas which remain inactive for 96 hours).
10. When materials are transported offsite, all materials shall be covered and effectively wetted to limit visible dust emissions, or at least 6 inches of freeboard space from the top of the container shall be maintained.
11. All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring.
12. The site access road shall be paved prior to conducting other onsite construction activities (e.g. grading of the processing area, construction of equipment footings, equipment installation).

MM2: To reduce short-term emissions from onsite mobile source construction equipment (e.g. NOx and PM_{10}), the applicant shall implement the following mitigation measures:

1. Idling time for all diesel-powered equipment shall be limited to no more than 5 minutes when not in use.
2. Heavy-duty (<50 horsepower) off-road vehicles to be used in the initial construction process, including owned, leased, and subcontractor vehicles, shall achieve a minimum fleet-average 45 percent particulate reduction, compared to the most current ARB fleet average at the time of construction. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.
3. Onsite truck and equipment engines shall be maintained in good running condition, in accordance with manufacturers' specifications. Maintenance records demonstrating compliance shall be kept onsite by the applicant and shall be made available to AQMD upon request.

4.4 BIOLOGICAL RESOURCES

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
g) Cause a reduction in acreage of forestland or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

Please refer to the Biological Characterization Report in Appendix B.

Habitat Impacts
Development of the proposed project would result in the loss of 128 acres of upland non-native annual grassland habitat. This impact is considered less than significant. The habitats previously discussed provide resources for a number of wildlife species. However, according to California GAP Analysis data (USGS Survey, 1998) for the watershed, these habitats are regionally abundant. Thus, given the regional abundance of annual grasslands and cropland and the preservation of the open space areas, impacts to upland habitats are considered to be less than significant.

Wildlife Impacts
Implementation of the project could result in indirect impacts to special-status wildlife species that occur as migrants or foragers on the site. This is considered insignificant.

The valley elderberry longhorn beetle is listed as Federally Threatened. The valley elderberry longhorn beetle is dependent upon its host plant, the elderberry shrub. After completion of reconnaissance surveys, it was concluded that no elderberry shrubs occur within the proposed project boundaries; therefore, there will be no impacts to this species.

No anadromous fish transit or reside in Burch Creek or No-Name Creek at or near the project site. Burch Creek and Rice Creek are designated as critical habitat for Central Valley spring-run Chinook salmon from the Sacramento River to Kirkwood Road. The two creeks are listed as critical habitat for California Central Valley steelhead from the Sacramento River to their confluence. The critical habitat designation continues on Rice Creek to Kirkwood Road. Juveniles have been observed up to Kirkwood Road, approximately 11 miles downstream from the project site.

Potential impacts to fish in the lower reaches of Burch Creek during the peak flow season when and where salmonids may occur will be minimal because of the following: 1) water will only be diverted from Burch Creek during periods of seasonal high flow; 2) several tributaries contribute flow below the PODs; and 3) and the maximum instantaneous diversion to offstream storage of approximately 40 cfs will retain significant water in Burch Creek. Further, available water at the mouth of Burch Creek is not likely a limiting factor for juvenile-rearing habitat for steelhead or spring-run Chinook given that few food resources exist due to the lack of instream aquatic vegetation and lack of instream cover, which creates an area of relatively inhospitable habitat. Finally, while the habitat at the mouth of Burch Creek near the Sacramento River can provide important refuge for juvenile salmonids, the diversion of roughly 2,000 af of water per year approximately 22 miles upstream will not significantly reduce water availability as flows are augmented by multiple tributaries downstream from the proposed diversions during the winter and proposed withdrawal season.

No deer herd migration routes will be impacted by the project.

Plant Impacts

Currently, no known populations of special-status plant species occur on the project site. Special-status plant species are known to occur within 2 miles of the study area, including Red Bluff dwarf rush and legenere. Direct impacts to all known populations of these species can be avoided. Prior to construction activities, the site will be surveyed for populations of these special-status plant species. If any special-status plants species are impacted during project activities, the impact would be considered significant and subject to mitigation. No special-status plant or animal species, other than incidental observation of two migratory bird species, were observed during reconnaissance-level surveys.

Mitigation Measures

If special-status plant species are noted and cannot be avoided during construction, CDFG shall be contacted immediately to provide consultation on the appropriate salvage and relocation measures. Special-status plant species that can be avoided shall be protected with exclusionary fencing to prohibit disturbance.

Within 3 days before construction on the dam begins, a biologist acceptable to the Deputy Director for Water Rights will survey the project area to ensure no special-status plant or wildlife species have inhabited the site. Implementation of these mitigation measures will reduce impacts to less than significant.

Endangered anadromous fish will not be impacted by reservoir development, as explained above. A bypass flow has been developed for the project. The impact, as mitigated, is less than significant.

Wetlands and Other Waters of the U.S. Impacts

A wetlands delineation has not been completed for the project area; however, an estimated 2,000 lineal feet (or 1.6 acres) of ephemeral stream channel will be impacted by the project through the inundation of the No-Name Creek Watershed. No-Name Creek and its tributaries are located within the area of the proposed reservoir. This creek has no tree or shrub stratum within the proposed project area until its confluence with Burch Creek. The dominant vegetation stratum within the project area of No-Name Creek is annual grass in combination with facultative plants found in the dry creek corridor. Following project construction, this area will be inundated and an equivalent or greater area of artificial wetlands created within the littoral zone of the reservoir. As the reservoir surface rises and falls, these areas will be wetted and dried over a longer period than the submerged streambed areas. Impacts to No-Name Creek and the associated ephemeral drainages resulting from inundation of the reservoir area are considered less than significant.

The diversion structure to be constructed in Burch Creek will result in a limited fill of the creek channel. Construction of the diversion will have short-term impacts on the riparian community during the construction period. Operation of the diversion is not anticipated to have long-term impacts on wetlands due to the proposed bypass flow. To reduce short-term impacts, (a) the area will be replanted following construction, (b) existing riparian vegetation will be avoided to the extent practicable, and (c) construction will be contingent on implementation of Best Management Practices (BMPs). The U.S. Army Corps of Engineers (USACE) and Central Valley RWQCB will be consulted prior to construction.

A Section 1600 Notification of Lake or Streambed Alteration Agreement establishing the conditions for working in the bed and on the banks of No-Name Creek and Burch Creek will be obtained from CDFG and complied with in addition to a Section 401 Water Quality Certification from the Central Valley RWQCB or State Water Board.

To facilitate the establishment of a productive ecosystem associated with the proposed reservoir, riparian vegetation will be planted to minimize bank erosion and maximize the area's habitat potential. The proposed dam will enhance habitat for wildlife by providing a year-round water source and fresh emergent and riparian habitat.

Mitigation Measures

The following BMP measures shall be implemented to reduce the indirect impacts to waters of the United States. Implementation of these mitigation measures will reduce impacts to a less than significant level.

1. Silt fencing or straw bale siltation barriers shall be installed between all waters of the United States and the dam construction area.
2. Initial site grading and levee construction shall be conducted during the dry summer months (May 1 through October 15).
3. Hydromulch and/or hydroseed (using native plant species or sterile seed) will be applied to all soil stockpiles to minimize wind and water erosion.

4. Disturbed soil, including roads, shall be watered frequently to prevent dust emissions.
5. Fueling and maintenance of construction equipment shall occur only at the processing facility to reduce the area of potential fuel spills, lubricant spills, etc.
6. Spill containment materials shall be kept onsite at all times to contain any accidental spill.
7. The design of the aggregate haul roads and reservoir levees shall be sloped toward the reservoir areas to prevent storm water runoff from leaving the site and flood waters from entering the reservoirs.
8. Work conducted within jurisdictional waters would be limited to the summer dry months, May 1 through October 15.
9. Additional mitigation measures may be implemented as conditions of the USACE 404 permit, Water Quality 401 Certification issued by the Central Valley RWQCB or State Water Board and/or the Section 1602 Streambed Alteration Agreement issued by CDFG.
10. Following reservoir construction, the banks will be planted with regionally appropriate overstory riparian vegetation to provide habitat and with understory vegetation to reduce the potential for soil erosion and sedimentation of waters. The planting list may include native tree, shrub, grass, and forb species along with sterile grasses that are quick growing. Examples of suitable vegetation include willow species (*Salix* sp.), cottonwood (*Populus fremontii*), mulefat (*Baccharis salicifolia*), coyote bush (*Baccharis pilularis*), cinquefoil (*Potentilla glandulosa*), mugwort (*Artemesia douglasiana*), creeping wildrye (*Leymus triticoides*), meadow barley (*Hordeum brachyantherum*), purple needlegrass (*Nasella pulchra*), sterile annual rye (*Lolium multiflorum*), and soft chess (*Bromus hordeaceus*). At the time of planting, the chosen palette will be determined by availability.

    Trees and shrubs will be planted on 7-x-7-foot spacings within three staggered rows. Planting holes will be dug to 1.5 times the depth and 2 times the width of the container size and backfilled. Soils will be prepped for planting through disking or lightly harrowing. Seed will be drilled or broadcasted at the recommended label rate. Trees and shrubs will be irrigated in the first 2 years to promote root growth and plant establishment.

4.5 CULTURAL RESOURCES

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	☐	☐	☐	☒

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

Discussion

A historical resource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. In 1992, the Public Resources Code was amended as it affects historical resources. The amendments included creation of the California Register of Historic Resources. The State Historical Resources Commission administers the California Register and adopted implementing regulations effective January 1, 1998. The California Register includes historical resources that are listed automatically by virtue of their appearance on, or eligibility for, certain other lists of important resources. The California Register incorporates historical resources that have been nominated by application and listed after public hearing. Also included are historical resources listed as a result of the State Historical Resources Commission's evaluation in accordance with specific criteria and procedures. CEQA requires consideration of potential impacts to resources that are listed or qualify for listing on the California Register, as well as resources that are significant but may not qualify for listing.

A cultural resources study was conducted by Genesis Society for the project area in June 2008. A copy of the report has been filed with the State Water Board and is included as Appendix D. A records search and literature review was completed to determine whether known cultural resources had been recorded within or adjacent to the project area, to assess the likelihood of unrecorded cultural resources based on archaeological, ethnographic, and historical documents and literature, and to review the distribution of nearby archaeological sites in relation to their environmental setting. The records search found that no prehistoric or historic cultural resources have been recorded within the project site, and no previous archaeological surveys have been conducted within its boundaries.

On June 5, 2008, the California Native American Heritage Commission (NAHC) was asked to review the Sacred Lands file for information on Native American cultural resources on the project site. The NAHC responded indicating that they have no knowledge of Native American resources within the project area.

The Genesis Society conducted a cultural resources field survey of the project area in June 2008. The survey included an intensive pedestrian survey by walking back and forth across the proposed project area with systematic transects maintained at 20- to 25-meter intervals. The property was found to be generally unaffected by historic through contemporary development, although a number of access roads have been graded through the property, and an actively farmed walnut orchard is located adjacent to the southern margin of the project area. No residential or farm-related structures were observed, with elements of the built environment being limited to fully contemporary steel-post supported fences.

Based on the findings of the archaeological survey, no cultural resources will be impacted by the project as proposed. However, in the event that unidentified cultural materials or human remains are encountered, the following mitigation measures will be used to reduce potential impacts to a less than significant level:

1. **Consultation in the event of inadvertent discovery of human remains**. If human remains are discovered, all work must stop in the immediate vicinity of the find and the County Coroner notified, according to Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15065.5(d) and (e) shall be followed.
2. **Consultation in the event of inadvertent discovery of cultural material**. The present evaluation and recommendations are based on the findings of an inventory-level surface survey only. There is always the possibility that important unidentified cultural materials could be encountered on or below the surface during the course of future construction or other residential development activities. This possibility is particularly relevant considering the constraints generally to archaeological field survey, and particularly where limited past disturbance, including access road grading, has occurred, as in the present case. In the event of an inadvertent discovery of previously unidentified cultural material, archaeological consultation will be sought immediately.

The site has not been surveyed for paleontological resources. It is possible that future grading, construction, or mining activities within the project area may uncover potentially significant paleontological resources. If any paleontological resources are found once project implementation is underway, all work in the immediate vicinity of the find will stop and the county will be immediately notified. A qualified paleontologist shall be retained to evaluate the finds and recommend appropriate mitigation measures.

4.6 GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☐	☒

iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion

The project area is located within the Great Valley geomorphic province. The predominant geologic unit in this area is the Upper Pliocene Non-marine, which characteristically contains formed rounded hills with moderate relief. It is composed of fluvial sedimentary deposits of semiconsolidated pale green, gray and tan sands; tuffaceous sands; silts; and clays with minor discontinuous gravel lenses and lenses of pebble and cobble conglomerates.

The Great Valley Province is a sedimentary basin approximately 400 miles long by 50 miles wide, located throughout the central portion of California. In the watershed, the province is characterized by a thick deposit of moderately deformed Jurassic and Cretaceous marine sedimentary layers that consist of detrital materials derived from uplifted basement rocks of the Klamath Mountain and Coast Range Provinces. Great Valley rocks consist primarily of mudstone, shale, and sandstone and occur mostly along the west side of the central valley. These units yield an abundance of suspended sediment but relatively little gravel to drainages.

The faults in the area are the Willows fault, Elder Creek Fault, and the Red Bluff fault. These inactive faults typically present no particular geologic or seismic hazards. Tehama County does not have any areas listed as being located within an Alquist-Priolo Earthquake Fault Zone. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. Earthquake Fault Zones are regulatory zones around active faults. The zones are defined by turning points connected by straight lines. Most turning points are identified by

roads, drainages, and other features on the ground. Earthquake Fault Zones are plotted on topographic maps at a scale of 1 inch = 2,000 feet. Zones vary in width but average about ¼ mile wide.

According to the Tehama County Soil Survey, the project area consists of 11 different soil types, ranging from deep, excessively drained gravelly loams to slowly permeable silty clay loams. Typical slopes range from 0 to 30 percent. The erosion hazard is slight to moderate. The primary soil types are Nacimiento-Newville complex, 10 to 30 percent slopes and Newville gravelly loam, 3 to 10 percent slopes.

The project will not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of known fault. The project will not result in strong seismic groundshaking, seismic-related ground failure, including liquefaction, or landslides. The project design for the dam will be approved by the Division of Dam Safety, which applies seismic safety standards to dam embankments.

The proposed project will not result in substantial soil erosion or loss of topsoil. It will not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse. The project will not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property. It will not be located in an area with soils known to be incapable of adequately supporting use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water. No septic tanks or alternative wastewater disposal systems will be installed.

4.7 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or environment through the routine transport/use/disposal of hazardous material?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled	☐	☐	☐	☒

pursuant to Government Code Section 65962.5 and create a significant hazard to the public or the environment?				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project in the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in there?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion

The project site and surrounding landscape currently consist of grasslands with the exception of a large walnut orchard located to the south. No chemicals or hazardous materials are currently stored or used in the project area, nor will any be used during construction. Diesel emissions from construction equipment are not considered significant, and no sensitive receptors are located in the project vicinity.

The proposed project is not located within a quarter mile of any existing or proposed schools, airports or airstrips, and the project will not interfere with an adopted emergency plan.

The proposed project is located in a rural area that contains substantial fuels (i.e. grasses, shrubs) that are susceptible to wildland fire. However, the proposed project does not consist of any activities that would introduce potential new sources of fire. No impacts are anticipated due to project activities.

4.8 HYDROLOGY AND WATER QUALITY

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such there would be a net deficit in aquifer volume or lowering of the local groundwater table level (e.g. production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion

The proposed dam and reservoir will be located on an unnamed tributary (No-Name Creek) to Burch Creek. When completed, the dam and reservoir will capture surface water runoff from approximately 800 acres (1.2 square miles). In contrast, the Burch Creek Watershed encompasses approximately 94,500 acres (148 square miles). The WAA completed for the

proposed diversion is included as Appendix C. For purposes of impact analyses, two PODs and three points of interest (POIs) were identified in the Burch Creek Watershed as follow:

- POD1 Point of Diversion (No-Name Creek)
- POD2 Point of Diversion (Burch Creek)
- POI 1 Uppermost point of anadromy
- POI 2 Confluence with Sacramento River
- POI 3 Point of License No. 10115 (Burch Creek)

Regularly recorded or official flow data are not available for Burch Creek or No-Name Creek; therefore, flows for this analysis were estimated using the rainfall/runoff rational method and the USGS area-ratio method. These methods are described in the WAA in Appendix C.

Using the area-ratio method, the estimated unimpaired flow or natural supply at POD 1 and POD 2 are 600 afa and 12,716 afa, respectively. The estimated unimpaired flow during the diversion season from November 1 through April 30 at POD 1 and POD 2 are 528 af and 11,190 af, respectively.. The fraction of runoff occurring during the diversion season was estimated using Elder Creek discharge data. Runoff estimates for all POIs using the rational method and the area-ratio method are listed in Tables 9 and 10, respectively. Supporting documentation for both analyses is included in the WAA in Appendix C.

Pursuant to CEQA, California Endangered Species Act (CESA), and Federal Endangered Species Act (ESA), the Division is required to evaluate cumulative impacts to natural hydrology. The cumulative flow impairment index (CFII) is an index used to evaluate the cumulative flow impairment demand of all existing and pending projects in a watershed of interest. The CFII is a percentage obtained by dividing **Demand** in acre-feet by **Supply** in acre-feet at a specified POI for the seasons of interest.

Table 9
NATURAL SUPPLY (RATIONAL METHOD)

Parameter	Symbol	Units	POD 1	POD 2	POI 3	POI 1	POI 2
Physical Location	---	---	POD at dam on No-Name Creek	POD on Burch Creek	Downstream water right	Upper point of anadromy	Burch Creek at Sac. River
Upstream Area	A	acres	810	16,030	40,900	65,800	94,500
Annual Upstream Precipitation	I	feet	1.5	1.6	1.46	1.48	1.46
Runoff Coefficient							
Relief	C_r	fraction	0.18	0.18	0.17	0.17	0.17
Soil Saturation	C_i	fraction	0.07	0.07	0.07	0.07	0.07
Vegetal Cover	C_v	fraction	0.06	0.06	0.06	0.06	0.06
Surface Storage	C_s	fraction	0.08	0.08	0.08	0.08	0.08
Sum	C	fraction	0.39	0.39	0.38	0.38	0.38
Unimpaired Flow [1]	Q	a-ft/year	480	10,020	24,500	37,000	52,400
Fraction Runoff during Diversion Season	r_d	fraction	0.88	0.88	0.88	0.88	0.88
Natural Supply during Diversion Season [2]	Q_{NSDS}	a-ft/DS	420	8,830	21,500	32,500	46,100
Fraction Runoff during Supply Season	r_s	fraction	0.88	0.88	0.88	0.88	0.88
Natural Supply during Supply Season [2, 3]	Q_{NSSS}	a-ft/SS	420	8,830	21,500	32,500	46,100

Notes:
[1] Unimpaired flow at POD or POI = C (runoff coefficient) * I (annual upstream precipitation) * A (upstream area).
[2] Natural supply at POD or POI = Unimpaired flow at POD or POI * fraction of runoff occurring during season.
[3] Diversion and supply seasons are the same.

Table 10
NATURAL SUPPLY (AREA-RATIO METHOD)

Parameter	Symbol	Units	Elder Creek	POD 1	POD 2	POI 3	POI 1	POI 2
Physical Location	---	---	USGS 11379500	POD at dam on No-Name Creek	POD on Burch Creek	Downstream water right	Upper point of anadromy	Burch Creek at Sac. River
Upstream Area	A	acres	59,348	810	16,030	40,900	65,800	94,500
Annual Upstream Precipitation	I	ft	2.54	1.5	1.6	1.46	1.48	1.46
Unimpaired Flow [1]	Q	a-ft/year	74,500	600	12,716	29,512	48,129	68,187
Fraction Runoff during Diversion Season	r_d	fraction	---	0.88	0.88	0.88	0.88	0.88
Natural Supply during Diversion Season [2]	Q_{NSDS}	a-ft/DS	---	528	11,190	25,970	42,353	60,004
Fraction Runoff during Supply Season	r_s	fraction	---	0.88	0.88	0.88	0.88	0.88
Natural Supply during Supply Season [2, 3]	Q_{NSSS}	a-ft/SS	---	528	11,190	25,970	42,353	60,004

Notes:
[1] Unimpaired flow at POD or POI = Q (Elder Creek) * A (POD or POI)/A (Elder Creek) * I (POD or POI)/I (Elder Creek).
[2] Natural supply at POD or POI = Unimpaired flow at POI * fraction of runoff occurring during season.
[3] Diversion and supply seasons are the same.

Demand is the "face" value entitlements of all existing and pending water rights, under all bases of right, above the POI in acre-feet using the Division's WRIMS database and water right files. Demand includes existing and pending water right applications for "post-1914" appropriators, Statements of Water Diversion and Use for "riparian" and "pre-1914" appropriators, small domestic use registrations, stockpond registrations, and any other known authorized diversions. For this analysis, the demand season is identified as extending from November 1 through April 30, the proposed diversion season.

Supply is the seasonal average unimpaired flow above the POI in acre-feet. For this analysis, the supply season is identified as extending from November 1 through April 30.

Based on the WRIMS database as of 30 March 2010, there are no recorded water rights above the proposed PODs on Burch Creek or No-Name Creek. One recorded water right exists below POD1/POD2 and above POI 1 and POI 2: License No. 10115 for 0.625 cfs between April 1 and October 31 and not to exceed 37 af per month or 186 af per year.

The CFII ranges between 6.3 percent and 4.4 percent at the upper and lower points of anadromy based on flows estimated using the rational method, and 4.8 percent and 3.4 percent at the upper and lower points of anadromy based on flows estimated using the area-ratio method.

POD 1 and POD 2 are located above the upper point of anadromy in Burch Creek. Based on this information in conjunction with a CFII ranging between 4.8 percent and 3.4 percent at the upper and lower points of anadromy, a minimum bypass flow of 1 cfs is proposed at POD 2 between November 1 and April 30. See previous discussion.

Only short-term construction activities associated with this project would occur at the project site. The project is not regulated, nor is it expected to be regulated, under waste discharge requirements. During operation of the proposed project, water would either be stored in an on-stream reservoir on No-Name Creek or pumped from Burch Creek and conveyed to the reservoir during the winter. The water will then be pumped from the reservoir and used to irrigate orchards during the irrigation season. Burch Creek is not listed on the State Water Board's 303(d) list as impaired.

As described in the Geology and Soils section, significant erosion and runoff from the project site is not expected to occur. The cumulative reduction in Burch Creek flow caused by the proposed project is minor, as shown previously in Table 2. The diversion of water will be limited to the winter period, when stream temperatures are cooler and diversion would not significantly impact water temperature or quality. The project is not located in an area subject to 100-year flood flows, as shown on Figure 14.

The proposed project does not involve the use of groundwater supplies. Groundwater recharge on the project site would be improved because demand on groundwater resources in the area would be reduced. No changes would occur to the existing conditions of geology, soils, or runoff. Impacts to groundwater would not occur.

BH Farming's present source of water is 400- to 800-plus-foot deep wells that are powered by two 385-horsepower diesel engines (using 240 gallons of diesel per day) and two 200-

horsepower electric motors. The local water table has been declining due to increased uses in the area – specifically, a large eucalyptus plantation. Groundwater levels in DWR Monitoring Well 24N03W17M001M are shown on Figure 15. The project is anticipated to have a positive effect on groundwater sources.

The dam proposed will be designed and constructed under the supervision of the Department of Water Resources, Division of Dam Safety. The standards to be used limit potential for dam failure and were selected to protect human health and welfare. The potential to expose populations due to loss from flooding is considered less than significant because of applicable regulations. In addition, because Burch Creek regularly overflows its banks in and around the town of Orland, the construction of the reservoir would be considered a benefit to ongoing flood problems.

As discussed in the Geology and Soils section, construction of the proposed project is not expected to significantly alter the drainage pattern of the project site or result in substantial erosion or unintended flooding.

To ensure that water is diverted in accordance with the project description and to minimize the project's potential to cause impacts to hydrology and water quality, the following shall be included as mitigation in any permit or license issued pursuant to the project:

1. The maximum rate of diversion to offstream storage from POD 2 shall not exceed 40 cfs.
2. The capacity of the reservoir covered under this permit shall not exceed 2,000 af.
3. The water appropriated from No Name Creek and Burch Creek shall be limited to the quantity which can be beneficially used and shall not exceed a combined total of 2,000 af to be collected from November 1 of each year to April 30 of the succeeding year.
4. Before storing water in the reservoir, permittee shall install and properly maintain a staff gage in the reservoir, satisfactory to the State Water Board, for the purpose of determining water levels in the reservoir. Permittee shall record the staff gage readings monthly from November 1 until April 30 of every year. Such readings shall be supplied to the State Water Board with each progress report submitted to the Board by permittee
5. Permittee shall install and maintain an outlet pipe of adequate capacity in the dam as near as practicable to the bottom of the natural stream channel in order that water entering the reservoir which is not authorized for appropriation under this permit can be released. Before starting construction, permittee shall submit plans and specifications of the outlet pipe to the Deputy Director for Water Rights for approval. Before storing water in the reservoir, permittee shall furnish evidence which substantiates that the outlet pipe has been installed in the dam. Evidence shall include photographs showing completed works or certification by a registered Civil or Agricultural Engineer.
6. For the protection of fish and wildlife, permittee shall bypass a minimum of 1 cubic foot per second (cfs) at the point of diversion on Burch Creek. The total streamflow shall be bypassed whenever it is less than 1 cfs. Prior to diversion, the permittee shall submit a compliance plan, satisfactory to the Deputy Director for Water Rights, which describes how the bypass flows required by the conditions of this permit will be measured and maintained.

7. No water shall be diverted under this permit until the permittee has installed a structure in Burch Creek, satisfactory to the State Water Board, which is capable of bypassing the flow required by the conditions of this permit. Permittee shall submit plans and specifications of the bypass structure to the Deputy Director for Water Rights, within six-months of the date the permit is issued. The plans for the bypass structure shall be reviewed and must be satisfactory to the Deputy Director for Water Rights, before any construction is undertaken. If the bypass structure is rendered inoperative for any reason, all diversions shall cease until such time as it is restored to service. Said bypass structure shall be properly calibrated, operated, and maintained by the permittee (or successors-in-interest) as long as any water is being diverted under any permit or license issued pursuant to Application 31771.
8. Permittee shall install and maintain a device satisfactory to the State Water Board to measure the rate and quantity of water diverted into the reservoir from Burch Creek. Prior to diversion, permittee shall also develop a method for measuring the diversions from the No-Name Creek. The measuring methodology shall be subject to review and approval of the Deputy Director for Water Rights. All in-line flow meters or other measuring devices must be maintained in operating condition as long as water is being diverted or used under this permit.
9. If the storage dam will be of such size as to be within the jurisdiction of the Department of Water Resources as to safety, construction under this permit shall not be commenced until the Department has approved the plans and specifications for the dam.
10. Prior to the start of construction or diversion or use of water under this permit, the permittee shall submit a Compliance Plan for approval by the Deputy Director for Water Rights that will demonstrate compliance with the flow bypass terms specified in this permit. The Compliance Plan shall include the following:
    a. A description of the physical facilities (i.e., outlet pipes, siphons, pipelines, bypass ditches, splitter boxes, etc.) that will be constructed or have been constructed at the project site and will be used to bypass flow.
    b. A description of the gages and monitoring devices that will be installed or have been installed to measure stream flow and/or reservoir storage capacity, including any necessary calibration.
    c. A time schedule for the installation and rating of these facilities.
    d. A description of the frequency of data collection and the methods for recording bypass flows and storage levels.
    e. An operation and maintenance plan that will be used to maintain all facilities in good condition.
    f. A description of the events that will trigger recalibration of the monitoring devices and the process that will be used to recalibrate.

    Permittee shall maintain all measurements and other monitoring required by this condition. Permittee shall provide measuring and monitoring records to the Deputy Director for Water Rights within 15 days upon request by the State Water Board.
11. Permittee shall prevent any debris, soil, silt, cement that has not set, oil, or other such foreign substance from entering into or being placed where it may be washed by rainfall runoff into the waters of the State.
12. Permittee shall implement the following BMPs during construction of the project:

The project will be implemented under permits and review of the Department of Water Resources, Division of Dam Safety; Tehama County Grading permit; Department of Fish and Game 1600 permit; USACE 404 permit; and SWRCB General Construction Permit. The General Construction Permit will require preparation of a Storm Water Pollution Prevention Plan (SWPPP), which will include all BMPs to be implemented during project construction. The construction will likely be a Level 2 construction project. The BMPs that may be included at the discretion of the Qualified SWPPP Developer/Practitioner include the following, taken from the most recent California Stormwater BMP Construction Handbook:

Erosion Control

EC-1 Scheduling
EC-2 Preservation of Existing Vegetation
EC-3 Hydraulic Mulch
EC-4 Hydroseeding
EC-5 Soil Binders
EC-6 Straw Mulch
EC-7 Geotextiles and Mats
EC-8 Wood Mulching
EC-9 Earth Dikes and Drainage Swales
EC-10 Velocity Dissipation Devices
EC-11 Slope Drains
EC-12 Streambank Stabilization
EC-13 Reserved
EC-14 Compost Blankets
EC-15 Soil Preparation/Roughening
EC-16 Non-Vegetative Stabilization

Sediment Control

SE-1 Silt Fence
SE-2 Sediment Basin
SE-3 Sediment Trap
SE-4 Check Dam
SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-7 Street Sweeping and Vacuuming
SE-8 Sandbag Barrier
SE-9 Straw Bale Barrier
SE-10 Storm Drain Inlet Protection
SE-11 Active Treatment Systems
SE-12 Temporary Silt Dike
SE-13 Compost Socks and Berms
SE-14 Biofilter Bags

Wind Erosion Control

WE-1 Wind Erosion Control

Tracking Control

TC-1 Stabilized Construction Entrance/Exit
TC-2 Stabilized Construction Roadway
TC-3 Entrance/Outlet Tire Wash

13. Permittee shall abide by the following general terms:

Permit Term 80

The State Water Board reserves jurisdiction over this permit to change the season of diversion to conform to later findings of the State Water Board concerning availability of water and the protection of beneficial uses of water in the Sacramento River. Any action to change the authorized season of diversion will be taken only after notice to interested parties and opportunity for hearing.

Permit Term 90

This permit is subject to prior rights. Permittee is put on notice that, during some years, water will not be available for diversion during portions or all of the season authorized herein. The annual variations in demands and hydrologic conditions in the Sacramento River are such that, in any year of water scarcity, the season of diversion authorized herein may be reduced or completely eliminated by order of the State Water Board, made after notice to interested parties and opportunity for hearing.

Permit Term 91

No diversion is authorized by this permit when satisfaction of inbasin entitlements requires release of supplemental project water by the Central Valley Project or the State Water Project.

a. Inbasin entitlements are defined as all rights to divert water from streams tributary to the Sacramento-San Joaquin Delta or the Delta for use within the respective basins of origin or the Legal Delta, unavoidable natural requirements for riparian habitat and conveyance losses, and flows required by the State Water Resources Control Board for maintenance of water quality and fish and wildlife. Export diversions and project carriage water are specifically excluded from the definition of inbasin entitlements.

b. Supplemental project water is defined as that water imported to the basin by the project plus water released from project storage which is in excess of export diversions, project carriage water, and project inbasin deliveries.

The State Water Board shall notify permittee of curtailment of diversion under this term after it finds that supplemental project water has been released or will be released. The Board will advise permittee of the probability of imminent curtailment of diversion as far in advance as practicable based on anticipated requirements for supplemental project water provided by the project operators.

4.9 LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion

The project site is located in a rural area in Tehama County. The Tehama County General Plan Land Use Element and its policies guide growth and the development and use of land in Tehama County. The Land Use Element of the General Plan designates the project area as Valley Floor Agriculture. The Tehama County Zoning Ordinance designates the project area as Exclusive Agriculture.

The area within the project site is currently grassland, with land to the south developed as orchard. The proposed project would not result in the development of physical barriers that would divide an established community. Under the proposed project, the project site would continue to be used for agricultural purposes, which are consistent with the County's General Plan and zoning designations. The proposed project would not have the potential to conflict with any existing habitat conservation plans or natural community conservation plans, as none currently exists for the project site or immediate vicinity.

4.10 MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion

The project area is not located in an area known to contain mineral resource deposits that would be of value to the region and the residents of the state. No mineral resources are located near the project site. No impacts would occur to mineral resources as a result of the proposed project.

4.11 NOISE

Would the project result in:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion

Potential sources of noise generated at the project site would result from the short-term operation of equipment during the construction of the dam and would be similar to existing agricultural equipment use in the project area. This is considered a less than significant impact.

The project is not located within 2 miles of an airport or airstrip.

4.12 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area either directly (i.e. by proposing new homes and businesses) or indirectly (i.e. through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

The proposed project is located in a rural part of Tehama County in an area that is currently under agricultural uses. The proposed project does not involve the development of any homes or businesses. It will not generate commercial activities substantial enough to induce substantial growth in the project area and does not involve the displacement of people or housing. The proposed project will have no impacts to population and housing.

4.13 PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion

Public services provided to the project area include fire protection by CalFire and the Tehama County Fire Department, police protection by the Tehama County Sheriff's Department, and K through 12th grade public education by the Corning Unified School District.

The proposed project will not result in new demand for government facilities or services. No impacts will occur to public services as a result of the proposed project.

4.14 RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would project increase use of neighborhood and regional parks or other recreational facility that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion

Tehama County has various types of parklands including federal recreation areas, state parks, regional parks, and local parks. Recreational opportunities include fishing, camping, swimming, picnicking, horseback riding, bicycling, hunting, hiking, and walking.

The proposed project will result in the continued agricultural use of the project site. No new demand will be generated for the use of the existing area parks. The proposed project does not include recreation facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. No impacts to recreation will occur as a result of the proposed project. Regular use of the reservoir for waterfowl and other water-dependent species will occur.

4.15 TRANSPORTATION/TRAFFIC

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☒

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazard by design feature (e.g. sharp curves, dangerous intersections) or incompatible use (e.g. farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☐	☐	☒

Discussion

Potential increases in traffic at or near the project site would result from the short-term operation of equipment during the construction of the dam and would be similar to existing agricultural equipment use in the project area. This is considered a less than significant impact.

The project is not located within 2 miles of an airport or airstrip.

4.16 UTILITIES AND SERVICE SYSTEMS

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion

Residences in the project area rely on private wells for domestic water supply and private septic systems for wastewater treatment. The Red Bluff landfill in Tehama County accepts solid waste from the project area. No new wastewater will be generated as a result of the proposed project. If the proposed project is approved, appropriative water rights will be allocated to the property to support existing walnut orchard operations. An analysis of surface water supply is discussed in the Hydrology and Water Quality section of this report. Additional groundwater recharge and protection is provided by the project. Additional water supplies, such as connection to public water supply systems, will not be required. The proposed project will not generate significant solid waste and will not conflict with government regulations concerning the generation, handling, or disposal of solid waste.

4.17 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Discussion

As discussed in the preceding sections, the proposed project has a potential to degrade the quality of the environment by adversely impacting water quality and biological resources. However, with implementation of the identified avoidance and minimization measures, potential impacts would be reduced to a less-than-significant level. In addition, all requirements, including the mitigation and monitoring measures of applicable water quality permits, will be implemented. No impacts to historical resources are anticipated.

The proposed project has a potential to result in adverse environmental impacts. These impacts, in combination with the impacts of other past, present, and future projects, could contribute to cumulatively significant effects on the environment. The primary environmental impact of concern associated with the proposed diversion and water storage is its contribution to the impact of cumulative diversions of the numerous small reservoirs and irrigation water diversions in the Sacramento River watershed and potential risk to federally listed anadromous fisheries in the Sacramento River mainstem, especially during periods of low flow. The project proposes to limit water diversion to the period from November 1 to April 30 each year, during the region's rainy season. Within the rainy season, more water will be diverted during high-flow events than normal-flow periods. A minimum 1 cfs bypass flow in Burch Creek is proposed. With implementation of the identified measures, the proposed project would avoid or minimize potential impacts and would not result in cumulatively considerable environmental impacts.

No potentially significant adverse affects to humans have been identified.

5.0 REFERENCES

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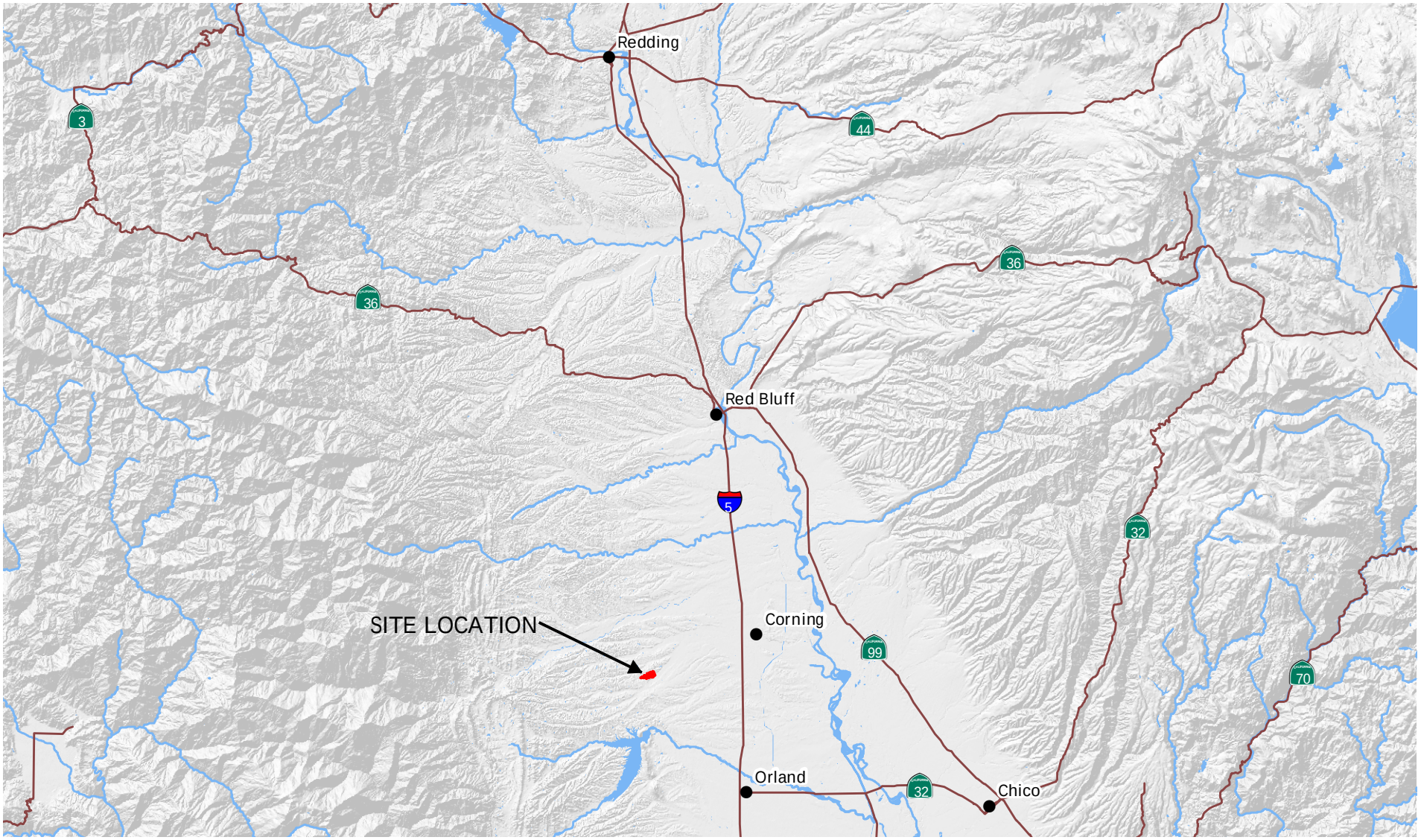
Figures



Highway
River
Lake, Pond, or Reservoir
Project Location

VESTRA

Miles
0 5 10 20

FIGURE 1
GENERAL SITE LOCATION
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

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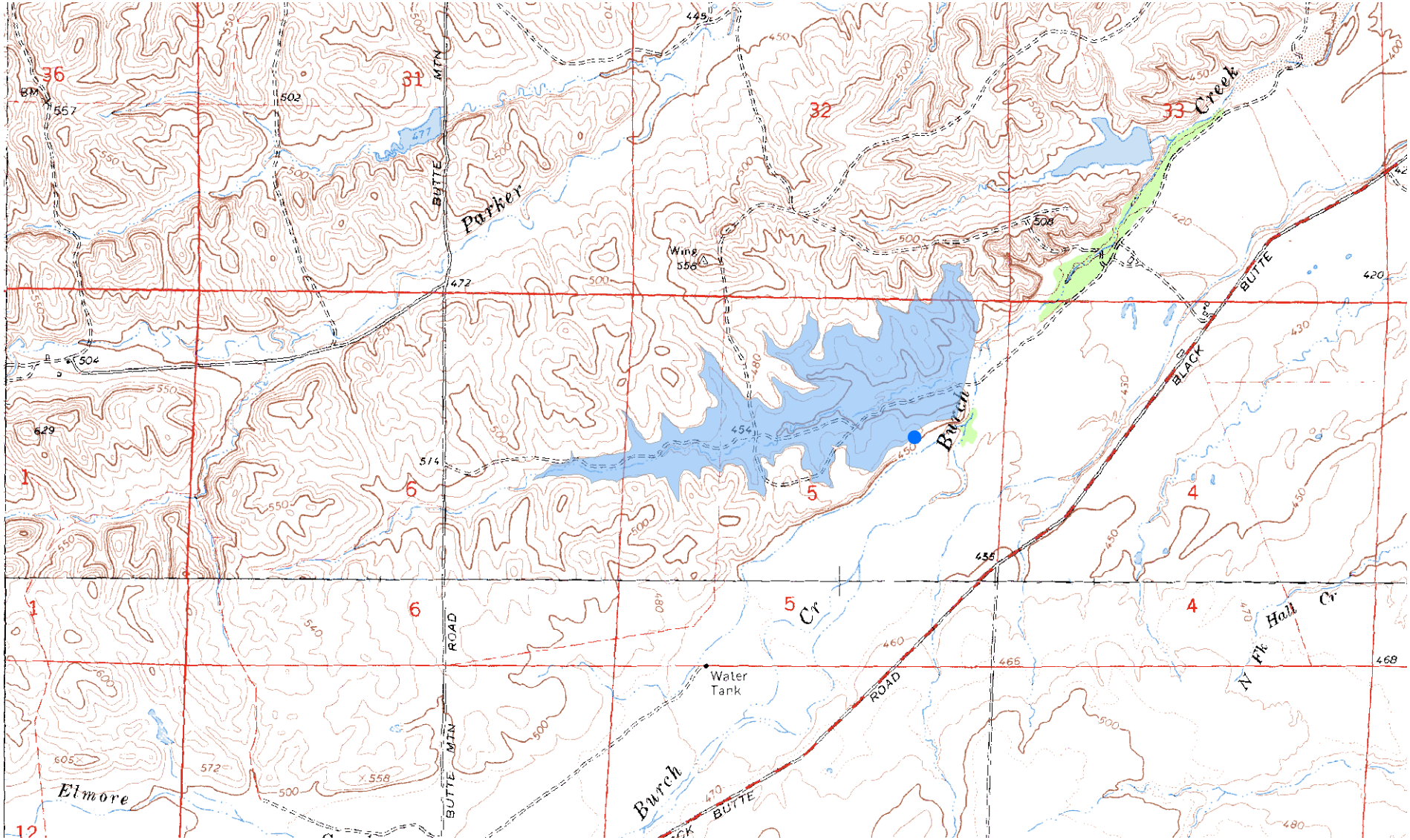


Proposed Extraction Location Along Burch Creek

Proposed Reservoir

VESTRA

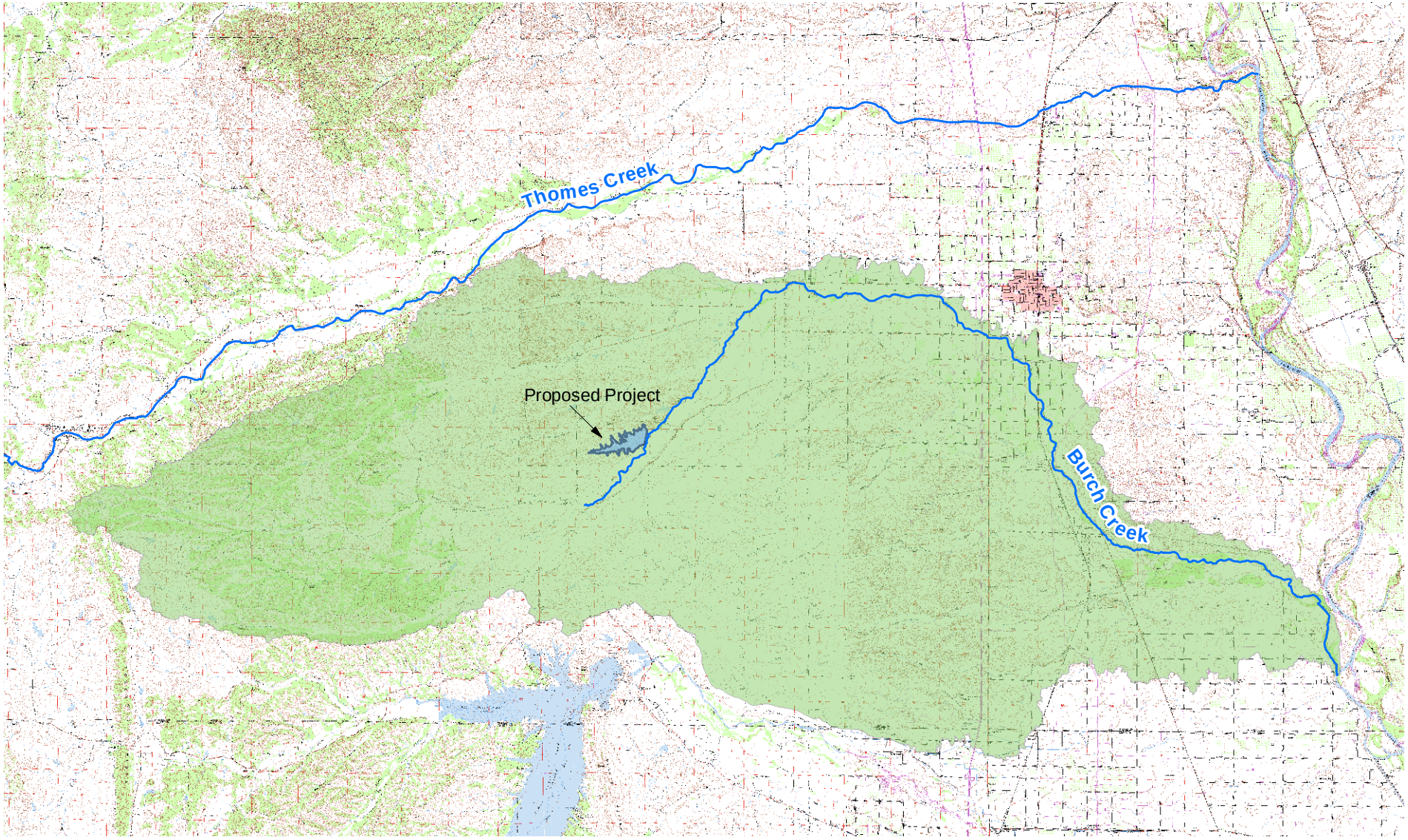
SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, HENLEYVILLE QUADRANGLE

N

0 1,000 2,000 4,000 Feet

FIGURE 2
USGS TOPOGRAPHIC MAP
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\InitialStudy\70812_TopoMap.mxd



Burch Creek Watershed Boundary

N

0 1.25 2.5 5 Miles

VESTRA

SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, HENLEYVILLE QUADRANGLE

FIGURE 3
BURCH CREEK WATERSHED
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

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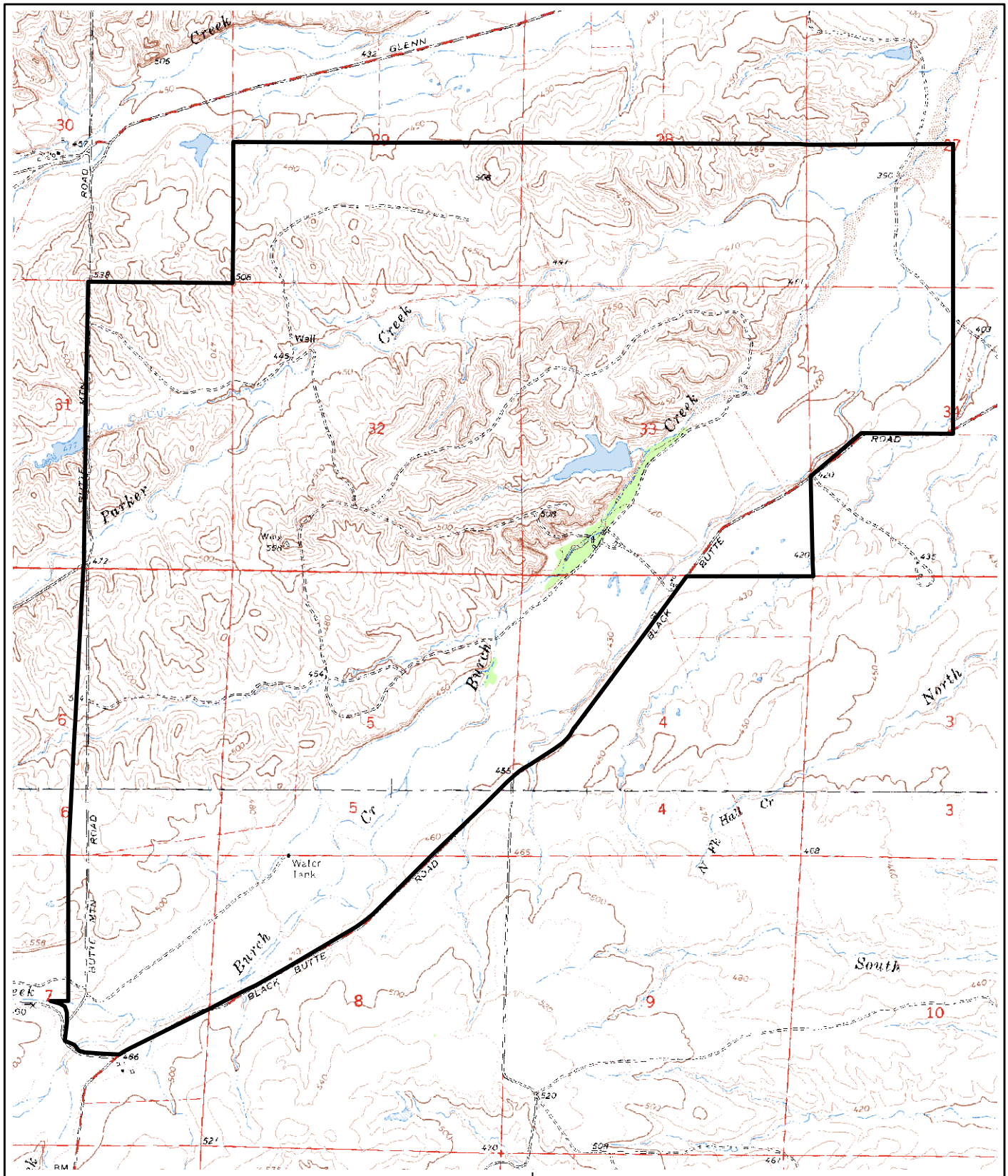


Ownership Boundary

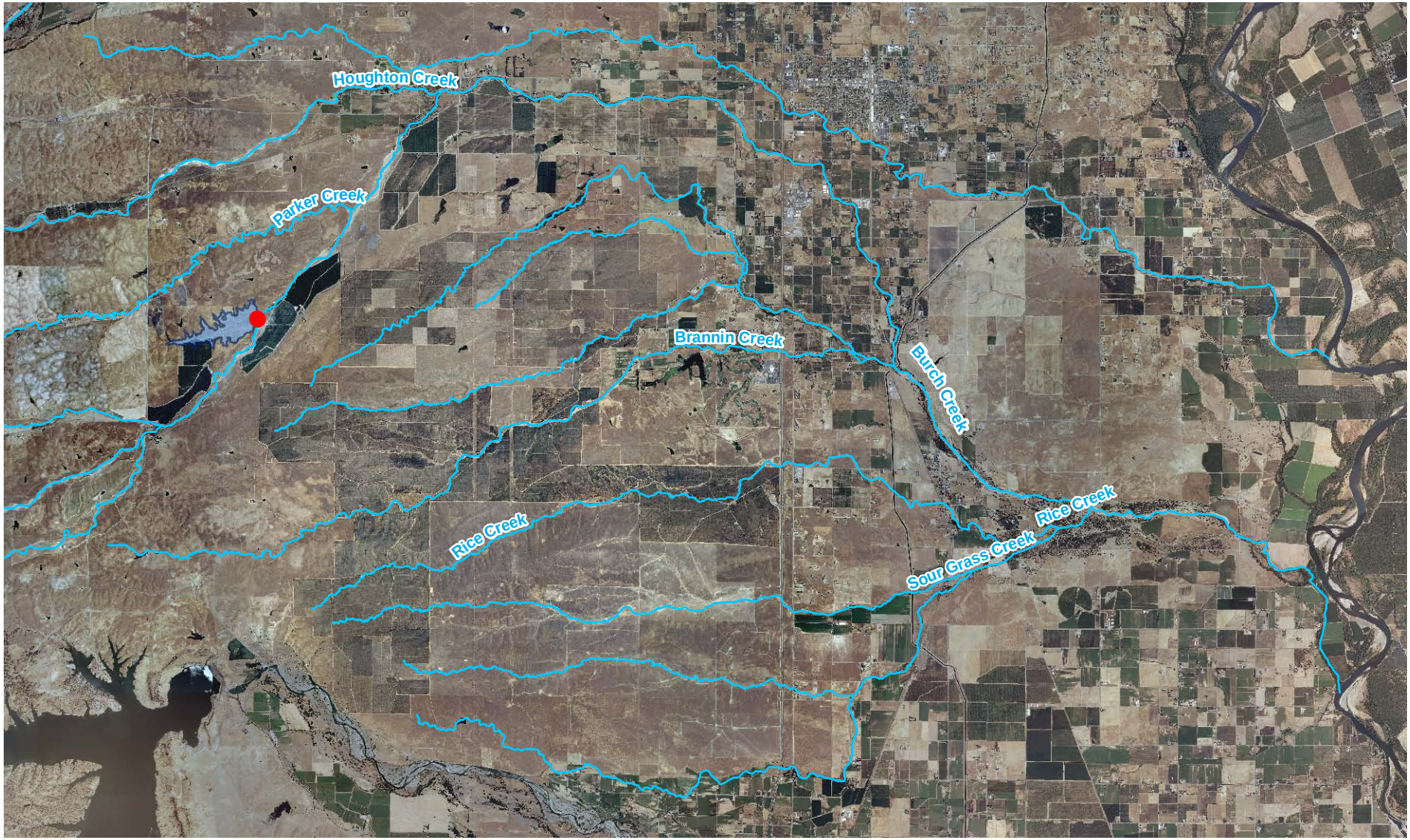
VESTRA

SOURCE: USGS 7.5' TOPOGRAPHIC MAP, BLACK BUTTE DAM AND HENLEYVILLE QUADRANGLES

0 1,250 2,500 5,000 Feet

FIGURE 4
OWNERSHIP BOUNDARY
AND PLACE OF USE
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

P:\GIS\70812\InitialStudy\70812_OwnershipBoundary.mxd



Estimated Point of Diversion

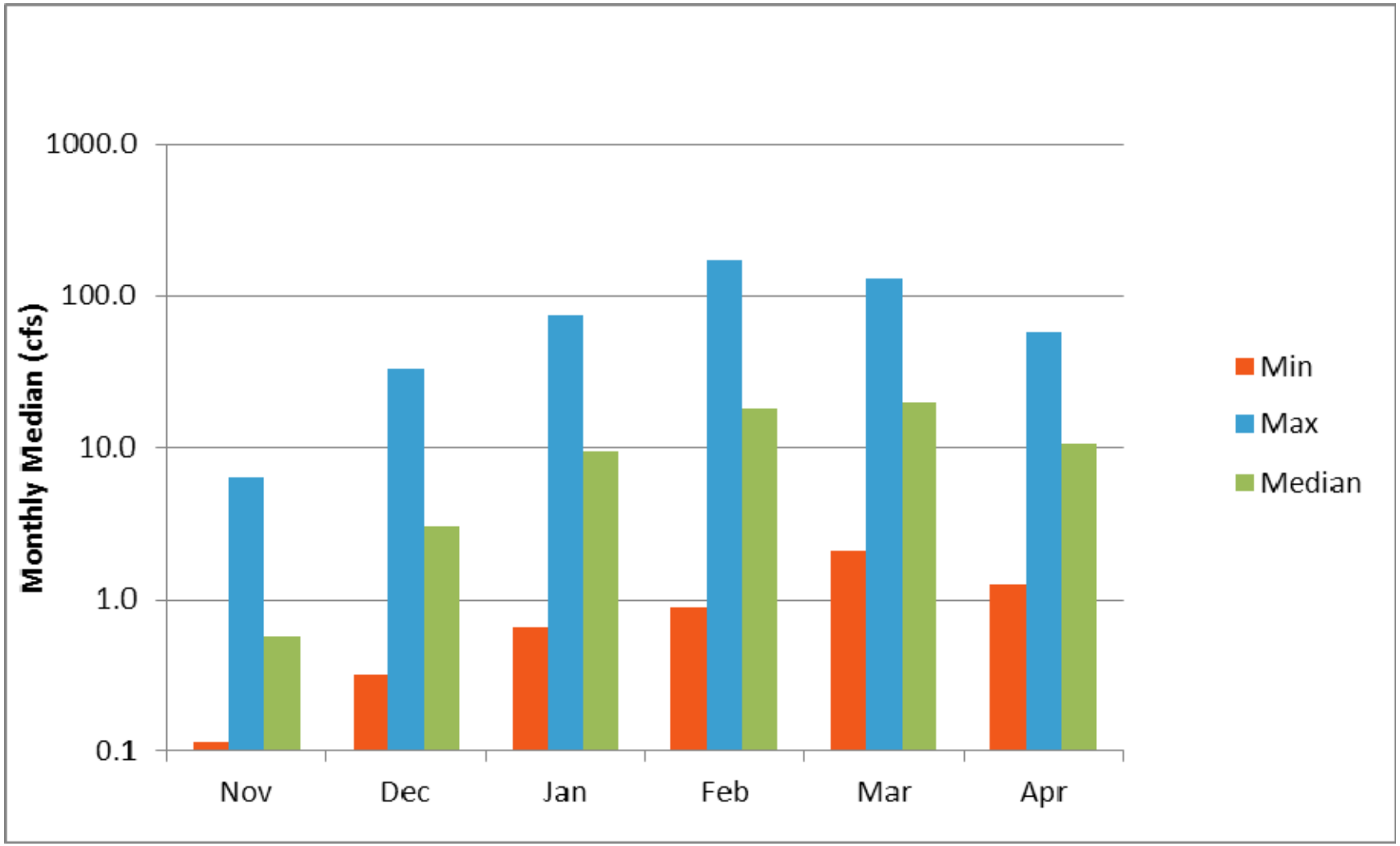
VESTRA

SOURCE: NAIP 2010

0 1 2 4 Miles

FIGURE 5
TRIBUTARY STREAMS
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

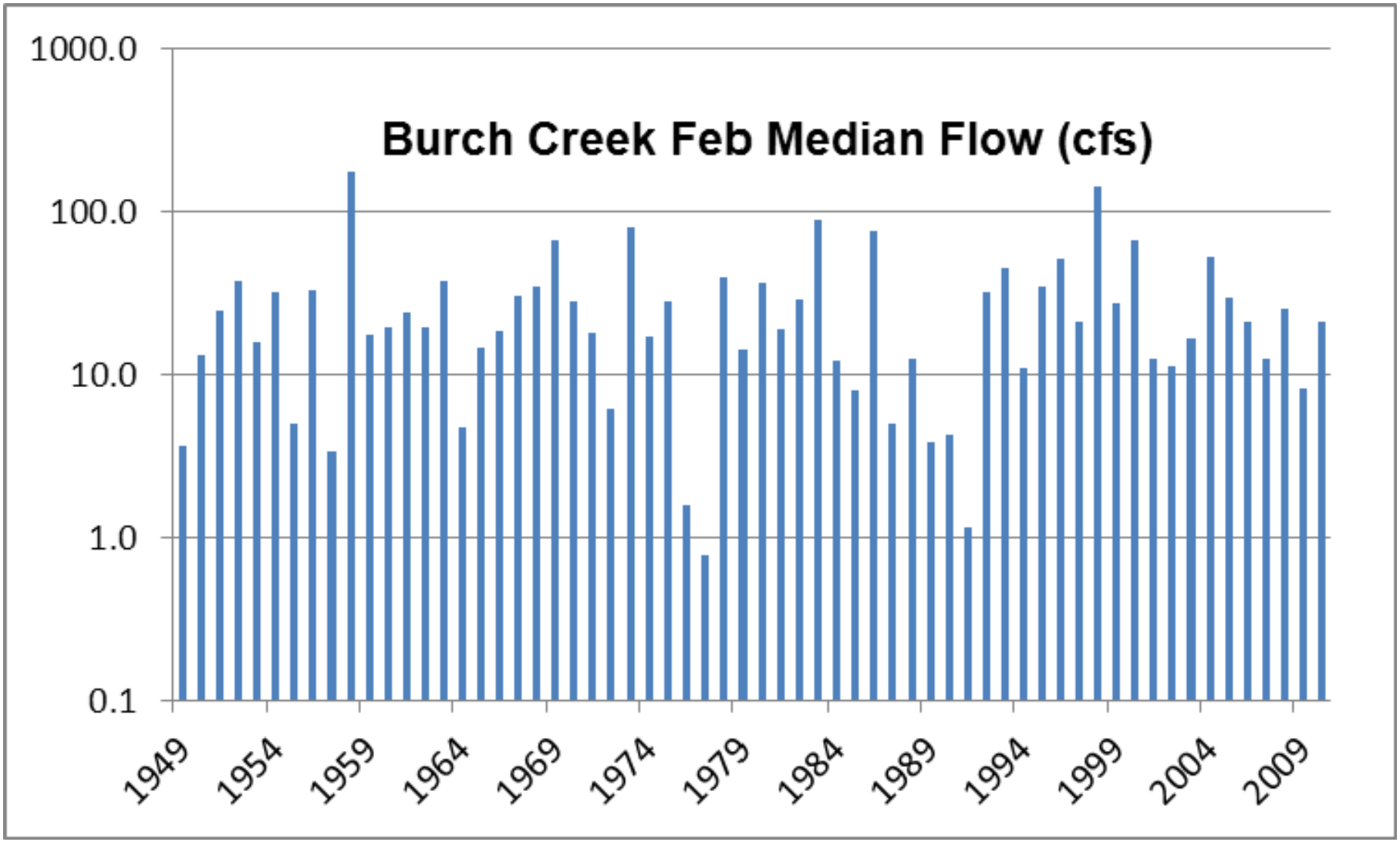
P:\GIS\70812\InitialStudy\70812_TributaryStreams.mxd



VESTRA

SOURCE: DWR 2010

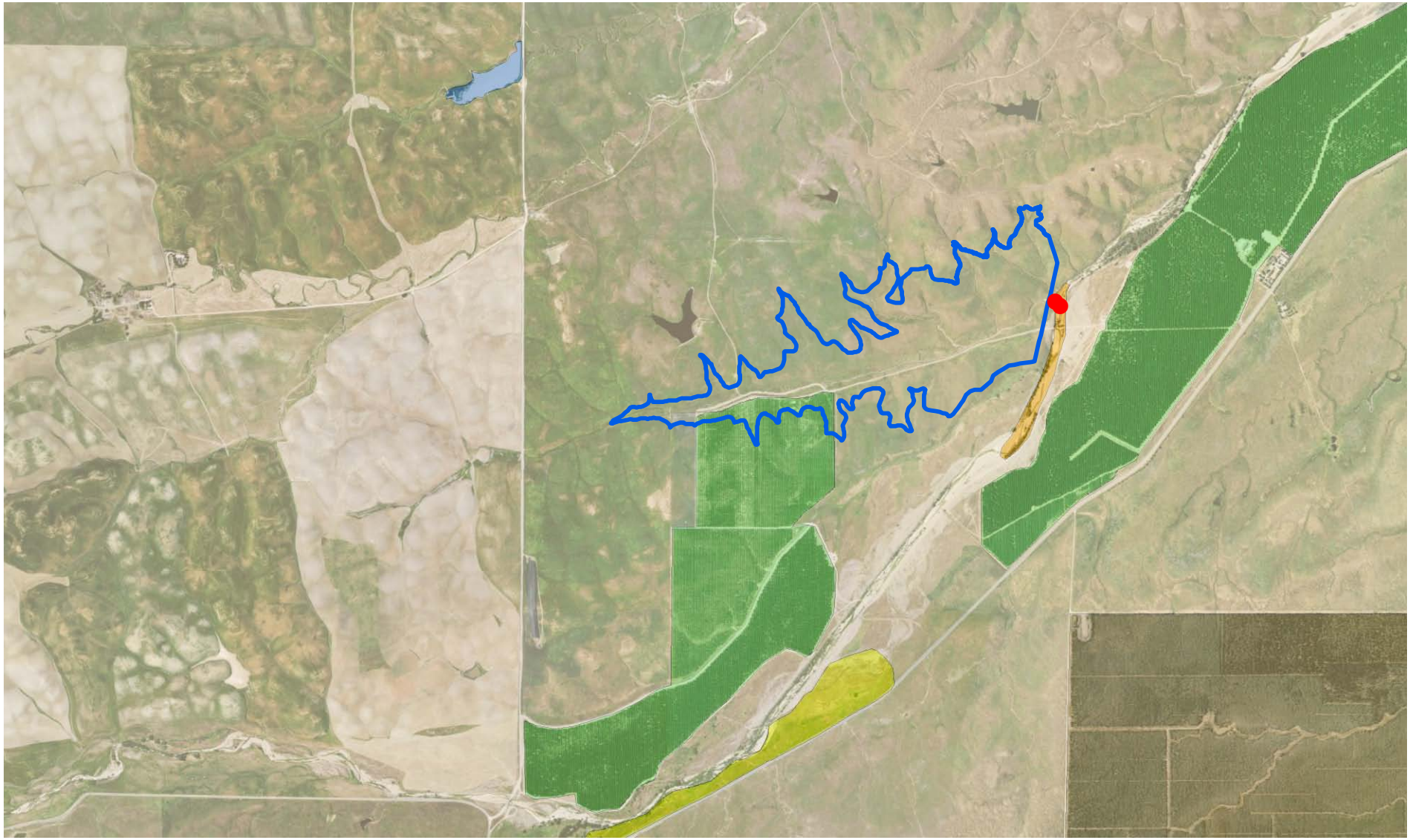
FIGURE 6
MONTHLY MEDIAN FLOW DURING DIVERSION SEASON
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA



VESTRA

SOURCE: DWR 2010

FIGURE 7
FEBRUARY MEDIAN FLOW
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA



Estimated Point of Diversion
Proposed Reservoir
Annual Grass
Eucalyptus
Fremont Cottonwood
Lacustrine
Orchard
Valley Needlegrass Grassland

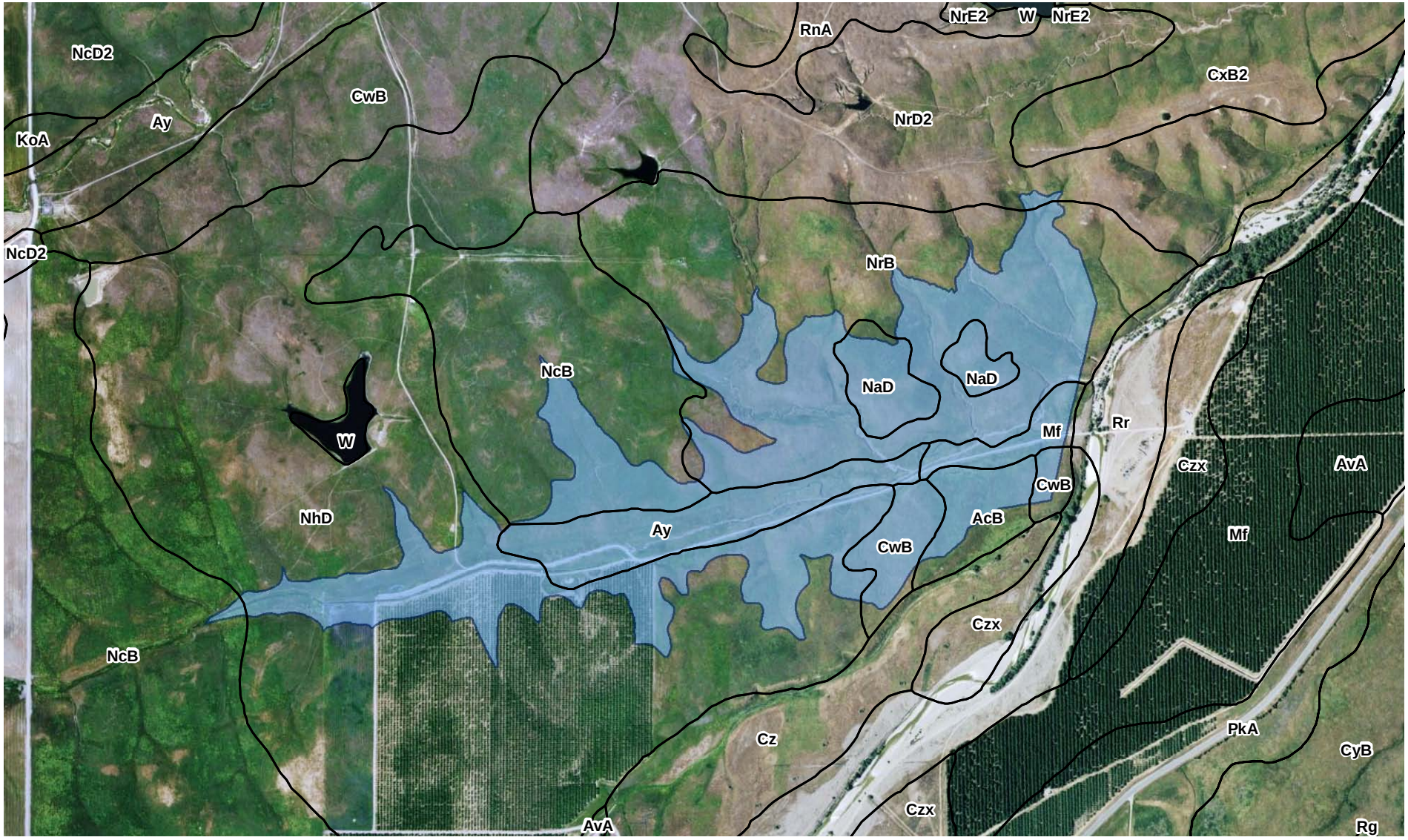
VESTRA

0 1,000 2,000 4,000 Feet

SOURCE: BING 2011; USFS CALVEG BY WHR TYPE 2005

FIGURE 8
VEGETATION COMMUNITIES
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\InitialStudy\70812_VegetationCommunities.mxd



Soil Map Unit

Proposed Reservoir

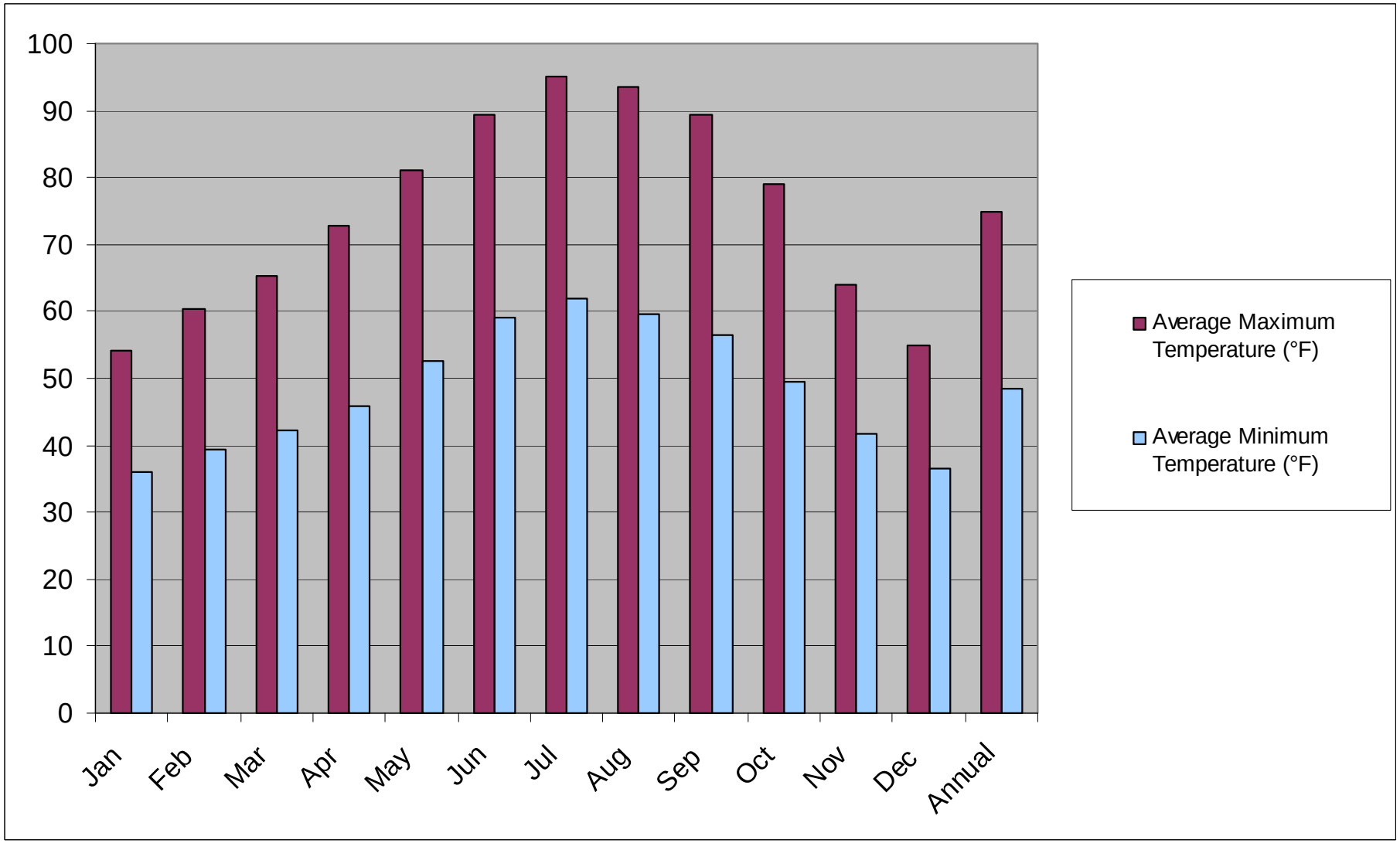
VESTRA

SOURCE: BING 2011; NRCS 2004

0 500 1,000 2,000 Feet

FIGURE 9
SOILS
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

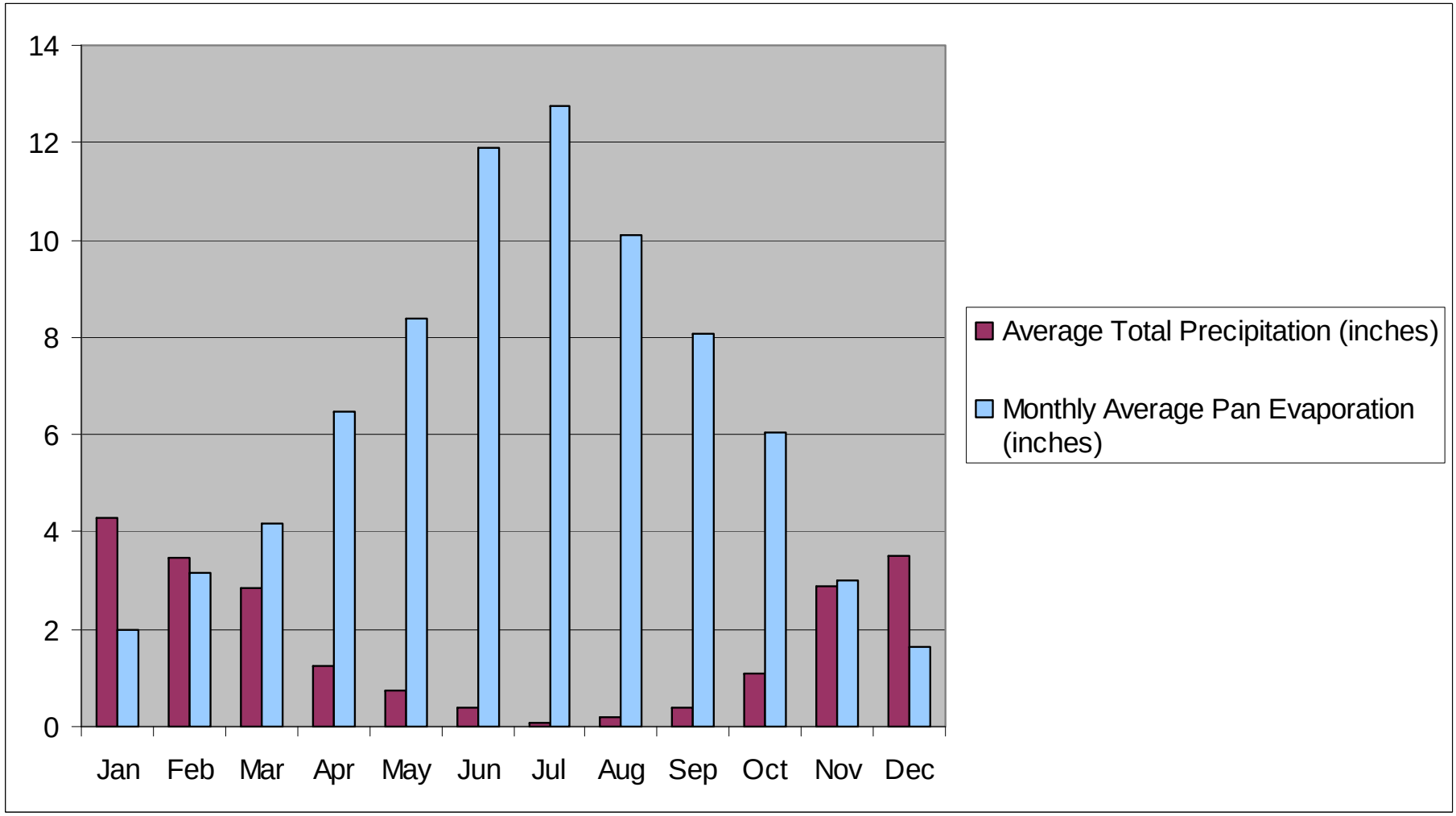
P:\GIS\70812\InitialStudy\70812_Soils.mxd



VESTRA

SOURCE: CORNING AIRPORT (CRG) WEATHER STATION, PERIOD OF RECORD 1952 TO 2005

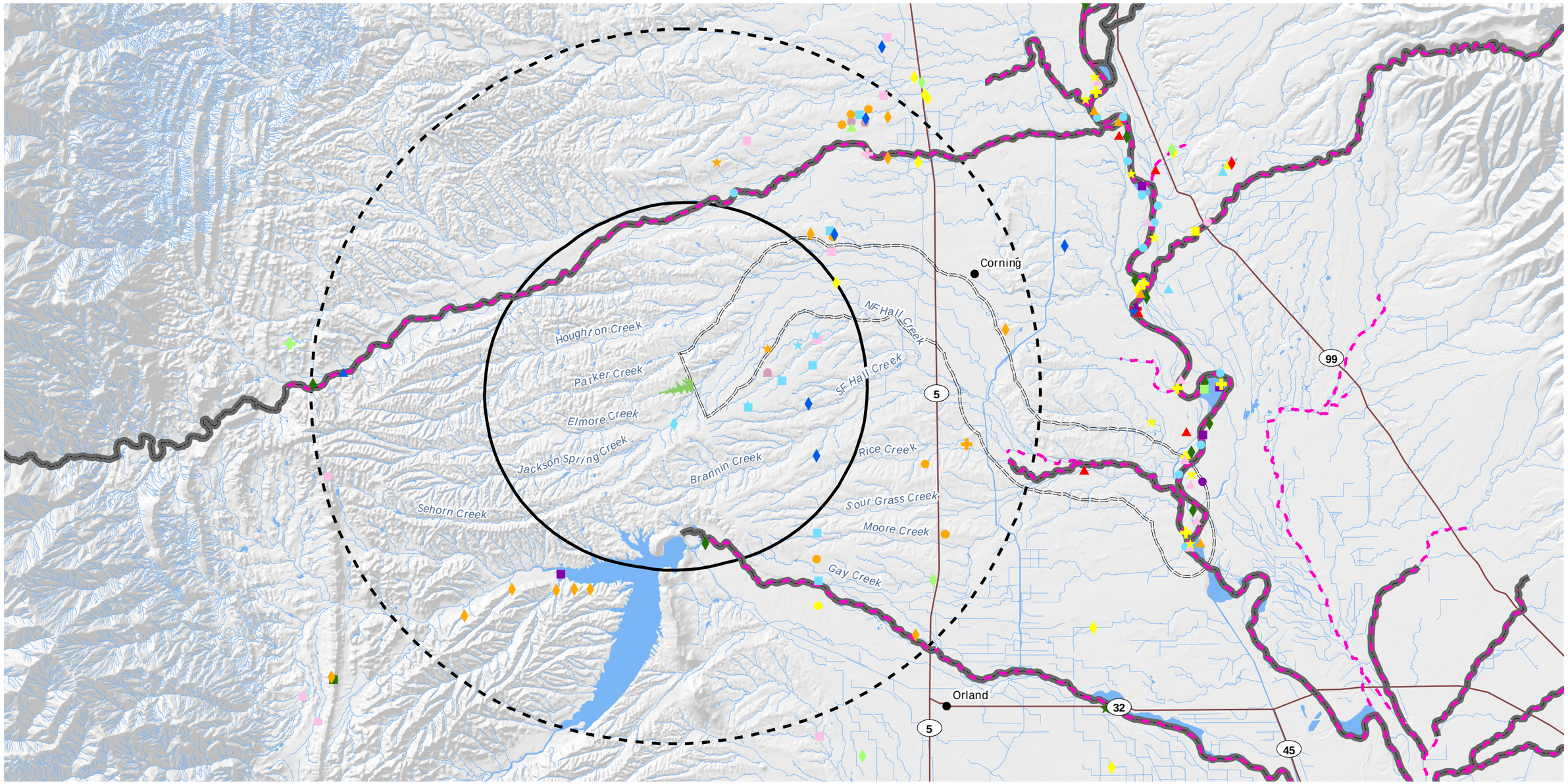
FIGURE 10
AVERAGE ANNUAL MINIMUM AND MAXIMUM TEMPERATURES
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA



VESTRA

SOURCE: CORNING AIRPORT (CRG) WEATHER STATION, PERIOD OF RECORD 1952 TO 2005

FIGURE 11
AVERAGE ANNUAL PRECIPITATION AND EVAPOTRANSPIRATION
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA



- Adobe-lily
- Ahart's dwarf rush
- Ahart's paronychia
- American badger
- Antioch Dunes anthicid beetle
- Baker's navarretia
- Bank swallow
- Blennosperma vernal pool andrenid bee
- Boggs Lake hedge-hyssop
- Brown fox sedge
- Burrowing owl
- California linderiella
- Central Valley Drainage Fall Run Chinook Stream
- Central Valley Drainage Valley Floor River
- Coastal and Valley Freshwater Marsh
- Dimorphic snapdragon
- Dwarf downingia
- Great blue heron
- Great egret
- Great Valley Cottonwood Riparian Forest
- Great Valley Mixed Riparian Forest
- Great Valley Valley Oak Riparian Forest
- Great Valley Willow Scrub
- Greene's tuctoria
- Henderson's bent grass
- Hoary bat
- Hoover's spurge
- Jepson's milk-vetch
- Legenere
- Long-eared myotis
- Long-legged myotis
- Norris' beard moss
- Northern Hardpan Vernal Pool
- Osprey
- Pallid bat
- Pink creamsacs
- Red Bluff dwarf rush
- Sacramento anthicid beetle
- Sierra Nevada red fox
- Silky cryptantha
- Silver-haired bat
- Slender Orcutt grass
- Stony Creek spurge
- Swainson's hawk
- Tricolored blackbird
- Valley elderberry longhorn beetle
- Valley Needlegrass Grassland
- Vernal pool fairy shrimp
- Vernal pool tadpole shrimp
- Western mastiff bat
- Western pond turtle
- Western red bat
- Western spadefoot
- Western yellow-billed cuckoo
- White-stemmed clarkia
- White-tailed kite
- Yellow warbler
- Yellow-breasted chat
- Yuma myotis
- Central Valley Spring Run Chinook Critical Habitat
- California Central Valley Steelhead Critical Habitat
- Stream or River
- Project Location
- 5-Mile Buffer Around Project Location
- 10-Mile Buffer Around Project Location
- 1-Mile Buffer Around Burch Creek

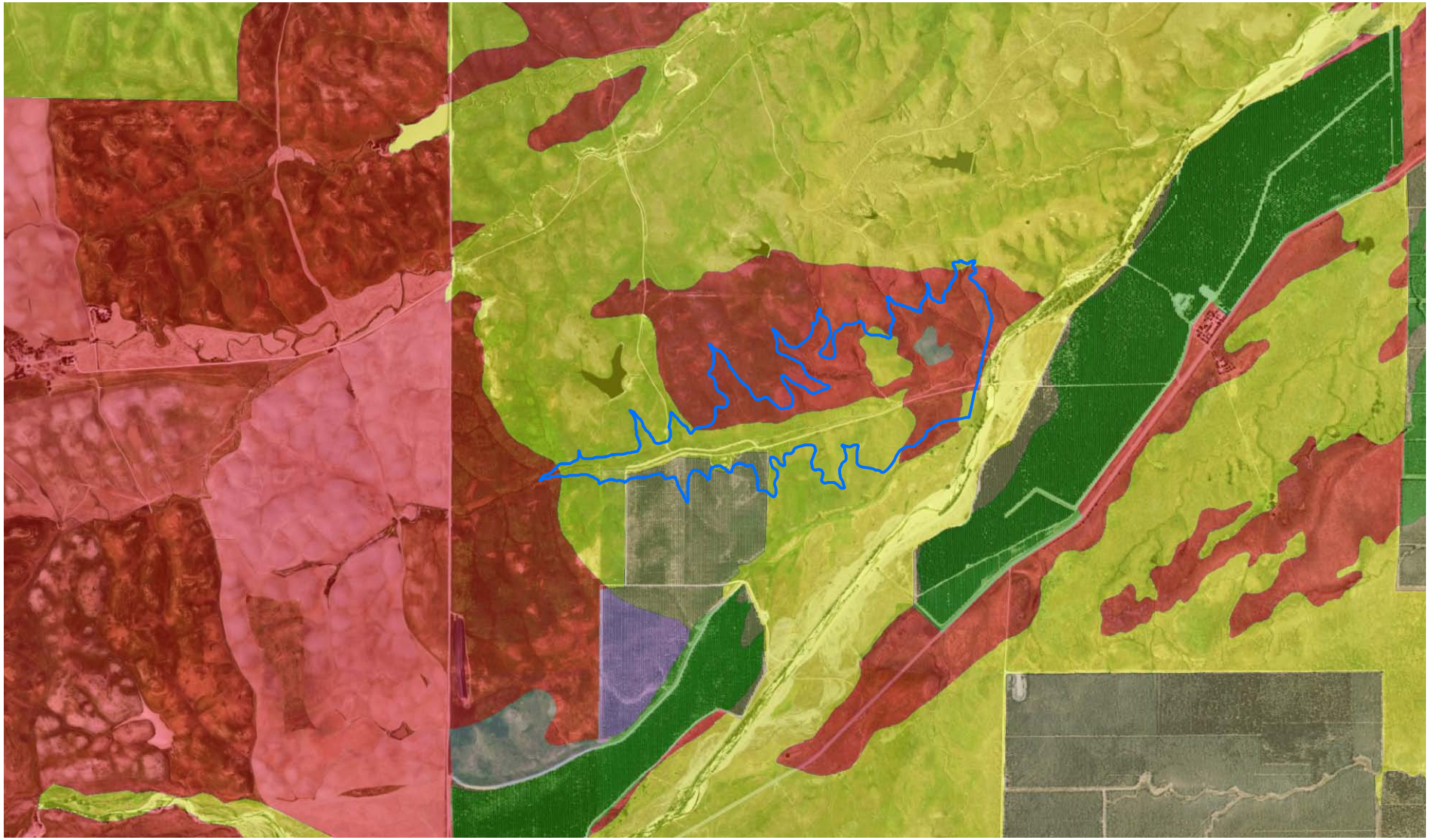
VESTRA

SOURCE: DFG CNDDB MARCH 2010 EDITION

0 1.25 2.5 5 Miles

FIGURE 12
CNDDB OCCURRENCES
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\70812_CNDDB.mxd



Proposed Pond Boundary
Grazing Land
Farmland of Local Importance
Prime Farmland
Farmland of Statewide Importance
Unique Farmland
Other Land

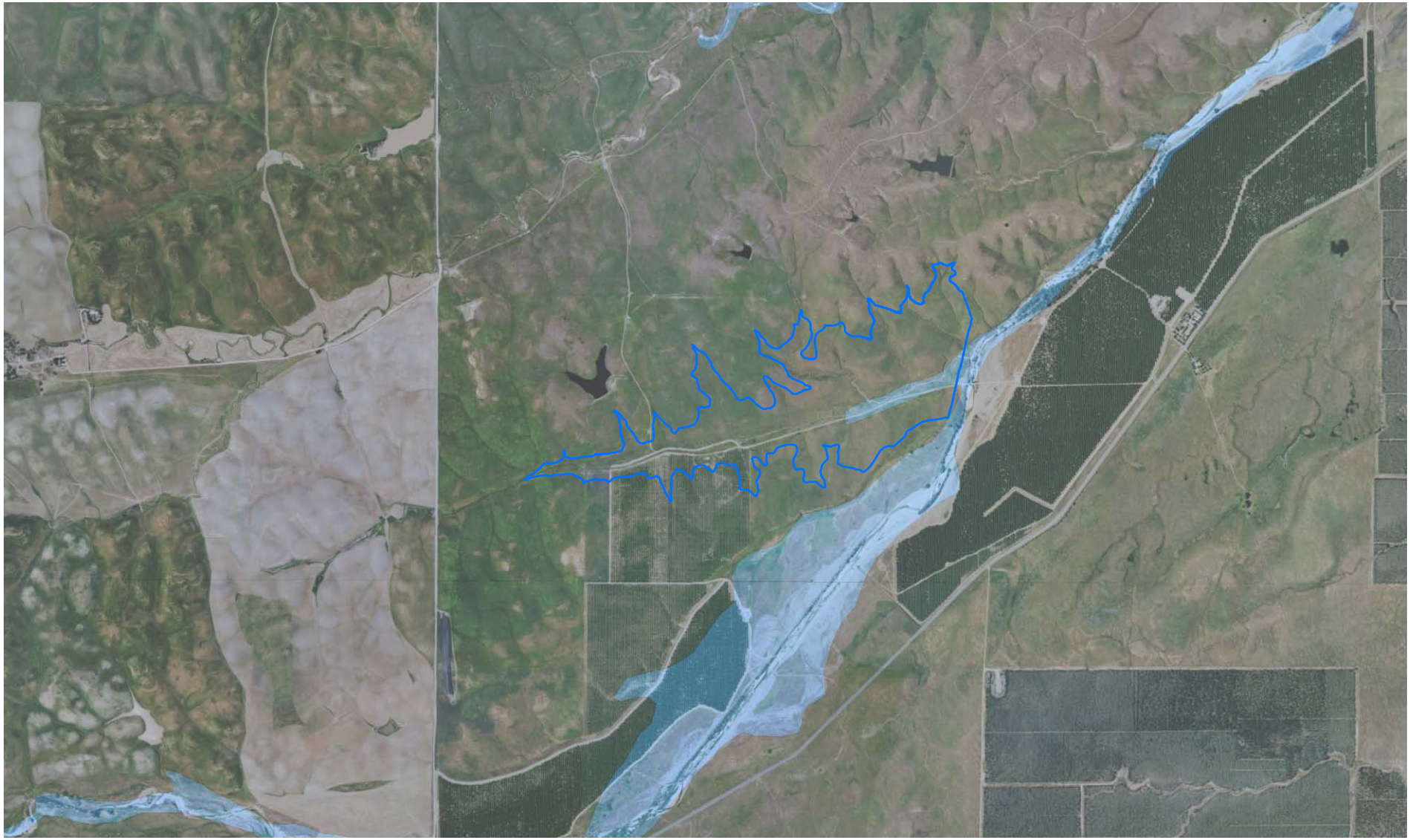
0 1,000 2,000 4,000 Feet

VESTRA

SOURCE: BING 2011; DOC FARMLAND MAPPING AND MONITORING PROGRAM 2006

FIGURE 13
IMPORTANT FARMLAND
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\InitialStudy\70812_ImportantFarmland.mxd



Proposed Reservoir

Zone A - Area Subject to Inundation

Zone X - Area Outside of 500-Year Flood

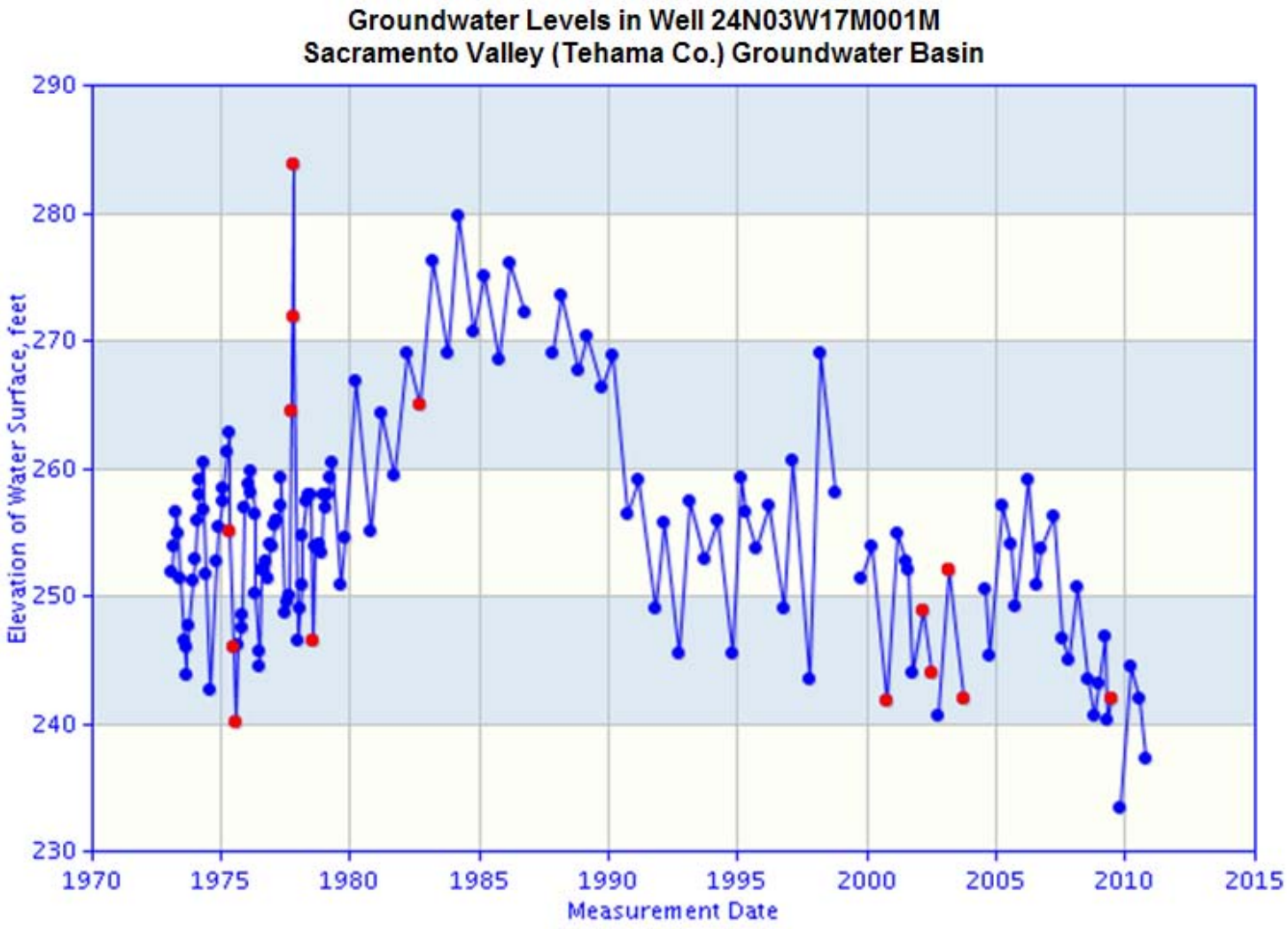
0 1,000 2,000 4,000 Feet

VESTRA

SOURCE: BING 2011; FEMA 2004

FIGURE 14
FLOOD INUNDATION ZONES
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\InitialStudy\70812_FloodZones.mxd



NOTE: red circles denote questionable measurements. Please see the data table below for specifics.

VESTRA

SOURCE: DWR 2011 Groundwater Level Data for Well 24N03W17M001M

FIGURE 15
GROUNDWATER ELEVATIONS
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

Appendix A

Responses to Comments

VESTRA

5300 Aviation Drive | Redding, CA 96002
Phone 530.223.2585 | Fax 530.223.1145
info@vestra.com | www.vestra.com

GIS, Environmental, & Engineering Services

June 9, 2011

70812

Ms. Kate Gaffney
Water Resource Control Engineer
Division of Water Rights
1001 I Street, 14th Floor
Sacramento, CA 95814

RE: Response to Comments
Environmental Documents Addendum and Water Availability Analysis
Application No. 31771 Burch Creek
Tehama County, California

Dear Ms. Gaffney:

BH Farming is in receipt of your comments dated January 14, 2011, on the Water Availability Analysis (WAA) Work Plan originally submitted in July 2010 for the BH Farming LLC No Name Creek Dam project. This letter responds to your comments and those from our conference call last month.

BACKGROUND

The proposed BH Farming LLC diversion is on Burch Creek approximately 11 miles upstream from the upper limit of anadromy and 22 miles from the confluence of Burch Creek and the Sacramento River. Burch Creek is a seasonal stream, and flows do not typically begin until late November or early December when storms saturate the ground and cause flow within the channel. Flows within Burch Creek normally cease by late March or early April for the remainder of the water year. During the water season, flows in Burch Creek are flashy, ranging from 0 to more than 800 cfs. BH Farming proposes to construct a reservoir on an unnamed tributary to Burch Creek to contain approximately 500 acre-feet and to pump approximately 1,500 acre-feet from upper Burch Creek during the water year for a total water right application of 2,000 acre-feet. The water will be stored in the new reservoir and used for frost control and to irrigate nut orchards.

The pumps planned for use at the diversion can operate economically only when sufficient water is available for several consecutive days. The water will be diverted into a nearby holding basin and pumped from the basin into the reservoir. The pumps will not operate at any other times as the cost of pumping outweighs the benefit of capturing only marginal volumes of water. Flows that exceed the capacity of the pumps will remain in Burch Creek.

The lower 8 miles of Burch Creek is designated as Critical Habitat for Central Valley steelhead (FR 70:52627) and spring-run Chinook salmon (FR 70:52590). Tributaries such as Burch Creek are also known to provide non-natal refuge for anadromous salmonids native to the Sacramento River (Maslin et al. 1999). This habitat is important when conditions in the Sacramento River are unfavorable due to high velocity or turbidity caused by releases from upstream dams for flood control or from storm events. The upper limit of anadromy in Burch Creek has been identified as near the railroad crossing at Kirkwood Road. Above this point, non-anadromous fish are comprised mainly of warm-water species that tend to be more tolerant of water quality conditions including higher temperatures and lower dissolved oxygen levels.

The majority of the water in Burch Creek at the point of anadromy enters the channel below the proposed point of diversion (POD) and will not be affected by the project. Several tributaries to Burch Creek contribute flow below the diversion including (proceeding downstream) Parker Creek, Houghton Creek, Brannin Creek, Rice Creek, and Sour Grass Creek (shown on Figure 1). The proposed 2,000 acre-feet diversion accounts for less than 4 percent of the water in Burch Creek at the upper limit of anadromy as previously defined. During wet years, this percentage may drop to as low as 1 percent.

REGULATORY HISTORY

BH Farming submitted a Water Rights Application (No. 31771) in March 2009. The SWRCB entered into a Memorandum of Understanding with BH Farming and VESTRA to conduct a WAA and CEQA documentation in January 2010. The Preliminary WAA Work Plan was approved by the State Water Resources Control Board (SWRCB) via email on March 25, 2010. A WAA and Initial Study were submitted in July 2010. SWRCB comments were received on the WAA/Initial Study on October 18, 2010, and the WAA was revised and resubmitted in November 2010. This letter responds to further comments received from the SWRCB on January 14, 2011.

The SWRCB approved the *Policy for Maintenance of In-stream Flows in Northern California Coastal Streams* on September 28, 2010. SWRCB staff requested that BH Farming implement some of the new criteria into the WAA being conducted for the unnamed tributary to the proposed reservoir and the pumping diversion on Burch Creek in the comments dated October 18, 2010. Burch Creek is not a coastal stream and flows due east across the Central Valley to the Sacramento River. BH Farming believes the policy is not applicable to Burch Creek.

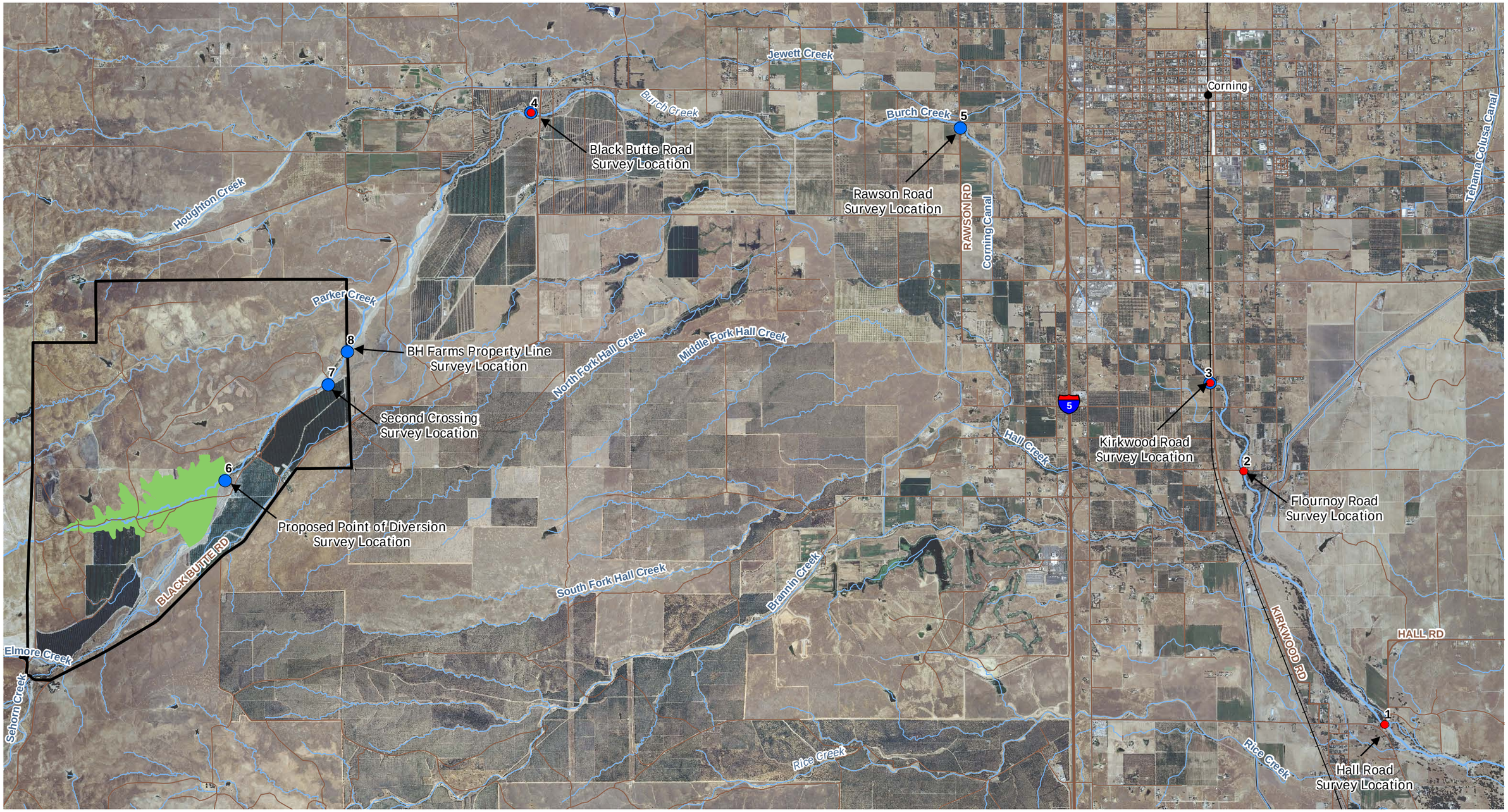
In recent correspondence, the SWRCB requested that BH Farming provide additional documentation to address the proposed unspecified bypass request in the permit allocation. During a subsequent conference call with SWRCB staff, BH Farming agreed to provide the following to address the bypass question:

- Detailed description of the flashiness of the system including daily flow diagrams,
- Detailed description of habitat along the stream channel,
- Photographs of Burch Creek at key locations,
- Detailed description of proposed bypass flow,
- Discussion of bypass flow measurement alternatives.

BH Farming also agreed to reduce the proposed diversion volume from 60 cfs (as requested in the Water Rights Application) to 40 cfs to provide greater upper-end daily bypass.

FLOW INFORMATION

Burch Creek receives minor flow from snow melt and the flow is dominated by peak storm events, resulting in intense variability. Water normally flows in the channel from late November to early May. During a "normal" year flows vary between zero flow during dry periods, which may occur intermittently during the winter, and greater than 350 cfs following storm events. In wet years, average daily flows can exceed 800 cfs. For the WAA and for the daily flow simulations presented here for Burch Creek, the area-ratio method was used based on data from Elder Creek (years of record 1949-2009), as discussed on page 6 of the WAA. Calculated Burch Creek flows were compared with the actual flow measurements at the proposed POD taken by BH Farming owners over the last 8 years, and the results are reasonable, especially during January, February, and March.



4/4/2011 Survey Location
5/4/2011 Survey Location
BH Farms Property Boundary
Project Area

N

0 0.5 1 2 Miles

VESTRA

SOURCE: NAIP 2010; USGS 2007; TEHAMA COUNTY 2007

FIGURE 1
SURVEY LOCATIONS
AND GENERAL INFORMATION
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\HabitatAssessment\70812_Waypoints_11x17.mxd

Because the flows in Burch Creek are directly correlated to precipitation events, flows are variable by year and month. This is unlike many perennial or even intermittent east-side streams in Tehama County or other stream systems in California which are fed by snowmelt and/or springs, where streams flow continuously, and the peaks are dampened. The west-side tributaries similar to Burch Creek behave much more like desert wash systems with immediate response, significant daily variation in flow, wide braided channels, limited riparian vegetation, and large volumes of bed load movement.

To represent the variability in flow occurrence and intensity, 3 years were selected from the simulated data set for Burch Creek. These years represent 2 years of average precipitation and 1 year of higher-than-average precipitation. The average years are defined by 21 inches of precipitation and wet years by 46 inches of precipitation. The years selected for presentation are 1988 (an average year), 1992 (an average year), and 1995 (an above-average year). The source of the precipitation data is the Red Bluff Weather Station with a period of record of 77 years, from 1933 to 2010. Data for the 3 years are summarized in Table 1 and the simulated average daily flows are shown graphically on Figure 2.

Table 1
FLOW DATA SUMMARY

Year	Comments	Nov	Dec	Jan	Feb	Mar	Apr	% of Total Flow @ POD[2]	% Total Flow @ POA[3]
		Flow (cfs)							
1988	Avg year (precipitation 21.3 inches)								
	Avg flow 17 cfs								
	Avg monthly flow available for diversion at POD	0.7	19.7	23.4	11.1	7.7	9.6		
	Avg monthly bypass flow [1]	0.6	12.1	9.3	1.7	1.4	3.4	25	6.1
1992	Avg year (precipitation 21.35 inches)								
	Avg flow 23 cfs								
	Avg monthly flow available for diversion at POD	0.3	1.9	5.0	22.8	29.4	20.7		
	Avg monthly bypass flow [1]	0.5	0.7	1.5	32.2	23.5	2.8	18	4.4
1995	Wet year (precipitation 45.9 inches)								
	Avg flow 74 cfs								
	Avg monthly flow available for diversion at POD	0.7	2.1	32.3	29.5	33.1	28.8		
	Avg bypass by month [1]	0.5	0.7	160	28.9	19	11.1	5.6	1.4

[1] – Assumes a minimum bypass of 0.5 cfs and a maximum diversion capacity of 40 cfs
[2] – Point of diversion
[3] – Point of anadromy

As shown, during the 1992 water year, the stream was essentially dry (< 1 cfs) until February when a significant rainfall event resulted in a peak runoff of 300 cfs. A second peak storm occurred in late March with a similar runoff pattern. In contrast, the 1988 average year had fewer peaks and more consistent flow. The selected wet year of 1995 shows significantly more flow and intensity of storms and runoff volumes, but again the system was characterized by low flows until January 1, reaching a peak runoff of 800 cfs. The objective of this discussion is to present the significant variability in the timing, intensity, and duration of flows at the POD.

The estimated average monthly bypass for each year is also presented in Table 1. As shown in the table, the average monthly bypass flow varies significantly with the distribution of precipitation and storm events;

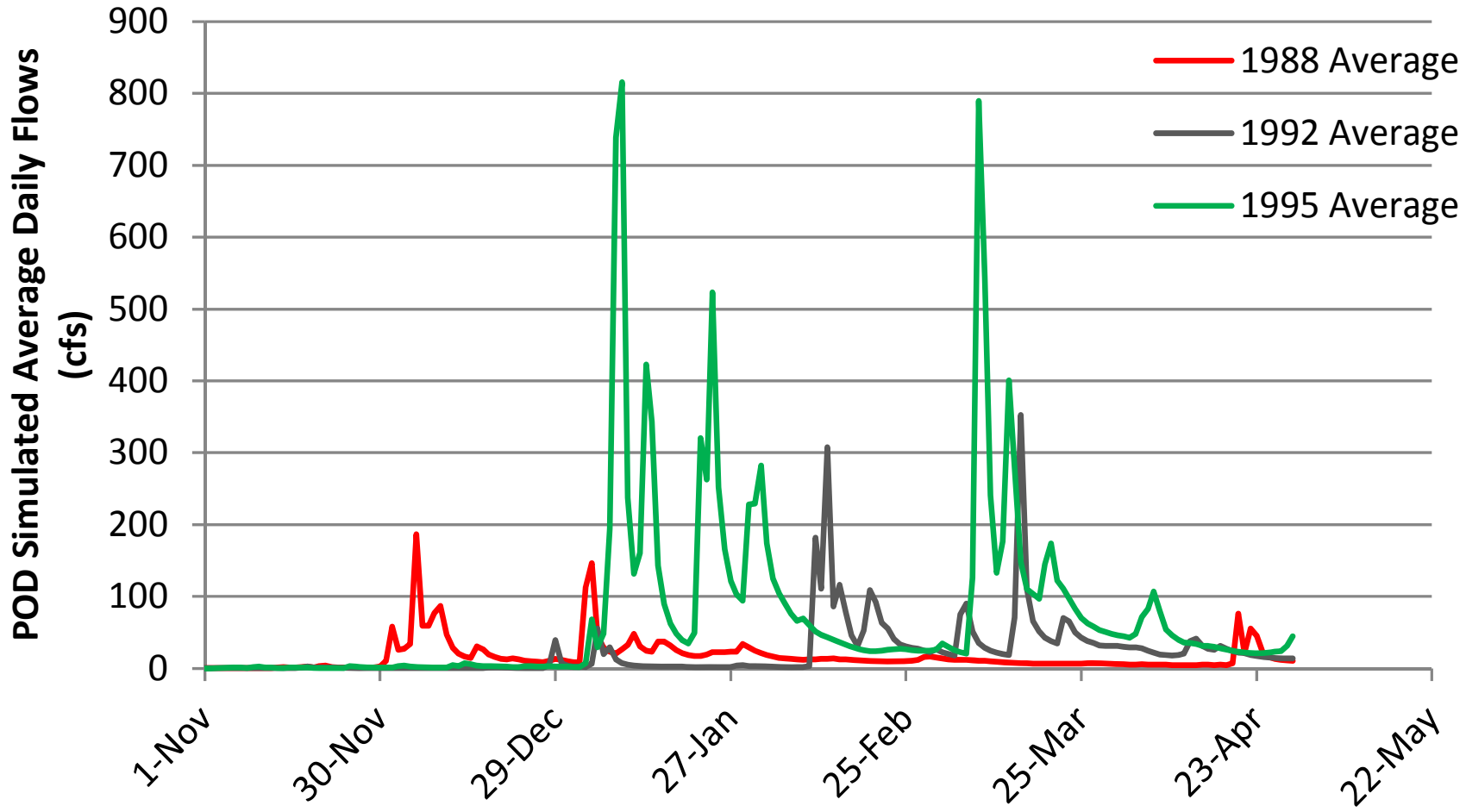


FIGURE 2
SIMULATED AVERAGE DAILY FLOW
SELECT YEARS
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

VESTRA

however, significant bypass flows in excess of 75 percent of the total flows are provided. Assuming a maximum pumping removal rate of 40 cfs and a lower limit of 0.5 cfs, in the 1988 average year 75 percent of the flow is bypassed. In the 1992 average year over 80 percent of the flow is bypassed, and in the example wet year (1995) 95 percent of the flow is bypassed. Even during one of the driest years of record (2007), over 60 percent of the flow is bypassed under the revised constraints of diversion.

PROPOSED BYPASS FLOW

Because of the flashy nature of Burch Creek flows, BH Farming proposes to divert only during the peak flow season from November to April, capturing a small percentage of the peaking storm events. No specific bypass amount was requested in the WAA due to the difficult nature in monitoring the flow volumes in a large, braided channel. The reduction of flow diversion from 60 cfs to 40 cfs will result in increased bypass at peak flows.

Following discussion with BH Farming, it was determined that a bypass can be returned to Burch Creek via a pipe from the actual pumping plant. Anytime the pump is on and diverting water, a set amount will be automatically returned to Burch Creek. BH Farming proposes a minimum continuous bypass flow of 250 gpm. For much of the season, the flows will be significantly greater as discussed previously. The return pipe can be monitored continuously during removal events, providing a measurable system.

As outlined in the WAA, the proposed 2,000 acre-feet diversion from Burch Creek at the POD accounts for less than 4 percent of the water in Burch Creek at the upper limit of anadromy. This percentage, of course, varies annually with the intensity of precipitation and storm events from as little 1 percent (wettest year) to up to 10 percent (driest year).

HABITAT ASSESSMENT

The purpose of the field investigation was to physically examine publically accessible reaches of Burch Creek for the presence and habitat of anadromous salmonids and to estimate how the proposed diversion may potentially impact the species. The investigation was conducted during two field surveys which took place on April 4, 2011, and May 4, 2011.

Initial Survey

Date of Survey:	April 4, 2011; start time 0930, end time 1330
Sites Surveyed:	Burch Creek at Hall Road, Burch Creek at Kirkwood (upper limit of anadromy), and Burch Creek at Black Butte Road (see Figure 1).
Surveyor(s):	Dave Vogel, Fisheries Scientist; Natural Resource Scientists, Inc. Robert Carey, Certified Wildlife Biologist; VESTRA Resources, Inc. Davey Vogel, Field Assistant; Natural Resource Scientists, Inc.
Weather:	Clear and Sunny, 50 to 60 degrees F

The reaches of the creek that were accessible to the survey crew were walked and/or snorkeled in areas where deep water, structures, or bubble curtains limited visibility. Surveyors looked for fish and visually characterized habitat suitability for salmonids. Flows were estimated at 15 cfs to 20 cfs at Hall Road, 8 cfs to 12 cfs at Kirkwood, and 8 cfs to 10 cfs at Black Butte Road.

Several upstream reaches of Burch Creek between Hall Road and Black Butte Road were examined. Water clarity was good in all locations and improved further above the confluence with Rice Creek, which was contributing flow with visibly turbid water. In all reaches surveyed, the substrate was clearly visible in areas less than around 18 inches deep. Snorkel surveys were conducted in deeper portions of the creek and in areas near the few isolated holding structures (rootwads, riprap along banks, bridge abutments, boulders, etc.).

Temperature was measured at each location and ranged between 58 and 62 degrees Fahrenheit, warming as the day progressed. Turbidity samples were collected and photographs were taken. Turbidity ranged from 2.54 units to 0.92 units, with the highest values recorded at the Hall Road site due to significant contribution of turbid flow from Rice Creek. Survey locations are shown on Figure 2. Temperature and turbidity data are included in Table 2.

Table 2
TEMPERATURE AND TURBIDITY SURVEY RESULTS
APRIL 4, 2011

Location	Time	Temperature (°F)	Turbidity (units)
Hall Road Bridge	1048 hours	58.0	2.54
Flournoy Bridge	1108 hours	58.5	0.92
Black Butte Road Bridge	1250 hours	62.5	1.06

Second Survey

Date of Survey: May 4, 2011; start time 1030, end time 1400

Sites Surveyed: Burch Creek at Kirkwood (upper limit of anadromy) and Burch Creek at Black Butte Road, Burch Creek at Ralston Road, Burch Creek at the BH Farming property boundary, Burch Creek at the BH Farming crossing, Burch Creek at mid-point, and Burch Creek at proposed POD.

Surveyor(s): John Andrews, Hydrologist
Wendy Johnston, Environmental Scientist

Weather: Clear and Sunny, 70 to 75 degrees F

The survey sites were selected based on accessibility, with the objective of obtaining additional flow and habitat information at additional locations in the upper reaches of Burch Creek. At each site, photographs were taken and habitat was evaluated both upstream and downstream. Site photographs taken during this survey are included in Appendix A. The survey locations are shown on Figure 1.

Flows were estimated at each location where flow occurred. Insufficient water was present to conduct snorkel surveys; however, visual inspections were made at each location for fish and other aquatic species. Notably, flows diminished with location downstream, with no flow observed at the Kirkwood or Flournoy Road locations likely due to riparian loss, channel subbing, or unauthorized removals. The results are included in Table 3.

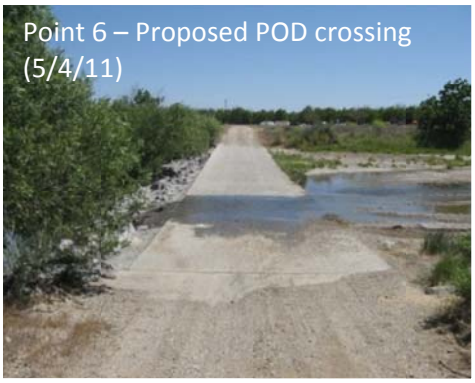
Table 3
SURVEY RESULTS
MAY 4, 2011

Location	Flow	Substrate	Bank	Vegetation	Notes
Flournoy Road Bridge	Dry	Fine gravely sand; homogeneous absence of woody debris/pools; flat slope.	Incised channel approx. 70 feet wide.	Reasonable canopy cover; dominant species eucalyptus.	ATV tracks in streambed
Kirkwood Bridge	Dry with a few remnant puddles	Fine gravely sand; homogeneous absence of woody debris/pools; flat slope.	Riprapped with concrete and rock. Channel approx. 120 ft wide.	Eucalyptus riparian mixed with Himalayan blackberry.	ATV tracks in channel
Rawson Road Bridge	Flat, shallow channel, <50 gpm. 2-6 inches deep, 4 ft wide.	Fine gravely sand; homogeneous/uniform absence of woody debris or pools; very flat slope.	Channel est. 100 ft in width.	Arundo, willow species. Significant algal matts in creek.	Evidence of vegetation lodged in bridge at 5 ft in elevation
Black Butte Road Bridge	200 gpm. 2-6 inches deep, est. 12 ft wide.	Fine gravely sand; homogeneous/uniform absence of woody debris/pools; very flat slope. Substrate mounded in places.	120 ft in width, with 60-ft defined channel.	Some arundo but more natural-appearing riparian cottonwood, willow, walnut, berries.	Evidence of cattle in creek
Proposed POD	Est. 500 gpm. Good flow for May.	Fine gravely sand; homogeneous/uniform very flat slope. Undercut below slab forming pool; no fish observed.	>200 ft across channel.	Riparian limited. Sand willow, cottonwood.	
Below POD at Second Crossing	Flow >1 cfs.	Very flat, braided channel.	Flat, braided channel, >200 ft across. Low banks.	No riparian.	Small school juvenile (2-3 inch) suckers and 1-inch fish in pool below crossing; number of small black chorus frog tadpoles, one light tan tadpole, species not identified
At BH Farming Property Line	Flow >1 cfs.	Very flat, braided channel.	Flat, braided channel, > 200 feet across. Low banks.	No riparian.	No fish observed; schools of tadpoles.

Habitat Description

Proposed POD

Burch Creek is an intermittent stream that is primarily influenced by peak flows that occur briefly after storms. At the proposed POD, these periodic "flashy" flow events have created a wide, heavily braided channel that is devoid of riparian vegetation, has poorly defined banks, and is in generally poor condition. The substrate is homogenous, consisting of small pebbles and sand with no large boulders, pools, or diversity. The substrate is unconsolidated and quite mobile at high flows.


Point 6 – Proposed POD crossing (5/4/11)

From November until late spring, flow is intermittent. Surface water recedes underground beneath the substrate during rainless periods. The watershed area draining above the POD is estimated at 16,000 acres with an intermittent daily flow of 0 to in excess of 800 cfs.

Point 6 – Proposed POD looking upstream (5/4/11)

POD to Upper Limit of Anadromy

The Burch Creek crossing of the Northern Pacific railroad tracks at Kirkwood Road is considered the upstream limit for anadromy. From the proposed POD downstream to this point, Burch Creek passes through 8 to 9 miles of agricultural rangeland and 2 to 3 miles of areas of urban and residential development. This reach includes the segment that passes south of the town of Corning. Here urbanization abuts the narrow and heavily impacted riparian zone. The area of the watershed that accounts for flow and habitat is in excess of 95,000 acres.

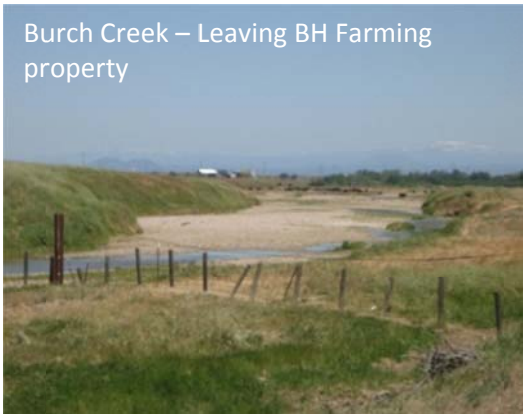
As with the upper portions of the stream, Burch Creek continues to be a wide, heavily braided channel. Vegetation, where it exists, is generally non-native and consists of *Arundo donax*, *Tamarix* spp., Himalayan blackberry (*Rubus armeniacus*), walnut (*Juglans regia*), and other introduced species. The banks become somewhat more defined and are often downcut and eroded. The substrate remains homogenous, consisting of small pebbles and sand with no large boulders, few pools, and limited diversity. The substrate remains unconsolidated and mobile at high flows.

For most of the year, flow is intermittent. Surface water recedes underground beneath the substrate during rainless periods. Livestock have access to the creek in many places, and there is evidence of grazing along the channel banks and within the channel zone, especially in the vicinity of and above Black Butte Road.

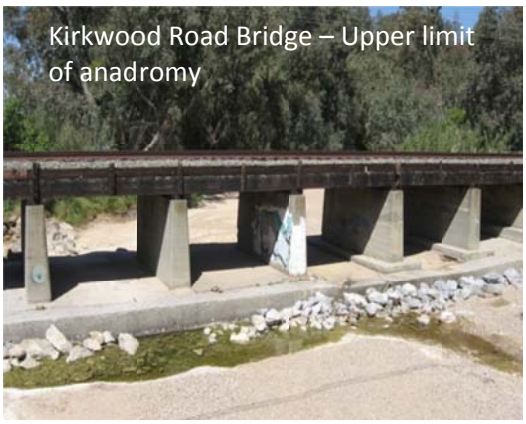
Point 7 – Second crossing (5/4/11)

There are low water crossings on Burch Creek that likely serve as fish passage barriers below the proposed POD. The crossing shown on the right is on BH Farming property, approximately 1 mile below the POD. A small school of juvenile suckers and numerous tadpoles were observed in a pool below the crossing. No fish were observed above this structure.

A school of 10 to 14 adult suckers was noted during the April survey at the Black Butte Road location; however, no fish were observed during the May survey. Photographs of areas of the stream reach from the proposed POD to the Kirkwood Bridge are shown below.



Upper Limit of Anadromy to the Sacramento River



Downstream from Kirkwood Road, Burch Creek is designated as Critical Habitat for Central Valley steelhead. Approximately 5 miles below Kirkwood Road, Rice Creek joins Burch Creek, and the combined flows of these creeks join the Sacramento River approximately 4 miles downstream. Anadromous salmonids are reported to possibly use these lower reaches of Burch Creek and Rice Creek as natal rearing and refuge habitat. Spawning habitat is marginal due to the lack of suitable stable flows that would allow for maturation of eggs and the lack of a gravel substrate. Further, the lack of water depth and instream vegetation limits available food resources. The lack of instream cover, or complex channel margins, severely reduces the value of these tributaries as functional

habitat for adult salmonids. The intense and variable nature of the flows also reduces Burch Creek's value for habitat for any aquatic organism.

Below the upper limit of anadromy, the channel of Burch Creek continues through private property primarily dedicated to agricultural uses. No rooted aquatic vegetation is present within the channel. Along the creek banks, riparian vegetation is sparse in most places and, where it exists, is comprised of mainly non-native tree and shrub species lining the channel banks *(Tamarix* spp., *Arundo donax, Eucalyptus* spp.). The Kirkwood Road rail bridge may also serve as a fish barrier during low flows. Livestock have access to the creek in many places, and there is evidence of grazing along the channel banks and within the channel zone.

Burch Creek is similar to many of the intermittent creeks on the west side of the northern Sacramento Valley which are characterized as having flashy drainages with discontinuous flows dependent upon winter storm events with little or no snowmelt runoff. Habitat along these creeks is typical of washes, with patches or segments of riparian interspersed with annual grassland and denuded banks. Infestations of *Arundo donax* and *Tamarix* spp. have established on open sand and gravel bars created by high-water events and can remove large volumes of water from the substrate through transpiration and lower the natural water table.

Fish Occurrences

At the proposed POD (approximately 22 miles upstream of its confluence with the Sacramento River), Burch Creek does not flow year round and likely supports only transient populations of fish during wet years. In its upper reaches, Burch Creek is a seasonally flowing tributary to the Sacramento River formed by a convergence of multiple intermittent streams. Approximately 1.4 miles south of the Kirkwood Bridge, Burch, Hall, and Brannin Creeks converge 7 miles from the Sacramento River. Rice Creek, which includes the tributaries of Sour Grass, Moore, and Gay Creeks, joins Burch Creek approximately 2.6 miles downstream (3 miles from the Sacramento River).

Flood control mechanisms (dams) on the Sacramento River and its main tributaries provide for controlled releases of flood waters, which can extend periods of high water in the Sacramento River. When high flows cause unfavorable conditions for salmonids (high velocity and turbidity) in the Sacramento River, juveniles seek refuge in smaller tributaries; thus, intermittent stream habitat is more critical in high-water years when flood releases occur. During low-water years, when the Sacramento River provides relatively stable rearing habitat, water flow in small side tributaries such as Burch Creek is less important.

With respect to fish habitat between the lowest and uppermost reaches surveyed, substrate was comprised of sand-sized material and pea gravel less than 10 mm in diameter. All areas lack the complexity generally associated with salmonid habitat. Few areas provide undercut banks, cobbles greater than 15 cm in diameter, or rooted aquatic vegetation. Large woody debris is virtually non-existent. Vegetation is sparse in most places and where it exists is comprised of mainly non-native tree and shrub species lining and inhabiting the channel banks.

Fish were not observed at most locations. Two large (30-cm) suckers *(Catostomus* spp.) were observed near Hall Road, and a group of roughly 12 to 15 similar fish were observed just upstream from Black Butte Road. Additionally, several unidentified (non-salmonid, likely *Cyprinidae*) small (7- to 8-cm) fish were observed along the vegetated banks near Black Butte Road. A single adult bullfrog was also observed in this location. Above Black Butte Road, a small school of juvenile suckers were observed in a pool below the BH Farming crossing. One sculpin *(Cottus* spp.) was observed in a turbulent area below the concrete bridge footing at the railroad crossing at Kirkwood.

Flow had ceased in the lower reaches of Burch Creek by the time of the survey conducted on May 4, 2011. No flow was observed at Flournoy Road near Kirkwood Road. Flow increased traveling toward the proposed POD, with increasing flows noticeable at Black Butte Road as compared to Rawson Road. Reportedly its is common for the creek to "sub" into the gravel during the later season. Also, riparian vegetation may have a significant effect on flow reduction.

Because water from Burch Creek will only be diverted during periods of seasonal high flow, the fact that several tributaries contribute flow below the POD and that the maximum instantaneous diversion capacity of approximately 40 cfs retains most of the water in the creek, potential impacts to fish in the lower reaches of Burch Creek during the peak flow season when, and where, salmonids may occur will be minimal. Further, available water at the mouth of Burch Creek is not likely a limiting factor for juvenile-rearing habitat for steelhead or spring-run Chinook given that few food resources exist due to the lack of instream aquatic vegetation and lack of instream cover, which creates an area of relatively inhospitable habitat. Finally, while the habitat at the mouth of Burch Creek can provide important refuge for juvenile salmonids, the diversion of roughly 1,500 acre-feet of water per year at a location 8 miles upstream will not significantly reduce water availability as flows are augmented by multiple tributaries downstream from the proposed diversion during the winter and proposed withdrawal season.

We appreciate Board staff comments on the previous WAA and believe this response should answer all of your questions and provide the information discussed in our recent phone conversation. Please let me know if you need anything else. We will update the Initial Study as soon as we hear from you that the responses herein addressed staff concerns.

Sincerely,

VESTRA Resources, Inc.

Wendy Johnston
Project Manager

Attachments

CC: Charles Crain/BH Farming
Hal Crain/BH Farming
Bob Crain/BH Farming
David Steffenson/Minasian, Spruance, Mieth, Soares & Sexton LLP
Barbara LeVake

Appendix A

Survey Photographs

4/4/11 SURVEY PHOTOGRAPHS

Point 1 – Hall Road
Looking downstream
4/4/2011

Point 1 – Hall Road
Looking downstream
4-foot deep pool along rip rap
Two 14-inch suckers observed
4/4/2011

Point 1 – Hall Road
Looking downstream
4/4/2011

Point 1 – Hall Road
No fish observed
4/4/2011

Point 1 – Hall Road
4/4/2011

Point 1 – Hall Road
Substrate
4/4/2011

Point 1 – Hall Road
Looking upstream
4/4/2011

Point 1 – Hall Road
Looking upstream
No fish observed
4/4/2011

Point 1 – Hall Road
Under bridge
No fish observed
4/4/2011

Point 2 – Flournoy Bridge
Looking upstream
4/4/2011

Point 2 – Flournoy Bridge
Looking downstream
4/4/2011

Point 3 – Kirkwood Road
Looking downstream from bridge
No fish observed
4/4/2011

Point 3 – Kirkwood Road
Looking downstream
No fish observed
4/4/2011

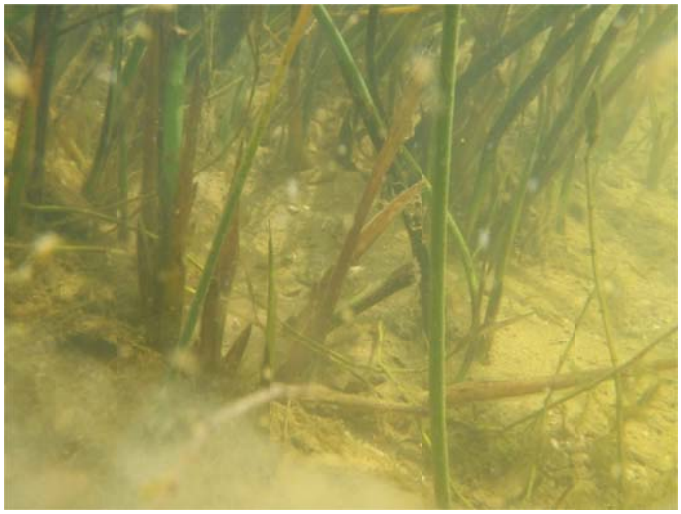
Point 3 – Kirkwood Road
Looking upstream to railroad bridge
4/4/2011

Point 3 – Kirkwood Road
Looking downstream below bridge
No fish observed
4/4/2011

Point 3 – Kirkwood Road
Looking upstream to railroad bridge
One sculpin observed
4/4/2011

Point 4 – Black Butte Road
Looking upstream
No fish observed
4/4/2011

Point 4 – Black Butte Road
Looking downstream
4/4/2011



Point 4 – Black Butte Road
Three small 1.5-inch non-salmonid fish
4/4/2011

Point 4 – Black Butte Road
Looking upstream
School of adult suckers
4/4/2011

5/4/11 SURVEY PHOTOGRAPHS

Point 5 – Rawson Road
Looking upstream from bridge
5/4/2011

Point 5 – Rawson Road
Looking at bridge
Debris showing peak flow level
5/4/2011

Point 5 – Rawson Road
Looking downstream
5/4/2011

Point 5 – Rawson Road
Looking upstream
5/4/2011

Point 4 – Black Butte Road
Looking upstream
5/4/2011

Point 4 – Black Butte Road
Looking downstream
5/4/2011

Point 4 – Black Butte Road
Looking at riparian from bridge
5/4/2011

Point 3 – Kirkwood Road
Rail bridge puddles
ATV track in sand
5/4/2011

Point 3 – Kirkwood Road
Looking downstream from bridge
5/4/2011

Point 3 – Kirkwood Road
Looking downstream from bridge
5/4/2011

Point 6 – Proposed point of diversion
Looking downstream
5/4/2011

Point 6 – Proposed point of diversion
Looking upstream
5/4/2011

Point 6 – Proposed point of diversion
Looking upstream
5/4/2011

Point 6 – Proposed point of diversion
Crossing
5/4/2011

Point 6 – Proposed point of diversion
Looking downstream
5/4/2011

Point 6 – Proposed point of diversion
No Name Creek entrance to Burch Creek
5/4/2011

Midway between Points 6 and 7
Looking upstream
5/4/2011

Midway between Points 6 and 7
Looking upstream
5/4/2011

Midway between Points 6 and 7
Looking upstream
5/4/2011

Point 7 – Second crossing
5/4/2011

Point 7 – Second crossing
Looking upstream
5/4/2011

Point 7 – Second crossing
Looking downstream
5/4/2011

Point 7 – Second crossing
5/4/2011

Point 7 – Second crossing
Looking upstream
5/4/2011

Point 8 – BH Farms property boundary
Fenceline
5/4/2011

Point 8 – BH Farms property boundary
5/4/2011

Appendix B

Biological Characterization Report

BIOLOGICAL CHARACTERIZATION REPORT

BH FARMING LLC
NO-NAME CREEK DAM PROJECT

Prepared for

BH Farming LLC

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

FEBRUARY 2009 (Rev. July 2010 & Nov 2010)

BIOLOGICAL CHARACTERIZATION REPORT
INITIAL BIOLOGICAL SURVEY
BH FARMING LLC
NO-NAME CREEK DAM PROJECT

Prepared for

BH Farming LLC

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

70812

FEBRUARY 2009 (Rev. July 2010 & Nov 2010)

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1 General Site Location
2 Proposed Project Area
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APPENDIX

A Species Lists

Section 1
INTRODUCTION

The purpose of this biological assessment is to characterize the biological resources within the project area and the potential effects of the proposed No-Name Creek Dam project, including the evaluation of special-status fish, wildlife, and plant species with potential to occur in the vicinity of the project site. These include species listed under the Federal and State Endangered Species Act as threatened or endangered, California Native Plant Society (CNPS) List 1 and 2 plants, and California Species of Special Concern.

This biological characterization study was conducted within the proposed project site to support various planning efforts for the construction of a dam for the purpose of developing an agricultural reservoir with a holding capacity of 1,722 acre-feet of water. The report includes a general description of habitats found within the project area and project vicinity, along with an assessment of potentially occurring special-status flora and fauna and their necessary resources. Though focused surveys for particular species were not within the scope of this characterization, reconnaissance-level surveys were completed by qualified biologists and incidental observations were documented and are included in this report. Other topics that are covered by this assessment include recommended mitigation measures and monitoring protocols to reduce project impacts to biological resources to a less-than-significant level.

SITE LOCATION

BH Farms is a privately owned walnut and almond farm located within the southwest ¼ of the northeast ¼ of Section 5, Township 23N, Range 4W in the USGS 7.5-minute Henleyville Quadrangle in Tehama County, California. The general site location is shown on Figure 1. BH Farms has been in operation for over 40 years and has been a regional leader in the growing, packaging, and sale of quality walnuts and almonds for most of that time. The deep, rich soils and pure waters of the Sacramento River Valley in northern California combine to provide ideal conditions for the production of quality walnuts and almonds.

PROJECT DESCRIPTION

BH Farming is a regional leader in the growing, packaging, and sale of quality walnuts and almonds. The proposed No-Name Creek Dam Project would supply an additional source of water to better irrigate and protect against frost for the growing walnut and almond farm, replacing dependence on groundwater pumping from wells. This will result in lower fuel use, recovery of groundwater supplies, enhancement of wetland habitat, and a secure source of agricultural and fire-suppression water.

Major components of the project consist of:

- Construction of a 45-foot-high dam along with a spillway and outlet works.
- Development of a reservoir with a storage capacity of approximately 2,000 acre-feet.
- Construction of a diversion structure on Burch Creek and placement of a pump works

to divert high flows to the reservoir. During the spring and fall, when Burch Creek is flowing and irrigation is actively occurring within the place of use, riparian-right water may be diverted for use

- Construction of a pump station and pipeline to transfer water from the sump to the reservoir area.
- Construction of a water-supply pipeline to connect stored water to the existing orchard delivery system.
- Planting of riparian and upland species to improve and increase wildlife habitat.
- Development of buffer strips between orchard blocks as a way to use tailwater and increase wildlife habitat.

The project is located in the Burch Creek Watershed (see Figure 3). The place of use is represented by cropland (orchard agriculture), as shown on Figure 4.

The primary source of water for storage in the reservoir will be storm/winter flows from a small unnamed stream (No-Name Creek), approximately 1 mile in length, located within the project area, and from peak winter storm flows pumped from Burch Creek. Dam facilities will include a spillway and outlet works, resulting in a 2,000 acre-foot-capacity reservoir. The inundation area to the watershed controlled by the dam drains approximately 800 acres. Average winter runoff is calculated at roughly 500 acre-feet. The proposed period of appropriation is December 1 through March 30 of each year.

As proposed, the project design incorporates components that will improve and increase wildlife habitat within the project area. Among these features are plantings of native species within the storage reservoir's riparian zone. The reservoir inundation area currently contains non-native annual grasses. The project site is located adjacent to the floodplain of Burch Creek. Wildlife corridors will develop between the natural floodplain of Burch Creek and the reservoir with the help of riparian plantings. The locations of plantings will be largely based upon the estimated inundation period at various reservoir elevations in order to maximize water availability. Wildlife Conservation Board funding would be used by the Tehama County Resource Conservation District for 3 years of biological monitoring to assess the effectiveness of the proposed habitat improvement project. The project area is adjacent to the applicant's orchard plantings. Because the land is currently used for cattle grazing and limited wildlife habitat, no use conflicts exist. Once established, the reservoir plantings are expected to improve habitat conditions for deer, small mammals, and resident and migratory bird species.

Section 2
SITE DESCRIPTION

TOPOGRAPHY

The topography of the project site is characteristic of the valley floor conditions found in the Lower Tehama West Watershed. The region is comparatively flat with steeper and more vegetated foothills to the west. California annual grasslands occupy rolling hills throughout the region.

CLIMATE AND HYDROLOGY

The Mediterranean climate of the region is characterized by warm to hot, dry summers and cool, wet winters. Temperature ranges vary between the lower elevations and the higher elevations of the mountains to the west, but are usually mild. Average monthly precipitation in nearby Red Bluff varies between 0.6 inches in July to 4.44 inches in January (Department of Water Resources, Corning Airport Weather Station, period of record 1952-2005). Average annual precipitation along the western perimeter of the watershed can approach 50 inches.

Scattered intermittent streams with occasional high flows best summarize the hydrology of the project area. Drainages flow in a general easterly direction to confluence along the Sacramento River. Large ponds, used for agricultural and fire suppression application, dot the landscape. Two seasonal streams occur in the project area. These are described below.

Burch Creek

Burch Creek carries water during the rainy season and is dry during summer. It is the larger of the two creeks in the project area, maintaining an intermittent riparian corridor including diverse tree, shrub, and herb stratums. Common vegetation species observed in and around the Burch Creek corridor are valley elderberry (*Sambucus mexicana)*, willow (*Salix* spp.), oak (*Quercus* spp.), and other small woody shrubs, as well as a diverse grass and herb media surrounding the drainage. This is mostly composed of non-native annual grasses and star thistle *(Centaurea solstitialis)*.

No-Name Creek

No-Name Creek conveys water seasonally. The general hydrogeological characteristics of this creek are summarized by intermittent, high-flow events causing scouring of the creek path. The area is defined by relatively low precipitation, gentle topography, and a relatively significant groundwater reservoir. No-Name Creek has four tributaries from the north side within the immediate confines of the project area, which drain the surrounding rolling hills. No-Name Creek is ephemeral. Flows begin immediately after large storm events and become dry shortly after the storms have passed. The drainage is generally dry by April, but drying trends largely depend on annual precipitation accumulations in the area, along with seasonal timing of rainfall events. There is no tree or shrub stratum within the creek bed in the proposed project area until its confluence with Burch Creek. The dominant vegetation stratum within the project area of

No-Name Creek is annual grass in combination with facultative plants found in the dry creek corridor.

GEOLOGY AND SOILS

The project area is located within the Great Valley geomorphic province. The predominant geologic unit in this area is the Upper Pliocene Nonmarine, which characteristically contains formed rounded hills with moderate relief. It is composed of fluvial sedimentary deposits of semiconsolidated pale green, gray and tan sands, tuffaceous sands, silts, and clays with minor discontinuous gravel lenses and lenses of pebble and cobble conglomerates.

The Great Valley Province is a sedimentary basin approximately 400 miles long by 50 miles wide, located throughout the central portion of California. In the watershed, the province is characterized by a thick deposit of moderately deformed Jurassic and Cretaceous marine sedimentary layers that consist of detrital materials derived from uplifted basement rocks of the Klamath Mountain and Coast Range Provinces. Great Valley rocks consist primarily of mudstone, shale, and sandstone and occur mostly along the west side of the central valley. These units yield an abundance of suspended sediment but relatively little gravel to drainages.

As defined in the Tehama County Soil Survey, the project area includes 11 different soil types. These are shown on Figure 3 and include:

Altamont Clay, 3 to 10 Percent Slopes
The Altamont series consists of deep, well-drained soils that formed in material weathered from fine-grained sandstone and shale. These soils are on gently sloping to very steep uplands.

Arbuckle Gravelly Loam, Clayey Substratum
This soil is found along narrow drainageways in low foothills. It is channeled by meandering, intermittent streams and usually adjoins the sloping to steep foothills through which the streams flow.

Corning Gravelly Loam, 3 to 8 Percent Slopes
This soil type has an uneven surface because of small drainage ways that cut through many of the areas. Most of the short drainageways are cut by gullies, which generally can be crossed with equipment used for cultivation. Sheet erosion is generally slight to moderate.

Cortina Complex
The Cortina series consists of very deep, somewhat excessively drained soils on alluvial fans and floodplains. These soils formed in gravelly alluvium from mixed rock sources. Slope ranges from 0 to 15 percent.

Cortina Gravelly Fine Sandy Loam
This soil type occurs on level to gently sloping summits and is somewhat excessively drained. It is a deep soil derived from metamorphic and sedimentary rock.

Maywood Loam, 0 to 3 Percent Slopes
The Maywood series consists of deep well-drained soils formed on floodplains. These soils formed in alluvium derived from mixed-rock sources. Slope ranges from 0 to 5 percent.

Nacimiento Silty Clay Loam, 10 to 30 Percent Slopes
Moderately sloping to strongly sloping, found on the low foothills. The surface of the soil is smooth and well drained. Runoff is medium, and permeability is slow. The available water-holding capacity and fertility are moderate. Erosion hazard is moderate.

Nacimiento-Newville Complex, 10 to 30 Percent Slopes
This soil type consists of Nacimiento silty clay loam, 10 to 30 percent slopes, and Newville gravelly loam, 10 to 30 percent slopes.

Nacimiento-Altamont Complex, 3 to 10 Percent Slopes
This soil type consists of Nacimiento silty clay loam, 3 to 10 percent slopes, and Altamont clay, terrace, 3 to 10 percent slopes.

Newville Gravelly Loam, 3 to 10 Percent Slopes
This soil is less steep, and runoff is slow to medium. The erosion hazard is slight to moderate.

Riverwash
This soil type is composed of gravelly alluvium occurring in drainages, typically on relatively flat ground with excessive draining capabilities; however, it is often inundated with in-channel water.

VEGETATION COMMUNITIES

The vegetation communities found in the project area can be classified primarily as annual grasslands. An element of agricultural influence is created by irrigation and farming activities associated with adjacent walnut and almond orchards. A foothill riparian community is present near the project area, concentrated on the banks of Burch Creek. For the purposes of this environmental analysis, the vegetation communities were identified using the CALVEG database (U.S. Forest Service) and the California Natural Diversity Database (CNDDB), and are described by the standards in the *Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995).

The two vegetation types identified using the CALVEG database are California annual grasses and forbes and orchard agriculture. Annual grasslands are the most dominant vegetation community occurring within the project area. Agriculture land in the project area consists of almond and walnut orchards. In addition, the CNDDB identified valley needlegrass grassland as occurring along the southern bank of Burch Creek, and reconnaissance-level field surveys identified the riparian area along Burch Creek as Fremont cottonwood series. These vegetation communities are described below and are shown on Figure 4.

Annual Grasses and Forbs
Annual grassland habitat occurs across most of California, especially in the lower elevation foothills, much like the area surrounding the project site. This habitat has a moderate to dense herbaceous layer composed mostly of annual grasses and forbs. Common species of northern California foothill grasslands include: Cheatgrass (*Bromus tectorum*), ripgut brome (*Bromus diandrus*), wild oat (*Avena fatua*), and soft chess (*Bromus hordeaceus*).

These annual grasslands are generally made up of introduced annual grasses and both native and introduced forbs. They exist in elevations below blue oak (*Quercus douglasii*) woodlands, where soil conditions do not favor hardwood growth, or as openings in blue oak woodlands.

Valley Needlegrass Grassland (as defined by Holland, 1986)
Valley needlegrass grassland (most likely nodding needlegrass (*Nasella cernua*) series or purple needlegrass (*Nasella pulchra*) series as defined by Sawyer and Keeler-Wolf, 1995) has become rare due to the encroachment of non-native annual grasses and agricultural conversion. As shown on Figure 4, the CNDDB has a record of a small area of this grassland approximately ½ mile away from the study area. The rare grassland will not be impacted by project activities.

Orchard Agriculture
Cropland within the place of use on BH Farming property includes walnut and almond orchards. Walnut and almond orchards provide habitat and forage for numerous wildlife species including, but not limited to, songbirds, reptiles, amphibians, raptors, and an array of mammals. In terms of forage, orchards are good for most of these wildlife species, but as a general rule, there is too much human activity within the orchards coinciding with nut production for favorable nesting habitat to occur (UCANR, 2001).

Fremont Cottonwood
The Fremont cottonwood series riparian zone can occur in areas along agricultural ditches and drainages, but is confined to Burch Creek within the study area. The riparian corridor is composed of winter deciduous trees and shrubs including, but not limited to, cottonwoods (*Populus* spp.) and willows (*Salix* spp.). There is a dense understory layer of grasses, sedges, rushes (*Juncus* spp.), and numerous other woody plants including, but not limited to, wild grape (*Vitis californica*), wild rose (*Rosa californica*), Himalayan blackberry (*Rubus armeniacus*), and poison oak (*Toxicodendron diversilobum*). Blue elderberry shrubs (*Sambucus mexicana*) occur in the Burch Creek riparian corridor below the project area. These shrubs are relatively abundant throughout the riparian area along Burch Creek, and potentially provide habitat for the federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*); however, no elderberry shrubs occur within the project area.

Section 3
SURVEY METHODOLOGY

DATABASE QUERIES

Database searches for potentially occurring special-status plant and wildlife species were conducted using the CNDDB and the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS) (Appendix A). The U.S. Fish and Wildlife Service (USFWS) was consulted in generating a list of special-status species that may occur within the project area or may be impacted by project activities (Appendix A). The CNDDB and CNPS were reviewed for records of special-status plant and wildlife species occurrence within the Henleyville 7.5' Quadrangle and eight surrounding quadrangles. The CNDDB and CNPS are limited to reported sightings and are not comprehensive lists of special-status plant and wildlife species that may occur in a particular area. The USFWS list is county-based and includes sensitive plant and animal species that may be impacted by project activities based on regional data.

For the purpose of this study, state and federally listed plants and animals that could potentially occur in the project area were included. This includes Federally Endangered, Federally Threatened, California Endangered, California Threatened, California Fully Protected, California Protected, and California Species of Special Concern listed within the CNDDB or included on the CNPS Lists 1 and 2 and USFWS species list. CNDDB occurrences within a 2-mile radius of the study site are depicted on Figure 5.

PEDESTRIAN SURVEYS

Reconnaissance-level biological surveys, acceptable to the Director of the Division of Water Rights, were carried out in May and June 2008 by qualified biologists. During the field surveys, the study area was traversed by walking to identify the site-specific potential for special-status plant and animal species and/or habitats. Potentially occurring special-status species, determined through database searches, and suitable habitats were surveyed for within and near the proposed project area. Surveys included documentation of observed plant and wildlife species. Binoculars were used to observe occurring fauna.

Aquatic habitats within and near the project area, including No-Name Creek and the associated intermittent drainages of No-Name Creek, Burch Creek, agriculture ponds, and adjacent upland habitats were investigated using the visual-encounter survey method. Biologists slowly walked the length of the ditch, visually searching the aquatic and nearby upland habitats for ichthyological and herpetological species with potential to occur within or near the proposed project area.

Section 4
RESULTS AND CONCLUSION

DATABASE SEARCHES

The special-status floral and faunal species identified as potentially occurring within the project boundaries, based on the database searches for the project vicinity, are listed in Tables 1 and 2, respectively. The site-specific potential for these species to occur within the area of potential effect or within the project area itself was assessed during field surveys. Although protocol-level surveys were not conducted, individuals of these species and their habitats were searched for during field work.

Table 1 POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES				
Common/ Scientific Names	**Status Fed/State/ CNPS**	**Distribution**	**Preferred Habitats**	**Potential for Occurrence Within Project Area**
Adobe-lily (*Fritillaria pluriflora)*	--/--/1B.2	Coastal range foothills, Sierra Nevadas and southern Oregon	Open grasslands in adobe soils	Marginal habitat on study site; unlikely occurrence
Ahart's paronychia (*Paronychia ahartii)*	--/--/1B.1	Butte, Shasta and Tehama Counties	Cismontane woodlands, valley and foothill grasslands, vernal pool edges	Suitable habitat on study site; low potential for occurrence
Baker's navarretia (*Navarretia leucocephala bakeri)*	--/--/1B.1	Interior North Coast Range and western Sacramento Valley	Vernal pools within grasslands, montane coniferous forests and low-elevation coniferous forests	No potential for occurrence
Boggs Lake hedge-hyssop (*Gratiola heterosepala)*	--/CE/1B.2	Interior North Coast Ranges, central Sierra Nevada foothills, Sacramento Valley, Modoc Plateau, southern Oregon	Vernal pools, reservoir edges, and other muddy clay soils	No potential for occurrence
Brown fox sedge (*Carex vulpinoidea)*	--/--/2.2	Distributed throughout North America	Riparian areas, marshes and sometimes in road side ditches	Suitable habitat on study site; low potential for occurrence
Butte County meadowfoam *(Limnanthes flocossa ssp. californica)*	FE/CE/1B.1	Endemic to 25-mile strip along foothills of Butte County	Vernal swales and margins of vernal pools	No potential for occurrence
Desert cymopterus *(Cymopterus deserticola)*	--/--/1B.2	Endemic to southern California; one historical occurrence in western Tehama County.	Deep, loose, well drained, fine to coarse sandy soils of alluvial fans and basins between 2060 and 3060 ft elevation within western Mohave Desert	No potential for occurrence
Dwarf downingia (*Downingia pusilla)*	--/--/2.2	Sacramento Valley and foothills of central coastal range	Vernal pools	No potential for occurrence
Greene's tuctoria (*Tuctoria greenei)*	FE/CR/1B.1	Central Valley; population in Modoc Plateau	Vernal pools within grasslands	No potential for occurrence
Hairy Orcutt grass (*Orcuttia pilosa)*	FE/CE/1B.1	Endemic to Central Valley	Vernal pools within grasslands	No potential for occurrence
Henderson's bent grass *(Agrostis hendersonii)*	--/--/3.2	Central Valley and northern California	Vernal pools within grasslands	No potential for occurrence
Hoover's spurge (*Chamaesyce hooveri)*	FT/--/1B.2	Endemic to Central Valley	Vernal pools	No potential for occurrence
Jepson's milk vetch *(Astragalus rattanii var. jepsonianus)*	--/--/1B.2	Coastal range from Napa to Tehama County	Chaparral, cismontane woodland, and valley and foothill grassland	Suitable habitat onsite; moderate potential for occurrence

Table 1
POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES

Common/ Scientific Names	Status Fed/State/ CNPS	Distribution	Preferred Habitats	Potential for Occurrence Within Project Area
Legenere (*Legenere limosa)*	--/--/1B.1	North Coast Ranges, southern Sacramento Valley, northern San Joaquin Valley, San Francisco Bay Area	Vernal pools, vernal marshes, lakes, ponds, sloughs	No potential for occurrence
Red Bluff dwarf rush (*Juncus leiospermus)*	--/--/1B.1	Cascade Range and northern Sacramento Valley (Shasta, Tehama, and Butte Counties)	Edges of vernal pools in valley grasslands, chaparral and foothill woodlands	No potential for occurrence
Silky cryptantha *(Cryptantha crinita)*	--/--/1B.2	Northern Sacramento Valley (Shasta and Tehama Counties	Sand and gravel deposits along seasonal drainages, generally below 300 meters	Suitable habitat onsite; low potential for occurrence
Slender Orcutt grass (*Orcuttia tenuis)*	FT/CE/1B.2	Cascades, Sierra Nevada foothills, inner North Coast Ranges, and Modoc Plateau	Vernal pools and other moist areas with clay soils in valley grasslands, coniferous forests or sagebrush scrub	No potential for occurrence
Stony creek spurge (*Chamaesyce ocellata)*	--/--/1B.2	Glenn and Tehama Counties	Chaparral and valley and foothill grasslands	Suitable habitat onsite; moderate potential for occurrence

Status definitions:
Federal
FE = Listed as endangered under the Federal Endangered Species Act
FT = Listed as threatened under the Federal Endangered Species Act
-- = No listing

State
CE = Listed as endangered under the California Endangered Species Act
CT = Listed as threatened under the California Endangered Species Act
CR = Listed as rare in California
-- = No listing

CNPS
1B = List 1B species: Rare, threatened, or endangered in California and elsewhere
2 = List 2 species: Rare, threatened, or endangered in California, but more common elsewhere
3 = List 3 species: Plants about which more information is needed to determine their status

Threat Code Extensions
.1 = Seriously endangered in California (over 80 percent of occurrences threatened; high degree and immediacy of threat)
.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)

Table 2 POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES				
Common/ Scientific Names	**Status Fed/State**	**Distribution**	**Preferred Habitat**	**Potential for Occurrence Within Project Area**
AMPHIBIANS				
California red-legged frog *(Rana draytonii)*	FT/CSC	California coastal areas from Point Arena south and Central Valley foothills	Permanent and semi-permanent aquatic habitats (i.e. creeks, coldwater ponds) with emergent / submergent vegetation and riparian species along edges; may aestivate in rodent burrows or cracks during dry periods. May disperse across upland areas.	Low potential within Burch Creek. Drainage does not support permanent water flow or emergent vegetation used by the species.
Western spadefoot *(Spea hammondii)*	--/CSC	California Central Valley	Use large vernal pools for breeding and foraging; burrows and cracks in uplands for aestivation.	None; no vernal pool habitat present within project area.
BIRDS				
Migratory Birds	MBTA/--	Throughout North America		High potential for nesting of some species within Burch Creek riparian corridor
Tricolored blackbird *(Agelaius tricolor)*	--/CSC	Central Valley, northeastern corner of California, small populations Oregon and Nevada	Nest near fresh water in adjacent vegetation, especially marshes. Forage in grasslands and croplands. Found in large colonies.	None; no suitable nesting habitat within or adjacent to project area.
Long-eared owl *(Asio otus)*	--/CSC	Breeds in northern Canada south to northeastern states, south as far as Baja in the West. Winters in southern Canada and through western states as far south as Mexico.	Nest in dense vegetation adjacent to foraging habitat in open grasslands, shrublands and forests.	Moderate potential for foraging within project area. Limited nesting potential associated with Burch Creek riparian corridor.
Burrowing owl *(Athene cunicularia)*	--/CSC	Throughout North America	Dry grasslands and deserts, open ponderosa pine and juniper forests.	Moderate foraging potential; potentially suitable nesting habitat within project area
Swainson's hawk *(Buteo swainsoni)*	--/CT	Throughout western U.S. during the summer	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, grain fields, and vegetable crops.	Moderate nesting potential within Burch Creek riparian corridor; nearest observation 5 miles from project area.
Western yellow-billed cuckoo *(Coccyzus americanus occidentalis)*	FC/CE	Western U.S.	Wide, dense riparian forests with thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging.	None; no suitable habitat present in project area due to lack of dense riparian habitat within Burch Creek corridor.

Table 2 POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES				
Common/ Scientific Names	**Status Fed/State**	**Distribution**	**Preferred Habitat**	**Potential for Occurrence Within Project Area**
Yellow warbler *(Dendroica petechia)*	--/CSC	Throughout North America	Wet, deciduous habitats, primarily riparian.	Low potential due to lack of dense riparian habitat within Burch Creek corridor.
White-tailed kite *(Elanus leucurus)*	--/FP	Western Oregon, Central Coast and Central Valley of California	Low foothills or valleys with valley or live oak, riparian areas, marshes near open grasslands for foraging.	Low potential due to lack of dense riparian habitat within Burch Creek corridor.
Yellow-breasted chat *(Icteria virens)*	--/CSC	Throughout most of U.S. during the summer	Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines.	Low potential due to lack of dense riparian habitat within Burch Creek corridor.
Bank swallow *(Riparia riparia)*	--/CT	Northern parts of North America during breeding, southern and South America during non-breeding	Riparian corridors; nest in cavities dug into riverbanks or loose, sandy cliffs.	None; no suitable nesting habitat within project area.
Northern spotted owl *(Strix occidentalis ssp. caurina)*	FT/CSC	Western states and Mexico; British Columbia south through Coast Ranges and Cascades to northern California east to the Pit River	Forests with complex structure, high canopy closure, large trees for nesting. Younger stands often used for foraging.	None; no suitable nesting or foraging habitat present with project area.
FISH (*Status designations are specific to ESUs/DPS of project location)				
Green sturgeon *(Acipenser medirostris)*	FT/--	Pacific coast (including major rivers) of Mexico, U.S., and Canada.	Nearshore oceanic waters, bays, estuaries. Spawn in large, turbulent, freshwater river mainstems.	None; no suitable habitat within project area.
Central Valley steelhead *(Oncorhynchus mykiss)*	*FT/--	Sacramento / San Joaquin river systems	Class I watercourses for spawning and rearing habitat	None; no suitable habitat within project area.
Central Valley winter-run Chinook salmon *(Oncorhynchus tshawytscha)*	FE/CE	Sacramento / San Joaquin river systems	Class I watercourses for spawning and rearing habitat	None; no suitable habitat within project area.
Central Valley spring-run Chinook salmon *(Oncorhynchus tshawytscha)*	FT/CT	Sacramento / San Joaquin river systems	Class I watercourses for spawning and rearing habitat	None; no suitable habitat within project area.
INVERTEBRATES				
Vernal pool fairy shrimp *(Branchinecta lynchi)*	FT/--	California Central Valley and southern Oregon	Vernal pools	None; no vernal pool habitat within project area.
Conservancy fairy shrimp (*Branchinecta conserviato)*	FE/--	California Central Valley	Vernal pools	None; no vernal pool habitat within project area.

Table 2
POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES

Common/ Scientific Names	Status Fed/State	Distribution	Preferred Habitat	Potential for Occurrence Within Project Area
Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*	FT/--	Endemic to the Central Valley of California	Only found in blue elderberry shrubs. Reliant on blue elderberry shrubs for all stages of life.	Elderberry shrubs do not occur within the project boundaries.
Vernal pool tadpole shrimp *(Lepidurus packardi)*	FE/--	California Central Valley	Vernal pools	None; no vernal pool habitat within project area.
MAMMALS				
Pallid bat *(Antrozous pallidus)*	FS/CSC	Western North America	Riparian habitats, arid deserts and grasslands near water. Rock crevices, hollow trees, caves and mines for roosting.	Low potential due to lack of quality roosting sites.
Fisher *(Martes pennanti)*	Candidate/ CSC	Klamath, Cascade, North Coast and Sierra Nevada mountain ranges	Intermediate- to old-growth forests with high canopy closure, cavities for denning.	None; no suitable habitat within project area.
American badger *(Taxidae taxus)*	--/CSC	North America except eastern and southern states of the U.S.	Open forests, shrublands, and grasslands with friable soils.	None; no suitable habitat within project area.
REPTILES				
Western pond turtle *(Actinemys marmorata marmorata)*	--/CSC	Portions of Washington, Oregon and California	Slow-moving streams, ponds. Requires year-round water. Lay eggs in uplands near water.	Low potential within Burch Creek. Drainage does not support permanent water flow required by the species.
Giant garter snake (*Thamnophis gigas*)	FT/CT	Endemic to most of Central Valley historically from Butte County south to Kern County with a gap in the middle. Currently more restricted.	Sloughs, marshes, irrigation ditches and rice fields. Requires year-round water.	None; no suitable habitat within or adjacent to project area.

Status definitions:
FE = listed as endangered under the federal Endangered Species Act.
FT = listed as threatened under the federal Endangered Species Act
CE = listed as endangered under the California Endangered Species Act.
CT = listed as threatened under the California Endangered Species Act
CSC = listed as a species of special concern by the California Department of Fish and Game
-- = no listing.

Flora

Plant species with low to high potential for occurrence within the project area are described below. Species with no potential for occurrence based on site-specific habitat availability are not discussed further.

Adobe-Lily (Fritillaria pluriflora)
Federal Status: none; State Status: none; CNPS Status: List 1B.2
This rare lily inhabits open grasslands with adobe soils in foothill woodlands or chaparral (UCANR, 2001). The adobe lily is threatened by grazing, development, mining, non-native plants and horticultural collection (CNPS). It flowers in late winter or in early spring when clay soils are saturated. It has a short stature and a uniformly pinkish-purple flower. The range of adobe-lily includes the coast range foothills, the Sierra Nevadas (below 2300 feet elevation), and southern Oregon (UCANR, 2001). The study site has moderately clayey soils and grassland habitats. Initial surveys were conducted after the blooming season; however, only marginal habitat occurs onsite and occurrence is unlikely.

Ahart's Paronychia (Paronychia ahartii)
Federal Status: none; State Status: none; CNPS Status: List 1B.1
Ahart's paronychia is a California endemic annual herb species typically found along vernal pool edges and rocky terraces in cismontane woodlands and valley and foothill grasslands. It is threatened primarily by habitat loss but may be affected by grazing, vehicles and trampling as well. Its range has only been documented to include Butte, Shasta and Tehama Counties (CNPS). It is a very short plant, growing to a maximum height of 1 inch with a 1/32-inch taproot (Flora of North America). Although this species is associated with vernal pools, it is know to occur within rocky outcrops or sites with low competition. Marginal habitat for Ahart's paronychia occurs on the study site; the potential for this species to occur onsite is low.

Brown Fox Sedge (Carex vulpinoidea)
Federal Status: none; State Status: none; CNPS Status: List 2.2
Brown fox sedge is a perennial herb found in riparian areas, marshes, and sometimes in road side ditches. It is primarily threatened by development (CNPS). It is distributed throughout North America (UCANR). Marginal habitat occurs on the study site, due to the lack of suitable perennial water source. No plants were observed during field surveys.

Jepson's milk vetch (Astragalus rattanii* var. *jepsonianus)
Federal status: none; State status: none; CNPS status: 1B.2
Jepson's milk vetch is an annual herb endemic to California that grows within annual grassland and foothills woodland. Its known range is within the coastal mountains from Napa County to Tehama County, generally between elevations of 400 to 600 meters. Although there is suitable habitat within the project site for the species, the potential for occurrence is low, due to the project area being slightly out of the species' normal elevation range.

Silky cryptantha (Cryptantha crinita)
Federal status: none; State status: none; CNPS status: List 1B.2
Silky cryptantha is a California endemic annual herb that inhabits sand and gravel deposits of seasonal streams or overflow channels of perennial waterways in the Northern Sacramento

Valley, generally below 1000 meters in elevation (CNPS). Although there is suitable habitat onsite, there is low potential for occurrence as the project area is outside the current range of the species. The nearest known occurrences are over 30 miles to the north and northeast, along Singer Creek and Dibble Creek, respectively (CNDDB).

Stony Creek spurge (Chamaesyce ocellata)
Federal status: none; State status: none; CNPS status: List 1B.2
Stony Creek spurge is an annual herb that inhabits chaparral and valley and foothill grasslands. It is primarily threatened by recreational activities, vehicles, and trampling. Stony Creek spurge has been documented as occurring in Glenn and Tehama Counties, but may inhabit other California counties as well. Suitable habitat for Stony Creek spurge does occur on the study site; therefore there is potential for this species to occur within the project area.

Fauna

Wildlife species with low to high potential for occurrence within the project area are described below. Species with no potential for occurrence based on site-specific habitat assessment are not discussed further.

California Red-legged Frog (Rana draytonii)
Federal Status: Threatened; California Species of Special Concern
This species occurs in California and northwestern Baja, Mexico and requires cool slow moving water in pond or marsh habitats with emergent and submergent vegetation. Habitats with the highest densities of frogs are deep-water pools (at least 2.5 feet deep) with dense stands of overhanging willows and a fringe of tulles or cattails. Although they can occur in ephemeral streams or ponds, it is unlikely that populations can be maintained in ephemeral streams in which all surface water disappears (Jennings and Hayes, 1994). Threats include introduced predators such as bullfrogs and brown trout (*Salmo trutta*), pollutants and habitat loss. Habitat on the project site is highly marginally due to the lack of a perennial water source. No breeding habitat occurs within the project area.

Burrowing Owl (Athene cunicularia)
Federal Status: none; State Status: Species of Concern
The Burrowing Owl is a relatively small owl with a rounded head, chocolate in color with white streaking or spotting. They have a white throat patch, long and rounded wings and short tail, both of which are brown with buff-white barring. Juveniles are similar to adults but are unstreaked to lightly streaked. Their breeding range extends from Mexico to Canada and scattered across the western United States. They have been observed in families or breeding colonies and use mammal burrows, rock cavities, or man-made burrow-like structures (i.e. old culverts) for nesting. They prefer open to sparsely vegetated areas for foraging. Known to occur throughout the Central Valley into the grasslands and blue oak woodlands of the lower foothills.

Long-eared Owl (Asio otus)
Federal Status: none; State Status: Species of Concern
Long-eared owl populations are primarily threatened by loss of crucial nesting and roosting habitat that includes dense vegetation in riparian corridors and tree groves that occur adjacent to grasslands. Long-eared owls occur in the far north of North America including Canada and the

western half of the U.S. Long-eared owl range in California is restricted to the eastern part of the state, including the Sierra Nevadas (Birds of North America). The orchards adjacent to grassland areas could provide foraging habitat for the long-eared owl; therefore, long-eared owls could be found on the project site but would not be negatively impacted by project activities as they would move elsewhere to forage.

Swainson's Hawk (Buteo swainsoni)
Federal Status: none; California Status: Threatened
Swainson's hawks forage in open stands of grass-dominated vegetation, sparse shrublands, and open woodlands. It is also often observed foraging in open row crop areas. Threats to this species seem to be centralized in the southern hemisphere part of their range, where shooting of raptors still occurs and highly toxic pesticides are still in use. The only breeding range of Swainson's hawks occurs in North America; its wintering range is in South America. Swainson's hawks breed in the western states, southern Canada and northern Mexico. In California, their range is restricted to far northeastern California, the Sacramento and San Joaquin Valleys, and the valleys of the Sierra Nevadas (Birds of North America). Suitable foraging habitat occurs within the study area. The nearest CNDDB recorded observation is 5 miles from the project site.

Yellow Warbler (Dendroica petechia)
Federal Status: none; California Species of Special Concern
The yellow warbler inhabits wet, deciduous habitats, especially riparian areas in California. They are found throughout much of the northern portion of North America during the breeding season, and they winter in Central and South America. Yellow warbler populations are threatened by habitat loss in the northern part of their range (Birds of North America). Marginally suitable habitat exists on the study site for yellow warblers due to a lack of dense riparian vegetation along Burch Creek.

White-tailed Kite (Elanus leucurus)
Federal Status: None; California Status: Fully Protected
The white-tailed kite is found primarily in western half of the Pacific Coast states; also in parts of Mexico and South America. These populations are all year-round residents. No migration between southern and northern areas occurs. This species seems to be expanding its range and some sightings have occurred in other states in the U.S. It uses a multitude of habitats including cropland/hedgerow, grassland/herbaceous, savannah, woodland – hardwood savannah, open woodland, marshes, partially cleared lands and cultivated fields, mostly in lowland situations. Threats to this species include loss of habitat. Marginal habitat exists within the project area for this species due to a lack of dense riparian vegetation along Burch Creek. None were observed during wildlife surveys.

Yellow-breasted Chat (Icteria virens)
Federal Status: none; California Species of Special Concern
This species prefers second growth, shrubby old pastures, thickets, bushy areas, scrub, woodland undergrowth, and fence rows, including low wet places near streams, pond edges, or swamps, thickets with a few tall trees and early successional stages of forest regeneration. Yellow-breasted chats commonly nest in bushes, brier tangles, vines, and low trees, generally in dense vegetation. The species' breeding range includes the eastern U.S. and scattered populations in the western states. It migrates to coastal Mexico and Central America during the winter.

Threats to this species include loss and degradation of riparian habitats and parasitism by brown-headed cowbirds. Marginal habitat for this species exists onsite due to a lack of dense riparian vegetation along Burch Creek. None were observed during wildlife surveys.

Pallid Bat (Antrozous pallidus)
Federal Status: none; California Species of Special Concern
Pallid bats occur throughout most of western North America. This bat is found in riparian habitats and is also associated with arid deserts and grasslands and often near rocky outcrops and water. The species will roost in a variety of habitats including rock crevices, hollow trees, caves, and mines. These bats are sensitive to roost disturbance. Marginal habitat occurs on the project site for this species due to a lack of quality roosting sites.

Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)
Federal Status: Threatened; California: none
Due to the presence of elderberry shrubs (*Sambucus* spp.) along Burch Creek below the project area, the valley elderberry longhorn beetle has been included in this study. The male beetles are very noticeable with their vibrant red wing covers and antennae as long as their bodies, while the females have black wing covers and shorter antennae. The beetle is endemic to California's Great Central Valley. Elderberry shrubs in the Central Valley are associated with riparian areas. Much of the riparian habitat in the central valley has been converted for agricultural uses. This habitat loss is the primary cause of the decline of the longhorn beetle (Essig Museum of Entomology). The project has been designed to avoid elderberry shrubs; therefore, there will be no impacts to this species or its habitat.

Western Pond Turtle (Actinemys marmorata)
Federal Status: Sensitive; California Species of Special Concern
The western pond turtle lives in slow-moving rivers, streams, and ponds, and occasionally has been observed in seasonally flowing streams. Loss of habitat is the primary threat concern. These turtles spend most of their lives in the water but lay their eggs in adjacent uplands (CaliforniaHerps.com). They range throughout the western states including California, Nevada, Oregon, and Washington, as well as British Columbia (NatureServe). The streams on the project site are seasonal and fast moving during the wet season, so habitat suitability is only marginal for this species. None were observed during surveys.

Salmonids

Burch Creek and No-Name Creek, within the project area (approximately 22 miles above the Burch Creek confluence with the Sacramento River) do not support salmonids. Burch Creek, a seasonally flowing tributary to the Sacramento River, is a convergence of multiple intermittent streams. Approximately 1.4 miles north of Kirkwood is the confluence of Burch, Hall and Brannin Creeks (7 miles from the Sacramento River). Rice Creek, which includes the tributaries of Sour Grass, Moore and Gay Creeks, converges with Burch Creek approximately 2.6 miles east of Kirkwood (3 miles from the Sacramento River). In its upper reaches, Burch Creek receives water from Houghton and Parker Creeks (below project) and Sehorn, Jackson Spring, and Elmore Creeks (above project).

Intermittent creeks on the west side of the northern Sacramento Valley can be characterized as flashy drainages, with discontinuous flows dependent upon winter storm events. Habitat along these creeks is typical of washes, with patches or segments of riparian habitat interspersed with

annual grassland and denuded banks. Many of the west-side drainages are infested with non-native *Arundo donax* and *Tamarix* spp., which have established on open sand and gravel bars created by high-water events.

Burch Creek and Rice Creek are listed as critical habitat for Central Valley spring-run Chinook salmon from the Sacramento River to Kirkwood. The two creeks are listed as critical habitat for CA Central Valley steelhead from the Sacramento River to their confluence. The critical habitat designation continues on Rice Creek to Kirkwood.

The drainage likely provides non-natal rearing habitat near the main-stem Sacramento for spring- and fall-run Chinook, especially in high-water years. Unlikely spawning potential exists for late-fall and winter-run Chinook. Juvenile Chinook have been observed in Rice Creek up to Kirkwood, approximately 5.5 stream-miles from the Sacramento River (Maslin).

Burch and Rice Creeks may provide limited spawning habitat for steelhead (December to April), although more likely in high-water years. The drainage does not provide enough flow late enough into the season to provide rearing habitat for steelhead unless seasonally used by juveniles coming out of the mainstem of the Sacramento River.

Flood control mechanisms (dams) on major North State rivers provide for slow release of flood waters, which extends periods of high water in the Sacramento River; therefore, intermittent stream habitat is more critical for juveniles in high-water years due to extended siltation and high velocity of the mainstem of the Sacramento River. During low-water years, when the Sacramento River provides relatively improved rearing habitat, water flow in Burch Creek is less important. The project will pull a higher percentage of flows from Burch Creek in low-water years, when habitat need and habitat potential in Burch Creek are at reduced levels.

PEDESTRIAN SURVEY RESULTS

Wildlife and botanical surveys were conducted in May and June 2008. No special-status plant species were observed within the proposed project area. Aside from one individual sharp-shinned hawk, there were no observations of listed wildlife species within or surrounding the proposed project area. Lists of species observed during botanical and wildlife surveys are included in Table 3 and Table 4, respectively.

Table 3
OBSERVED FLORA

Species
Almond Tree (*Prunus* spp.)
Arroyo Willow *(Salix lasiolepis)*
Walnut Trees (*Juglans* spp.)
Yellow Star Thistle *(Centaurea solstitialis)*
Rushes *(Juncus* spp.*)*
Cheatgrass (*Bromus tectorum*)
Ripgut Brome (*Bromus diandrus*)
Dandelion (*Taraxacum* spp.)
Red Brome/ Foxtail Brome (*Bromus rubens*)
Medusahead (*Taeniatherum caput-medusae*)
(*Aster* sp.)
Crested Dogstail Grass (*Cynosurus cristatus*)
Black Oak (*Quercus kelloggii*)

Table 4 OBSERVED FAUNA		
Species	**No. Observed**	**Comments**
Common Garter Snake (*Thamnophis sirtalis*)	1	Terrestrial
Red-Tailed Hawk (*Buteo jamaicensis*)	2	Soaring/foraging
Sharp-Shinned Hawk (*Accipiter striatus)*	1	Soaring/foraging
Western Fence Lizards (*Sceloporus occidentalis*)	5	Terrestrial

CONCLUSION

The No-Name Creek Dam project will essentially serve to dam and hold water conveyed by a seasonal stream. This will establish a perennial water source that will serve to enhance the existing foraging and dispersal potential for wildlife and provide agricultural and fire suppression applications. It is assumed that the completed project will diminish the annual grassland habitat near the proposed project; however, impacts to wildlife that may use this habitat will be minimal due to the habitat's abundance in the general region and the ability of those species to move to nearby habitat.

In conclusion, the loss of habitat resulting from the construction of the proposed dam is unlikely to impact any special-status species or their habitat. The project will provide an additional perennial source of water, which will increase habitat quality and diversity.

The No-Name Creek Dam will provide a valuable source of water for the agricultural applications of BH Farms. In addition, overall water quality will be improved by the established wetland functions that may include:

- Reduction in the severity of downstream floods by storing and releasing water during drier periods.
- Streambank and shoreline erosion protection.
- Recharge of groundwater, potentially reducing water shortages during dry spells.
- Provision of fish and wildlife foraging habitat, breeding grounds, and resting areas.
- Improved water quality by breaking down, removing, using and/or retaining nutrients, organic waste and sediment carried to the wetland with runoff from the watershed.

Section 5
PROPOSED MITIGATION MEASURES

Mitigation measures will be approved by the responsible agency before the project proceeds. The following mitigation is recommended:

- Impacts to existing riparian vegetation and other waters of the U.S. will be avoided and/or minimized to the extent practical. Being a water dependent project, some impacts to waters of U.S. are unavoidable.
- Construction activities shall be implemented in full compliance with Sections 401 and 404 of the Clean Water Act. As such, the necessary mitigation will be implemented for unavoidable impacts to waters of the U.S.
- Impacts to fish species which may occur within the project area will be avoided by conducting project activities during the dry season while No-Name Creek and Burch Creek are dry. The ability for aquatic life movement on Burch Creek will be maintained.
- Impacts to migratory bird species will be avoided by conducting project activities outside of the normal breeding window (April 1 to August 1). Should project activities occur during the breeding window, a pre-construction migratory bird nesting survey will be completed. Should nesting birds be observed within or adjacent to the project area, appropriate avoidance measure (i.e. buffers) will be established until the young have fledged.
- Silt fencing or straw bale siltation barriers shall be installed between all waters of the U.S. and the construction area.
- Hydromulch and/or hydroseed (using native plant species) will be applied to all soil stockpiles to minimize wind and water erosion.
- Disturbed soil, including roads, shall be watered frequently to prevent dust emissions.
- Fueling and maintenance of construction equipment shall occur only at the processing facility to reduce the area of potential fuel spills, lubricant spills, etc.
- The design of the aggregate haul roads and reservoir levees shall be sloped toward the reservoir areas to prevent storm water runoff from leaving the site and flood waters from entering the reservoirs.
- Additional mitigation measures may be implemented as conditions of the Section 401 Water Quality Certification issued by the Central Valley RWQCB and/or the Section 1602 Streambed Alteration Agreement issued by DFG.

Section 6
REFERENCES

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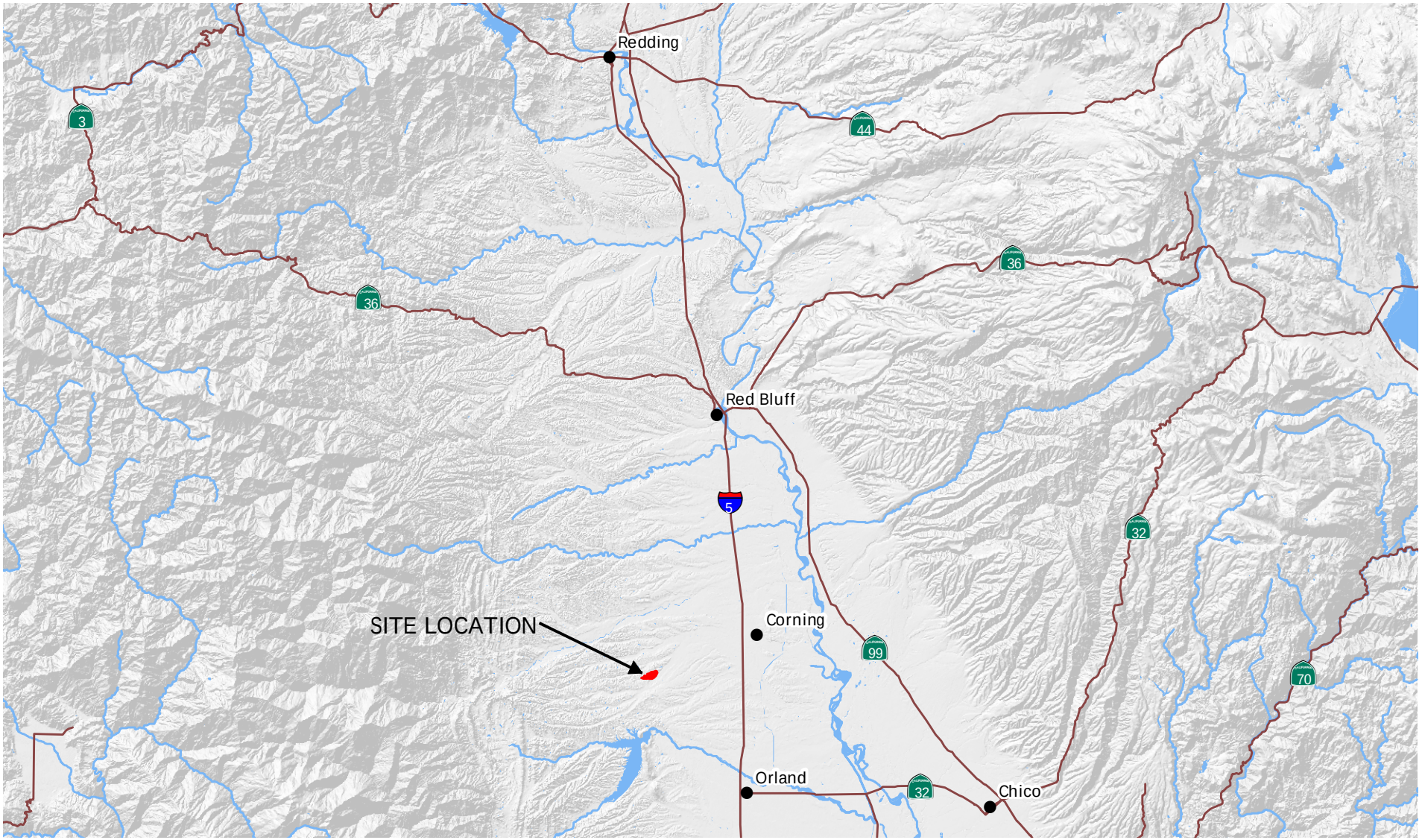


Project Area
Lake, Pond, or Reservoir
Highway
River

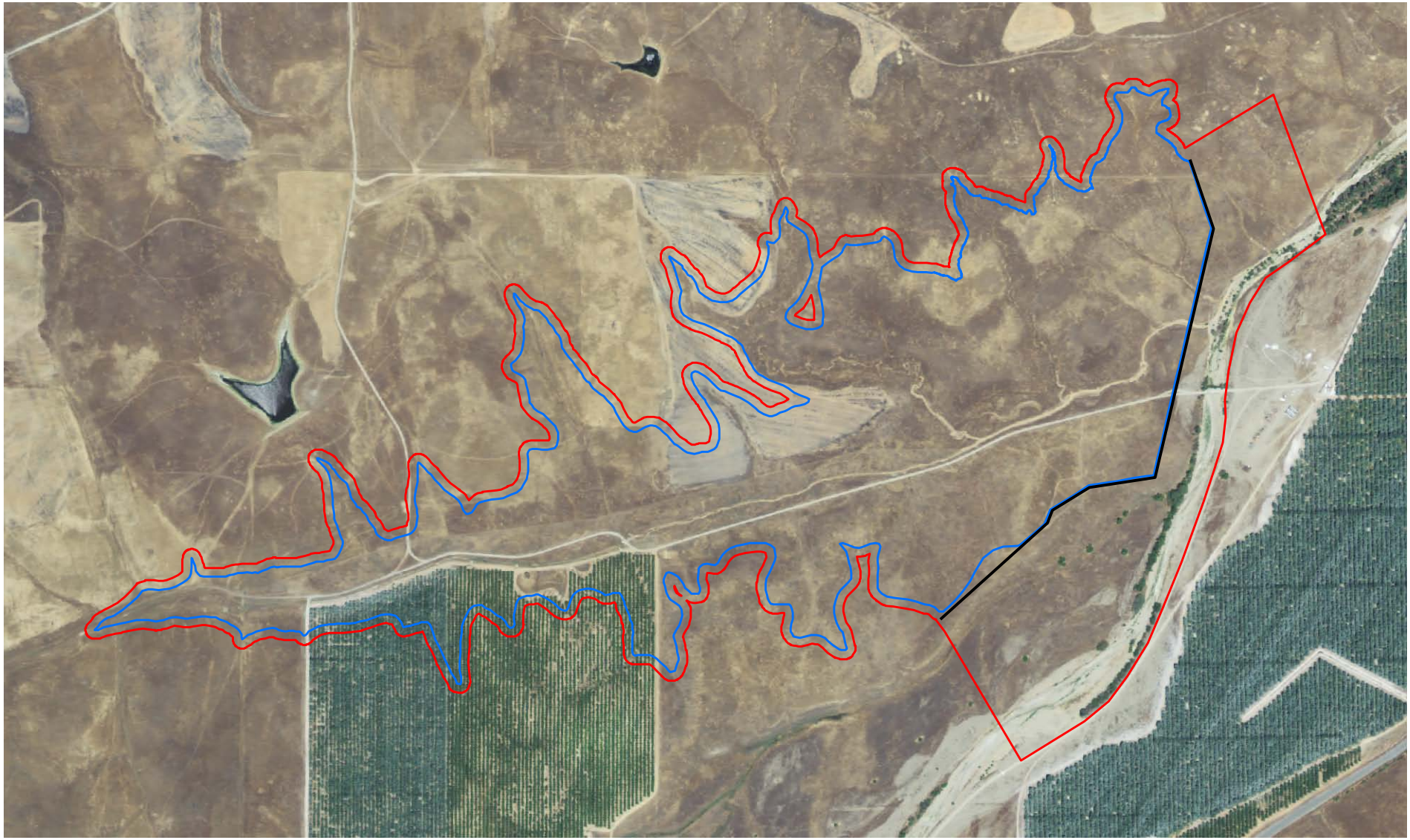
N

0 5 10 20 Miles

VESTRA

FIGURE 1
GENERAL SITE LOCATION
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\BioReport\70812_Figure1_GeneralSiteLocation.mxd



Proposed Dam

Proposed Reservoir Boundary

Project Area

N

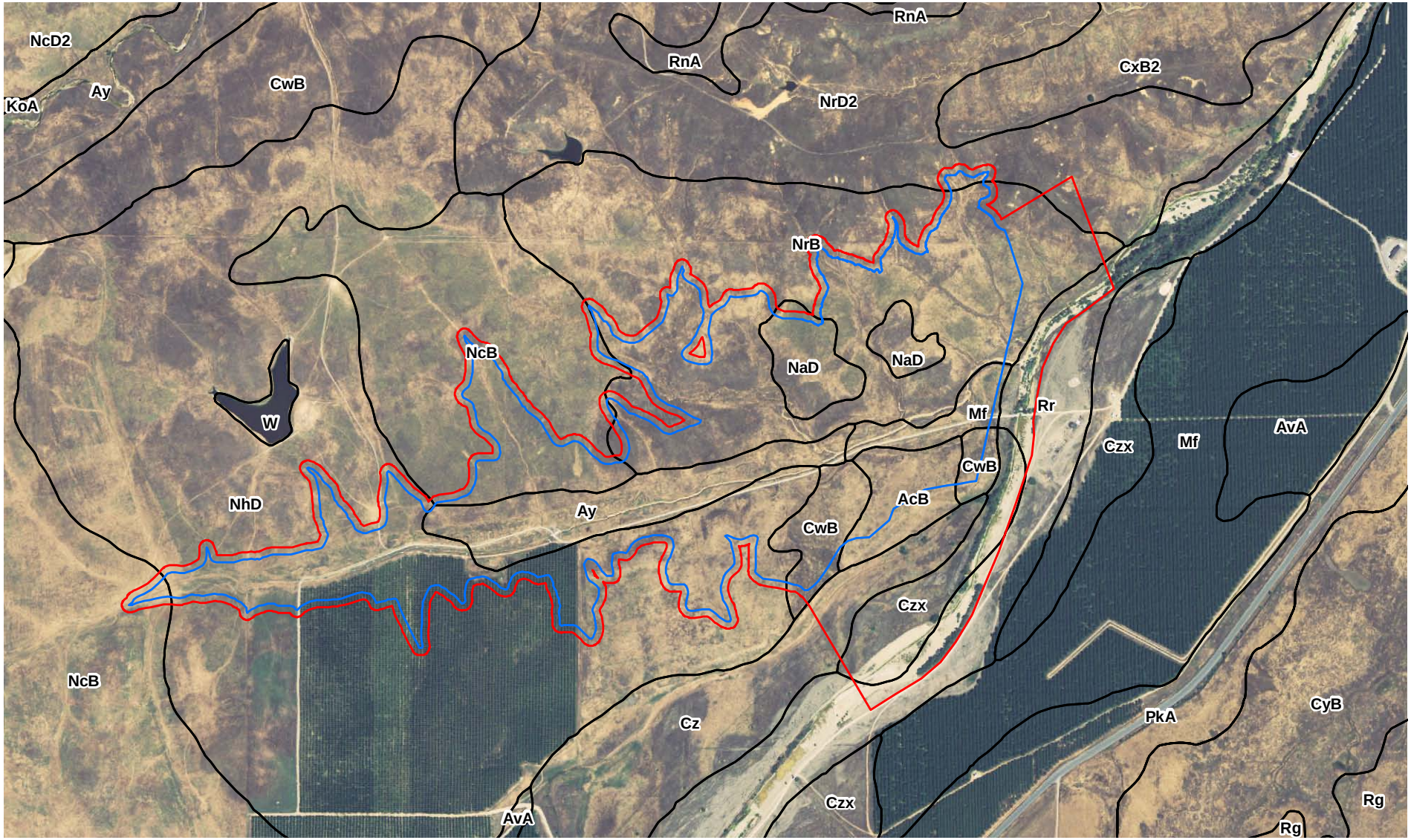
0 400 800 1,600 Feet

VESTRA

SOURCE: NAIP 2009

FIGURE 2
PROPOSED PROJECT AREA
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\BioReport\70812_ProjectArea.mxd



Proposed Reservoir Boundary

Project Area

Soil Map Unit

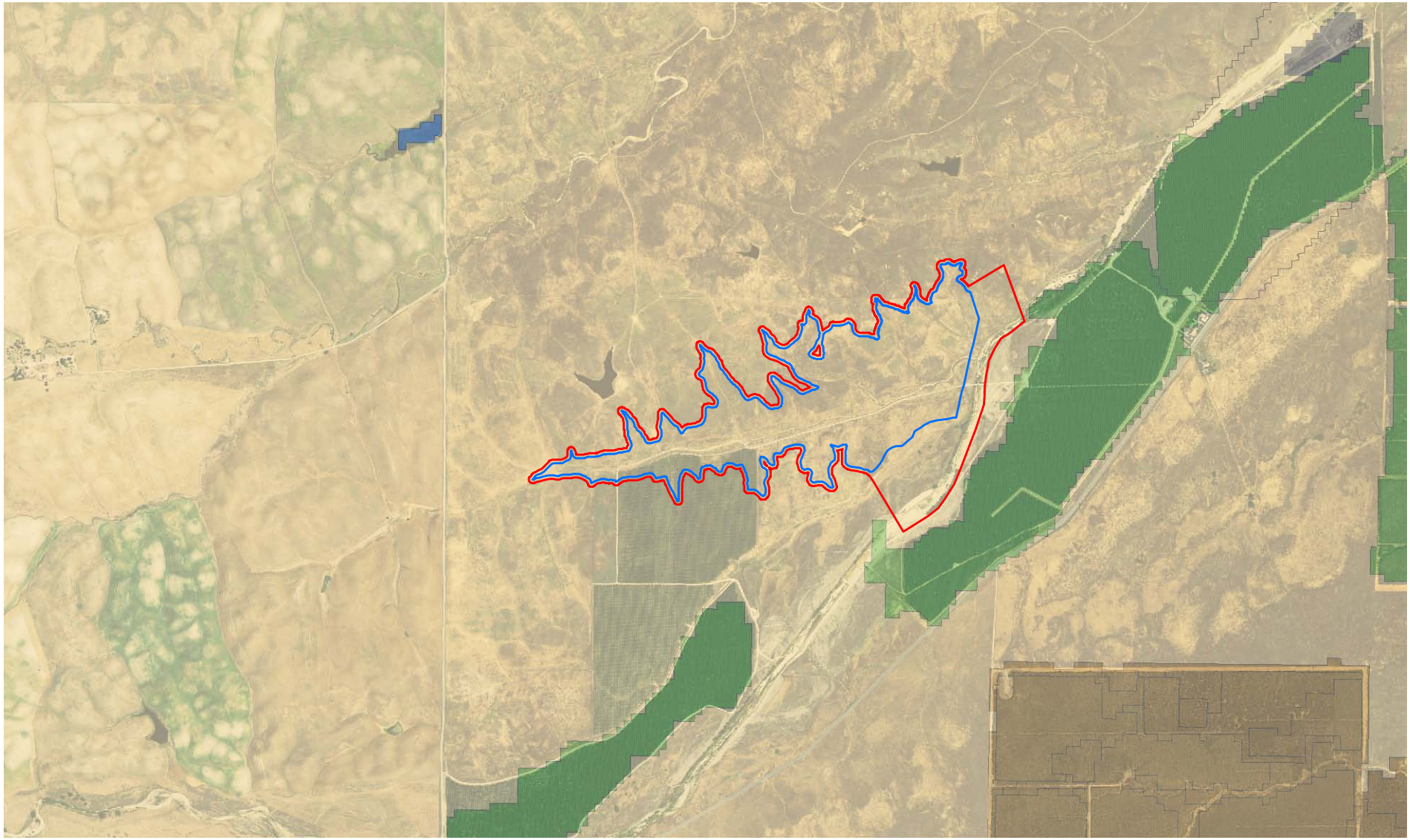
0 500 1,000 2,000 Feet

VESTRA

SOURCE: NAIP 2005; NRCS 2004

FIGURE 3
SOILS
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

P:\GIS\70812\BioReport\70812_Soils.mxd



Proposed Reservoir Boundary
Project Area
Annual Grass
Barren
Cropland
Eucalyptus
Lacustrine

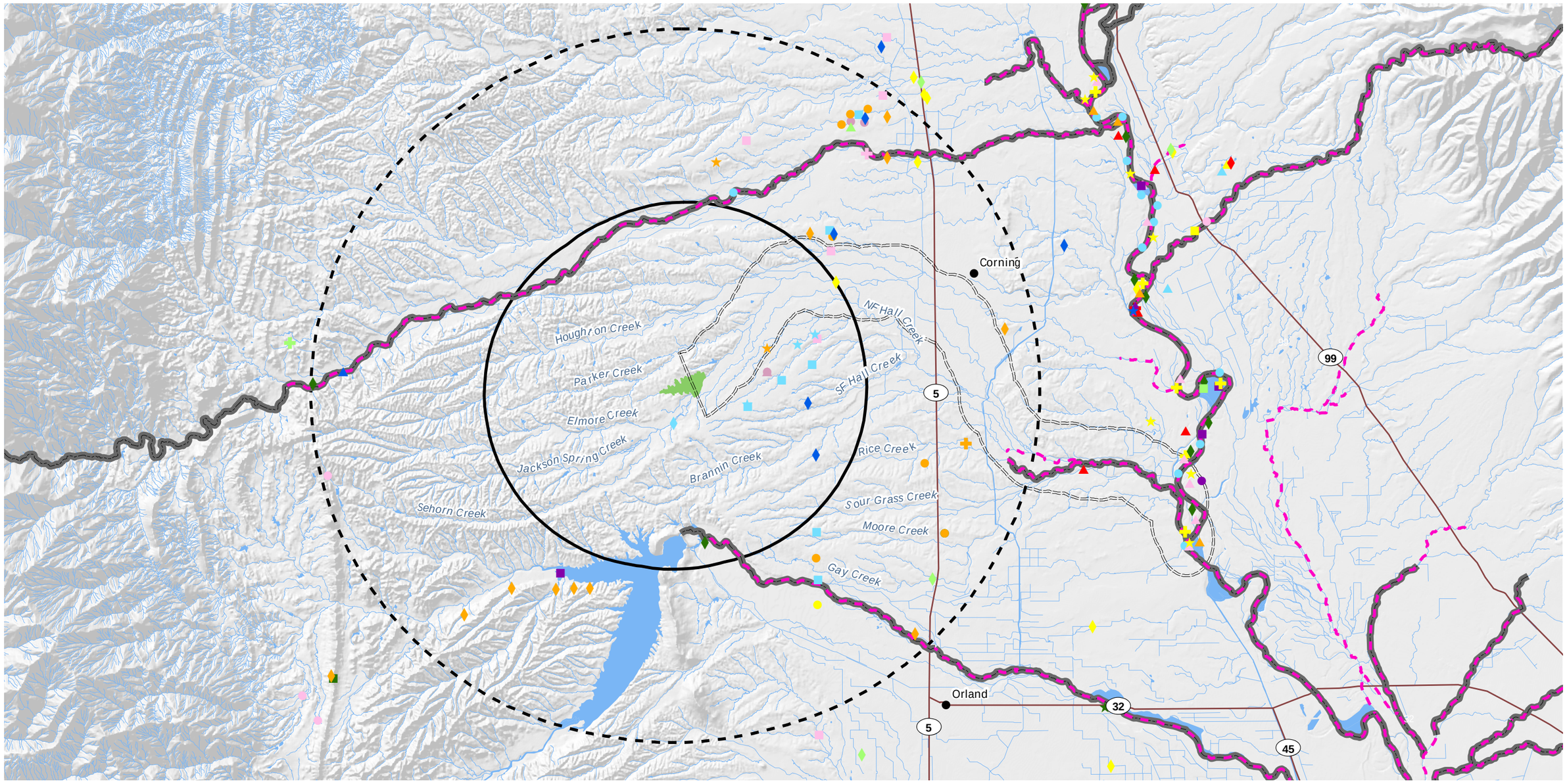
VESTRA

0 1,000 2,000 4,000 Feet

SOURCE: NAIP 2005; USFS CALVEG BY WHR TYPE 2005

FIGURE 4
VEGETATION COMMUNITIES
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

P:\GIS\70812\BioReport\70812_VegetationCommunities.mxd



- Adobe-lily
- Ahart's dwarf rush
- Ahart's paronychia
- American badger
- Antioch Dunes anthicid beetle
- Baker's navarretia
- Bank swallow
- Blennosperma vernal pool andrenid bee
- Boggs Lake hedge-hyssop
- Brown fox sedge
- Burrowing owl
- California linderiella
- Central Valley Drainage Fall Run Chinook Stream
- Central Valley Drainage Valley Floor River
- Coastal and Valley Freshwater Marsh
- Dimorphic snapdragon
- Dwarf downingia
- Great blue heron
- Great egret
- Great Valley Cottonwood Riparian Forest
- Great Valley Mixed Riparian Forest
- Great Valley Valley Oak Riparian Forest
- Great Valley Willow Scrub
- Greene's tuctoria
- Henderson's bent grass
- Hoary bat
- Hoover's spurge
- Jepson's milk-vetch
- Legenere
- Long-eared myotis
- Long-legged myotis
- Norris' beard moss
- Northern Hardpan Vernal Pool
- Osprey
- Pallid bat
- Pink creamsacs
- Red Bluff dwarf rush
- Sacramento anthicid beetle
- Sierra Nevada red fox
- Silky cryptantha
- Silver-haired bat
- Slender Orcutt grass
- Stony Creek spurge
- Swainson's hawk
- Tricolored blackbird
- Valley elderberry longhorn beetle
- Valley Needlegrass Grassland
- Vernal pool fairy shrimp
- Vernal pool tadpole shrimp
- Western mastiff bat
- Western pond turtle
- Western red bat
- Western spadefoot
- Western yellow-billed cuckoo
- White-stemmed clarkia
- White-tailed kite
- Yellow warbler
- Yellow-breasted chat
- Yuma myotis
- Central Valley Spring Run Chinook Critical Habitat
- California Central Valley Steelhead Critical Habitat
- 5-Mile Buffer Around Project Location
- 10-Mile Buffer Around Project Location
- 1-Mile Buffer Around Burch Creek
- Project Area
- Stream or River

VESTRA

0 1.25 2.5 5 Miles

SOURCE: DFG CNDDB MARCH 2010 EDITION

FIGURE 5
CNDDB OCCURRENCES
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

P:\GIS\70812\BioReport\70812_CNDDB.mxd

Appendix A

Species Lists

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Mon, Apr. 19, 2010 14:26 c

{QUADS_123} =~ m/595A|611C|611D|594B|594C|610C|595B|595(Search

Tip: Having trouble with a multi-word search? Try a single word, e.g. `ginger` or `cobra`.
[all tips and help.][search history]

Your Quad Selection: Henleyville (595A) 3912283, Red Bank (611C) 4012214, West Of Gerber (611D) 4012213, Corning (594B) 3912282, Kirkwood (594C) 3912272, Gerber (610C) 4012212, Flournoy (595B) 3912284, Sehorn Creek (595C) 3912274, Black Butte Dam (595D) 3912273

Hits 1 to 11 of 11

Requests that specify topo quads will return only Lists 1-3.

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

open	save	hits	scientific	common	family	CNPS
		1	**Agrostis hendersonii**	Henderson's bent grass	Poaceae	List 3.2
		1	**Chamaesyce ocellata ssp. rattanii**	Stony Creek spurge	Euphorbiaceae	List 1B.2
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Cymopterus deserticola**	desert cymopterus	Apiaceae	List 1B.2
		1	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Scrophulariaceae	List 1B.2
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Legenere limosa**	legenere	Campanulaceae	List 1B.1
		1	**Navarretia leucocephala ssp. bakeri**	Baker's navarretia	Polemoniaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

No more hits.

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Landscape
Henleyville and eight surrounding quads

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
1	***Actinemys marmorata***	western pond turtle	ARAAD02030			G3G4	S3		SC
2	***Agelaius tricolor***	tricolored blackbird	ABPBXB0020			G2G3	S2		SC
3	***Agrostis hendersonii***	Henderson's bent grass	PMPOA040K0			G1Q	S1.1	3.2	
4	***Anthicus antiochensis***	Antioch Dunes anthicid beetle	IICOL49020			G1	S1		
5	***Anthicus sacramento***	Sacramento anthicid beetle	IICOL49010			G1	S1		
6	***Athene cunicularia***	burrowing owl	ABNSB10010			G4	S2		SC
7	***Branchinecta lynchi***	vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3		
8	***Buteo swainsoni***	Swainson's hawk	ABNKC19070		Threatened	G5	S2		
9	***Chamaesyce ocellata ssp. rattanii***	Stony Creek spurge	PDEUP0D1P1			G4T3	S3.3	1B.2	
10	***Coccyzus americanus occidentalis***	western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1		
11	***Dendroica petechia brewsteri***	yellow warbler	ABPBX03018			G5T3?	S2		SC
12	***Desmocerus californicus dimorphus***	valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2		
13	***Downingia pusilla***	dwarf downingia	PDCAM060C0			G3	S3.1	2.2	
14	***Elanus leucurus***	white-tailed kite	ABNKC06010			G5	S3		
15	***Gratiola heterosepala***	Boggs Lake hedge-hyssop	PDSCR0R060		Endangered	G3	S3.1	1B.2	
16	***Icteria virens***	yellow-breasted chat	ABPBX24010			G5	S3		SC
17	***Juncus leiospermus var. leiospermus***	Red Bluff dwarf rush	PMJUN011L2			G2T2	S2.2	1B.1	
18	***Legenere limosa***	legenere	PDCAM0C010			G2	S2.2	1B.1	
19	***Lepidurus packardi***	vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3		
20	***Linderiella occidentalis***	California linderiella	ICBRA06010			G3	S2S3		
21	***Navarretia leucocephala ssp. bakeri***	Baker's navarretia	PDPLM0C0E1			G4T2	S2.1	1B.1	
22	***Oncorhynchus tshawytscha***	chinook salmon - Sacramento River winter-run ESU	AFCHA0205B	Endangered	Endangered	G5	S1		
23	***Pandion haliaetus***	osprey	ABNKC01010			G5	S3		
24	***Paronychia ahartii***	Ahart's paronychia	PDCAR0L0V0			G3	S3	1B.1	
25	***Riparia riparia***	bank swallow	ABPAU08010		Threatened	G5	S2S3		
26	***Spea hammondii***	western spadefoot	AAABF02020			G3	S3		SC
27	***Taxidea taxus***	American badger	AMAJF04010			G5	S4		SC

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

April 19, 2010

Document Number: 100419010428

Breanna Owens
VESTRA Resources
5300 Aviation Drive
Redding, CA 96002

Subject: Species List for Tehama County

Dear: Ms. Owens

We are sending this official species list in response to your April 19, 2010 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 18, 2010.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 100419010428

Database Last Updated: December 1, 2009

No quad species lists requested.

County Lists

Tehama County

Listed Species

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (E)
Critical habitat, Conservancy fairy shrimp (X)

Branchinecta lynchi

Critical habitat, vernal pool fairy shrimp (X)
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Lepidurus packardi

Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris

green sturgeon (T) (NMFS)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Rana aurora draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Birds

Strix occidentalis caurina
Critical habitat, northern spotted owl (X)
northern spotted owl (T)

Plants

Chamaesyce hooveri
Critical habitat, Hoover's spurge (X)
Hoover's spurge (T)

Limnanthes floccosa ssp. californica
Butte County (Shippee) meadowfoam (E)
Critical habitat, Butte County (Shippee) meadowfoam (X)

Orcuttia pilosa
Critical habitat, hairy Orcutt grass (X)
hairy Orcutt grass (E)

Orcuttia tenuis
Critical habitat, slender Orcutt grass (X)
slender Orcutt grass (T)

Tuctoria greenei
Critical habitat, Greene's tuctoria (=Orcutt grass) (X)
Greene's tuctoria (=Orcutt grass) (E)

Candidate Species

Amphibians

Rana muscosa
mountain yellow-legged frog (C)

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Mammals

Martes pennanti
fisher (C)

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** proje within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by t list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environment documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that n result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together t avoid or minimize the impact on listed species and their habitat. Such consultation would resu in a biological opinion by the Service addressing the anticipated effect of the project on listed proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and a likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct a indirect impacts to listed species and compensates for project-related loss of habitat. You shou include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essenti to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals

on our candidate list when we have enough scientific information to eventually propose th for listing as threatened or endangered. By considering these species early in your plannir process you may be able to avoid the problems that could develop if one of these candida was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defir by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, yo will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 1 2010.

Appendix C

Water Availability Analysis

WATER AVAILABILITY ANALYSIS
APPLICATION NO. 31771

BH FARMING TO APPROPRIATE WATER FROM BURCH CREEK
TEHAMA COUNTY, CALIFORNIA

Prepared for

BH Farming LLC

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

OCTOBER 2011 (Previous Revisions July 2010, Nov 2010)

WATER AVAILABILITY ANALYSIS
APPLICATION NO. 31771

BH FARMING TO APPROPRIATE WATER FROM BURCH CREEK
TEHAMA COUNTY, CALIFORNIA

Prepared for

BH Farming LLC

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

70812

OCTOBER 2011 (Previous Revisions July 2010, Nov 2010)

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1.0 INTRODUCTION

The purpose of this report is to summarize the results of the Water Availability Analysis conducted for water appropriation Application No. 31771 located within the Burch Creek Watershed in Tehama County, California. The objectives of the analysis are as follow:

- Provide information required under California Water Code Sections 1275 (a), 1375 (d), 1243, and 1243.5 and California Code of Regulations, Title 23, Section 782, to demonstrate whether water is available for appropriation; and
- Determine the impact of the proposed diversion project on stream flow to evaluate potential impacts to Public Trust Resources and provisions for compliance with various federal and state requirements. Examples include the California Environmental Quality Act (CEQA), the California Endangered Species Act (CESA), California Fish and Game Code, and the federal Endangered Species Act (ESA).

2.0 PROJECT DESCRIPTION

BH Farming LLC submitted Application No. 31771 to the State Water Resources Control Board (State Water Board) in 2009. The application covers the appropriation of water from Burch Creek and an unnamed tributary (No-Name Creek) to a storage reservoir. The State Water Board, Division of Water Rights (Division), received and executed the Memorandum of Understanding (MOU) relating to water right Application No. 31771 dated February 2, 2010. The MOU designates the following:

Applicant Representative
Charles Crain
BH Farming LLC
10660 Bryne Avenue
Los Molinos, California 96055
(530) 527-1079

Representative Consultant
Wendy Johnston
VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002
(530) 223-2585

MOU Manager
Kate Gaffney
State Water Resources Control Board
P.O. Box 2000
Sacramento, California 95812-2000
(916) 341-5360

The application seeks to divert 2,000 acre-feet of water from a combination of the capture of water from No-Name Creek (a tributary to Burch Creek) and diversion from Burch Creek into a proposed offstream reservoir located on No-Name Creek. The diversion season, as proposed, is November 1 to April 30. Application No. 31771 requests direct diversion to storage at BH Farming, a privately owned walnut and almond farming enterprise.

2.1 PROJECT LOCATION

The project area is located in Tehama County, approximately 8 miles southwest of Corning. The Burch Creek Watershed, proposed points of diversion, points of interest, and other features in the area are shown on Figure 1.

2.2 APPLICATION BACKGROUND

The application was submitted to the State Water Board in 2009. The State Water Board received and executed the MOU relating to water right Application No. 31771 in February 2010. When irrigation is to occur, riparian-right water will be diverted for use within the place of use without storage of the diverted water for more than 30 days. No petitions to appeal the application were filed.

2.3 WATER NEED

The appropriation of riparian-right water would serve to replace the current pumping of groundwater to supply water for irrigation and frost protection for the farm enterprise. This practice will result in lower fuel use, protection of local groundwater resources, and enhancement of wetland habitat.

Major components of the project consist of:

- Construction of an approximately 45-foot-high dam with spillway and outlet works
- Creation of reservoir with storage capacity of approximately 2,000 acre-feet
- Construction of pump station and pipeline to transfer water from Burch Creek to the reservoir area
- Construction of water supply pipeline to connect stored water to the existing orchard delivery system
- Planting of riparian and upland species to enhance wildlife habitat
- Creation of wildlife corridors between the Burch Creek floodplain and reservoir plantings

The project, located within the Burch Creek Watershed, entails construction of a dam and reservoir. The reservoir will store water for use as frost protection and irrigation of 500 acres of established walnuts and almonds, as well as new orchards to be planted once the storage and conveyance infrastructure are complete. The primary sources of water for storage in the reservoir would be storm and winter flows from No-Name Creek and peak winter storm flows from Burch Creek. The project area is shown on Figure 1.

Within the project area, Burch Creek is an intermittent stream that flows continually during the rainy season. Fish may be seasonally present at this location, and aquatic habitat is available for for non-fish species. Based on the regulations for classifying watercourses outlined in the California Forest Practice Rules (California Code of Regulations, Title 14, Section 916.5, Table 1), this segment is classified as a Class II watercourse. In contrast, the segment of No-Name Creek in the project area is an ephemeral draw that only flows during and immediately following precipitation events. This segment is classified as a Class III watercourse.

2.4 PROPOSED STORAGE CAPACITY

The tributary watershed controlled by the proposed dam drains approximately 730 acres. The proposed storage capacity is approximately 2,000 acre-feet. The period of appropriation for storage would be November 1 through April 30.

2.5 PROPOSED OPERATION

The diversion will occur from Burch Creek directly or from an infiltration gallery, depending upon final design. An infiltration gallery would reduce disturbance to the stream channel and damage to the diversion facilities and intake during high-flow events. The Burch Creek floodplain is currently degraded.

The maximum capacity of the diversion facilities is anticipated to be 40 cubic feet per second (cfs) for pumping of up to 2,000 acre-feet into the reservoir during flood or high-flow conditions. Water would be pumped approximately 35 feet through a pipe or series of pipes extending approximately 200 feet horizontally into the reservoir. Water would be measured at the point of diversion. In years when substantial flows are provided by No-Name Creek, the Burch Creek diversion would be substantially reduced.

As proposed, the project design incorporates components that will enhance wildlife habitat within the project area. These components include plantings of native species within the storage reservoir's riparian zone. The reservoir inundation area is currently characterized as non-native annual grassland. The project site is located adjacent to the floodplain of Burch Creek. The riparian area, consisting of willows, cottonwoods, scattered valley oak, red bud, and buckeye, will be restored. Wildlife corridors would develop between the natural floodplain of Burch Creek and the reservoir through the establishment of various riparian and upland plantings. The locations of plantings will be based largely upon the estimated inundation period at various reservoir elevations as a means to maximize water availability.

The project area is adjacent to the applicant's orchard plantings. The land is currently used for cattle grazing and limited wildlife habitat; consequently, no use conflicts exist. Once established, the reservoir plantings are expected to improve habitat conditions for deer and small mammal species as well as resident and migratory bird species.

2.6 BURCH CREEK SUMMARY

Burch Creek, a seasonally flowing tributary to the Sacramento River, is a convergence of multiple intermittent streams. The confluence of Burch, Hall, and Brannin Creeks is approximately 1.4 miles north of Kirkwood Road (7 miles from the Sacramento River). Rice Creek, which includes the tributaries of Sour Grass, Moore, and Gay Creeks, converges with Burch Creek approximately 2.6 miles east of Kirkwood Road (3 miles from the Sacramento River). In its upper reaches, Burch Creek receives water from Houghton and Parker Creeks (below project) and Sehorn, Jackson Spring, and Elmore Creeks (above project). See Figure 2.

Burch Creek and Rice Creek are listed as critical habitat for Central Valley spring-run Chinook salmon from the Sacramento River to Kirkwood Road. The two creeks are listed as critical habitat for Central Valley steelhead from the Sacramento River to their confluence east of Kirkwood Road, and the critical habitat designation continues on Rice Creek to Kirkwood Road. Kirkwood Road is located 14.9 miles downstream from the proposed diversion and has been identified as the upper limit of anadromy in Burch Creek (POI 1). The lower limit of anadromy has been identified as the confluence of Burch Creek and the Sacramento River.

2.7 OTHER DIVERSIONS

One other user is listed on Burch Creek: Leroy and Wilma Coleman, License No. 10115, issued June 16, 1972. This point of diversion is shown on Figure 1 as POI 3. License No. 10115 is for the diversion of 0.625 cfs for the period of April 1 to October 31 of each year, limited to 186 acre-feet per year or 37 acre-feet in a 30-day period to be applied to beneficial uses on 50 acres within Section 21, T24N, R3W. The period of overlap of the proposed BH Farming diversion with the use of License No. 10115 would be 30 days in the month of April. A copy of License No. 10115 is included in Appendix A.

2.8 POINTS OF DIVERSION AND POINTS OF INTEREST

Two points of diversion (POD) and three points of interest (POI) were identified in the Burch Creek Watershed as follow:

- POD 1 Proposed dam site on No-Name Creek
- POD 2 Proposed POD on Burch Creek
- POI 1 Uppermost point of anadromy
- POI 2 Confluence with Sacramento River
- POI 3 Point of License No. 10115 (Burch Creek)

These points are depicted on Figure 1; relevant information is summarized in Table 1. Delineation of watershed areas and acreages above each point is shown on Figures 3, 4, and 5.

POI 1 is the uppermost point of anadromy on lower Burch Creek, which is designated from this point downstream as critical habitat for salmon and steelhead. POI 2 is the confluence of Burch Creek and the Sacramento River, the farthest downstream point in the Burch Creek Watershed, and also important to salmonid anadromy. POI 3 is the existing diversion for License No. 10115.

Table 1 POINTS OF DIVERSION AND INTEREST SUMMARY					
Parameter	**POD 1**	**POD 2**	**POI 3**	**POI 1**	**POI 2**
Physical Location	At dam on No-Name Creek	POD on Burch Creek	Downstream water right	Upper point of anadromy	Burch Creek at Sac River
Diversion Season	Nov 1-Apr 30[1]	Nov 1-Apr 30[1]	Apr 1-Oct 31[2]	NA	NA
Supply Season	Nov 1-Apr 30[3]	Nov 1-Apr 30[3]	Nov 1-Apr 30[3]	Nov 1-Apr 30[3]	Nov 1-Apr 30[3]
Diversion	Approx. 500 a-ft annually (max. 40 cfs)[1]	Approx. 1,500 a-ft annually (max. 40 cfs)[1]	0.625 cfs (max 37 a-ft/month 186 aft./year)[2]	NA	NA
Minimum/ Avg. Bypass	0 cfs	1 cfs/>10 cfs	1 cfs/>10 cfs	NA	NA

Notes:
[1] Application No. 31771
[2] License No. 10115
[3] Assumed to be same as POD 1 and POD 2 diversion season.

2.9 DIVERSION AND SUPPLY SEASONS

For this Water Availability Analysis, the diversion and supply seasons are defined as occurring between November 1 and April 30 – the proposed diversion season in Application No. 31771.

3.0 METHODS

Burch Creek is an ungaged tributary to the Sacramento River. Therefore, flows at the points of diversion and points of interest are estimated using the rainfall/runoff rational method and the U.S. Geological Survey (USGS) area-ratio method. These methods are described briefly in this section.

3.1 PARAMETER ESTIMATION

Information used to estimate unimpaired flows at the points of diversion and points of interest include daily stream flow data from a nearby stream (USGS Gage No. 11379500 on Elder Creek, Figure 1), watershed/drainage areas, precipitation, slope, soil type, and vegetation coverage. Aerial data were estimated using USGS 10-meter digital elevation model data to calculate drainage boundaries and slope. The precipitation data used in the analysis are based on long-term annual precipitation data compiled from USGS, California Department of Water Resources (DWR), and California Department of Conservation, Division of Mines and Geology, over a 60-year period (1900 to 1960). Soil data were provided by the U.S. Department of Agriculture Soil Conservation Service's 1967 *Soil Survey for Tehama County*. Vegetation data were captured from the U.S. Forest Service existing vegetation data (CALVEG) using the California Wildlife Habitat Relationship System designations for vegetation classification. Supporting documentation is included in Appendix B.

3.2 RATIONAL METHOD

The rational method was proposed in the Preliminary Work Plan to be used for the calculation of water availability. This method is commonly used to design hydraulic structures and predict peak flood flows. However, this method has been accepted by the State Water Board to estimate unimpaired flow based on annual precipitation. The equation for the method used is:

$$Q = C\ I\ A * r$$

Where:

Q = Estimated natural supply above POD or POI during season of interest (acre-feet)
C = Runoff coefficient
I = Mean annual precipitation in watershed above POD or POI (feet)
A = Watershed/drainage area above POD or POI (acres)
r = Fraction of annual flow occurring during season of interest.

The runoff coefficient represents the fraction of water that will run off the ground surface following precipitation events. The value is based on soil type, relief, vegetation, and surface storage. The numeric contributions of each of these factors to the runoff coefficient are based on information presented in the California Department of Transportation *Highway Design Manual*.

The fraction of runoff occurring during the season of interest was estimated using discharge data from Elder Creek near Paskenta (USGS Gage No. 11379500), shown in Table 2. Overall, approximately 88 percent of the annual discharge occurs during the proposed diversion season. This gage was selected due to its proximity to the area of interest, similarity in runoff patterns, and minimal upstream diversions. The results of the rational method analyses for the PODs/POIs are included in Table 3.

3.3 AREA-RATIO METHOD

In addition to the rational method, Burch Creek flows were estimated using daily stream flow data from Elder Creek (USGS Gage No. 11379500) and the area-ratio method. The equation for this method is shown below:

$$Q = Q_{gage} * A_{(POD\ or\ POI)}/A_{gage} * I_{(POD\ or\ POI)}/I_{gage} * r$$

where:

Q = Estimated unimpaired flow at POI during season of interest (acre-feet)
Q^{gage} = Unimpaired mean annual flow recorded at gage (acre-feet)
$A_{(POD\ or\ POI)}$ = Watershed/drainage area above POD or POI (acres)
A_{gage} = Watershed/drainage area above gage (acres)
$I_{(POD\ or\ POI)}$ = Mean annual precipitation in watershed above POD or POI (feet)
I_{gage} = Mean annual precipitation in watershed above gage (feet)
r = Fraction of annual flow occurring during season of interest

The results are provided in Table 4.

Table 2 ELDER CREEK DISCHARGE SUMMARY (USGS GAGE 11379500)			
Water Year[1]	Water Year Discharge (a-ft)	Diversion Season (Nov-Apr) Discharge (a-ft)	Percent Diversion Season Discharge (%)
1949	50,333	44,435	88
1950	23,099	21,029	91
1951	55,999	47,480	85
1952	96,725	84,948	88
1953	74,831	65,966	88
1954	80,656	73,396	91
1955	27,315	21,307	78
1956	135,448	121,965	90
1957	40,051	32,770	82
1958	205,232	183,450	89
1959	34,295	32,033	93
1960	42,475	38,702	91
1961	37,813	34,864	92
1962	39,107	35,917	92
1963	76,751	63,854	83
1964	17,433	15,391	88
1965	122,097	112,657	92
1966	62,880	59,177	94
1967	103,912	81,175	78
1968	43,514	40,012	92
1969	126,217	111,446	88
1970	96,561	92,601	96
1971	77,640	69,823	90
1972	18,408	16,583	90
1973	115,353	106,075	92
1974	144,999	134,201	93
1975	89,643	74,472	83
1976	10,126	8,171	81
1977	4,840	3,648	75
1978	133,352	124,143	93
1979	37,693	31,916	85
1980	91,554	85,055	93
1981	51,405	48,140	94
1982	105,444	94,619	90
1983	219,328	186,953	85
1984	77,981	74,629	96
1985	34,170	31,395	92
1986	112,444	107,739	96
1987	18,006	16,348	91
1988	43,965	38,239	87
1989	30,449	27,504	90
1990	14,078	8,874	63
1991	27,867	23,041	83
1992	56,310	52,278	93
1993	102,019	83,299	82
1994	15,839	13,150	83
1995	184,342	165,942	90
1996	80,506	73,311	91
1997	83,565	80,890	97
1998	209,445	160,351	77

Table 2 ELDER CREEK DISCHARGE SUMMARY (USGS GAGE 11379500)			
Water Year[1]	**Water Year Discharge (a-ft)**	**Diversion Season (Nov-Apr) Discharge (a-ft)**	**Percent Diversion Season Discharge (%)**
1999	64,467	54,839	85
2000	82,005	72,677	89
2001	48,391	44,462	92
2002	65,529	62,347	95
2003	100,785	84,454	84
2004	89,540	85,297	95
2005	120,332	84,747	70
2006	139,385	122,753	88
2007	18,753	17,247	92
2008	48,740	42,830	88
2009	27,008	23,301	86
MEAN	**75,220**	**66,399**	**88**
Note: [1] Water Year begins on October 1 and ends on September 30 of the following year			

Table 3
NATURAL SUPPLY (RATIONAL METHOD)

Parameter	Symbol	Units	POD 1	POD 2	POI 3	POI 1	POI 2
Physical Location	---	---	POD at dam on No-Name Creek	POD on Burch Creek	Downstream water right	Upper point of anadromy	Burch Creek at Sac. River
Upstream Area	A	acres	810	16,030	40,900	65,800	94,500
Annual Upstream Precipitation	I	feet	1.5	1.6	1.46	1.48	1.46
Runoff Coefficient							
Relief	C_r	fraction	0.18	0.18	0.17	0.17	0.17
Soil Saturation	C_i	fraction	0.07	0.07	0.07	0.07	0.07
Vegetal Cover	C_v	fraction	0.06	0.06	0.06	0.06	0.06
Surface Storage	C_s	fraction	0.08	0.08	0.08	0.08	0.08
Sum	C	fraction	0.39	0.39	0.38	0.38	0.38
Unimpaired Flow[1]	Q	a-ft/year	480	10,020	24,500	37,000	52,400
Fraction Runoff during Diversion Season	r_d	fraction	0.88	0.88	0.88	0.88	0.88
Natural Supply during Diversion Season[2]	Q_{NSDS}	a-ft/DS	420	8,830	21,500	32,500	46,100
Fraction Runoff during Supply Season	r_s	fraction	0.88	0.88	0.88	0.88	0.88
Natural Supply during Supply Season[2, 3]	Q_{NSSS}	a-ft/SS	420	8,830	21,500	32,500	46,100

Notes:
[1] Unimpaired flow at POD or POI = C (runoff coefficient) * I (annual upstream precipitation) * A (upstream area).
[2] Natural supply at POD or POI = Unimpaired flow at POD or POI * fraction of runoff occurring during season.
[3] Diversion and supply seasons are the same.

Table 4
NATURAL SUPPLY (AREA-RATIO METHOD)

Parameter	Symbol	Units	Elder Creek	POD 1	POD 2	POI 3	POI 1	POI 2
Physical Location	---	---	USGS 11379500	POD at dam on No-Name Creek	POD on Burch Creek	Downstream water right	Upper point of anadromy	Burch Creek at Sac River
Upstream Area	A	acres	59,348	810	16,030	40,900	65,800	94,500
Annual Upstream Precipitation	I	ft	2.54	1.5	1.6	1.46	1.48	1.46
Unimpaired Flow [1]	Q	a-ft/year	74,500	600	12,716	29,512	48,129	68,187
Fraction Runoff during Diversion Season	r_d	fraction	---	0.88	0.88	0.88	0.88	0.88
Natural Supply during Diversion Season[2]	Q_{NSDS}	a-ft/DS	---	528	11,190	25,970	42,353	60,004
Fraction Runoff during Supply Season	r_s	fraction	---	0.88	0.88	0.88	0.88	0.88
Natural Supply during Supply Season[2, 3]	Q_{NSSS}	a-ft/SS	---	528	11,190	25,970	42,353	60,004

Notes:
[1] Unimpaired flow at POD or POI = Q (Elder Creek) * A (POD or POI)/A (Elder Creek) * I (POD or POI)/I (Elder Creek).
[2] Natural supply at POD or POI = Unimpaired flow at POI * fraction of runoff occurring during season.
[3] Diversion and supply seasons are the same.

4.0 ANNUAL UNIMPAIRED FLOW

Annual unimpaired flow is the total volume of water, on average, that would flow past a particular location on an annual basis if no diversions or impairments were taking place in the watershed above that point. Annual unimpaired flows in Burch Creek were estimated using the rational method and the area-ratio method; the results are presented in this section.

4.1 RATIONAL METHOD

Annual unimpaired flows in Burch Creek estimated using the rational method were summarized in Table 3. The combined estimated unimpaired flow or natural supply at POD 1 and POD 2 is 10,500 acre-feet per year; the estimated unimpaired flow during the diversion season from November 1 through April 30 is 9,250 acre-feet per year. Supporting documentation is included in Appendix B.

4.2 AREA-RATIO METHOD

Annual unimpaired flows in Burch Creek estimated using the area-ratio method were summarized in Table 4. The combined estimated unimpaired flow or natural supply at POD 1 and POD 2 is 13,316 acre-feet per year; the estimated unimpaired flow during the diversion season from November 1 through April 30 is 11,718 acre-feet per year. These unimpaired flow estimates are approximately 25 percent higher than the estimates obtained using the rational method. Supporting documentation is included in Appendix B. The fraction of runoff occurring during the diversion season was estimated using the Elder Creek discharge data, which were provided in Table 2.

5.0 WATER AVAILABILITY AT THE POINT OF DIVERSION

The available water at the points of diversion during the diversion season from November 1 to April 30, based on the rational and area-ratio flow estimates presented above, is summarized in Tables 5 and 6.

Table 5
AVAILABLE WATER AT POINTS OF DIVERSION (RATIONAL METHOD)

Parameter	POD 1 and POD 2	Source
Physical Location	Points of diversion	---
Diversion Season	Nov 1-Apr 30	Table 1
Natural Supply during Diversion Season	9,250 a-ft	Table 3 (420 a-ft + 8,830 a-ft)
Demand	2,000 a-ft annually	Proposed diversion (from Table 1) with no upstream diversions
Minimum Bypass Flow	>1 cfs	---
Available Water	7,250 a-ft annually	Natural supply during diversion season less demand and minimum bypass flow

Table 6 AVAILABLE WATER AT POINTS OF DIVERSION (AREA-RATIO METHOD)		
Parameter	**POD 1 and POD 2**	**Source**
Physical Location	Points of diversion	---
Diversion Season	Nov 1-Apr 30	Table 1
Natural Supply during Diversion Season	11,718 a-ft	Table 4 (528 a-ft + 11,190 a-ft)
Demand	2,000 a-ft annually	Proposed diversion (from Table 1) with no upstream diversions
Minimum Bypass Flow	>1 cfs	---
Available Water	9,718 a-ft annually	Natural supply during diversion season less demand and minimum bypass flow

The estimates for unimpaired flows at the proposed point of diversion on Burch Creek during the diversion season range from 7,250 acre-feet using the rational method to 9,718 acre-feet using the area-ratio method. This does not include the reserved bypass flow.

6.0 CUMULATIVE FLOW IMPAIRMENT INDEX

Pursuant to CEQA, CESA, and the federal ESA, the Division is required to evaluate cumulative impacts to natural hydrology. The cumulative flow impairment index (CFII) is an index used to evaluate the cumulative flow impairment demand of all existing and pending projects in a watershed of interest. The CFII is a percentage obtained by dividing **Demand** in acre-feet by **Supply** in acre-feet at a specified **POI** for the seasons of interest.

Demand is the "face" value entitlements of all existing and pending water rights, under all bases of right, above the point of interest in acre-feet using the Division's Water Rights Information Management System (WRIMS) database and water right files. Demand includes existing and pending water right applications for "post-1914" appropriators, Statements of Water Diversion and Use for "riparian" and "pre-1914" appropriators, small domestic use registrations, stockpond registrations, and any other known authorized diversions. For this analysis, the demand season is identified as extending from November 1 through April 30, the proposed diversion season. Demand is summarized in Table 7.

Supply is the seasonal average unimpaired flow above the point of interest in acre-feet. For this analysis, the supply season is identified as extending from November 1 through April 30, the same as the proposed diversion season.

Based on the WRIMS database as of 30 March 2010, there are no total entitlements of recorded water rights above the points of diversion. One recorded water right exists below the project location and above POI 1 and POI 2: License No. 10115 for 0.625 cfs between April 1 and October 31 and not to exceed 37 acre-feet per month or 186 acre-feet per year.

Table 7
DEMAND ABOVE POI NOs. 2, NO. 3 and NO. 4

Water Right ID No.	Source	Direct Diversion Rate (a-ft)	Direct Diversion Season	Adjusted Direct Diversion Amount Oct 1-Mar 31 (a-ft)*	Face Value Storage Amount (a-ft)	Storage Season	Adjusted Storage Amount Oct 1-Mar 31 (a-ft)*	Cumulative Adjusted Diversion Amount Oct 1-Mar 31 (a-ft)	Purpose of Use Code**
10115***	Burch Creek	186 @ 0.625 cfs	Apr 1 to Oct 31	0	0	0	0	0	I
Totals:		186		0	0	0	0	0	I

Notes:
* Place footnotes explaining adjustments here – no adjustments
**B-Mining, C-Milling, D-Domestic, E-Fire Protection, G-Dust Control, H-Fish Culture, I-Irrigation, J-Industrial, K-Incidental Power, L-Heat Protection, M-Municipal, N-Frost Protection, P-Power, R-Recreational, S-Stockwatering, T-Snow Making, W-Fish and Wildlife Protection and/or Enhancement, Z-Other.
*** Taken as 0.625 cfs not to exceed 37 acre-feet per 30 days in name of Coleman

Cumulative impacts analysis is summarized in Table 8. The CFII ranges between 6.3 percent and 4.4 percent at the upper and lower points of anadromy based on flows estimated using the rational method, and 4.8 percent and 3.4 percent at the upper and lower points of anadromy based on flows estimated using the area-ratio method.

Table 8
CUMULATIVE IMPACTS

Parameter	POD 1	POD 2	POI 3	POI 1	POI 2
Physical Location	POD at dam on No-Name Creek	POD on Burch Creek	Downstream water right	Upper point of anadromy	Burch Creek at Sac. River
Diversion Season	Nov 1-Apr 30	Nov 1-Apr 30	Apr 1-Oct 31	na	na
Supply Season	Nov 1-Apr 30	Nov 1-Apr 30	Nov 1-Apr 30	Nov 1-Apr 30	Nov 1-Apr 30
Season of Interest (SI)	Nov 1-Apr 30	Nov 1-Apr 30	Nov 1-Apr 30	Nov 1-Apr 30	Nov 1-Apr 30
Diversion during SI	Approx. 500 a-ft[2]	Approx. 1,500 a-ft[2]	37 a-ft	0 a-ft	0 a-ft
Demand during SI	Approx. 500 a-ft[2]	Approx. 1,500 a-ft[2]	2,037 a-ft	2,037 a-ft	2,037 a-ft
Natural Supply during SI (Rational Method)	420	8,830	21,500 a-ft	32,500 a-ft	46,100 a-ft
CFII (RM) [1]	476%	23%	9.5%	6.3%	4.4%
Natural Supply during SI (Area-Ratio Method)	528	11,190	25,970	42,353	60,004
CFII (ARM) [1]	379%	18%	7.8%	4.8%	3.4%

Notes:
[1] CFII = Demand during season of interest/unimpaired or natural supply during season of interest * 100.
[2] Maximum diversion from both POD 1 and POD 2 = 2,000 a-ft.

7.0 BYPASS FLOW

The State Water Board requested BH Farming to follow the *Policy for Maintenance of In-Stream Flows in Northern California Streams,* which recommends a bypass flow equal to or greater than the median February flow on Class II coastal streams above the upper limit of anadromy. It was later determined that the Policy does not apply to Burch Creek because it is a seasonal inland stream, it is a Class II stream, and the proposed diversion is located approximately 11 miles above the upper limit of anadromy. Because of the Policy's emphasis on median flow, the following analysis addresses median flow variables relative to a bypass calculation.

Prior to evaluating median flows in Burch Creek, it is important to note that Burch Creek is a seasonal stream that flows primarily during the rainy season. Stream flow commences in the late fall in response to the first major precipitation event and generally continues into May. Unlike Elder Creek to the north, snowmelt following the end of the rainy season is not a significant source of runoff. The channel is usually dry between June and November, and it is not unusual for a portion of the channel to go dry between December and May, depending on rainfall.

To illustrate the monthly flow variability in Burch Creek, monthly median flows during the proposed diversion season are shown on Figure 6. These data are based on estimated daily flows for Burch Creek derived using the area-ratio method and daily Elder Creek flow data collected between 1948 and 2009. As shown, annual February median flows range between less than 1 cfs and 175 cfs (see Figure 7), with a median of approximately 20 cfs; and annual November median flows range between 0.1 cfs and 6.4 cfs, with a median of approximately 0.6

cfs. For comparison, February median flows ranged between 9 cfs during the 10-year period between 1985 and 1994, and 33 cfs during the 10-year period between 1991 and 2000.

To address the annual, monthly, and daily flow variability observed in Burch Creek, the proposed bypass should consider both low- and high-flow conditions. As mentioned, low- and no-flow conditions are common during the first portion of the proposed diversion season. High-flow conditions, often increasing by several orders of magnitude over a 24-hour period, are common during the second portion of the proposed diversion season. It is important to maintain both of these conditions when establishing bypass flows.

Because of the flashy nature of Burch Creek flows, BH Farming proposes to divert only during the peak flow season from November to April, capturing a small percentage of the peaking storm events. BH Farming proposes a passive bypass flow of 1 cfs. The reduction of the flow diversion from 60 cfs to 40 cfs will result in increased bypass at peak flows. To maintain the low- and high-flow conditions characteristic of Burch Creek, the applicant proposes to establish a minimum bypass flow and an upper diversion limit that achieves an average daily bypass of at least 10 cfs during the proposed diversion season and normal rainfall year. As shown in Table 9, a minimum bypass of 1 cfs and an upper diversion limit of 40 cfs achieve this goal. To monitor compliance with this condition, the proposed diversion structure will be designed with a maximum capacity of 40 cfs and, whenever water is being diverted, 1 cfs will be bypassed through passive design in the diversion structure.

Burch Creek flows, diversion, and bypass results (assuming a minimum bypass of 1 cfs and an upper diversion limit of 40 cfs), based on estimated daily flows for Burch Creek derived using the area-ratio method and daily Elder Creek flow data for three average years (1970, 1981, and 1992), one wet year (1995), and one dry year (2007) are summarized in Table 9. As shown, the average daily bypass during the proposed diversion season in years of average precipitation varies between 10 cfs (1981) and 24 cfs (1970). In contrast, the average daily bypass during the proposed diversion season in the dry and wet years varies between 2 cfs (2007) and 52 cfs (1995).

Average monthly bypass flows at the point of diversion are included in Table 9. In a normal year, 75 percent of the total flow will be bypassed. In most years, the reservoir will be filled in early February. The 2,000 acre-feet proposed in the appropriation is approximately equal to 60 days of inlet cubic feet per second, so the reservoir will be filled in 60 days, allowing the full, unimpaired flow to bypass the remainder of the year. In the average year, the reservoir will be filled by mid-February.

The minimum bypass flows will be provided either through the use of a passive flow system, such as a sized bypass pipe remaining in the channel, or will be bypassed out if a pump intake system. The actual diversion structure has not yet been designed; however, it is assumed the structure will divert the Burch Creek flow into a cistern for pumping. The diversion structure will allow for the passage of all peak flows over 40 cfs and a base bypass of 1 cfs.

As outlined in Table 9, the 2,000 acre-feet diversion from Burch Creek at the point of diversion accounts for less than an average of 4 percent of the water in Burch Creek at the upper limit of anadromy. This percentage varies annually with the intensity of precipitation and storm events.

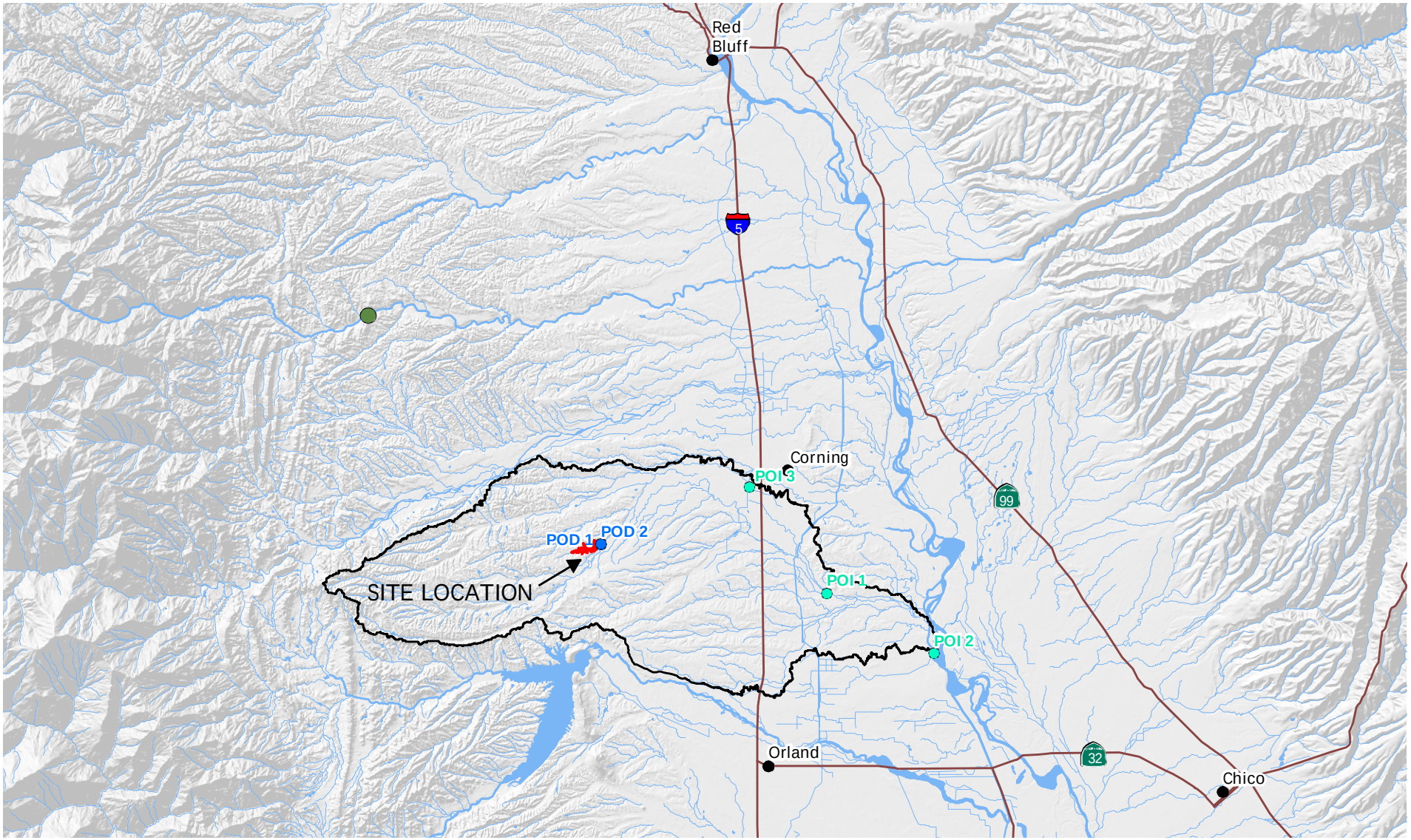
Table 9
BURCH CREEK MONTHLY FLOW SUMMARY

Parameter	Units	Nov	Dec	Jan	Feb	Mar	Apr	Avg	% POD	% POA
1970 (average year, annual precipitation = 22.13 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	0.62	6.5	8.4	1.53	2.32	0.07	3.2		
Unimpaired Burch Creek Flow	monthly avg (cfs) [1]	1	28	142	33	31	8	41		
Proposed BH Diversion	monthly avg (cfs) [2]	0	15	27[4]	26	23	6	16		
Total Estimated Bypass	monthly avg (cfs) [3]	1	13	115	7	8	2	**24**	**14**	**2.6**
1981 (average year, annual precipitation = 20.86 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	0.42	2.62	5.48	1.87	4.87	1.71	2.8		
Unimpaired Burch Creek Flow	monthly avg (cfs) [1]	1	12	48	28	26	13	21		
Proposed BH Diversion	monthly avg (cfs) [2]	0	5	12	19[4]	19	11	11		
Total Estimated Bypass	monthly avg (cfs) [3]	1	7	36	9	7	2	**10**	**27**	**5.0**
1992 (average year, annual precipitation = 21.35 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	0.7	3.9	2.8	7.8	3.4	1.2	3.3		
Unimpaired Burch Creek Flow	monthly avg (cfs) [1]	1	3	6	55	53	23	24		
Proposed BH Diversion	monthly avg (cfs) [2]	0	2	5	23[4]	29	20	13		
Total Estimated Bypass	monthly avg (cfs) [3]	1	1	2	32	24	3	**11**	**23**	**4.3**
1995 (wet year, annual precipitation = 45.90 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	5.0	4.2	21.5	1	10.2	2.1	7.3		
Unimpaired Burch Creek Flow	monthly avg (cfs) [1]	1	3	193	58	142	40	73		
Proposed BH Diversion	monthly avg (cfs) [2]	0	2	32[4]	29	33	29	21		
Total Estimated Bypass	monthly avg (cfs) [3]	1	1	160	29	109	11	**52**	**8**	**1.5**
2007 (dry year, annual precipitation = 13.95 inches)										
Parameter	**Units**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Avg**		
Red Bluff Precipitation	monthly (inches)	0.4	2.8	7	2.1	0.1	0.1	2.1		
Unimpaired Burch Creek Flow	monthly avg (cfs) [1]	2	7	3	20	11	4	8		
Proposed BH Diversion	monthly avg (cfs) [2]	1	5	2	13	9	3[4]	6		
Total Estimated Bypass	monthly avg (cfs) [3]	1	2	1	7	2	1	**2**	**70**	**13**

Notes:
[1] Monthly unimpaired flow volume in Burch Creek expressed in cubic feet divided by seconds per month
[2] Proposed monthly diversion volume from Burch Creek expressed in cubic feet divided by seconds per month
[3] Monthly bypass volume around proposed diversion expressed in cubic feet divided by seconds per month
[4] The total volume diverted will not exceed 2,000 a-ft in this month and no additional water will be diverted

Assumptions:
Daily Burch Creek flows estimated using area-ratio method and Elder Creek watershed as baseline
40 cfs maximum diversion capacity
System will be designed to bypass a minimum of 1 cfs when water is being diverted from Burch Creek

Figures



USGS Gage 11379500
Point of Interest
Proposed Point of Diversion
Highway
Stream or River
Burch Creek Watershed
Proposed Reservoir Location
Lake, Pond, or Reservoir

N

0 2 4 8 Miles

VESTRA

FIGURE 1
PROJECT LOCATION
AND OTHER FEATURES
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

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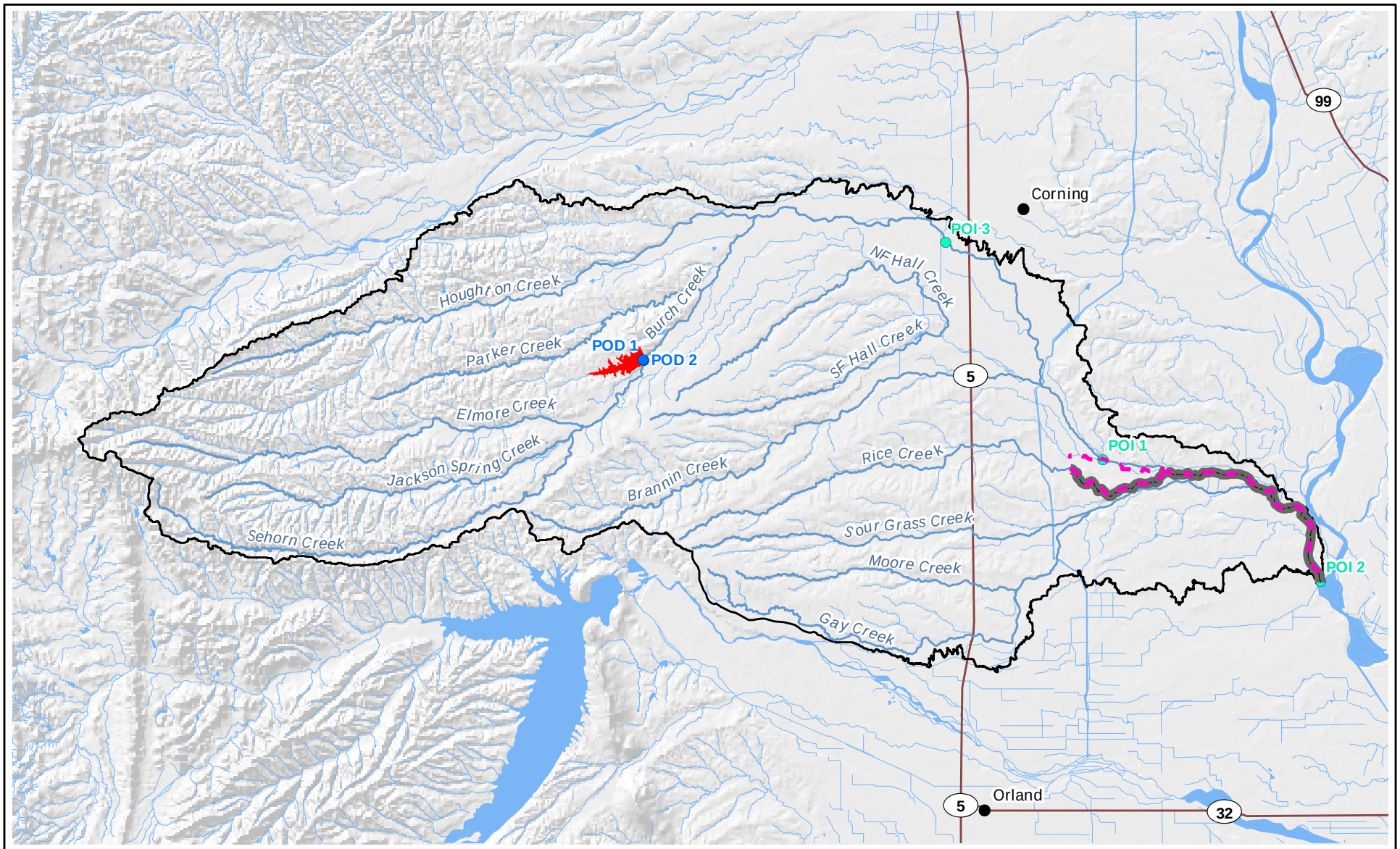

Point of Interest
Point of Diversion
Central Valley Spring Run Chinook Critical Habitat
California Central Valley Steelhead Critical Habitat
Burch Creek Watershed
Proposed Reservoir Location

VESTRA

0 1.25 2.5 5 Miles

FIGURE 2
BURCH CREEK WATERSHED HYDROLOGY
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

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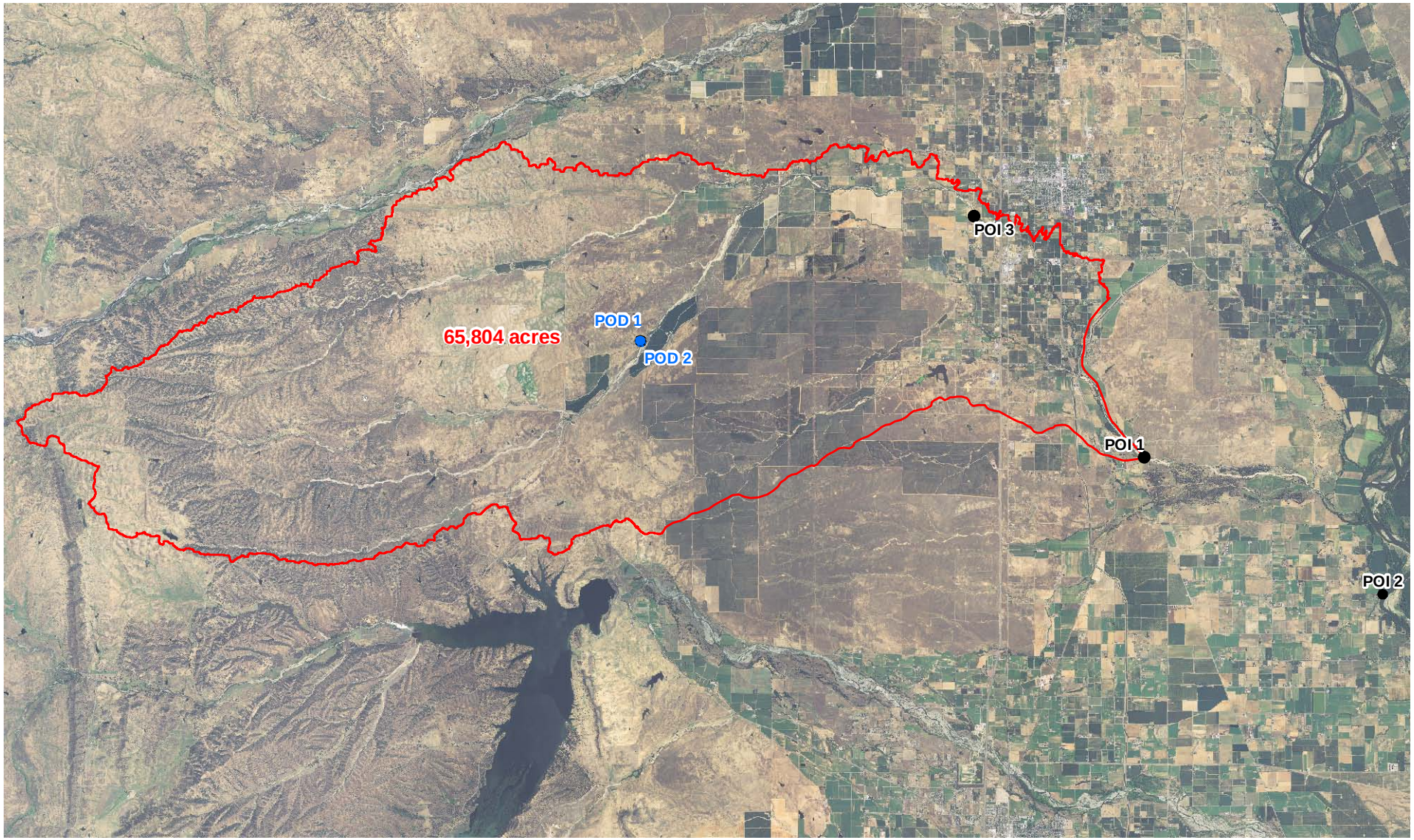

Point of Interest

Point of Diversion

Watershed for Point of Interest 1

N

0 1.5 3 6 Miles

VESTRA

SOURCE: NAIP 2005

FIGURE 3
DELINEATION OF WATERSHED AREAS AND ACREAGES POI 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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Point of Interest

Point of Diversion

Watershed for Point of Interest 2

N

0 1.5 3 6 Miles

VESTRA

SOURCE: NAIP 2005

FIGURE 4
DELINEATION OF WATERSHED AREAS AND ACREAGES POI 2
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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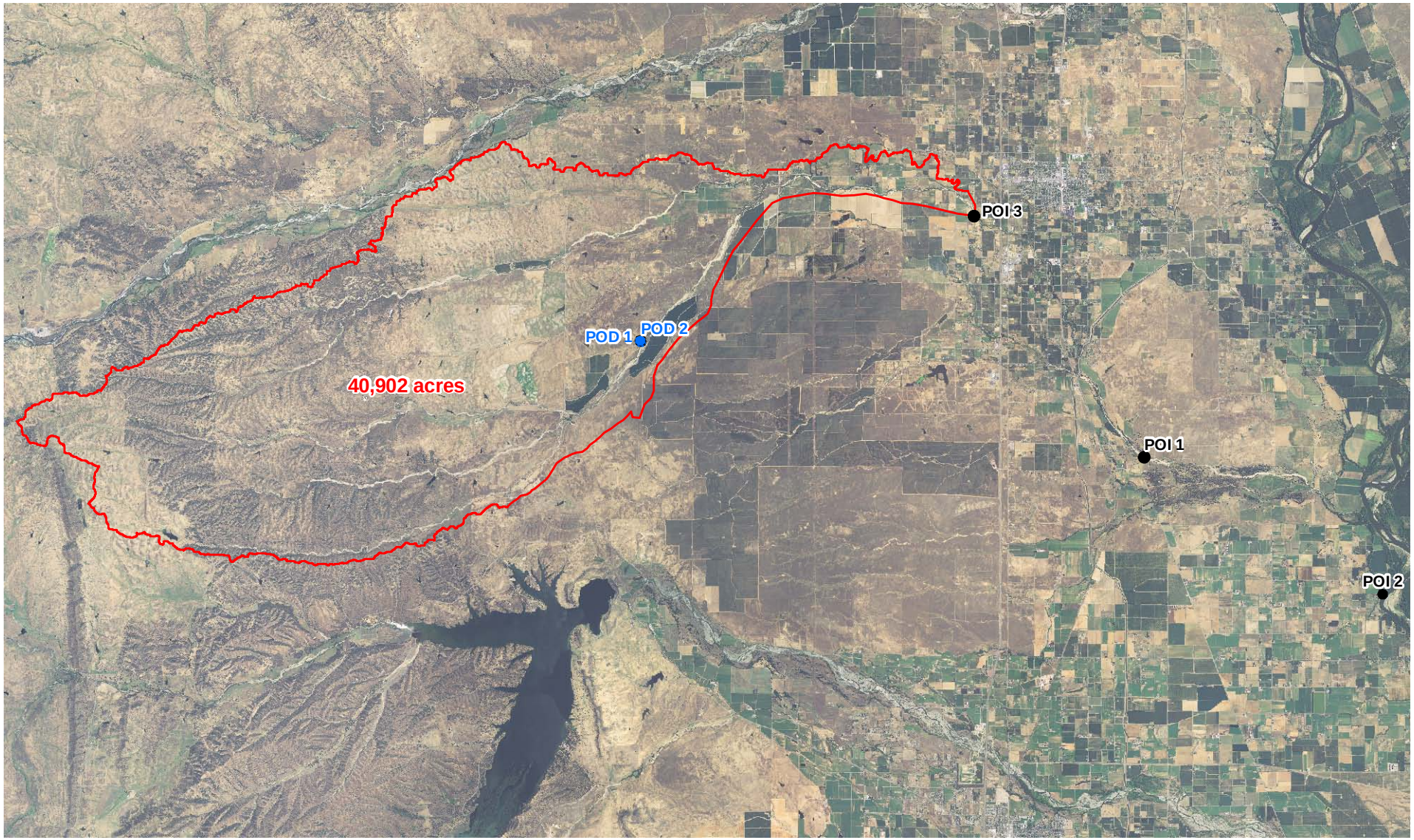

Point of Interest

Point of Diversion

Watershed for Point of Interest 3

N

0 1.5 3 6 Miles

VESTRA

SOURCE: NAIP 2005

FIGURE 5
DELINEATION OF WATERSHED AREAS AND ACREAGES POI 3
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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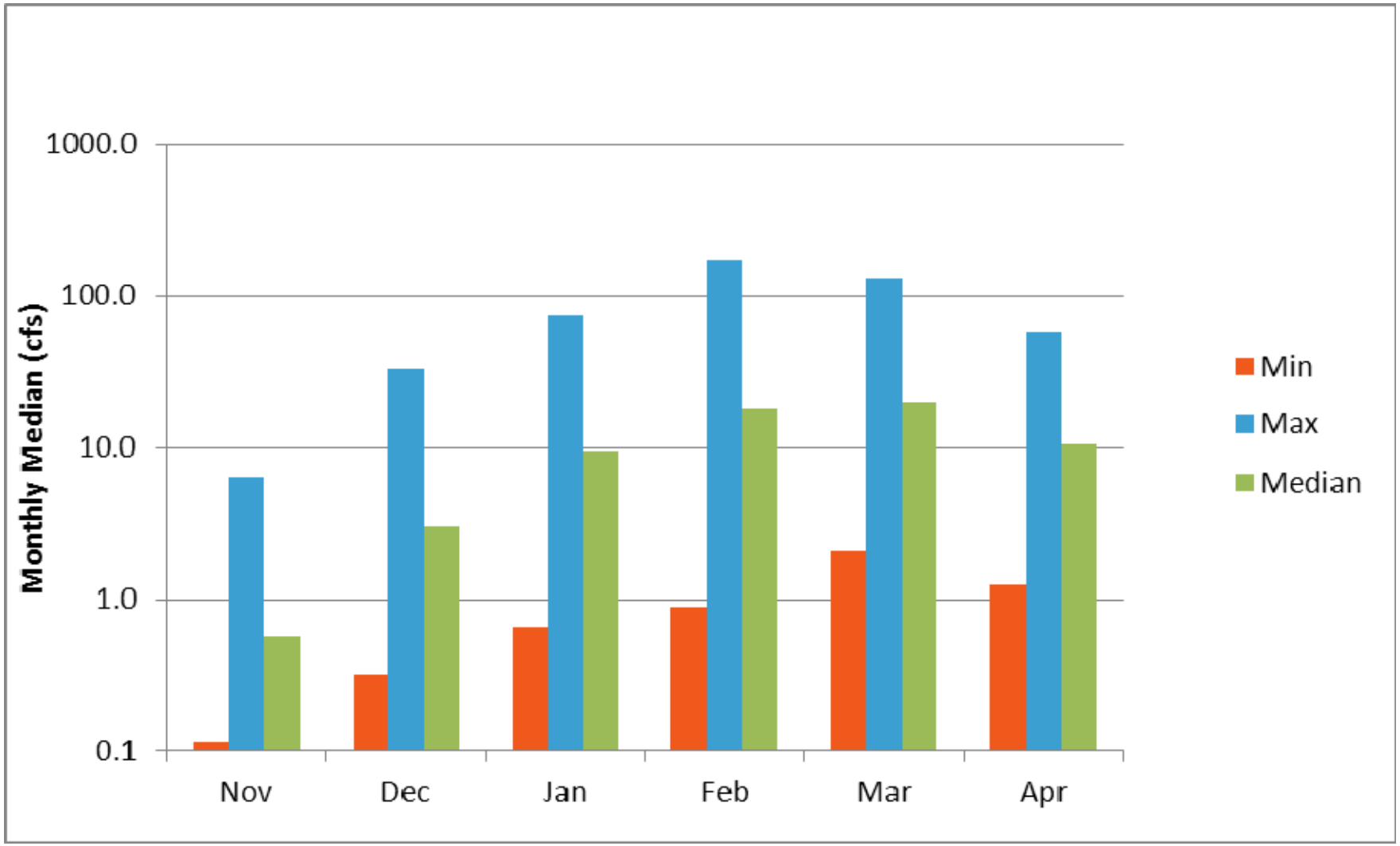
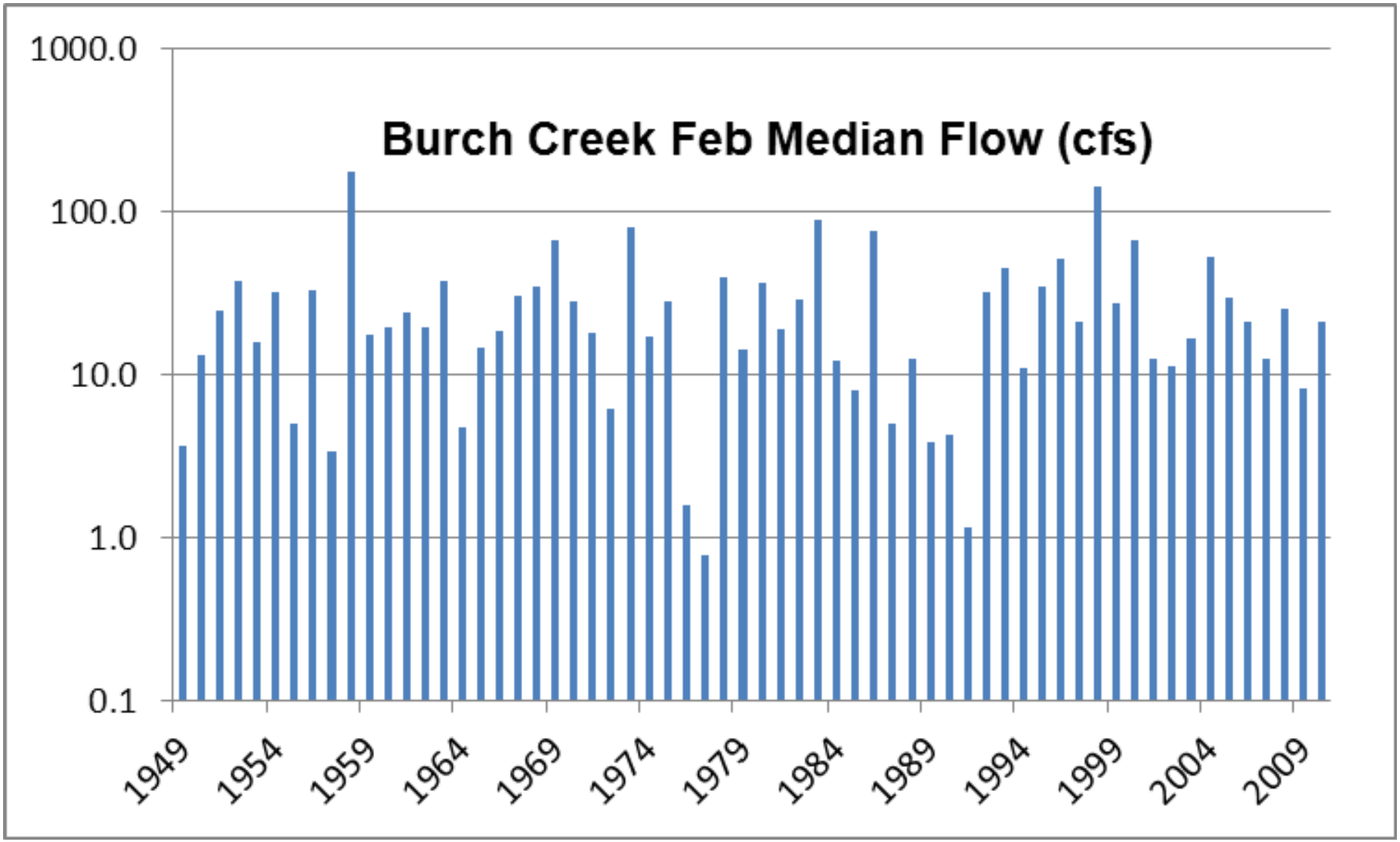


VESTRA

SOURCE: DWR 2010

FIGURE 6
MONTHLY MEDIAN FLOW DURING DIVERSION SEASON
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA



VESTRA

SOURCE: DWR 2010

FIGURE 7
FEBRUARY MEDIAN FLOW
NO NAME CREEK DAM PROJECT
TEHAMA COUNTY, CALIFORNIA

Appendix A

License No. 10115: License for Diversion and Use of Water

STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

License for Diversion and Use of Water

APPLICATION 22272 PERMIT 15491 LICENSE 10115

THIS IS TO CERTIFY, *That* LEROY V. COLEMAN AND WILMA L. COLEMAN
ROUTE 1, BOX 195, CORNING, CALIFORNIA 96021

HAVE *made proof as of* JUNE 16, 1972 *(the date of inspection) to the satisfaction of the State Water Resources Control Board of a right to the use of the water of* BURCH CREEK IN TEHAMA COUNTY

tributary to RICE CREEK THENCE SACRAMENTO RIVER

for the purpose of IRRIGATION USE
under Permit 15491 *of the Board and that the right to the use of this water has been perfected in accordance with the laws of California, the Regulations of the Board and the permit terms; that the priority of this right dates from* AUGUST 24, 1965 *and that the amount of water to which this right is entitled and hereby confirmed is limited to the amount actually beneficially used for the stated purposes and shall not exceed* SIX HUNDRED TWENTY-FIVE THOUSANDTHS (0.625) CUBIC FOOT PER SECOND, TO BE DIVERTED FROM APRIL 1 TO OCTOBER 31 OF EACH YEAR. SO LONG AS THERE IS NO INTERFERENCE WITH OTHER RIGHTS, JUNIOR, AS WELL AS SENIOR, LICENSEE MAY INCREASE HIS RATE OF DIVERSION TO A MAXIMUM OF 1.83 CUBIC FEET PER SECOND; PROVIDED THAT THE TOTAL QUANTITY DIVERTED IN ANY 30-DAY PERIOD DOES NOT EXCEED 37 ACRE-FEET. THE MAXIMUM AMOUNT DIVERTED UNDER THIS LICENSE SHALL NOT EXCEED 186 ACRE-FEET PER YEAR.

THE POINTS OF DIVERSION OF SUCH WATER ARE LOCATED:

(1) NORTH 3,100 FEET AND EAST 600 FEET FROM SW CORNER OF SECTION 21, T24N, R3W, MDB&M, BEING WITHIN SW1/4 OF NW1/4 OF SAID SECTION 21 AND
(2) NORTH 1,900 FEET AND EAST 1,900 FEET FROM SW CORNER OF SECTION 21, T24N, R3W, MDB&M, BEING WITHIN NE1/4 OF SW1/4 OF SAID SECTION 21.

A DESCRIPTION OF LANDS OR THE PLACE WHERE
SUCH WATER IS PUT TO BENEFICIAL USE IS AS FOLLOWS:

10 ACRES WITHIN SW1/4 OF NW1/4 OF SECTION 21, T24N, R3W, MDB&M
10 ACRES WITHIN NW1/4 OF SW1/4 OF SECTION 21, T24N, R3W, MDB&M
30 ACRES WITHIN NE1/4 OF SW1/4 OF SECTION 21, T24N, R3W, MDB&M

50 ACRES TOTAL

UPON A JUDICIAL DETERMINATION THAT THE PLACE OF USE UNDER THIS LICENSE OR A PORTION THEREOF IS ENTITLED TO THE USE OF WATER BY RIPARIAN RIGHT, THE RIGHT SO DETERMINED AND THE RIGHT ACQUIRED UNDER THIS LICENSE SHALL NOT RESULT IN A COMBINED RIGHT TO THE USE OF WATER IN EXCESS OF THAT WHICH COULD BE CLAIMED UNDER THE LARGER OF THE TWO RIGHTS.

12/15/98 Asgd. to Robert A. Singletary & Janet M. Singletary

Licensee shall allow representatives of the Board and other parties, as may be authorized from time to time by the Board, reasonable access to project works to determine compliance with the terms of this license.

All rights and privileges under this license, including method of diversion, method of use and quantity of water diverted are subject to the continuing authority of the Board in accordance with law and in the interest of the public welfare to prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of said water.

~~*This continuing authority of the Board may be exercised by imposing specific requirements over and above those contained in this license with a view to minimizing waste of water and to meeting the reasonable water requirements of licensee without unreasonable draft on the source. Licensee may be required to implement such programs as (1) routing or regulating the water allocated, (2) restricting diversions so as to eliminate agricultural tailwater or to reduce return flow, (3) suppressing evaporation losses from water surfaces, (4) controlling phreatophytic growth and (5) installing, maintaining, and operating efficient water measuring devices to assure compliance with the quantity limitations of this license and to determine accurately water use as against reasonable water requirements for the authorized project. No action will be taken pursuant to this paragraph unless the Board determines, after notice to affected parties and opportunity for hearing, that such specific requirements are physically and financially feasible and are appropriate to the particular situation.~~

Reports shall be filed promptly by licensee on appropriate forms which will be provided for the purpose from time to time by the Board.

The right hereby confirmed to the diversion and use of water is restricted to the point or points of diversion herein specified and to the lands or place of use herein described.

This license is granted and licensee accepts all rights herein confirmed subject to the following provisions of the Water Code:

Section 1625. Each license shall be in such form and contain such terms as may be prescribed by the Board.

Section 1626. All licenses shall be under the terms and conditions of this division (of the Water Code).

Section 1627. A license shall be effective for such time as the water actually appropriated under it is used for a useful and beneficial purpose in conformity with this division (of the Water Code) but no longer.

Section 1628. Every license shall include the enumeration of conditions therein which in substance shall include all of the provisions of this article and the statement that any appropriator of water to whom a license is issued takes the license subject to the conditions therein expressed.

Section 1629. Every licensee, if he accepts a license does so under the conditions precedent that no value whatsoever in excess of the actual amount paid to the State therefor shall at any time be assigned to or claimed for any license granted or issued under the provisions of this division (of the Water Code), or for any rights granted or acquired under the provisions of this division (of the Water Code), in respect to the regulation by any competent public authority of the services or the price of the services to be rendered by any licensee or by the holder of any rights granted or acquired under the provisions of this division (of the Water Code) or in respect to any valuation for purposes of sale to or purchase, whether through condemnation proceedings or otherwise, by the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State, of the rights and property of any licensee, or the possessor of any rights granted, issued, or acquired under the provisions of this division (of the Water Code).

Section 1630. At any time after the expiration of twenty years after the granting of a license, the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State shall have the right to purchase the works and property occupied and used under the license and the works built or constructed for the enjoyment of the rights granted under the license.

Section 1631. In the event that the State, or any city, city and county, municipal water district, irrigation district, lighting district, or political subdivision of the State so desiring to purchase and the owner of the works and property cannot agree upon the purchase price, the price shall be determined in such manner as is now or may hereafter be provided by law for determining the value of property taken in eminent domain proceedings.

Dated: MAY 15 1973

STATE WATER RESOURCES CONTROL BOARD

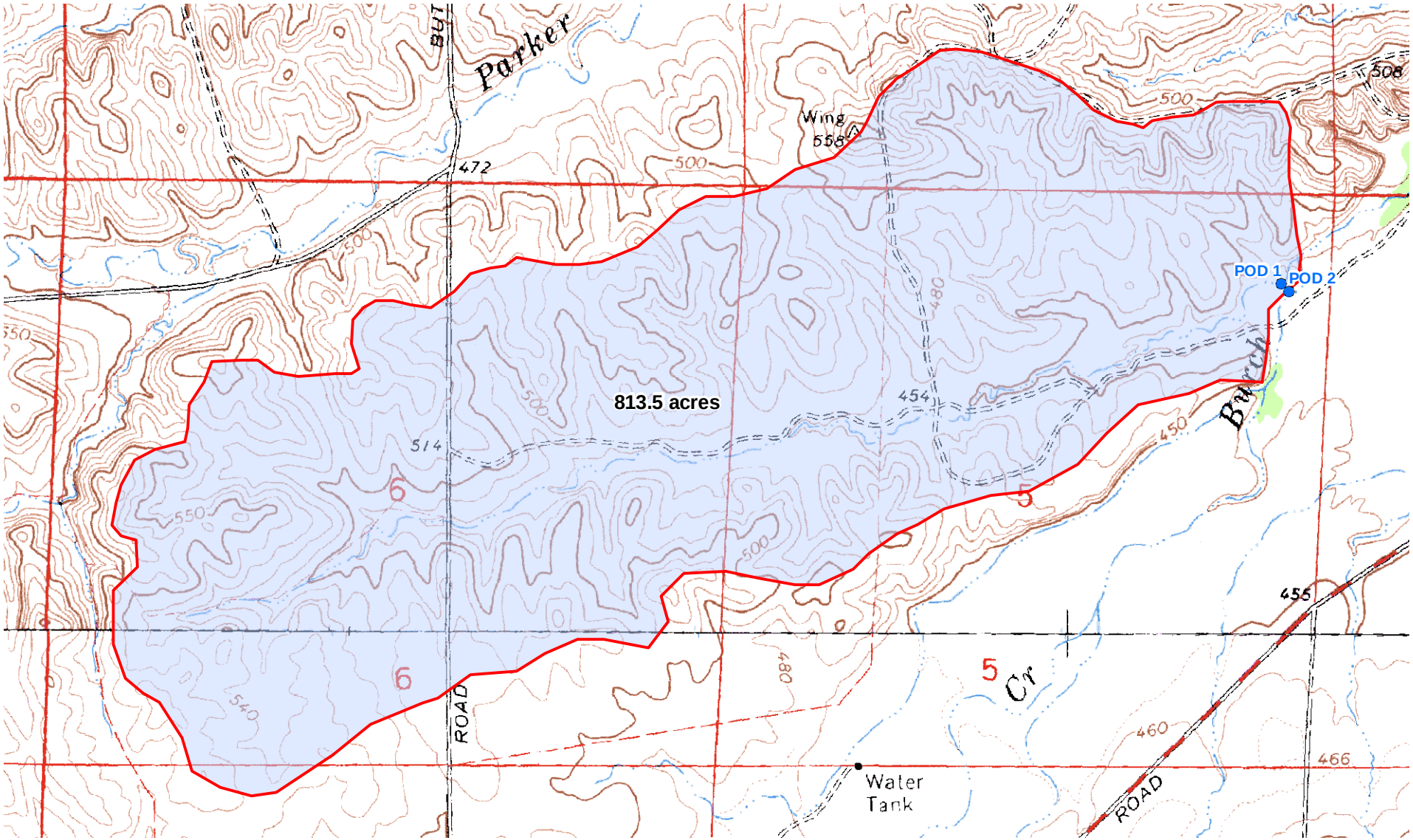
K. L. Woodward

Chief, Division of Water Rights

2

Appendix B

Base Data for Calculations



VESTRA

SOURCE: NAIP 2005

ISOHYETALS
POINT OF DIVERSION 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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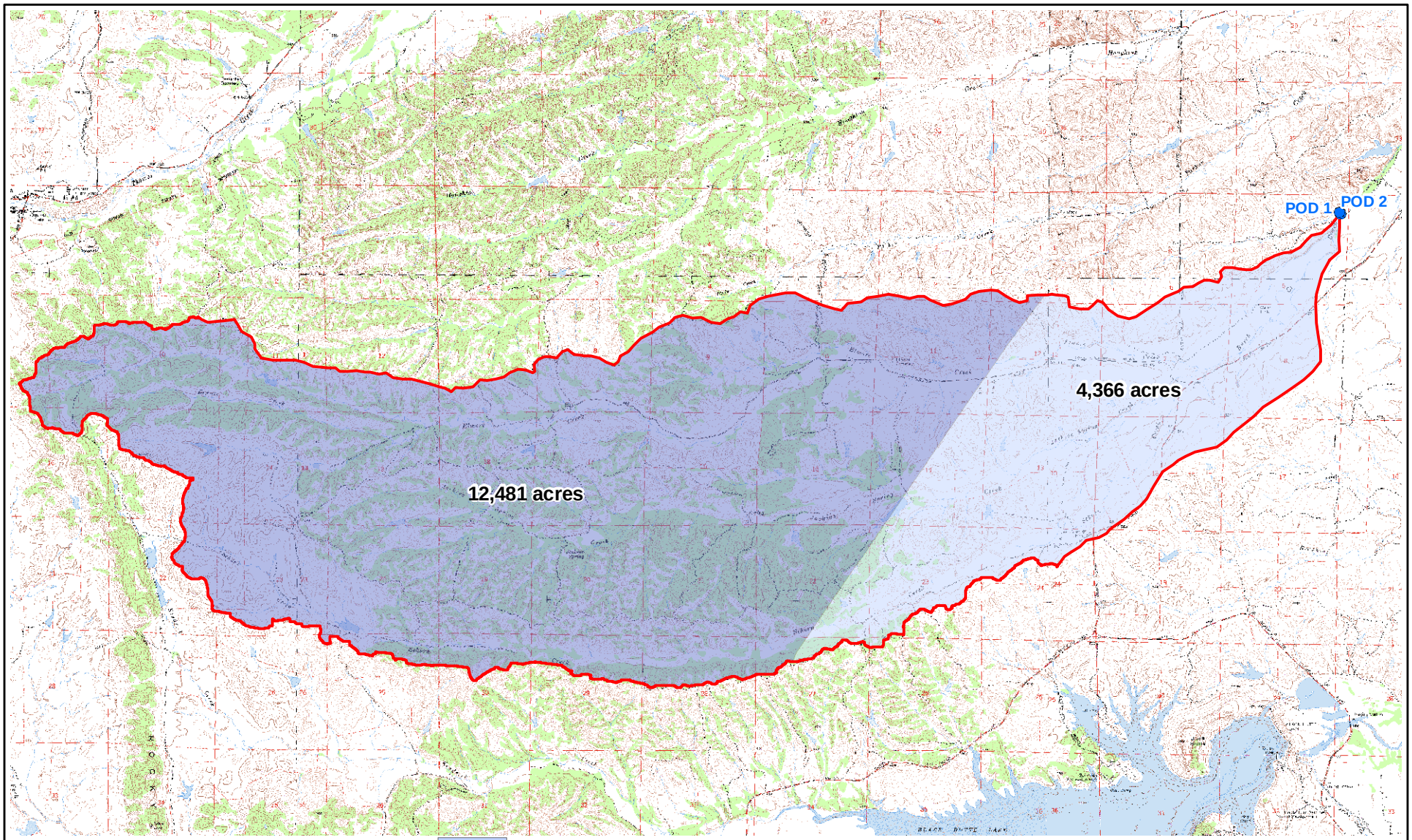

Point of Diversion

Point of Interest

Watershed for Point of Diversion 2

<18 inches per year

18 - 22.5 inches per year

N

Feet

0 4,300 8,600 17,200

VESTRA

SOURCE: NAIP 2005

ISOHYETALS
POINT OF DIVERSION 2
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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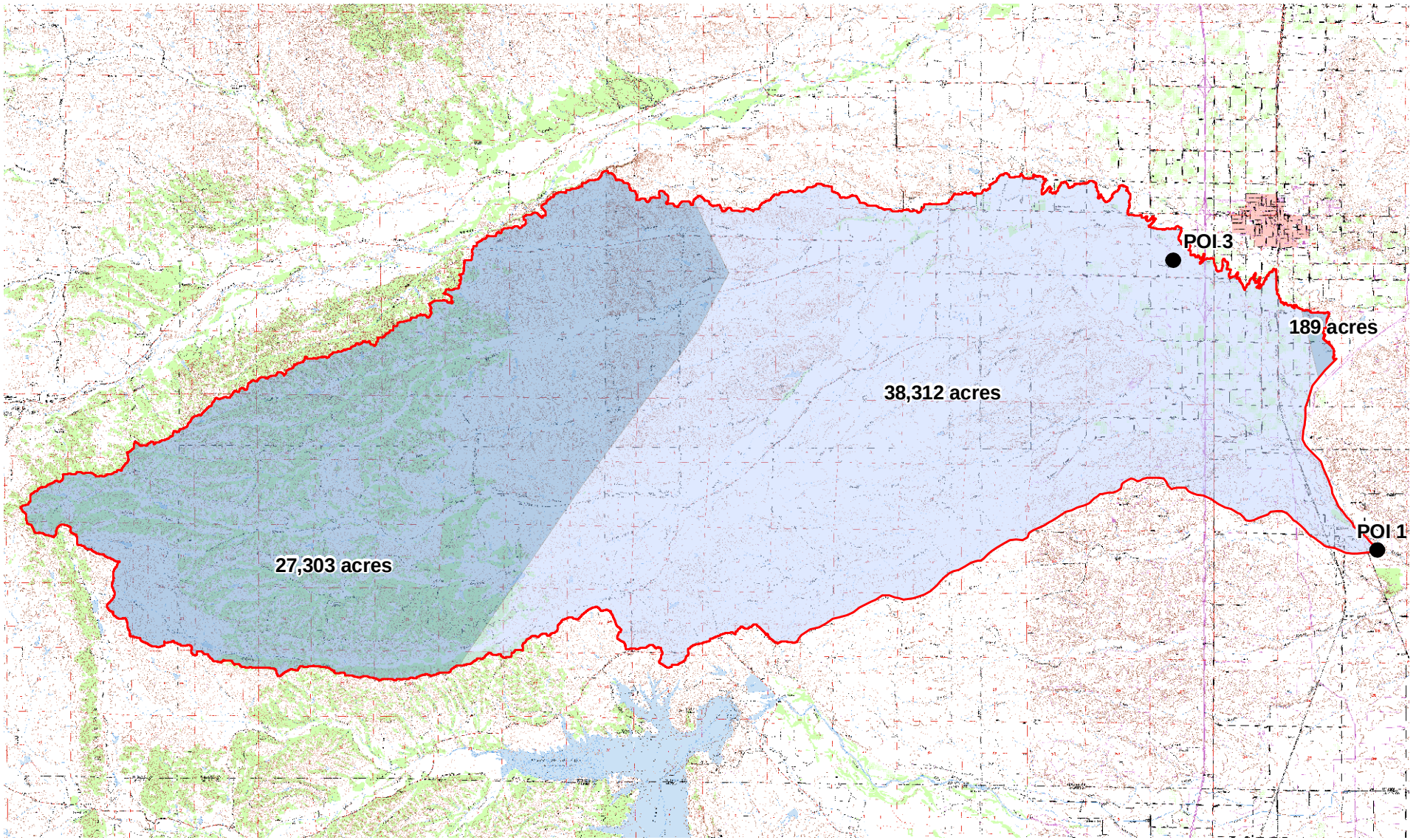

Point of Interest

Watershed for Point of Interest 1

<18 inches per year

18 - 22.5 inches per year

N

0 8,000 16,000 32,000 Feet

VESTRA

SOURCE: NAIP 2005

ISOHYETALS
POINT OF INTEREST 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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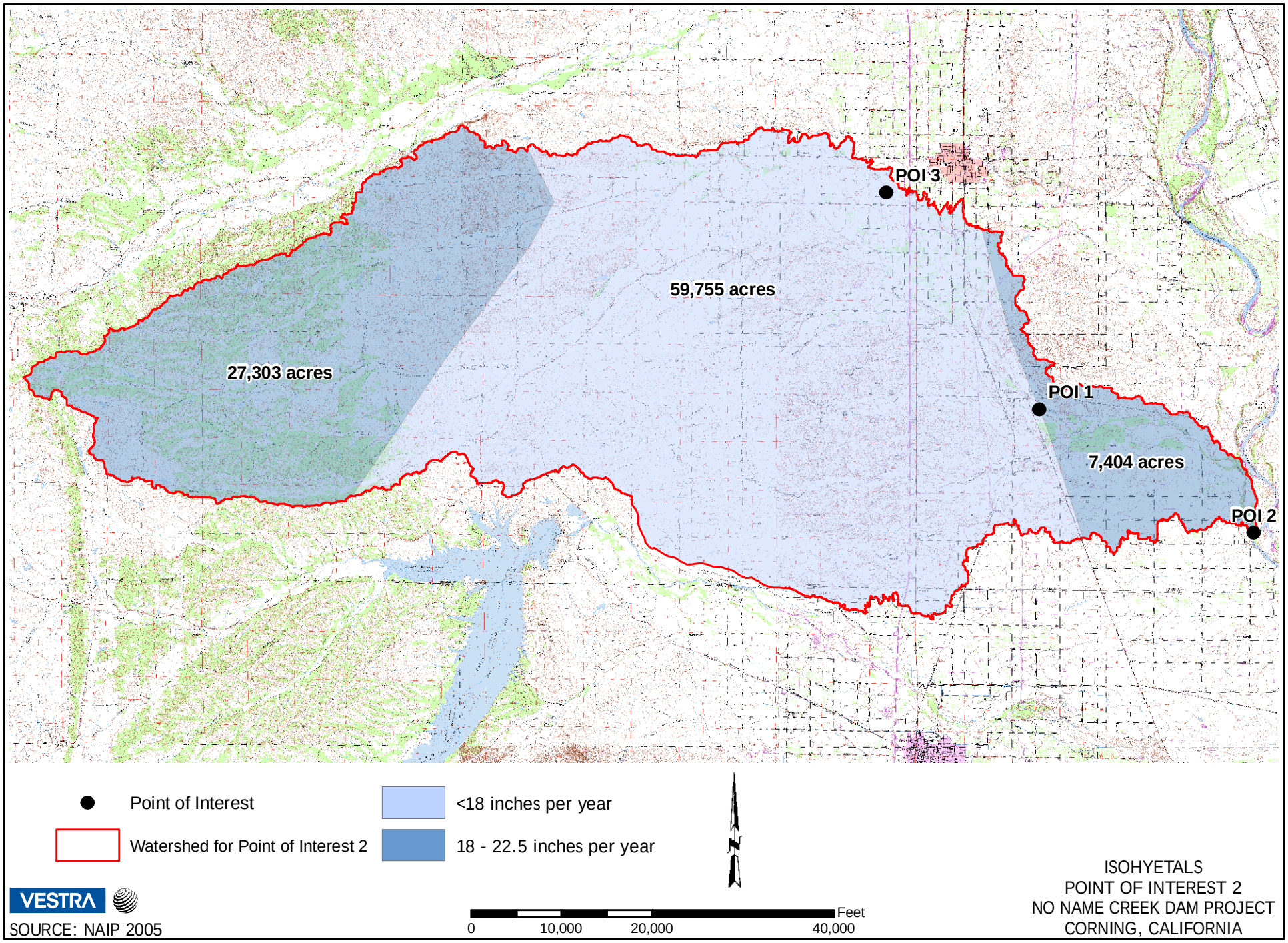

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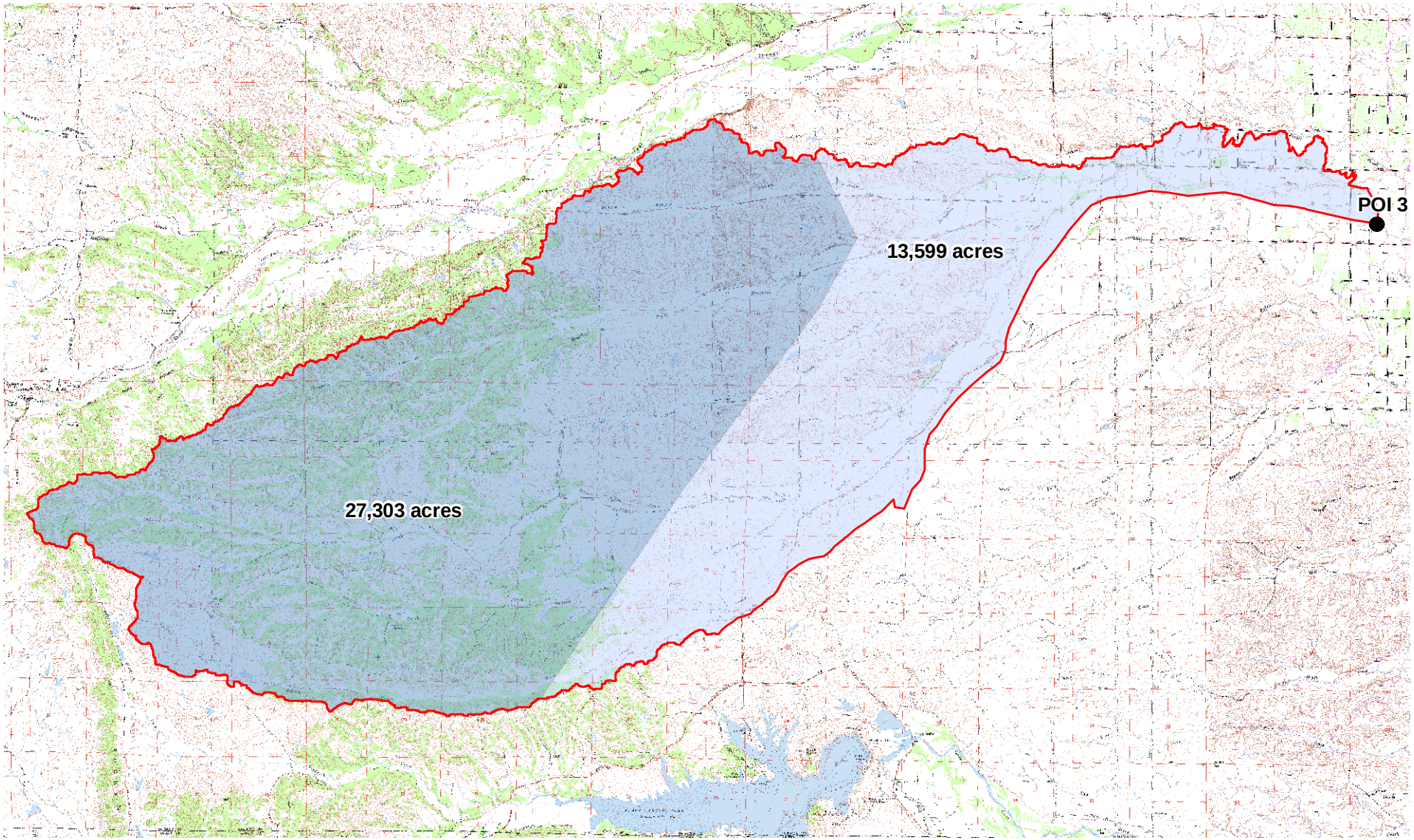

Point of Interest

Watershed for Point of Interest 3

<18 inches per year

18 - 22.5 inches per year

N

0 7,000 14,000 28,000 Feet

VESTRA

SOURCE: NAIP 2005

ISOHYETALS
POINT OF INTEREST 3
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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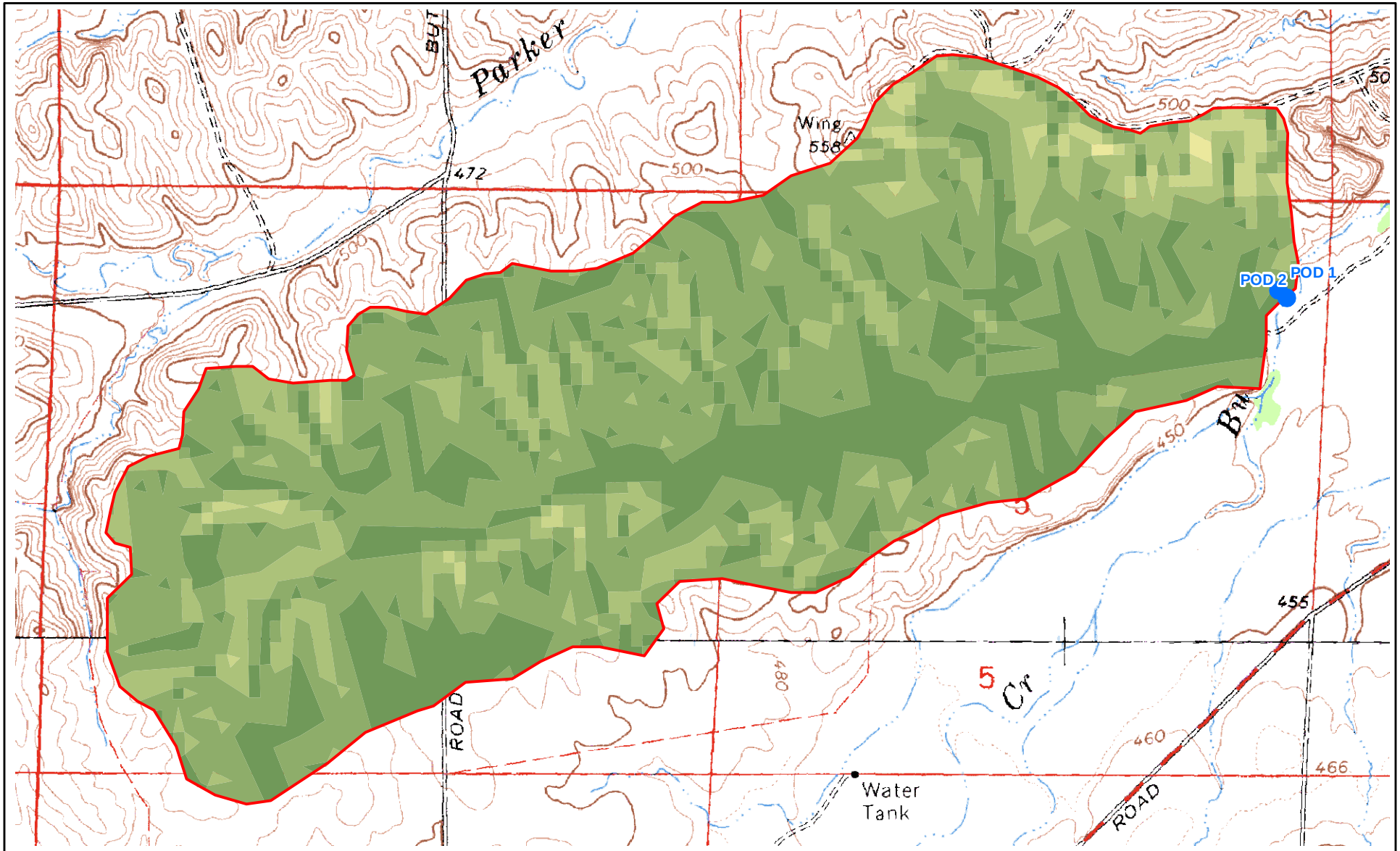

VESTRA

SOURCE: USGS 7.5' TOPOGRAPHIC MAP

SLOPE
POINT OF DIVERSION 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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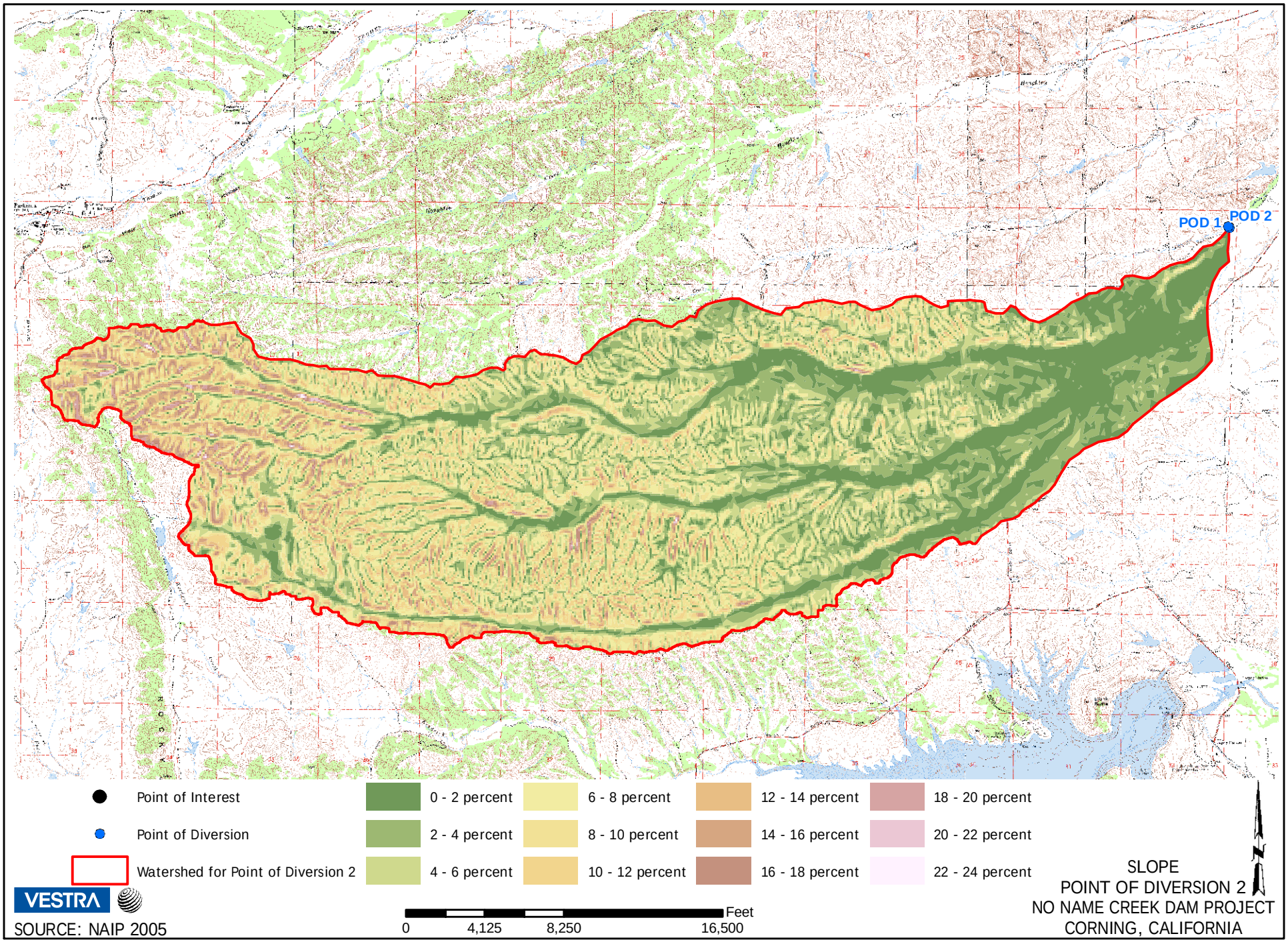

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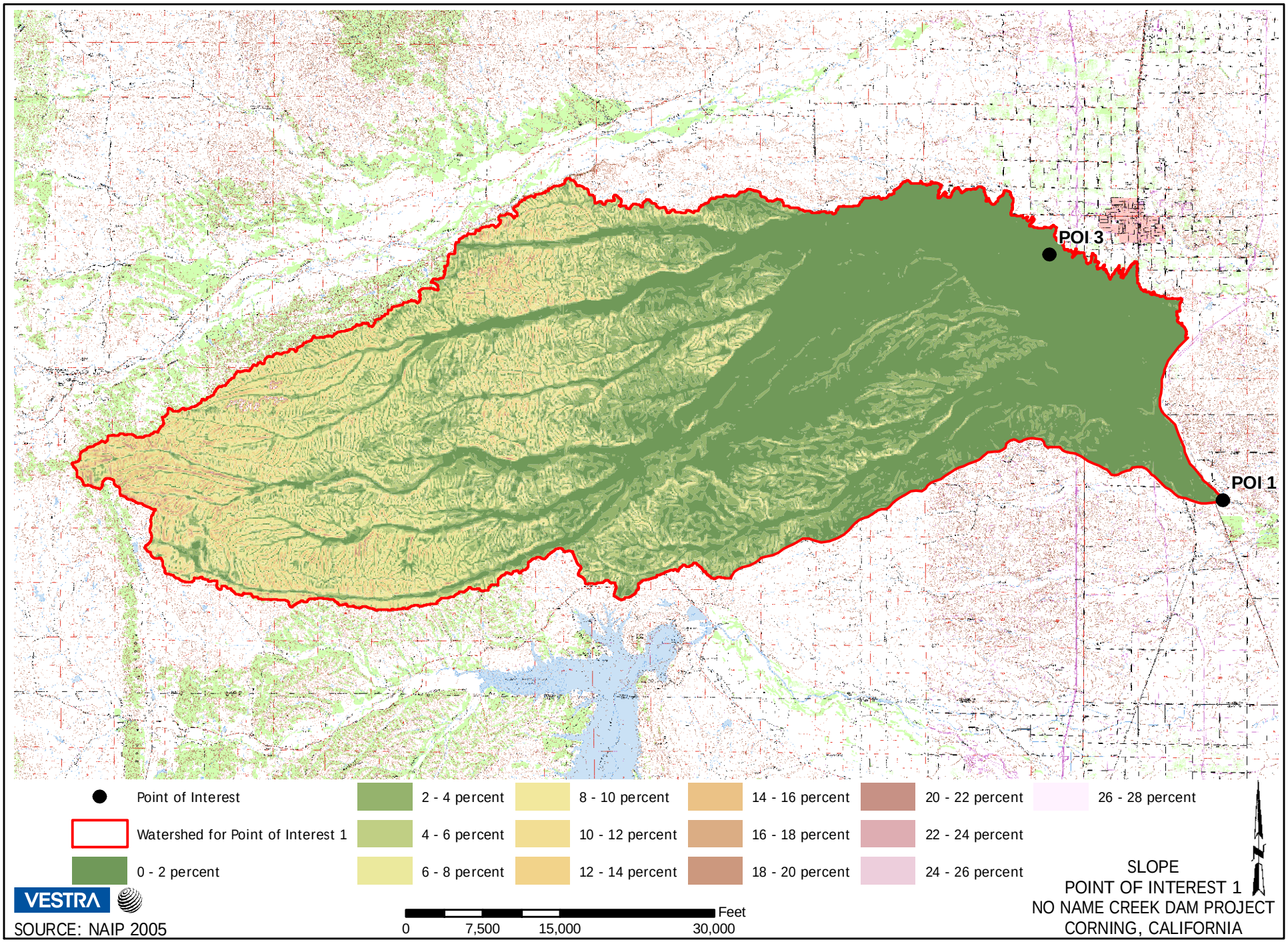

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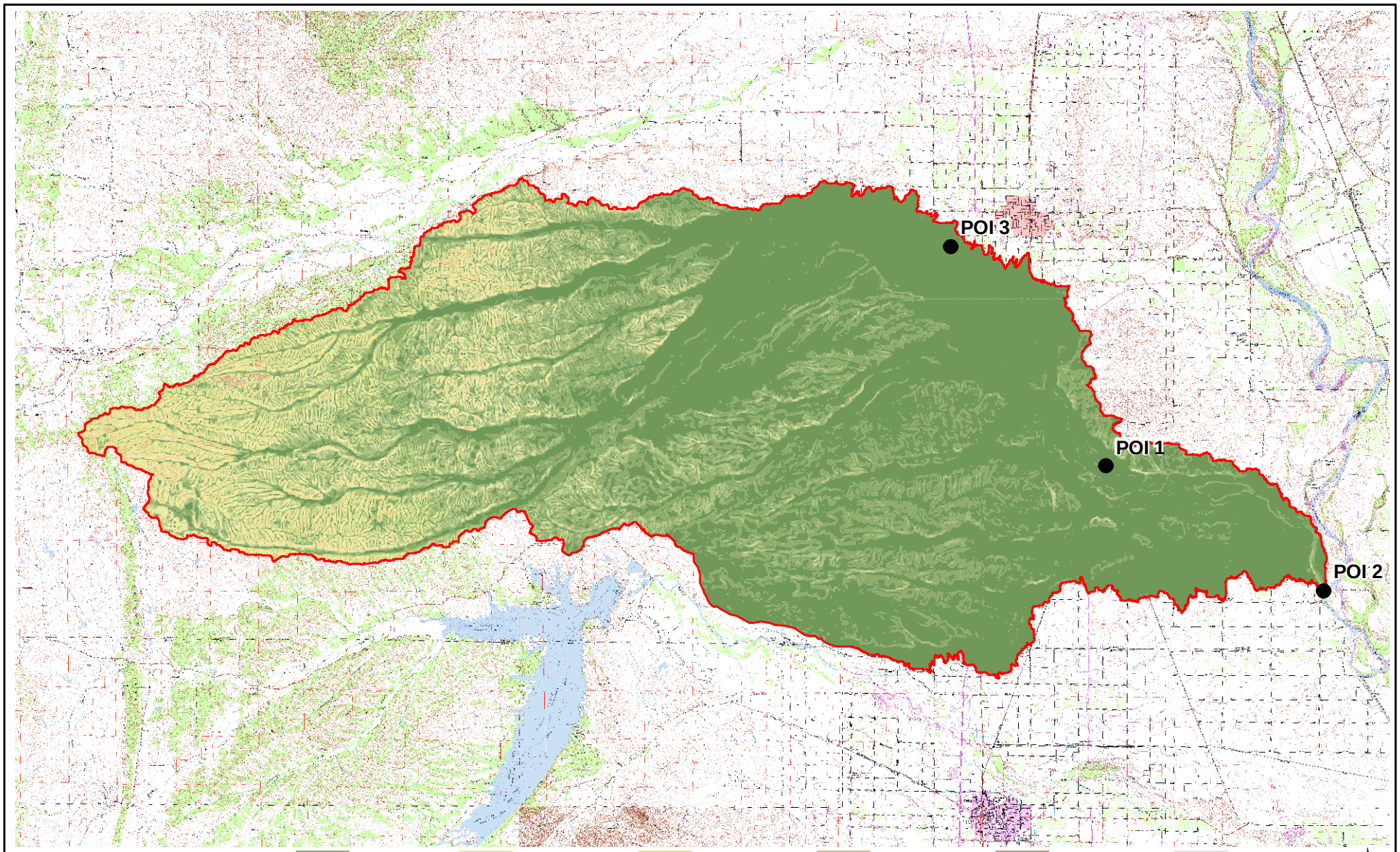

Point of Interest
Watershed for Point of Interest 2
0 to 2 percent
2 to 4 percent
4 to 6 percent
6 to 8 percent
8 to 10 percent
10 to 12 percent
12 to 14 percent
14 to 16 percent
16 to 18 percent
18 to 20 percent
20 to 22 percent
22 to 24 percent
24 to 26 percent
26 to 28 percent
28 to 30 percent
30 to 32 percent
32 to 34 percent
34 to 36 percent

VESTRA

SOURCE: NAIP 2005

0 9,500 19,000 38,000 Feet

SLOPE
POINT OF INTEREST 2
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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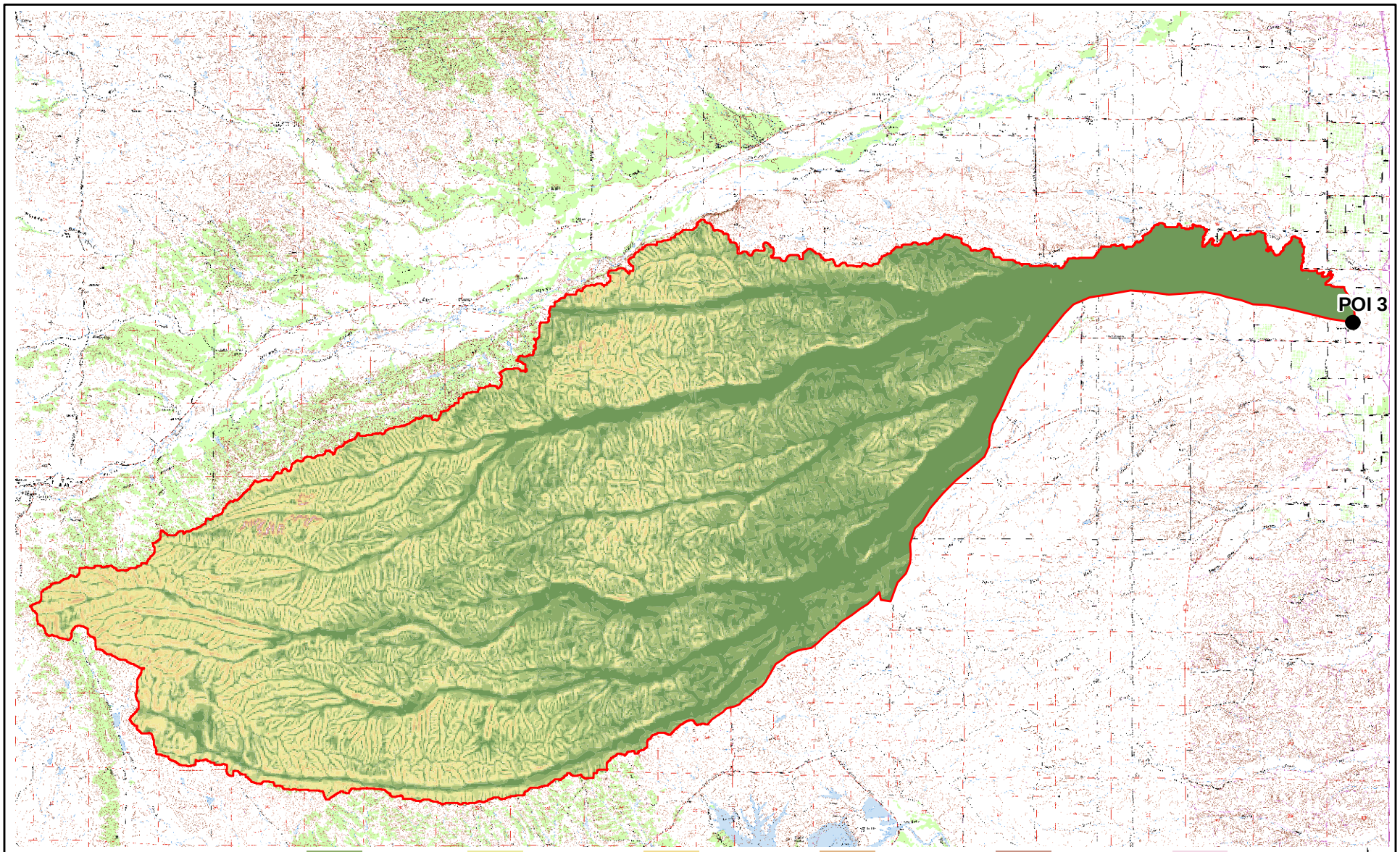

Point of Interest
Watershed for Point of Interest 3
0 - 2 percent
2 - 4 percent
4 - 6 percent
6 - 8 percent
8 - 10 percent
10 - 12 percent
12 - 14 percent
14 - 16 percent
16 - 18 percent
18 - 20 percent
20 - 22 percent
22 - 24 percent
24 - 26 percent
26 - 28 percent
28 - 30 percent
30 - 32 percent
32 - 34 percent
34 - 36 percent

VESTRA

SOURCE: NAIP 2005

0 6,250 12,500 25,000 Feet

SLOPE
POINT OF INTEREST 3
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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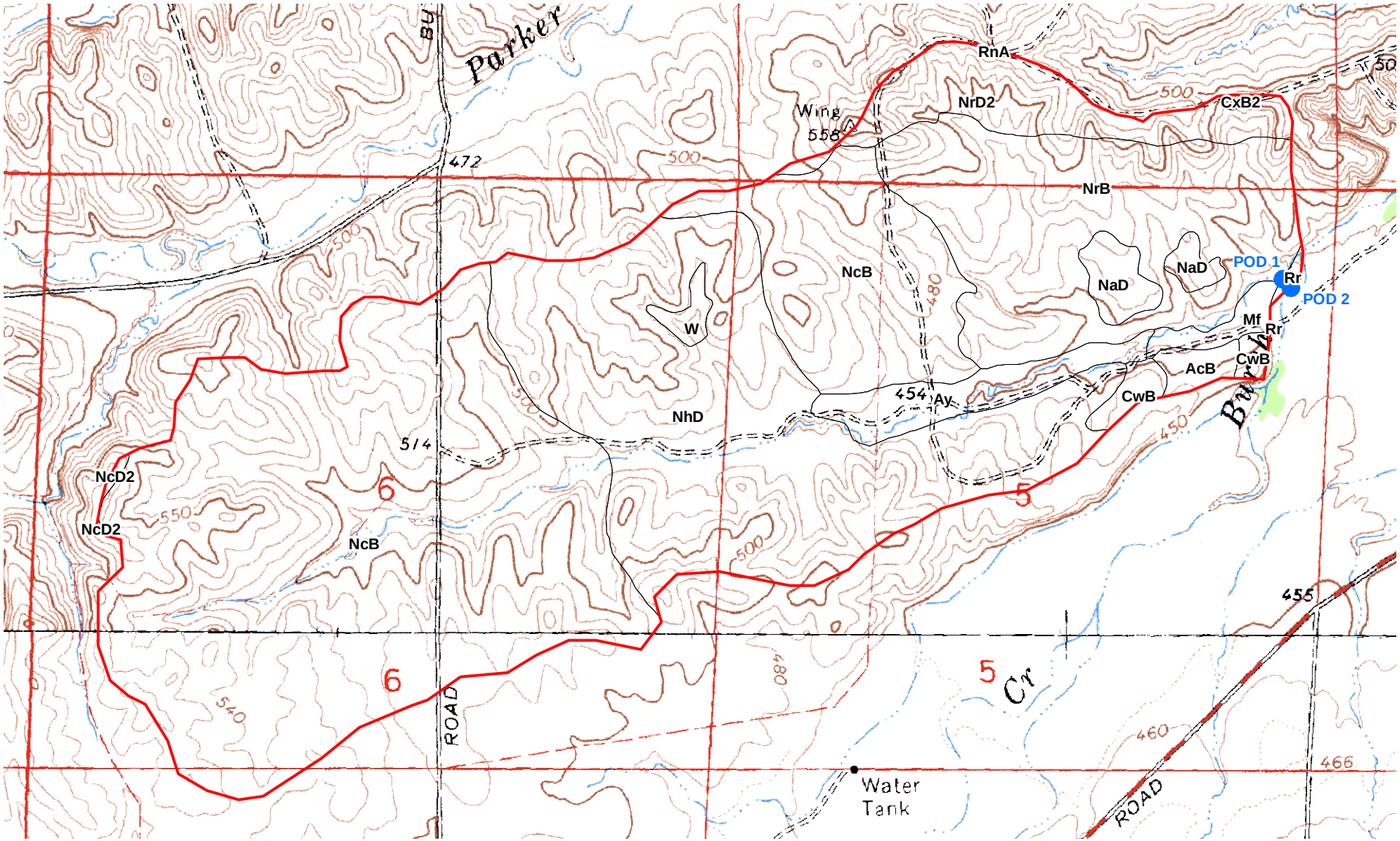

Point of Diversion

Watershed for Point of Diversion 1

Soil Map Unit

VESTRA

SOURCE: NAIP 2005; NRCS 2004

0 700 1,400 2,800 Feet

SOILS
POINT OF DIVERSION 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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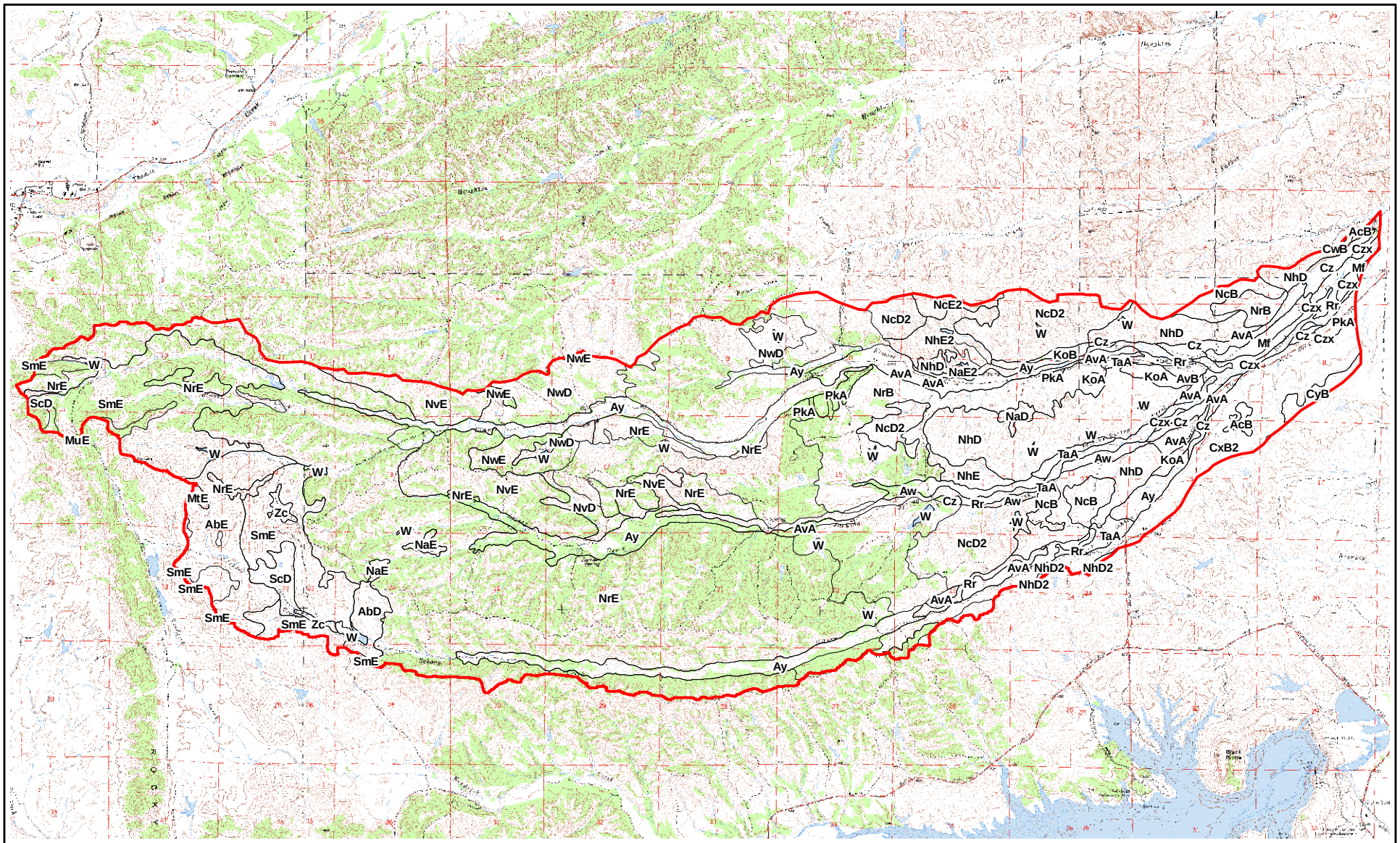


Point of Interest

Watershed for Point of Diversion 2

Soil Map Unit

VESTRA

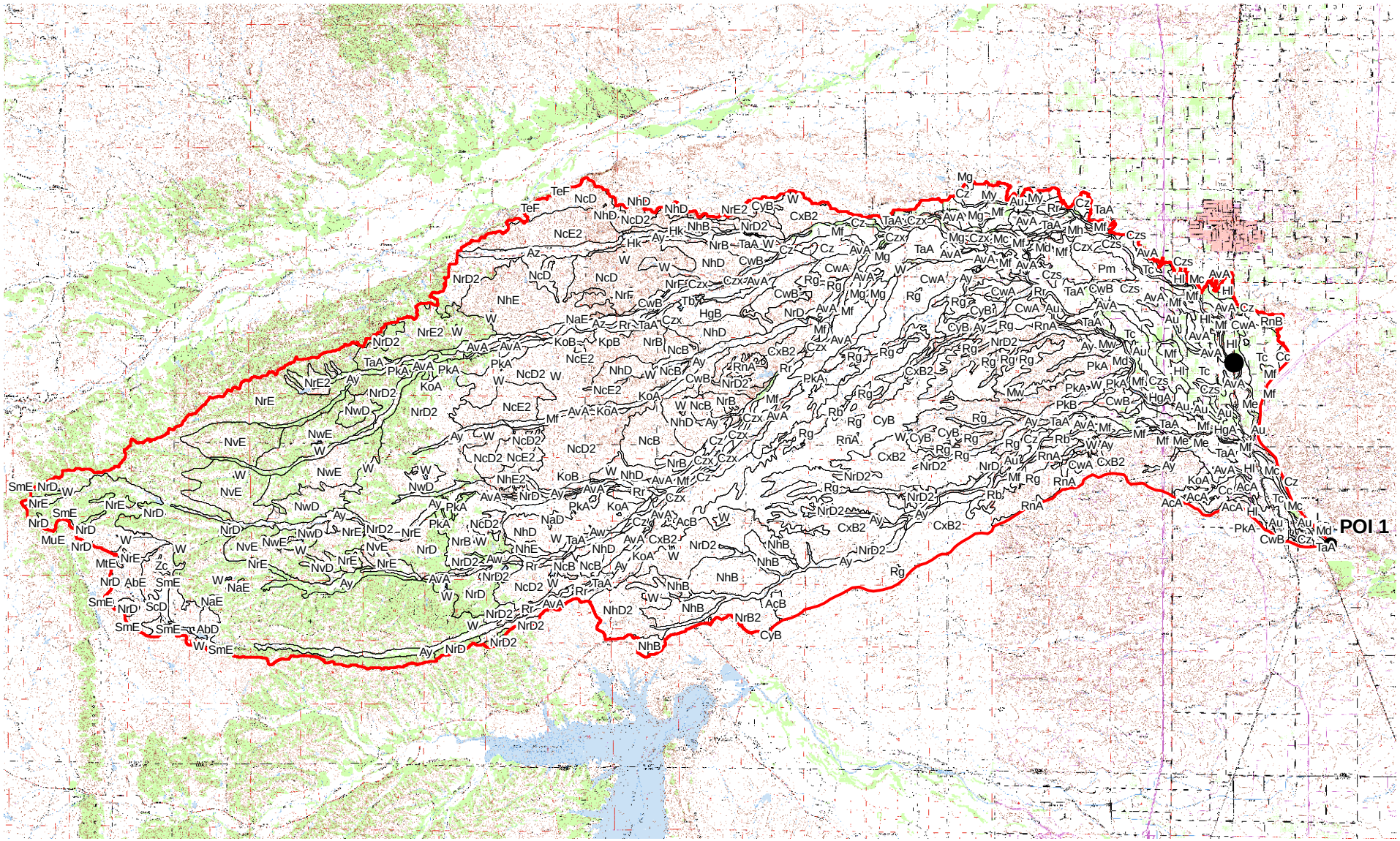
Feet

0 3,500 7,000 14,000

SOURCE: NAIP 2005; NRCS 2004

SOILS
POINT OF DIVERSION 2
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

P:\GIS\70812\WaterStudy\Appendix\70812_Soils_POD2.mxd



Point of Interest

Watershed for Point of Interest 1

Soil Map Unit

Feet

0 6,500 13,000 26,000

SOURCE: NAIP 2005; NRCS 2004

SOILS
POINT OF INTEREST 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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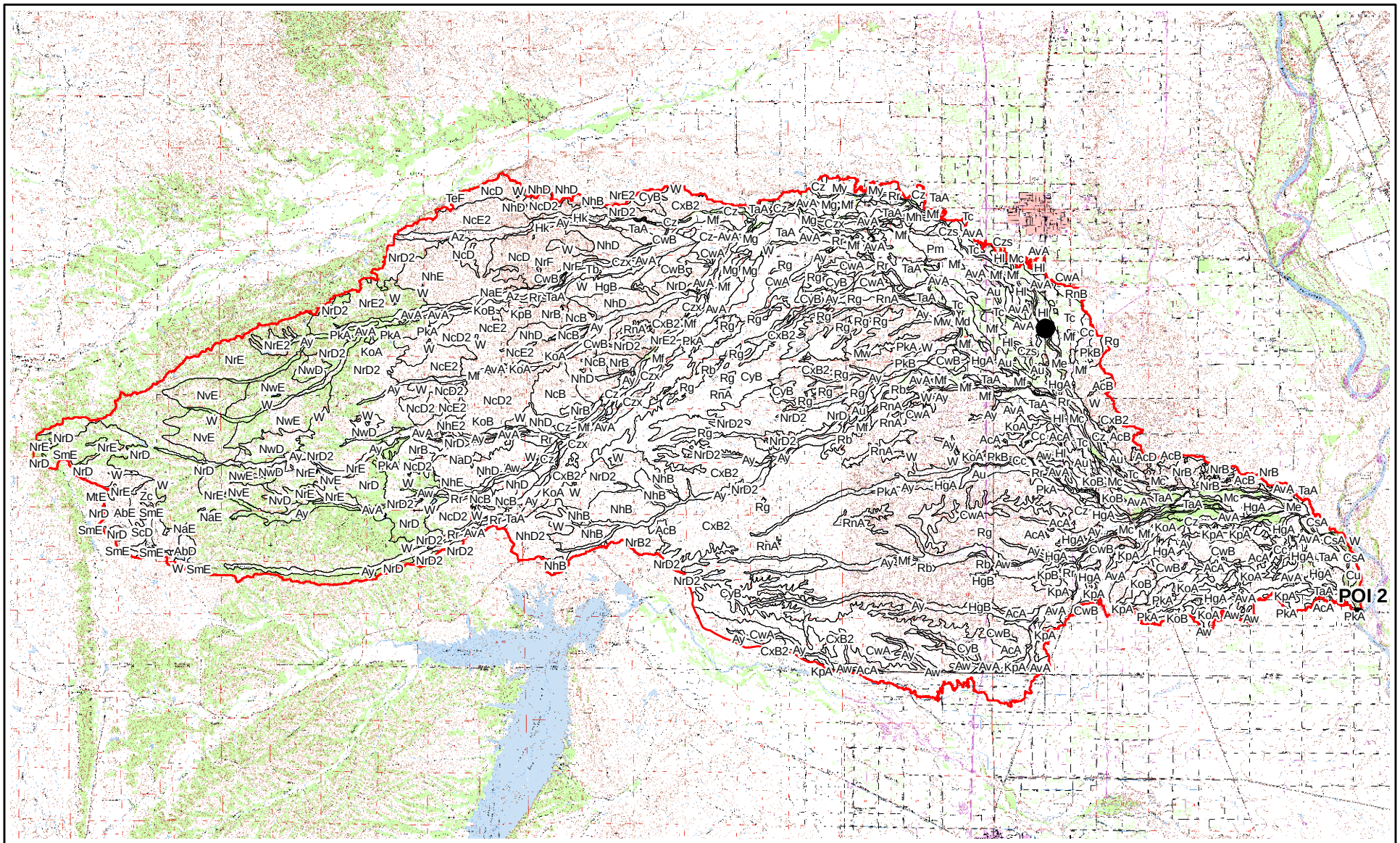

Point of Interest

Watershed for Point of Interest 2

Soil Map Unit

Feet

0 8,000 16,000 32,000

SOURCE: NAIP 2005; NRCS 2004

SOILS
POINT OF INTEREST 2
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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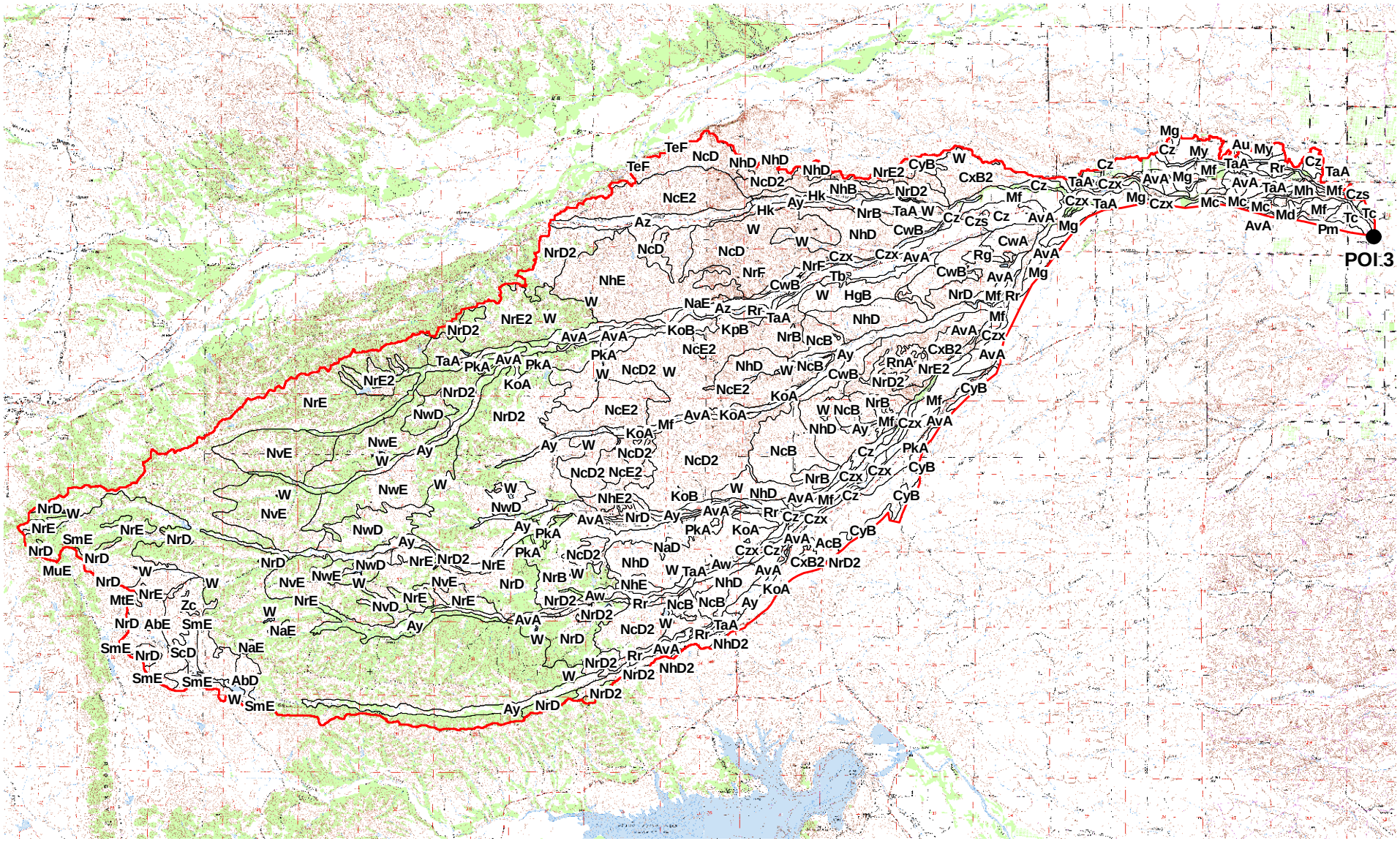

Point of Interest

Watershed for Point of Interest 3

Soil Map Unit

VESTRA

SOURCE: NAIP 2005; NRCS 2004

0 5,500 11,000 22,000 Feet

SOILS
POINT OF INTEREST 3
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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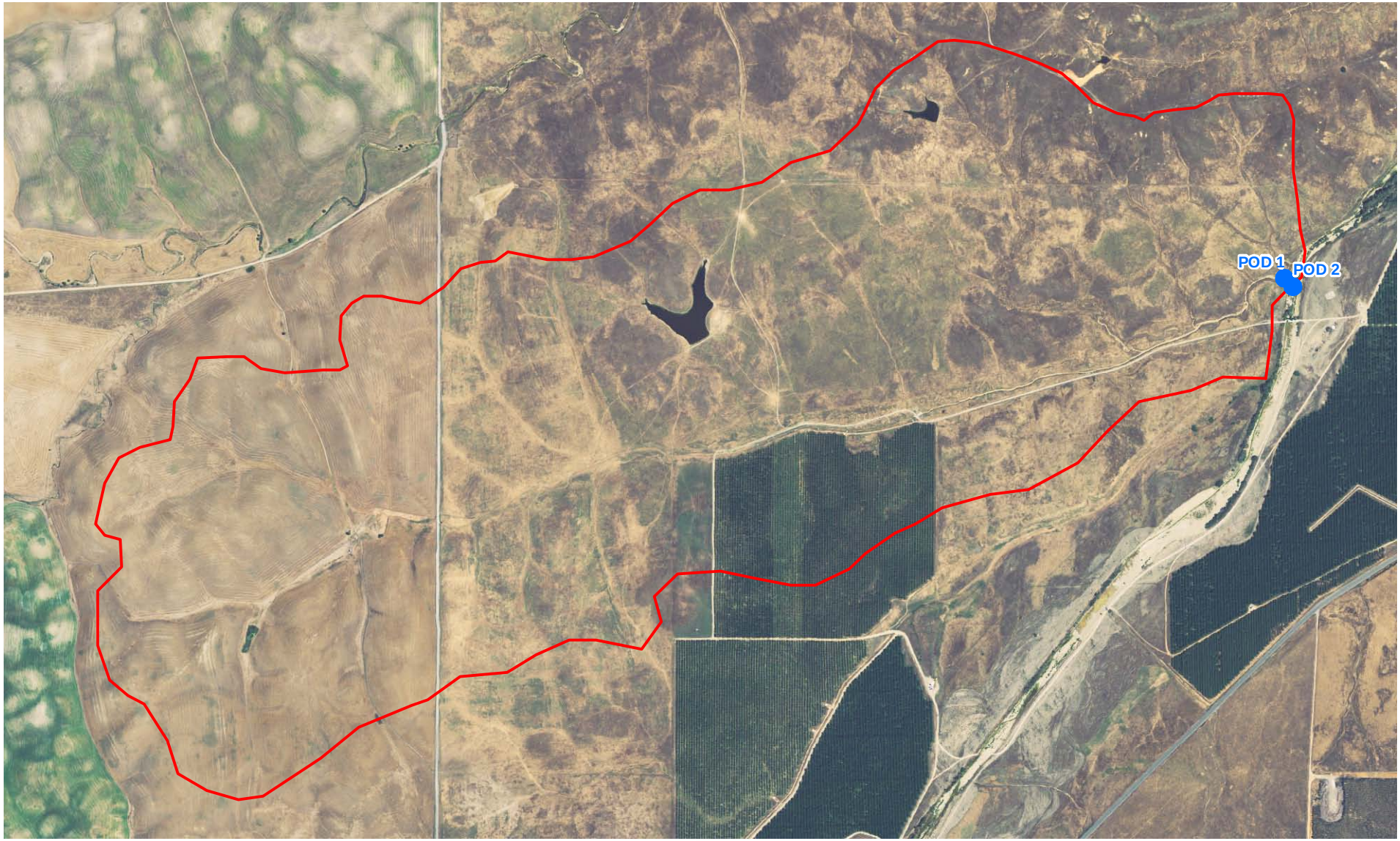

Point of Diversion

Watershed for Point of Diversion 1

Waterbody

0 800 1,600 3,200 Feet

WATER BODIES
POINT OF DIVERSION 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

VESTRA

SOURCE: NAIP 2005; USGS 2006

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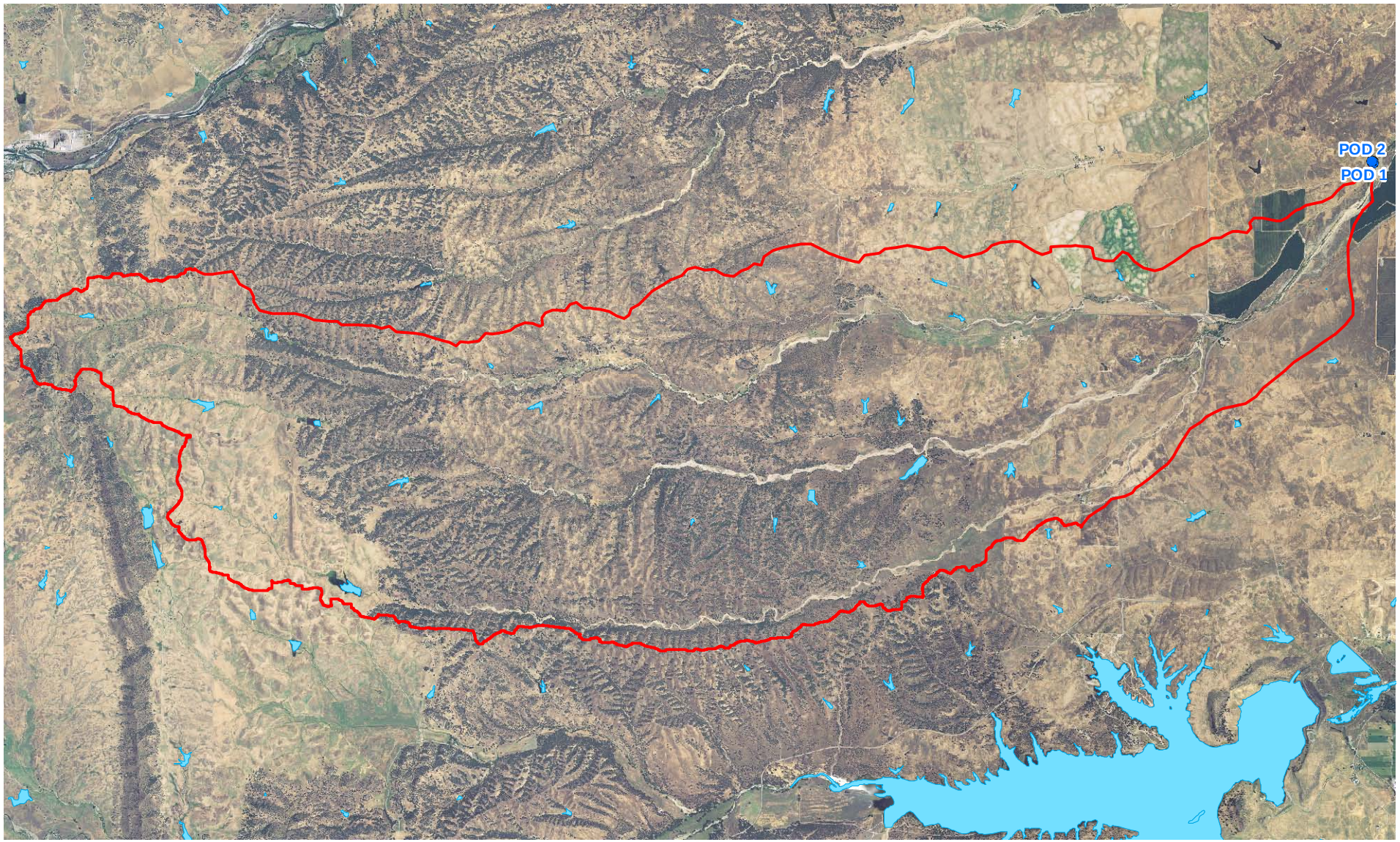

Point of Interest

Point of Diversion

Watershed for Point of Diversion 2

Waterbody

N

0 3,950 7,900 15,800 Feet

VESTRA

SOURCE: NAIP 2005; USGS 2006

WATER BODIES
POINT OF DIVERSION 2
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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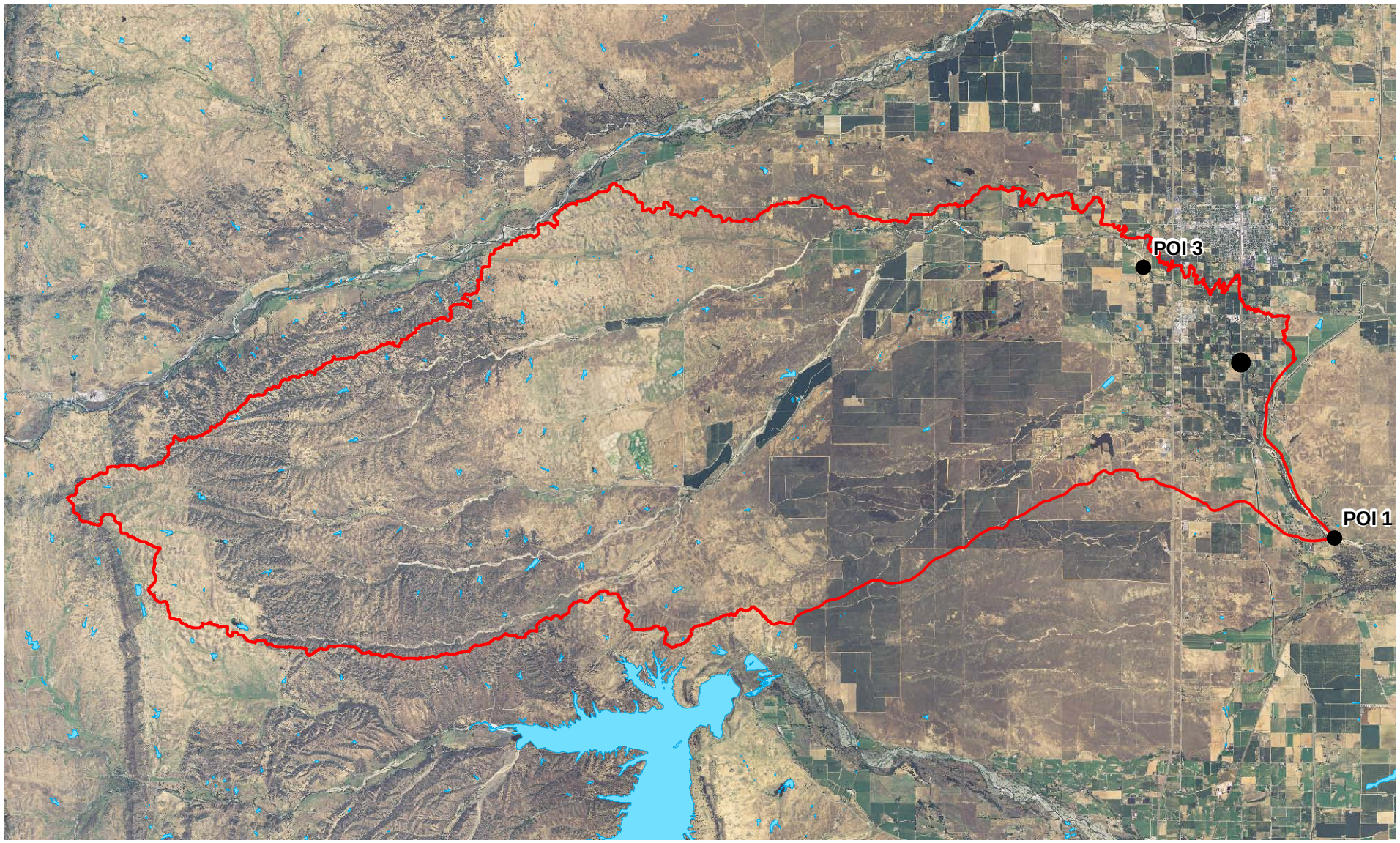

Point of Interest

Watershed for Point of Interest 1

Waterbody

N

0 7,500 15,000 30,000 Feet

VESTRA

SOURCE: NAIP 2005; USGS 2006

WATER BODIES
POINT OF INTEREST 1
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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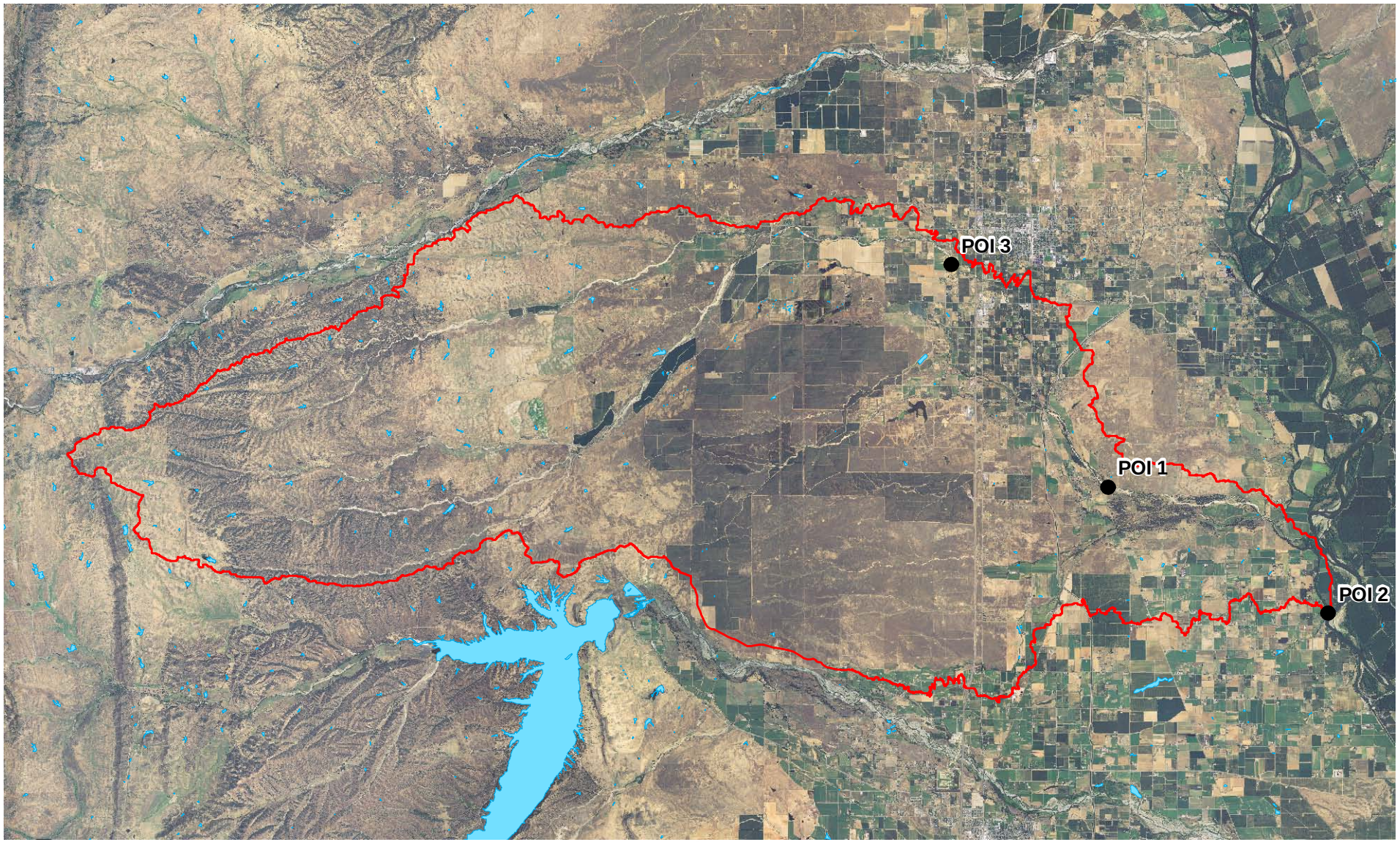

Point of Interest

Watershed for Point of Interest 2

Waterbody

N

0 9,500 19,000 38,000 Feet

VESTRA

SOURCE: NAIP 2005; USGS 2006

WATER BODIES
POINT OF INTEREST 2
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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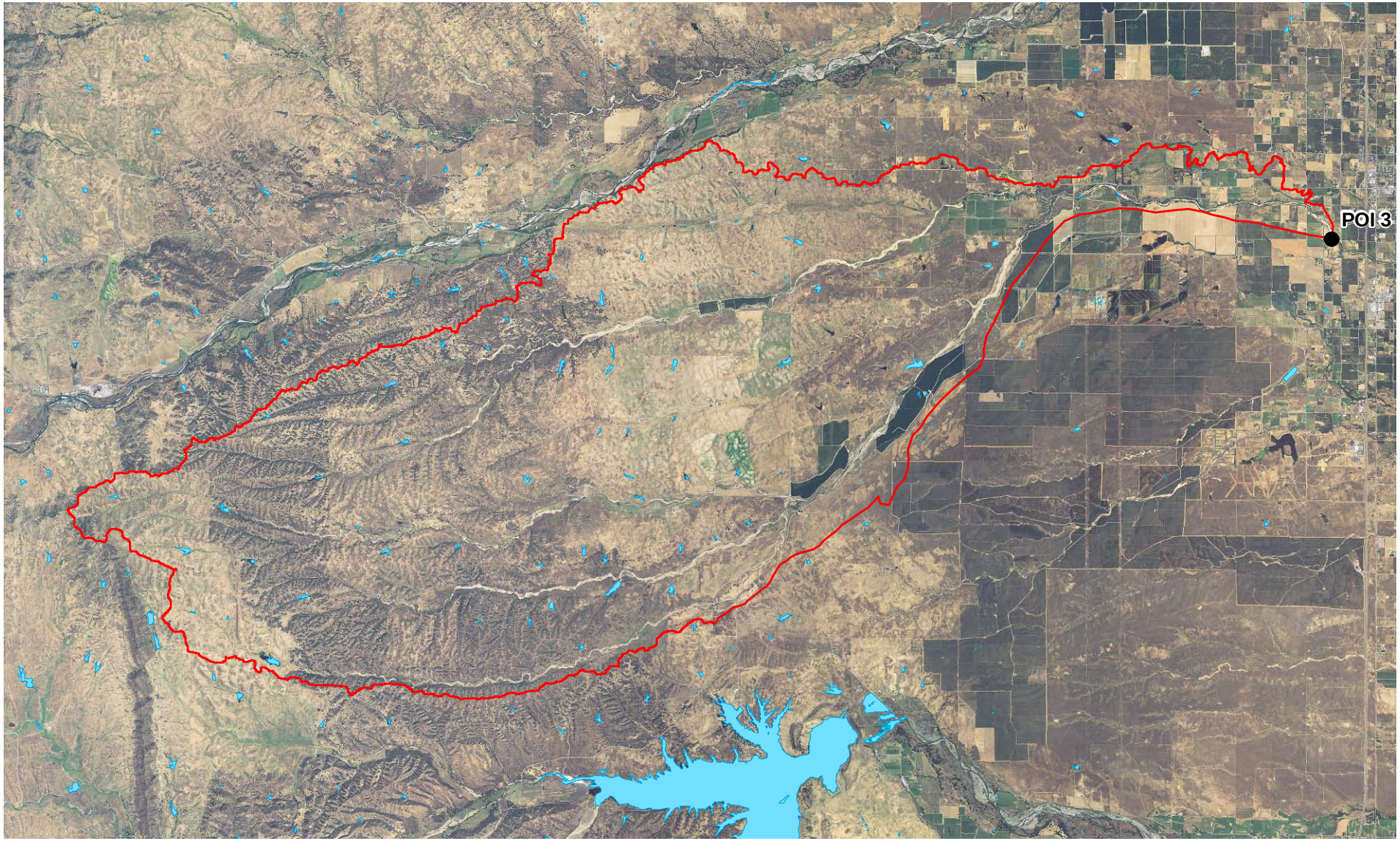

Point of Interest

Watershed for Point of Interest 3

Waterbody

N

0 7,000 14,000 28,000 Feet

VESTRA

SOURCE: NAIP 2005; USGS 2006

WATER BODIES
POINT OF INTEREST 3
NO NAME CREEK DAM PROJECT
CORNING, CALIFORNIA

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Appendix D

Archeological Inventory Report

ARCHAEOLOGICAL INVENTORY SURVEY

Proposed No-Name Creek Dam Project,
c. 128 Acres, Tehama County, California.

Prepared for

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96001

Author

Sean Michael Jensen, M.A.

Keywords *for Information Center Use:*

Archaeological Inventory Survey, c. 128 acres, Tehama County, CEQA/NEPA, USGS Henleyville, Ca. 7.5' Quad., No Historic Properties/Significant Historical Resources.

June 10, 2008

1. INTRODUCTION

Project Background

This report details the results of an archaeological inventory survey involving approximately 128 acres of land located along an unnamed, ephemeral tributary of Burch Creek in Tehama County, California. Proposed action involves construction of an earth dam upstream from the confluence of the referenced tributary of Burch Creek with Burch Creek itself, and clearing of vegetation and related activities associated with creation of a reservoir with a surface area affecting approximately 128 acres.

The proposed project will involve physical disturbance to ground surface and sub-surface components in conjunction with dam construction, limited land re-contour, and vegetation clearing, and will therefore have the potential to impact cultural resources located within the Area of Potential Effect (APE), which consists of the c. 128-acre project area itself (see attached ***Project Location Map***). Evaluation of the project's effects to cultural resources must be undertaken in conformity with Tehama County rules and regulations, and in compliance with requirements of the California Environmental Quality Act of 1970, Public Resources Code, Section 21000, et seq. (CEQA), and The California CEQA Environmental Quality Act Guidelines, California Administrative Code, Section 15000 et seq. (Guidelines as amended).

Scope of Work

Compliance with CEQA requires completion of projects in conformity with the amended (October 1998) Guidelines, including in particular Section 15064.5. Based on these guidelines, the following tasks were considered an adequate and appropriate Scope of Work for the present archaeological inventory:

- Conduct a records search at the Northeast Information Center of the California Historical Resources Information System at CSU-Chico and consult with the Native American Heritage Commission for Sacred Land listings. The goals of the records search and consultation are to determine (a) the extent and distribution of previous archaeological surveys, (b) the locations of known archaeological sites and any previously recorded archaeological districts, and (c) the relationship between known sites and environmental variables. This step is also designed to ensure that, during subsequent field survey work, all significant historical resources and/or unique archaeological resources are discovered, correctly identified, and properly interpreted.

- Conduct a complete-coverage, intensive pedestrian survey of the APE. The purpose of the pedestrian survey is to ensure that previously recorded sites identified during the records search and consultation are re-located and significance evaluations updated on the basis of existing conditions vis-à-vis site integrity and condition. For previously undocumented sites discovered, the field survey would involve formally recording these on State DPR-523 Primary Records. For both previously identified and newly identified resources, the level of field work would be sufficient to recommend measures to avoid,

minimize or mitigate adverse effects of the project to any sites recommended significant or potentially significant per CEQA.

- Upon completion of the records search, consultation and pedestrian survey, prepare an archaeological survey report that identifies project impacts and that addresses site treatment for cultural resources recommended significant or potentially significant and that will or could be impacted by the project.

The present document constitutes the final report for this project, detailing the results of the records search, consultation and pedestrian field survey and providing recommendations for treatment of significant historical resources to be affected. All field survey procedures followed guidelines provided by the State Historic Preservation Office (Sacramento) and conform to accepted professional standards.

Location

The No Name Creek Dam Project will affect approximately 128 acres of land located along an unnamed, ephemeral tributary of Burch Creek in southern Tehama County, California. Glenn Road is located roughly two miles north of the project, while Black Butte Road is located less than one-half mile to the south. Lands affected are located within a portion of Sections 5 and 6 of Township 23 North, Range 4 West, as shown on the USGS Henleyville, California, 7.5' series quadrangle (see attached ***Project Location Map***).

Lands within this general area have remained largely undeveloped for residential or commercial uses, being utilized since about 1865 for ranching and farming. During the past several decades, the pace of development to the east along the Interstate 5 corridor has increased substantially, with intensive residential and commercial development ongoing. However, the project area continues to be utilized primarily for ranching and limited farming and agricultural use.

Based on available topographic and other maps, but notwithstanding the effects of past and on-going land uses (historic farming and ranching), the project area appeared to contain lands of generally moderate sensitivity for both prehistoric and historic-period sites and features.

2. EXISTING CONDITIONS

Several information sources were considered relevant to evaluating the types of sites and site distribution that might be encountered within the project area. The information evaluated includes data maintained by the Northeast Information Center of the California Historical Resources Information System (CSU-Chico), consultation with the Native American Heritage Commission, and published and unpublished documents relevant to regional environment, prehistory, ethnography, and early historic developments.

Northeast Information Center Records

The records of the Northeast Information Center (CSU-Chico) were examined for existing recorded prehistoric and historic sites and previous archaeological survey within or near the project area (Records Search dated June 2, 2008, File # W08-51, copy attached), with the following results.

Previous Archaeological Survey:

None of the 128-acre project area has been subjected to past survey by a professional archaeologist. Likewise, no archaeological surveys have been conducted within a quarter mile of the project area.

Recorded Cultural Resources:

No prehistoric or historical cultural resources have been formally recorded or otherwise identified within, adjacent or within a quarter mile of the project area.

Native American Consultation

In conjunction with the records search for the present project, the Native American Heritage Commission (NAHC) was contacted regarding Sacred Land Listings. The NAHC indicated that there are no Sacred Land listings for the project area or adjacent lands.

Other Sources

In addition to examining records at the Northeast Information Center at CSU-Chico and Native American consultation, the following sources were also reviewed at the Information Center, or separately:

- The National Register of Historic Places (2007).
- The California Register of Historical Resources (2006)
- The California Inventory of Historic Resources (1976).
- California Historical Landmarks (State of California 1996).
- California Points of Historical Interest (May 1992 and updates).
- The Historic Property Directory (OHP March 2008).
- OHP Determinations of Eligibility (2007).
- Published and unpublished documents relevant to environment, ethnography, prehistory and early historic developments in the vicinity (reviewed below), providing context for assessing site types and likely site distribution patterns for the project area.

Environment: The project area is located within lands at the margin of the Northern Sacramento Valley and the lower reaches of the North Coast Range. This area receives winter storm runoff from a significant watershed, with most of the streams in the area flowing generally west-east or -northeasterly through uplifted sediments of the Sacramento Valley floor. The present project area is located a short distance west of the western edge of

the Valley, and contains lands of limited relief (elevations range from approximately 400 to 500 feet above mean sea level).

In view of the surface water sources throughout this area, prehistoric use and occupation was moderate to intensive, but the population was not randomly distributed. Clearly, the most intensively occupied land areas were along primary (year-round) water courses in the area, including Burch Creek to the south of the No Name Creek Dam Project Area, and of course along the Sacramento River to the east. Prehistoric habitation seems particularly concentrated at confluences of year-round streams, and elsewhere along such streams where good south and southwesterly exposures were available.

There is fair resemblance between today's environmental context and that which existed 150 years ago, since very little of the land has been leveled or intensively farmed, with no evidence of gold mining operations in the immediate vicinity (i.e., no evidence of historic dredging or channelization work along major streams).

Prehistory: The earliest residents in the Great Central Valley are represented by the Fluted Point and Western Pluvial Lakes Traditions, which date from about 11,500 to 7,500 years ago (Moratto 2004). Within portions of the Central Valley of California, fluted projectile points have been found at Tracy Lake (Heizer 1938) and around the margins of Buena Vista Lake in Kern County. Similar materials have been found to the north, at Samwell Cave near Shasta Lake and near McCloud and Big Springs in Siskiyou County. These early peoples are thought to have subsisted using a combination of generalized hunting and lacustrine exploitation (Moratto 2004).

These early cultural assemblages were followed by an increase in Native population density after about 7,500 years ago. One of the most securely dated of these assemblages in north-central California is from the Squaw Creek Site located north of Redding. Here, a charcoal-based C-14 date suggests extensive Native American presence around 6,500 years ago, or 4,500 B.C. Most of the artifactual material dating to this time period has counterparts further south, around Borax (Clear) Lake in relatively close proximity to the southwest of the present project area, and the Farmington Area in a Valley setting east of Stockton. Important artifact types from this time period include large wide-stemmed projectile points and manos and metates.

In the Northern Sacramento Valley in the general vicinity of the project area, aboriginal populations continued to expand between 6,500 and 4,500 years ago. Early Penutian-speaking arrivals in this area may be represented by the archaeological complex known in the literature as the "Windmiller" or "Early Horizon." These sites date to about 4,000-5,000 years ago, with the connection to Penutian-speaking peoples suggested on the basis of extended burials, large leaf-shaped and stemmed projectile points similar to points of the Stemmed Point Tradition in the Plateau and portions of the Great Basin, large villages established along major waterways, and elaborate material culture with a wide range of ornamental and other non-utilitarian artifact types being present (Ragir 1972). The continuation of this pattern through the "Middle Horizon", or from about 1,000 B.C. to A.D. 300, has also been documented at riverine sites within the Sacramento Valley, including several sites along the Sacramento River west of Chico and near Colusa, south-southeast of the present project area.

Sometime around AD 200-300, the Valley may have experienced another wave of Penutian immigration. Arriving ultimately from southern Oregon and the Columbia and Modoc Plateau region and proceeding down the major drainage systems (including the Feather, Yuba and American Rivers and of course the Sacramento River), these Penutian-speaking arrivals may have displaced the earlier populations, including remnant Hokan-speaking peoples still resident within the Valley, especially along the Sacramento River. Presumably introduced by these last Penutian-speaking peoples to arrive were more extensive use of bulbs and other plant foods, animal and fishing products more intensively processed with mortars and pestles, and perhaps the bow and arrow and associated small stemmed- and corner-notched projectile points.

Ethnography: The project area is located within territory which, at the time of initial contact with Euroamerican culture (*circa* AD 1850), was claimed by the Nomlaki (Goldschmidt 1978). Nomlaki core territory included lands along and west of the Sacramento River, from Cottonwood Creek in the north to around Princeton in the south.

The Nomlaki were Penutian speakers for whom the basic social unit was the family, although the village may also have functioned as a social, political and economic unit. Villages were usually located near major water courses, inhabited mainly in the winter as it was necessary to go out into the hills and higher elevation zones to establish temporary camps during food gathering seasons (i.e., spring, summer and fall). Villages typically consisted of a scattering of bark houses, numbering from four or five to several dozen in larger villages, each house containing a single family of from three to seven people.

As with all northern California Indian groups, economic life for these Penutian speaking peoples revolved around hunting, fishing and the collecting of plant foods. Deer were an important meat source and were hunted by individuals by stalking or snaring, or by groups in community drives. Salmon runs, and other food resources available along the nearby Sacramento River and some of its major tributaries, also contributed significantly to Nomlaki economy. While much of the fish protein was consumed immediately, a significant percentage, particularly during the fall salmon run, was prepared for storage and consumed during winter months. Acorns represented one of the most important vegetal foods and were particularly abundant within the Oak Park Woodland that flanked both sides of the Sacramento River and its major tributaries in prehistoric times.

Relations between Euro-Americans and Native Americans in the northern Sacramento Valley followed the course of interaction documented in most other parts of North America, but with particularly devastating consequences for the Sacramento Valley Indians. John Work's fur trapping expedition through the Central Valley in 1832-33 resulted in the introduction of several communicable diseases, the results of which were devastating to Nomlaki culture and society (Work 1945; Cook 1955).

As elsewhere in northern California, only fragmentary evidence of Nomlaki material culture remains, due in part to perishability and in part to the impacts to archaeological sites resulting from later (historic) land uses. Based on the results of previous survey work within this portion of the northern Sacramento Valley and adjacent foothill lands, a range of prehistoric site types is known to be present, including middens with associated surface scatters, surface

scatters without associated middens, small surface features such as rock rings and circles, petroglyphs, food processing stations (including mortar holes and metate slicks), and isolated flakes and flaked stone artifacts.

Clearly, not all of these site types were expected to be present within the present project area, but rather these were considered the most likely *types* to be encountered if any sites or features were discovered at all.

Historical Context: The first Euroamerican arrivals into the area include participants in Spanish and Mexican expeditions and early fur trapping ventures, several of which come through and made brief stays within this portion of the Northern Sacramento Valley. However, history in this area of the Valley really begins with the appearance of Euroamerican emigrants such as Granville Swift who accompanied the Kelsey Party in 1843 on their journey to California. Swift served in John Sutter's campaign for California independence (the Bear Flag Revolt) and later served as a militia Captain in Fremont's California Battalion. Swift later settled immediately north of Orland (several miles east of the present project area), between the core of the City and Stony Creek, and established cattle ranching operations that at one time extended south through the present project area, down to Woodland and westerly into the foothill regions west of Corning, Orland and Willows.

The community of Willows, located south of the present project area, emerged as a true community in the 1870's with arrival of the Southern Pacific Railroad. As elsewhere in California, many of the communities in the Great Central Valley (including not only Willows, but nearby Orland and Corning) were purposefully created and funded by the railroads, with one of the objectives being to provide necessary services for the system itself (water, fuel), and another being to benefit from housing construction spurred by the extension of the railroad itself. For most of these communities, early growth was directly related to and dependent upon the railroad, where substantial benefits to local agriculture and ranching (both sheep and cattle as well as grain and orchard crops) accompanied expansion of markets created by availability of long-haul freight.

The growth in agriculture through the late 19th and early 20th Centuries fostered the development of local trade, and soon even more communities emerged in this part of the Valley. Willows, Orland and Corning all stood out as examples of larger grain shipping points in northern California, with Orland later becoming the center of the Orland Federal Irrigation Project (OFIP), a precursor to the Central Valley Project, covering an area of 20,000 acres of the Stony Creek watershed. The Glenn – Colusa Canal represents another substantial irrigation project feature in the general region, although none of these particular features are located within or close to the present No Name Creek Dam Project Area.

Additional historic themes for the general vicinity include water storage (e.g., Black Butte Reservoir) and additional water diversion and distribution projects not associated with OFIP, and more recently, urban expansion in the vicinity of the existing communities of Corning and Orland.

Collectively, these various historic and contemporary activities have impacted the local cultural resource base, although the present project area appears substantially outside the boundaries of impact associated with these activities.

3. PEDESTRIAN SURVEY and INVENTORY

All of the project area was subjected to intensive pedestrian survey by walking back and forth across the c. 128-acre property with systematic transects maintained at c. 20-25 meter intervals. In searching for cultural resources, the surveyor considered the results of background research and was alert for unusual contours, soil changes, distinctive vegetation patterns, exotic materials, artifacts, feature or feature remnants and other possible markers of cultural sites.

During the present pedestrian survey, the property was found to be generally unaffected by historic through contemporary development, although a number of access roads have been graded through the property, and an actively farmed walnut orchard is located adjacent to the southern margin of the project area.

No residential or farm-related structures were observed, with elements of the built environment being limited to fully contemporary steel-post supported fences.

Prehistoric Sites

Neither the existing records at CSU-Chico, consultation with the Native American Heritage Commission, nor the present pedestrian field survey have documented any prehistoric sites or artifacts, traditional use areas, or sacred land listings within, adjacent or close to the project area. The absence of prehistoric cultural material within the project area is explained primarily by the absence of a permanent surface water source within the "arroyo" comprising the project area, coupled with much more suitable habitation locales along nearby Burch Creek and at confluences of Burch Creek with several of its larger tributaries.

Historical Sites

Neither the existing records at CSU-Chico nor the present pedestrian field survey have identified any historical sites or artifacts within, adjacent or close to the project area. The USGS quadrangle map and historical maps reviewed at the Information Center do not depict past residential or ranch-related structures within the project area. Existing roads may be historic in terms of initial use, although the two observed examples within the project area have been recently widened and graded and exhibit no evidence of possible historic use, such as two-track ruts, rock support walls, or associated historic artifacts or features. In conclusion, the two graded access roads observed within the project area are considered contemporary.

4. PROJECT IMPACTS

A project may have a significant impact on cultural resources if the project will or could result in the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance or values of the resource would be materially impaired.

Based on the specific findings detailed above under ***Pedestrian Survey and Inventory***, no historical resources or unique archaeological resources are present within the project area and no historical resources will be impacted by the project, as presently proposed.

5. PROJECT SUMMARY

This report details the results of an archaeological survey involving approximately 128 acres of land located along an unnamed, ephemeral tributary of Burch Creek in Tehama County, California. Proposed action involves construction of an earth dam upstream from the confluence of the referenced tributary of Burch Creek with Burch Creek itself, and clearing of vegetation and related activities associated with creation of a reservoir with a surface area affecting approximately 128 acres.

A search of State data bases, including all records and documents available at the Northeast Information Center, consultation with the Native American Heritage Commission, and intensive-level pedestrian survey have failed to identify any prehistoric or historical cultural resources, traditional use areas, areas of traditional collecting, sacred lands, or other cultural resource issues of concern within or adjacent to the subject property.

Based on the findings of the present archaeological survey, no cultural resources will be impacted by the project, as presently proposed. Despite these negative findings, however, the following general provisions are considered appropriate:

1. ***Consultation in the event of inadvertent discovery of human remains***: In the event that human remains are inadvertently encountered during any ground-disturbing activity or at any time subsequently, State law shall be followed, which includes but is not limited to immediately contacting the County Coroner's office upon any discovery of human remains.

2. ***Consultation in the event of inadvertent discovery of cultural material***: The present evaluation and recommendations are based on the findings of an inventory-level surface survey only. There is always the possibility that important unidentified cultural materials could be encountered on or below the surface during the course of future construction or other residential development activities. This possibility is particularly relevant considering the constraints generally to archaeological field survey, and particularly where limited past disturbance, including access road grading, has occurred, as in the present case. In the event of an inadvertent discovery of previously unidentified cultural material, archaeological consultation should be sought immediately.

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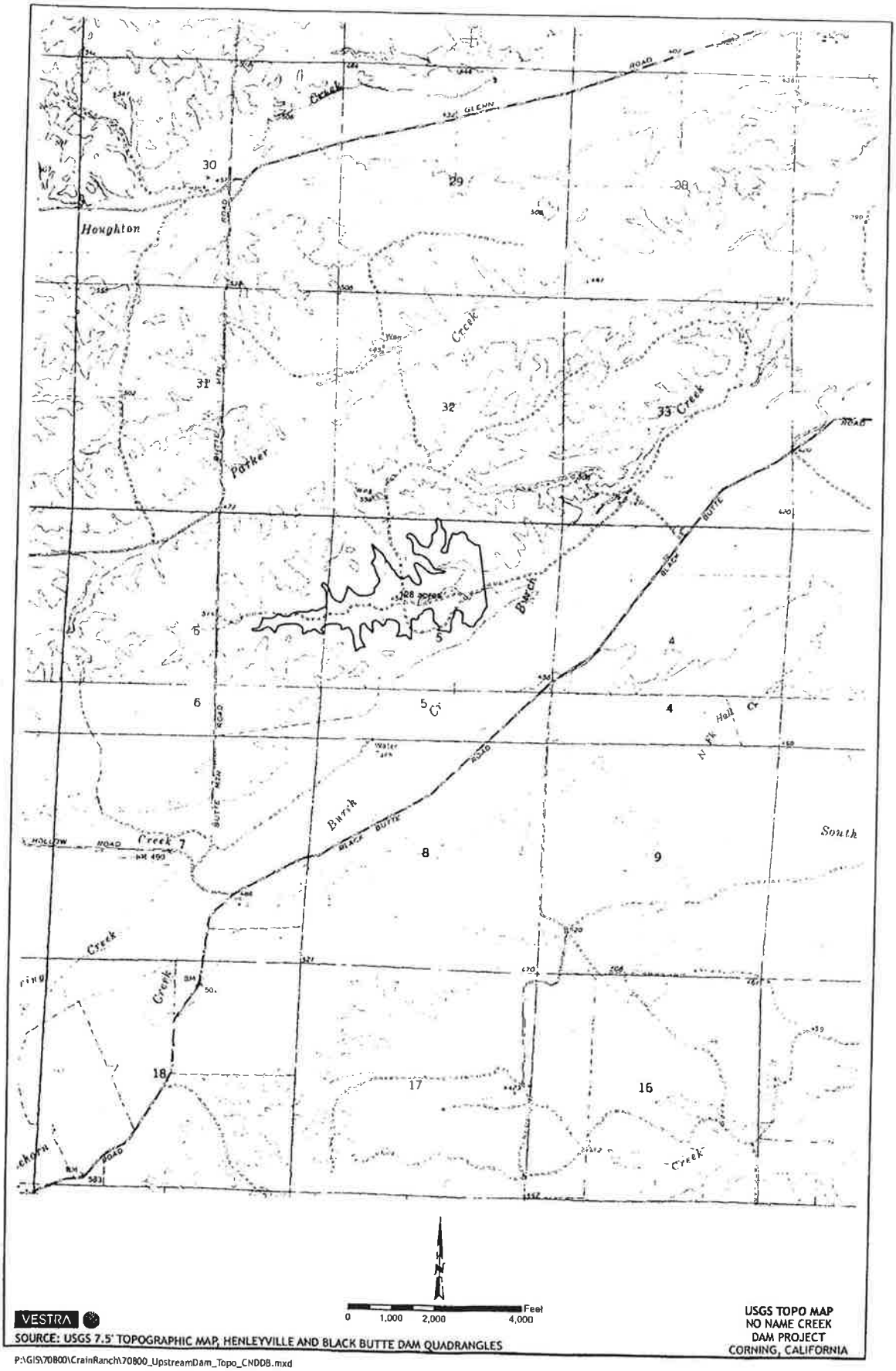
ARCHAEOLOGICAL INVENTORY SURVEY

Proposed No-Name Creek Dam Project,
c. 128 Acres, Tehama County, California.

ATTACHMENTS

- Project Location Map.
- Copy of Records Search from Northeast Information Center, W08-51.
- Copy of letter to the Native American Heritage Commission (NAHC).



VESTRA

SOURCE: USGS 7.5' TOPOGRAPHIC MAP, HENLEYVILLE AND BLACK BUTTE DAM QUADRANGLES

USGS TOPO MAP
NO NAME CREEK
DAM PROJECT
CORNING, CALIFORNIA

P:\GIS\70800\CrainRanch\70800_UpstreamDam_Topo_CNDDB.mxd

Northeast Center of the
California Historical Resources
Information System

BUTTE
GLENN
LASSEN
MODOC
PLUMAS
SHASTA
SIERRA
SISKIYOU
SUTTER
TEHAMA
TRINITY

California State University, Chico
Building 25, Suite 204
Chico, California 95929-0377
Phone (530) 898-6256
Fax (530) 898-4413

I.C. FILE #W08-51

AGREEMENT OF CONFIDENTIALITY

I, the undersigned, have been granted access to archaeological data on file at the Northeast Center of the California Historical Resources Information System. I understand the confidential nature of this information and agree to respect that confidentiality by not disclosing specific site locations to unauthorized individuals or in publicly distributed documents without written consent of the State Historic Preservation Officer or the Information Center Coordinator.

I agree to submit completed site records and reports pertinent to this project to this Information Center no later than 60 days after completion of field investigation. Subsequent reports on the identified sites that are pertinent to archaeological resource management will be submitted as well.

I understand that failure to comply with the above agreement is grounds for denial of access to archaeological data at any California Historical Resources Information Center.

Sean Jensen
Name

X Sean Jensen
Signature

6-2-08
Date

Genesis Society
Affiliation

(530) 680-6170
Telephone

7053 MOLOKAI DRIVE PARADISE, CA 95969
Address

Purpose of Research: Planning (X) Scientific/Academic ( ) Other ( )

NO-NAME CREEK RESERVOIR
Project

Tehama Co.
Location

T 23N, R4W, S. 5, 6
Maps

Henleyville 7.5

STAFF USE ONLY

Time:
IN: 10:30
OUT: 10:40

Adrienne Slattery
Information Center Staff

Backlog (✓) AS

Fees:	1 hour(s) @ $100.00/hr	$100.00
	____ staff hours @ $40.00/hr	$_____
Photocopy Charges:	____ copies @ $.15/page	$_____
Other:	_____	$_____
TOTAL:		$100.00

*** THIS IS NOT AN INVOICE ***

GENESIS SOCIETY

a Corporation Sole

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(530) 680-6170 VOX
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sean-jensen@sbcglobal.net

June 5, 2008

Native American Heritage Commission
Attn.: Ms. Debbie Treadway
915 Capitol Mall, Room 364
Sacramento, California 95814

Subject: ***No-Name Creek Dam Project, c. 128-acres, Tehama County.***

Dear Debbie:

Enclosed is a USGS topo-based map showing the location for a proposed dam construction project involving approximately 128-acres in Tehama County.

We have been requested to conduct the archaeological survey for this project, and are requesting a search of your Sacred Land Files for the project area identified on the attached map and as further described below.

Project Name:	No-Name Creek Dam Project, c. 128-acres
County:	Tehama
Map:	USGS Henleyville, Ca. 7.5' quad
Location:	Portion of Sections 5 & 6 of T23N, R4W.

Thanks in advance for your assistance.

Regards,

Sean Michael Jensen

Sean Michael Jensen, Administrator