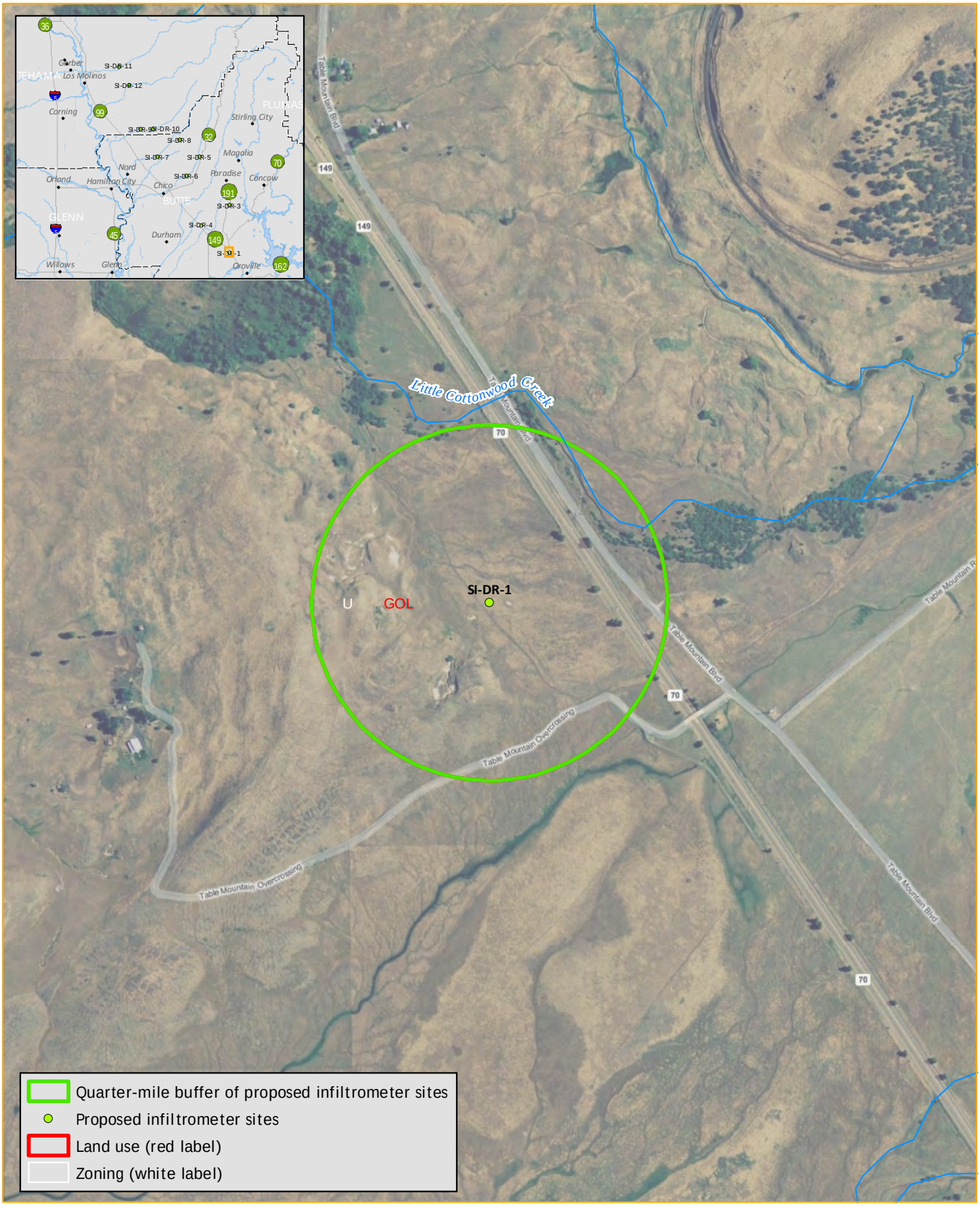
Appendix A
Soil Infiltration Sites - Aerial Photos

Lower Tuscan

SI-DR-1



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
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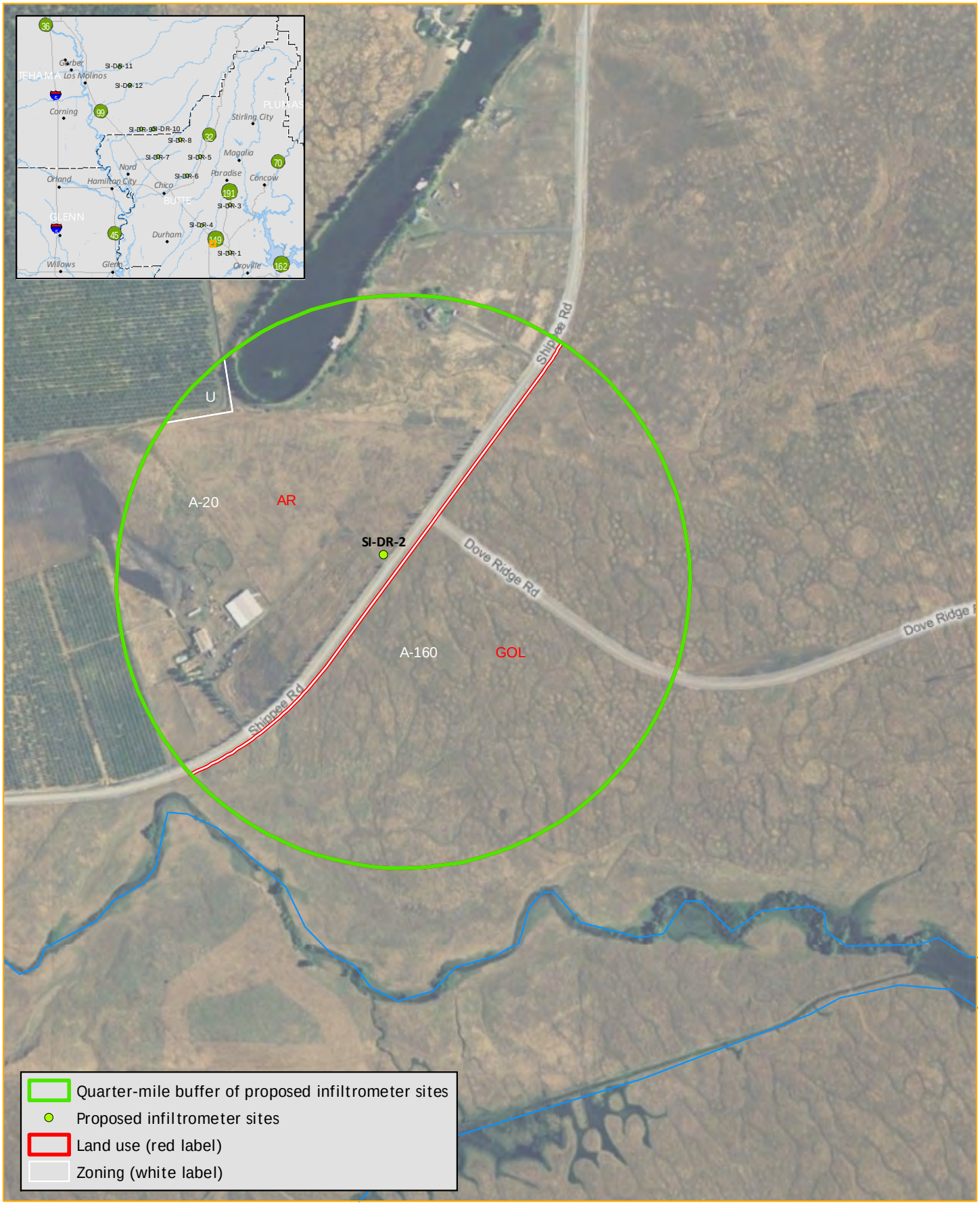
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-2



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
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Feet
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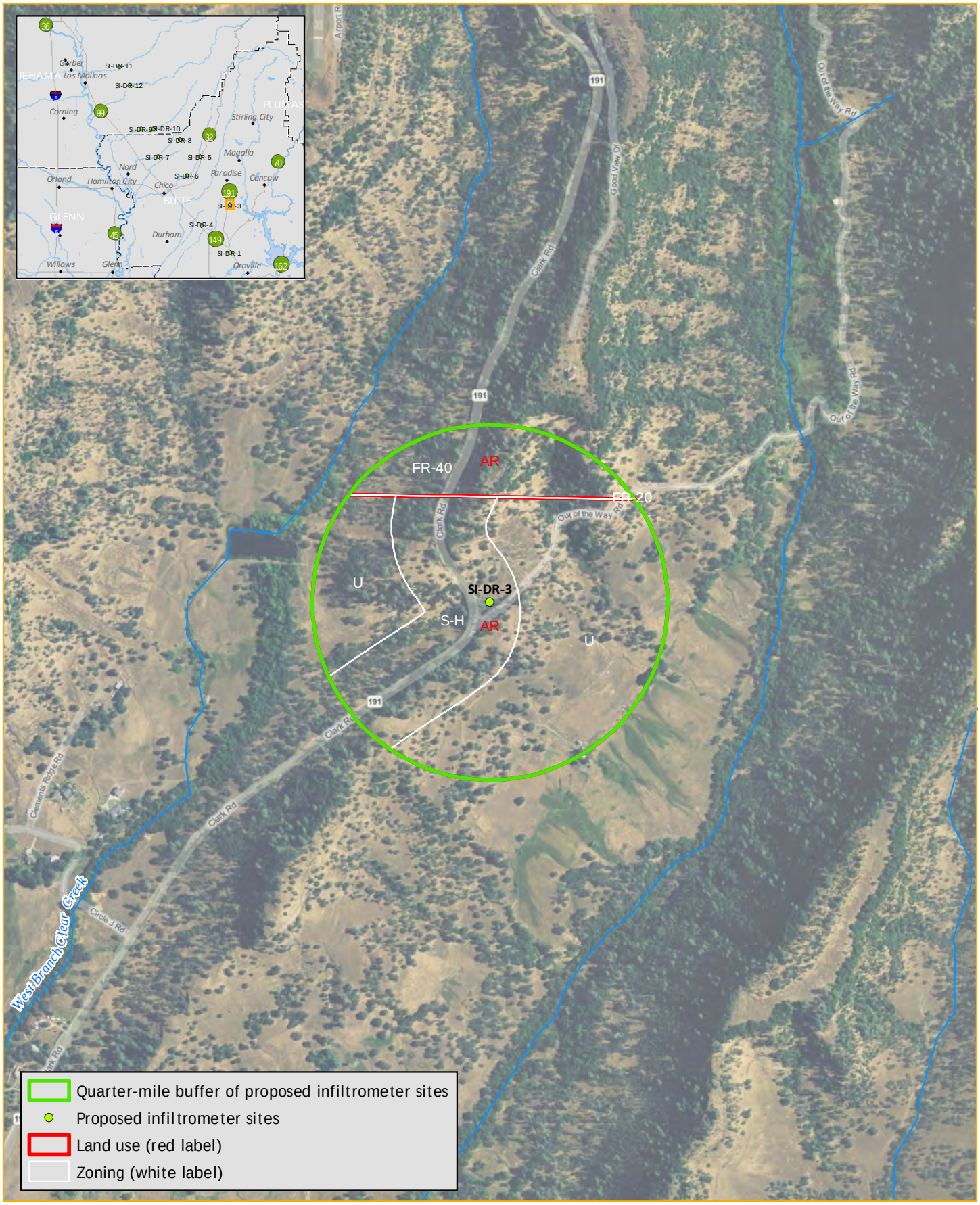
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-3



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
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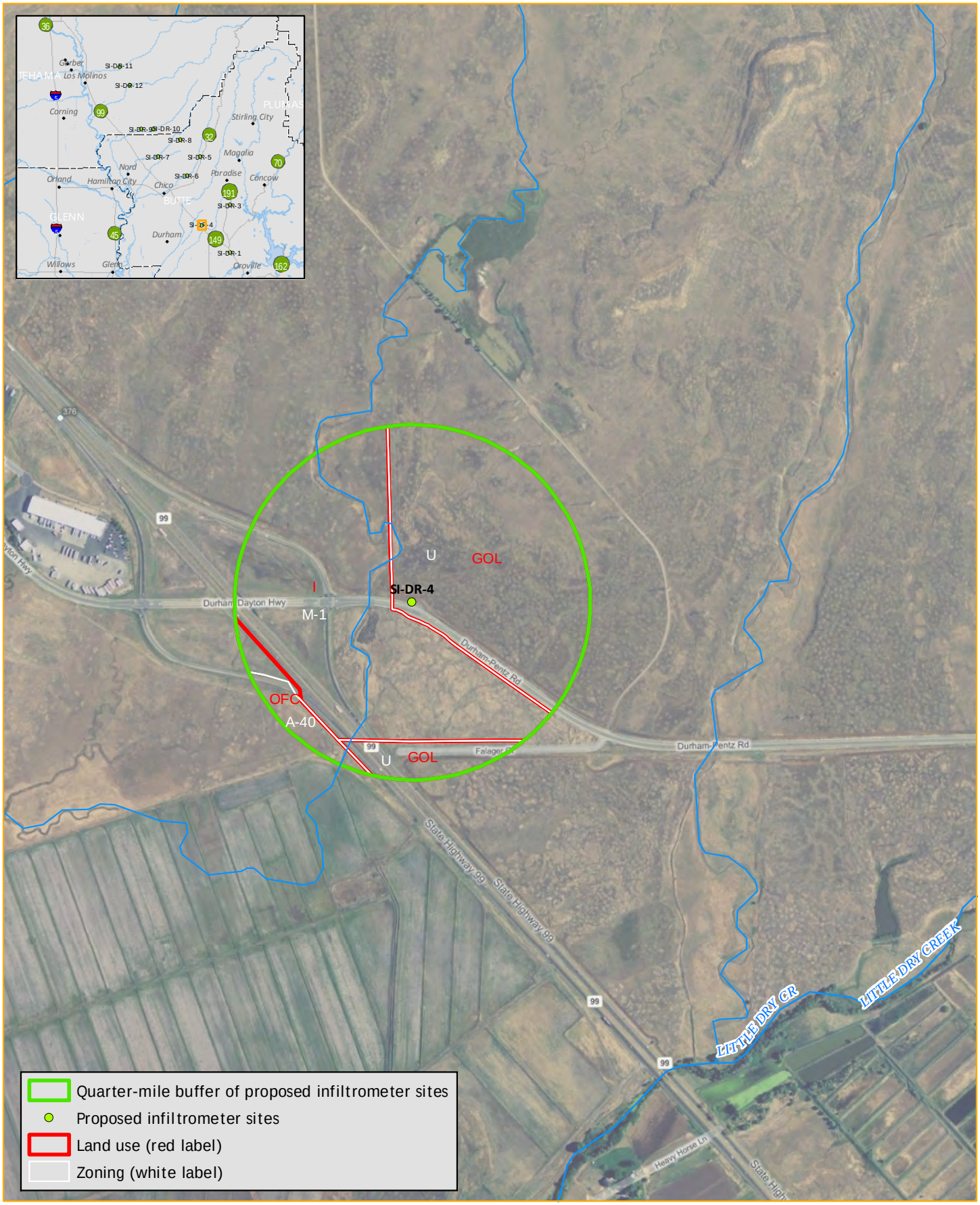
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-4



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

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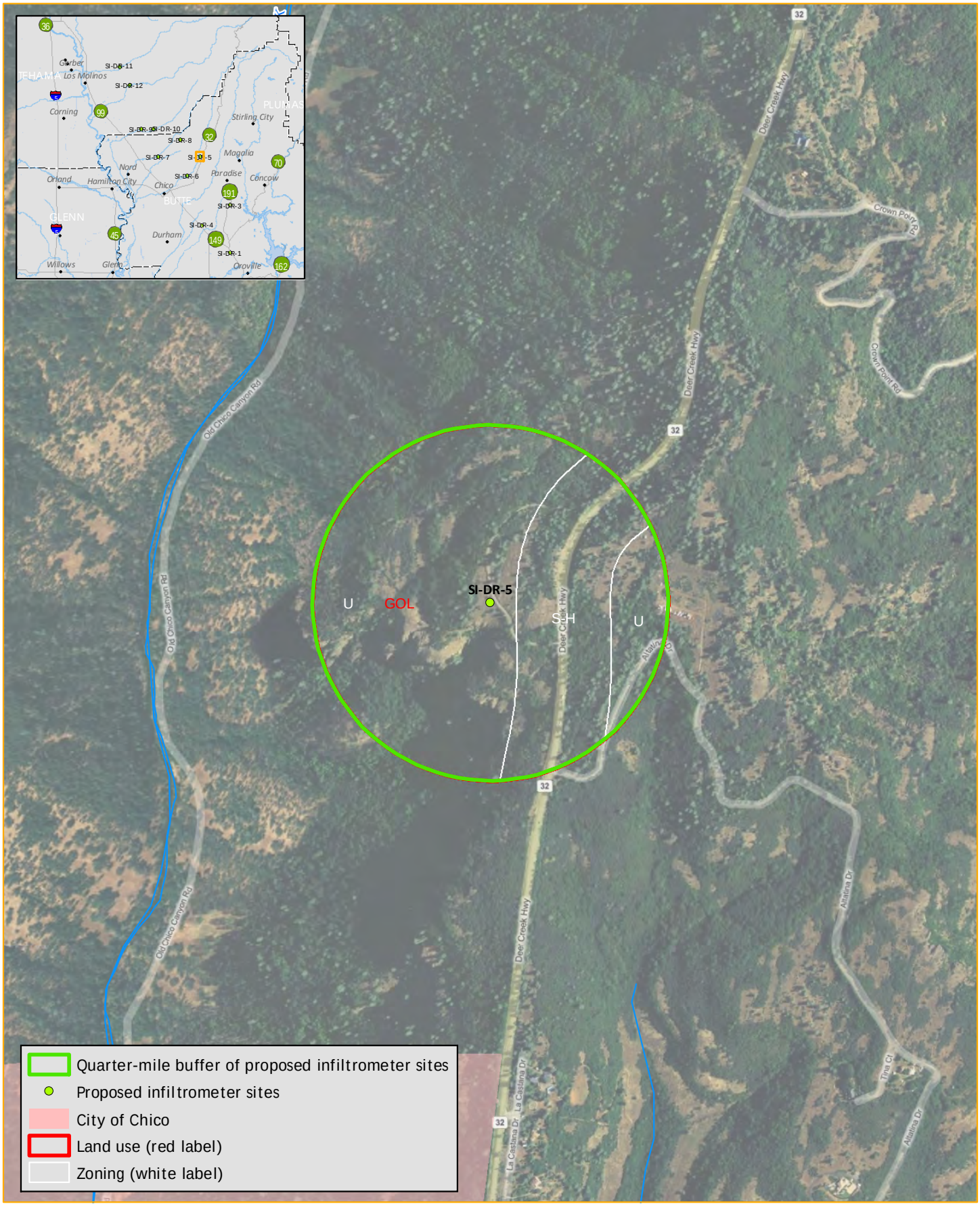
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-5



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
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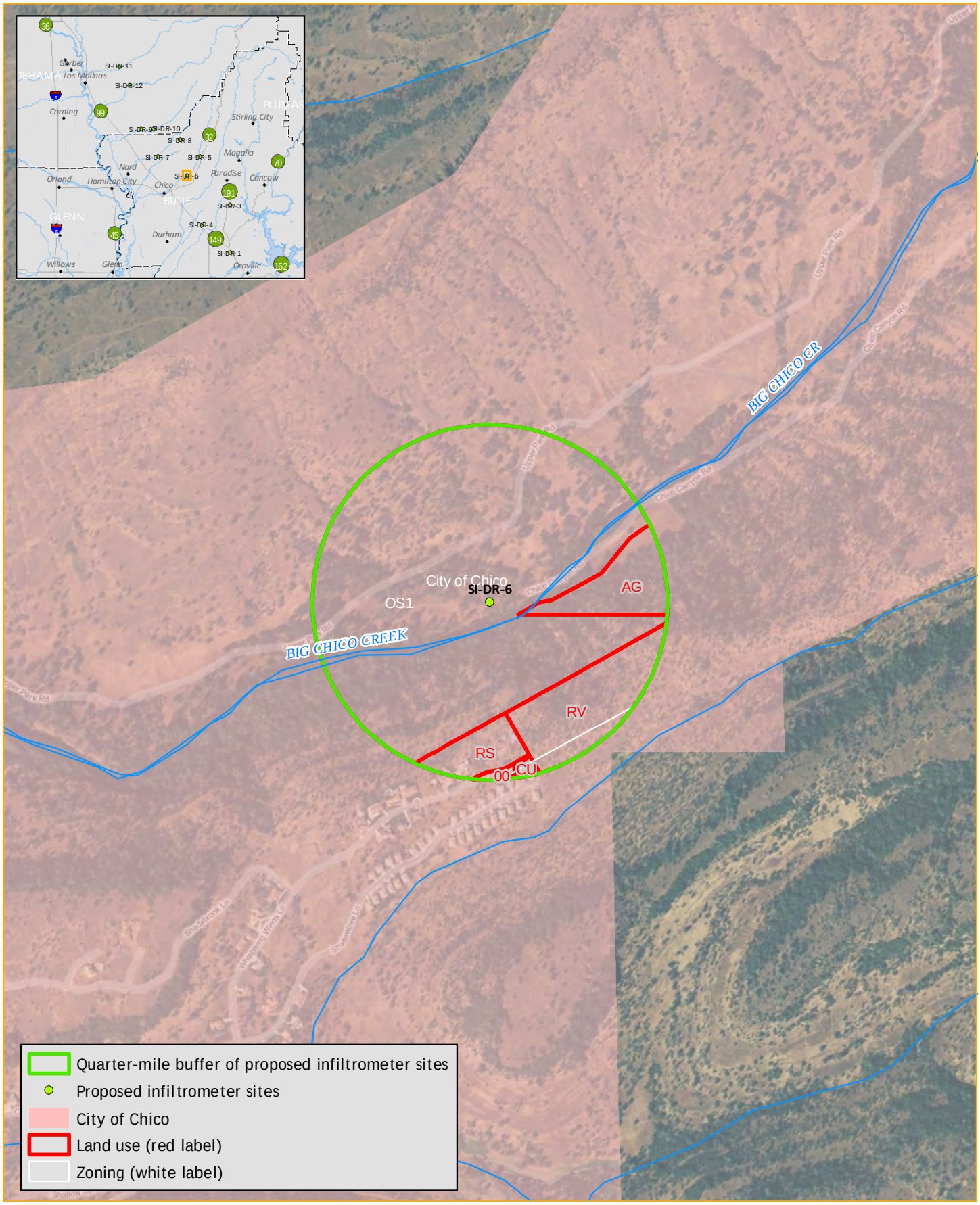
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-6



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

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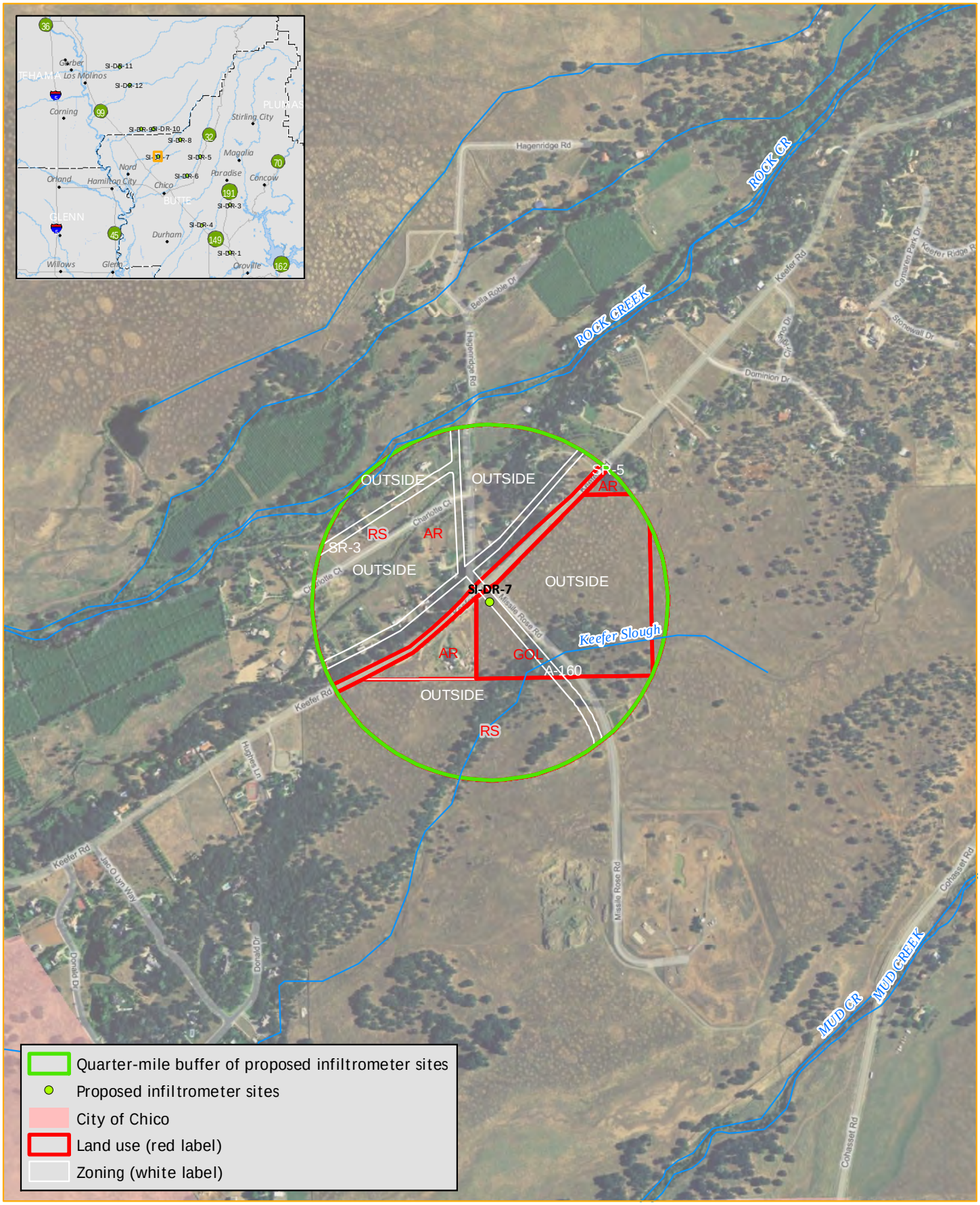
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-7



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Zoning/Land Use data provided by Butte County
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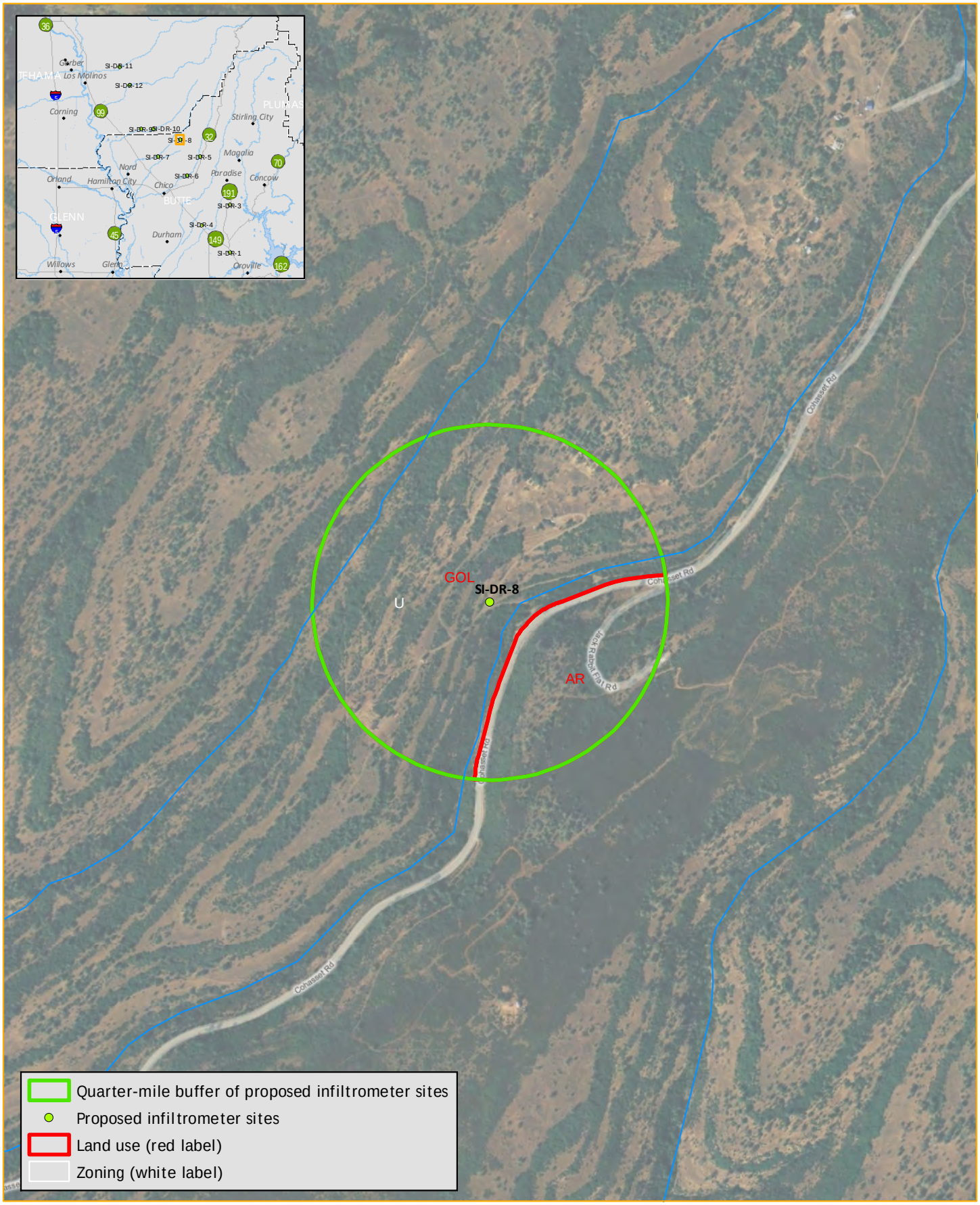
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-8



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

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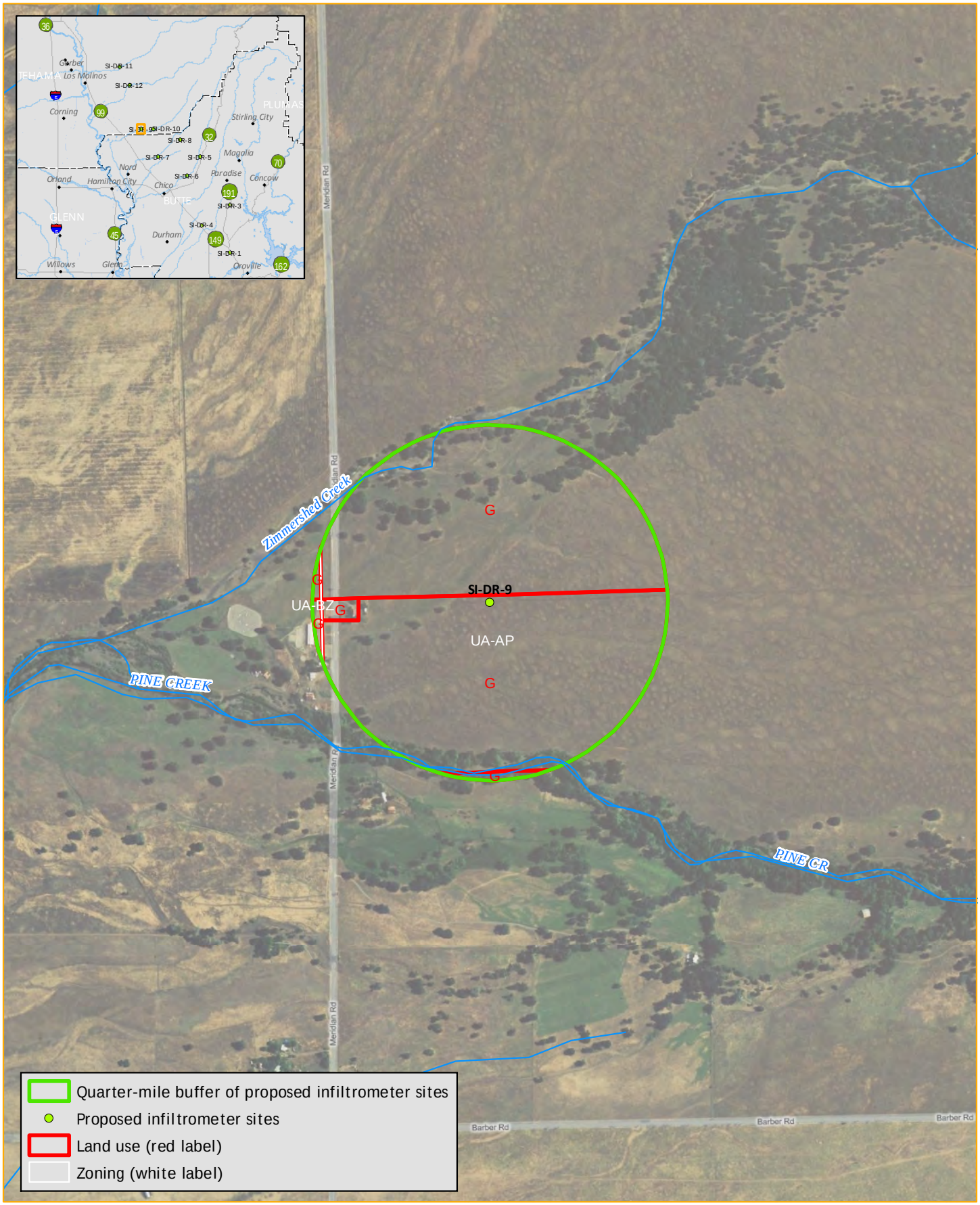
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-9



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Tehama County
Map date: May 6, 2010

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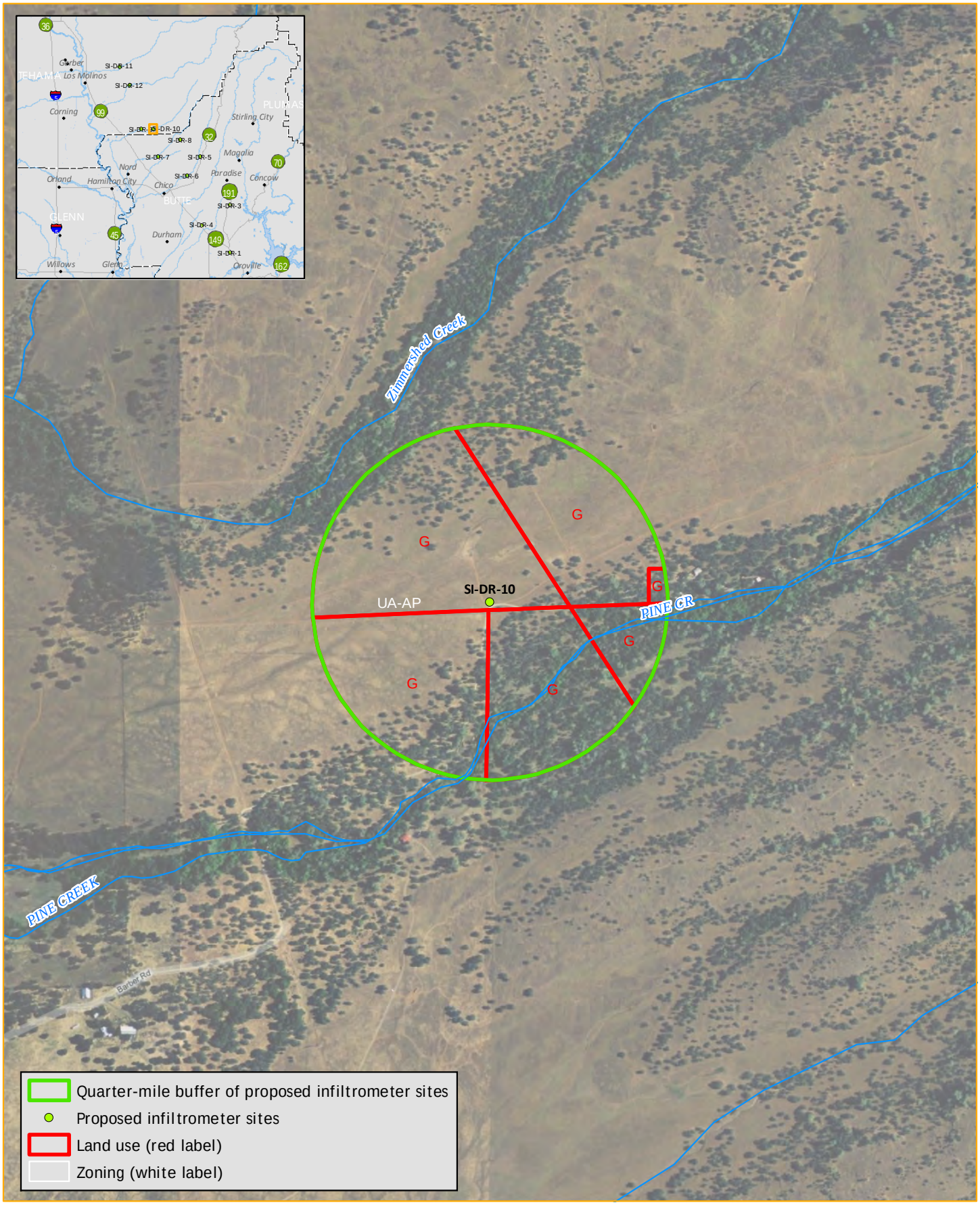
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-10



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Zoning/Land Use data provided by Tehama County
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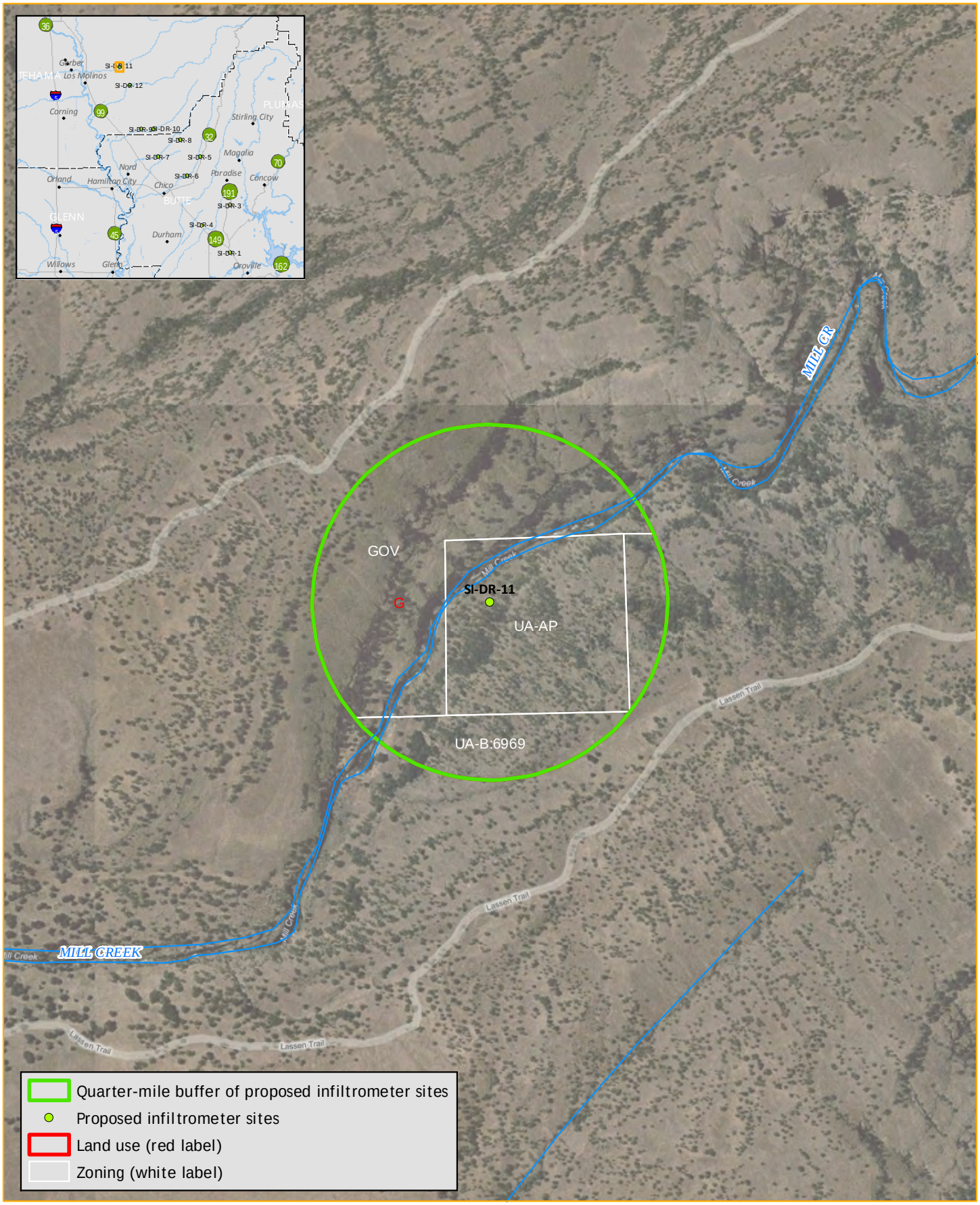
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-11



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Tehama County
Map date: May 6, 2010

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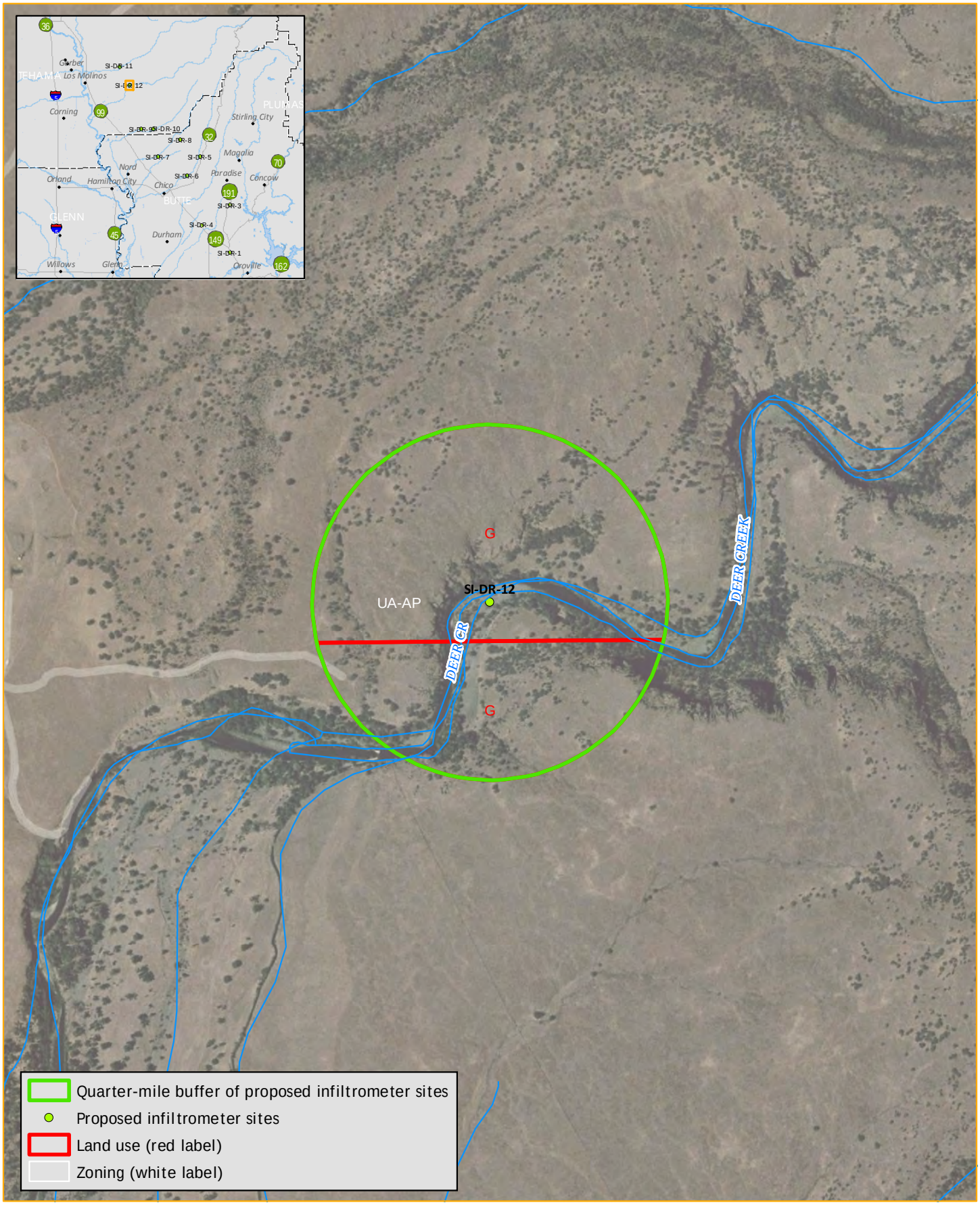
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

SI-DR-12



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Tehama County
Map date: May 6, 2010

Feet
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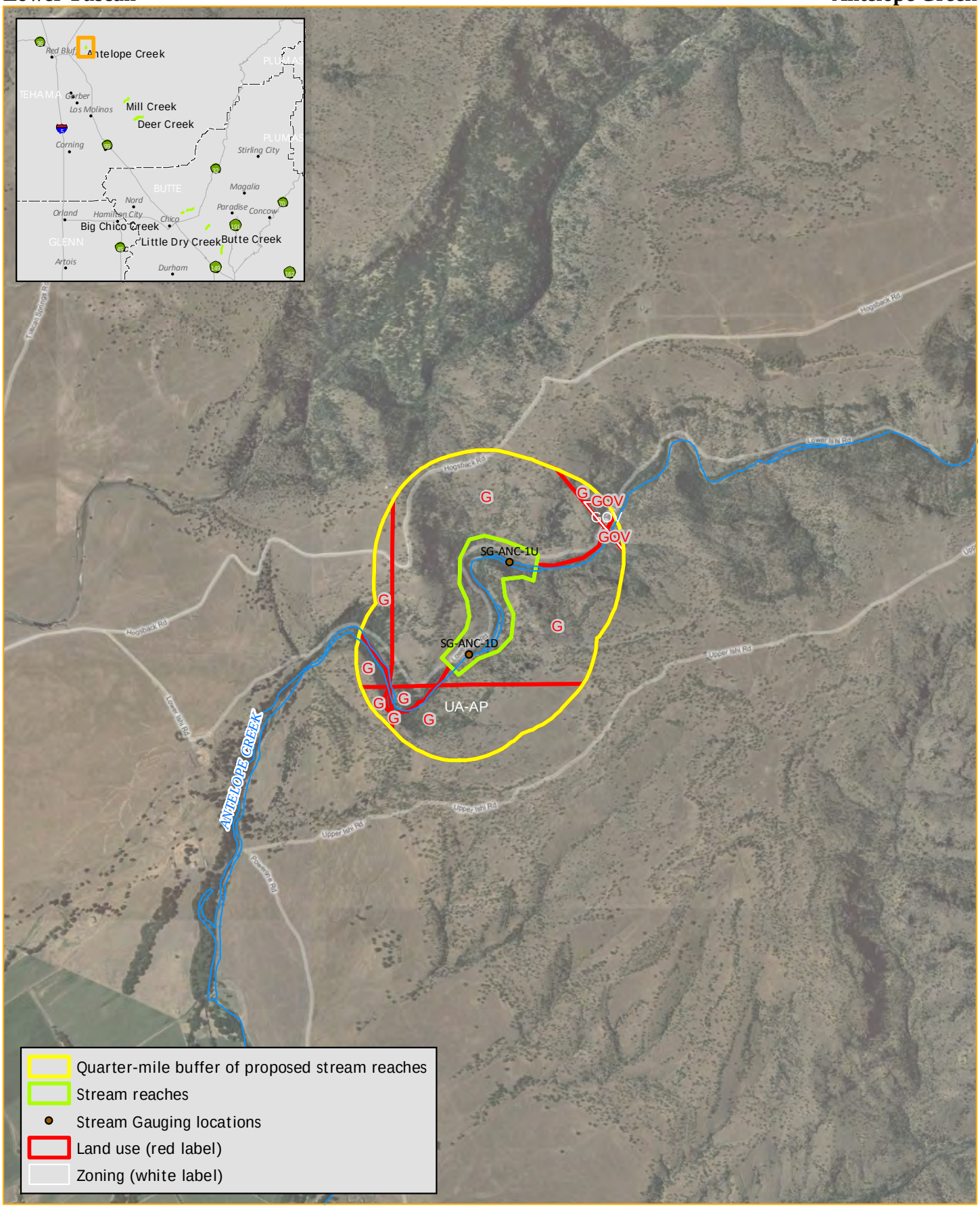
GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Appendix B
Stream Reach Activities - Aerial Photos

Lower Tuscan

Antelope Creek



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Tehama County
Map date: May 6, 2010

Feet
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GALLAWAY CONSULTING
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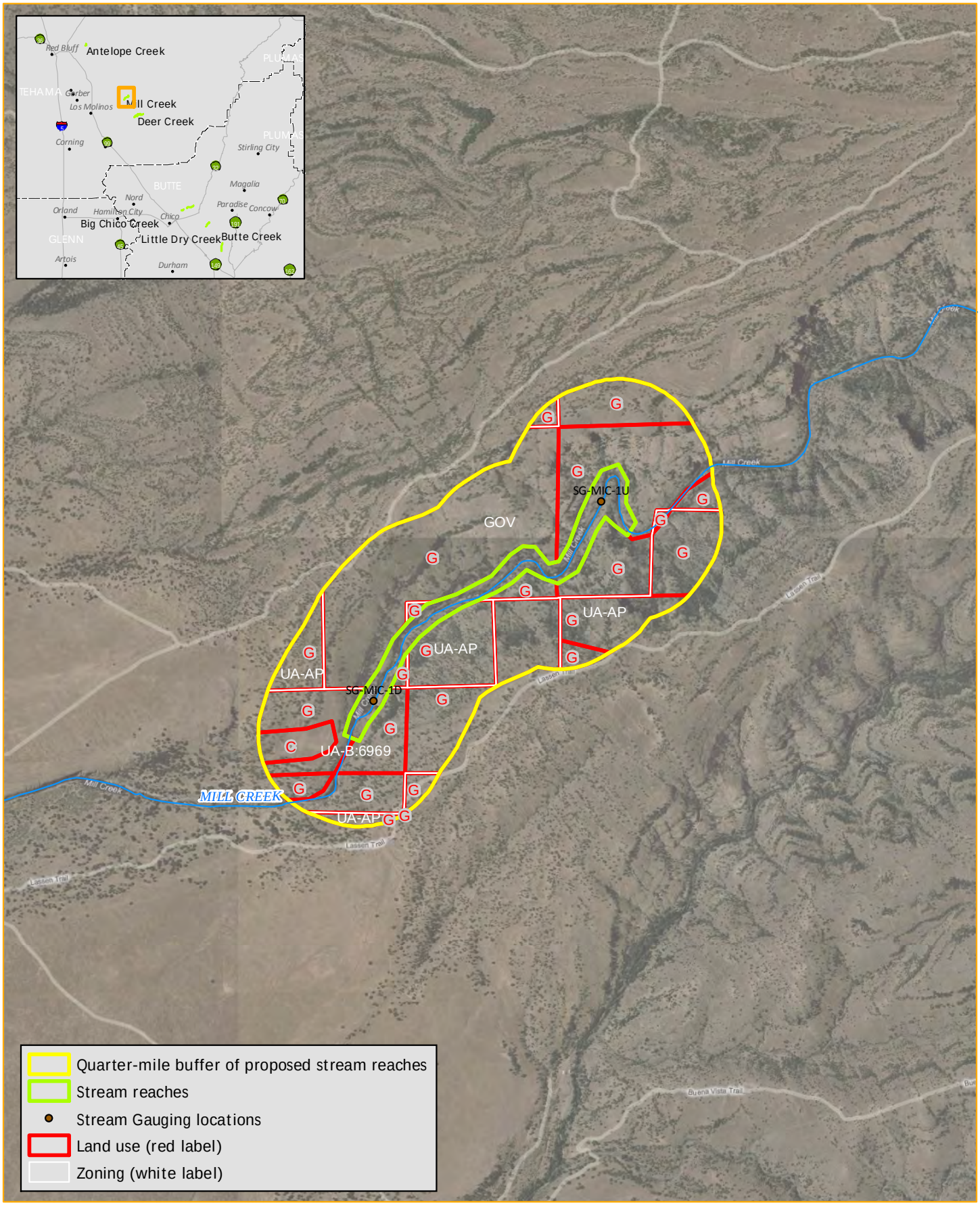
Lower Tuscan

Mill Creek



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Tehama County
Map date: May 6, 2010

Feet
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GALLAWAY CONSULTING
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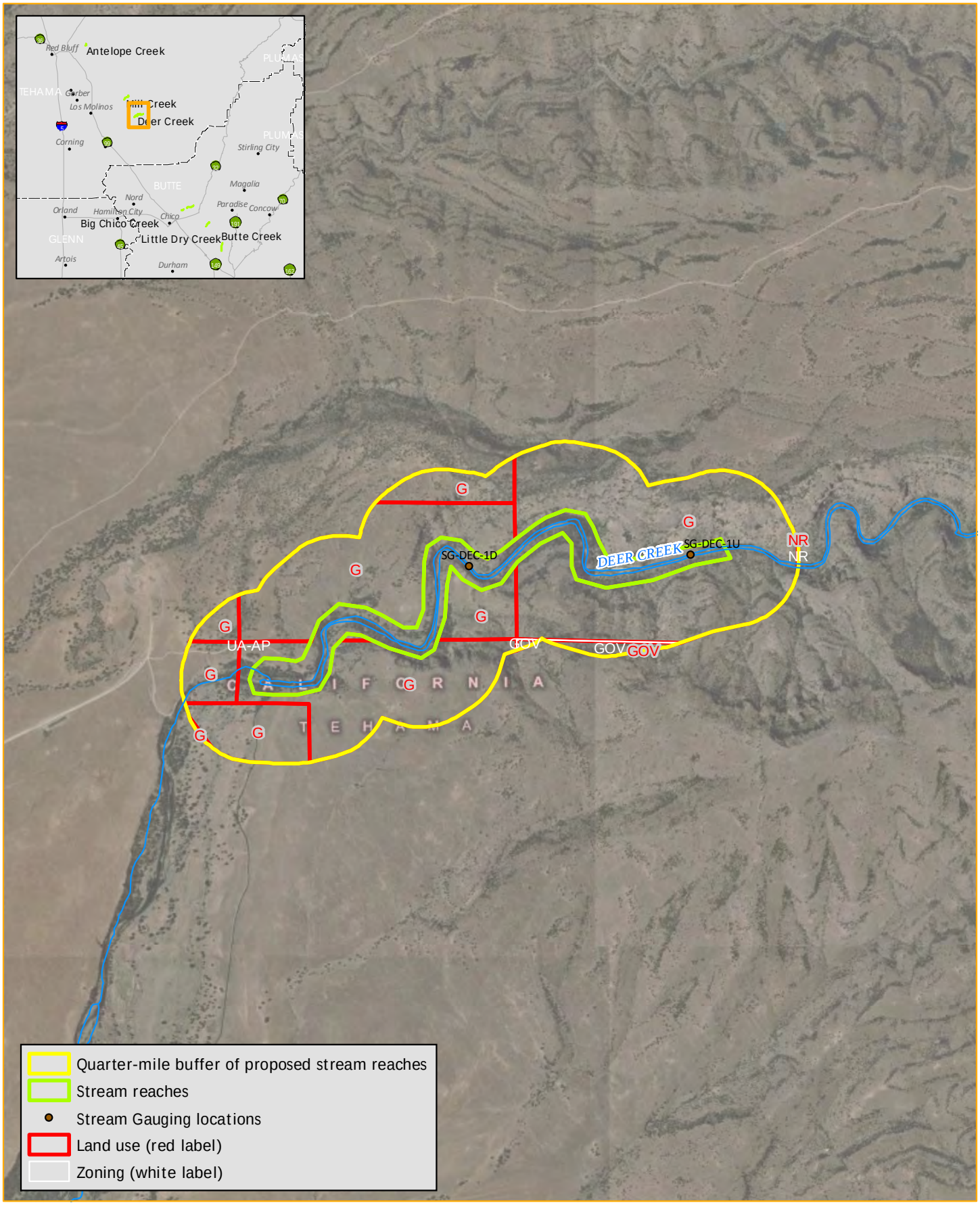
Lower Tuscan

Deer Creek



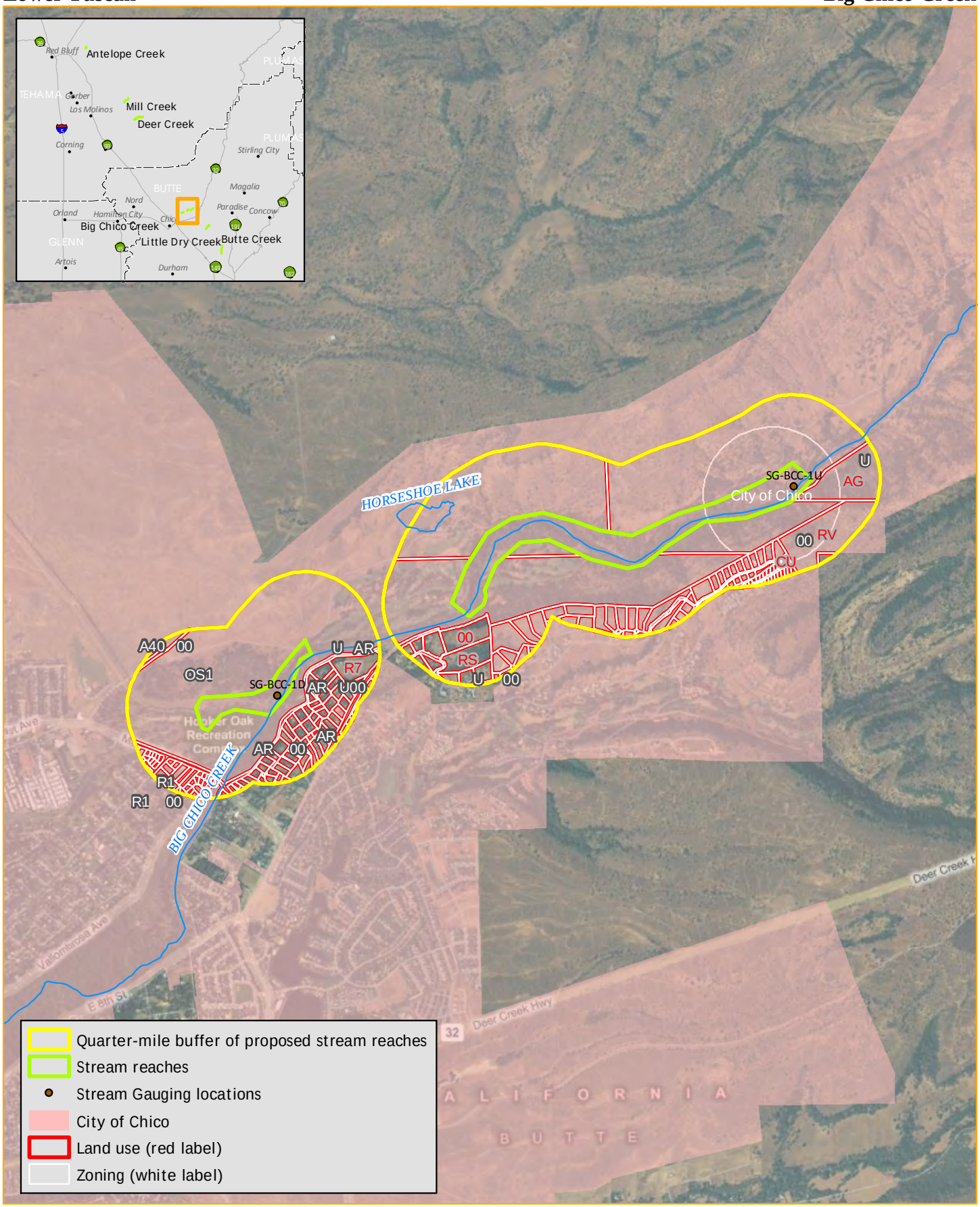
Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Tehama County
Map date: May 6, 2010

Feet
0 1,000 2,000

GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

Big Chico Creek



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County, City of Chico
Map date: May 6, 2010

Feet
0 500 1,000

GALLAWAY CONSULTING
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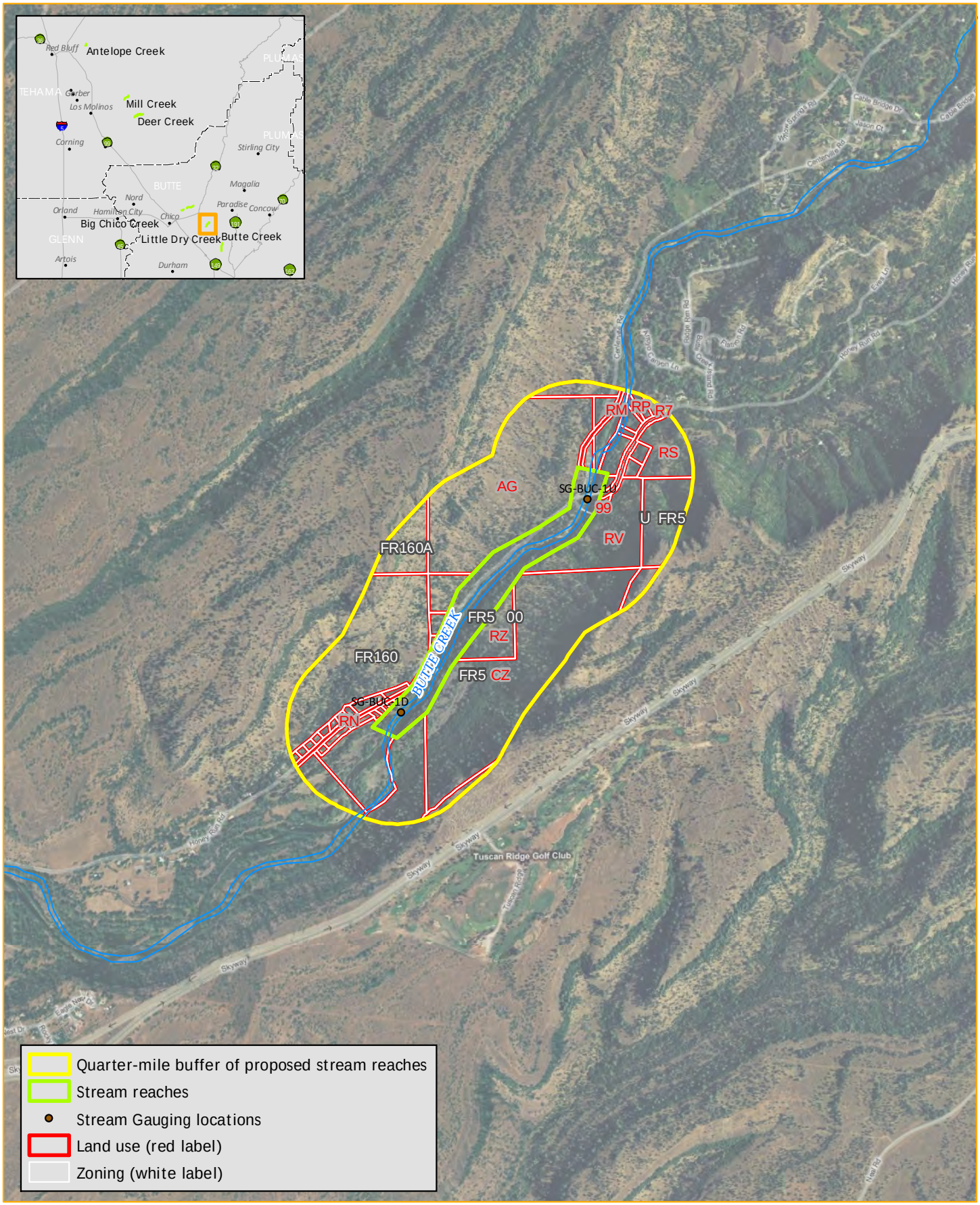
Lower Tuscan

Butte Creek



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
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GALLAWAY CONSULTING
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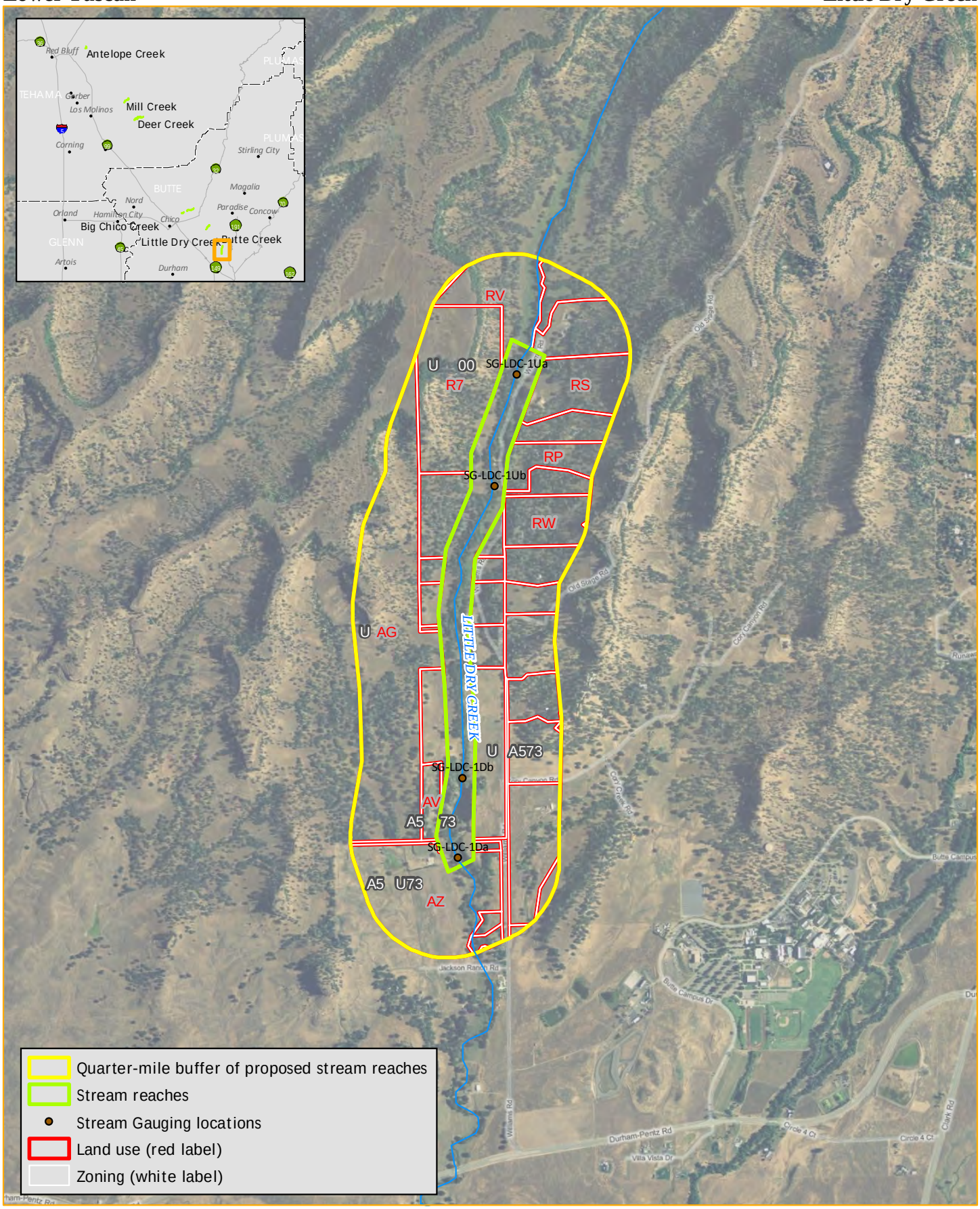
Lower Tuscan

Little Dry Creek



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
0 500 1,000

GALLAWAY CONSULTING
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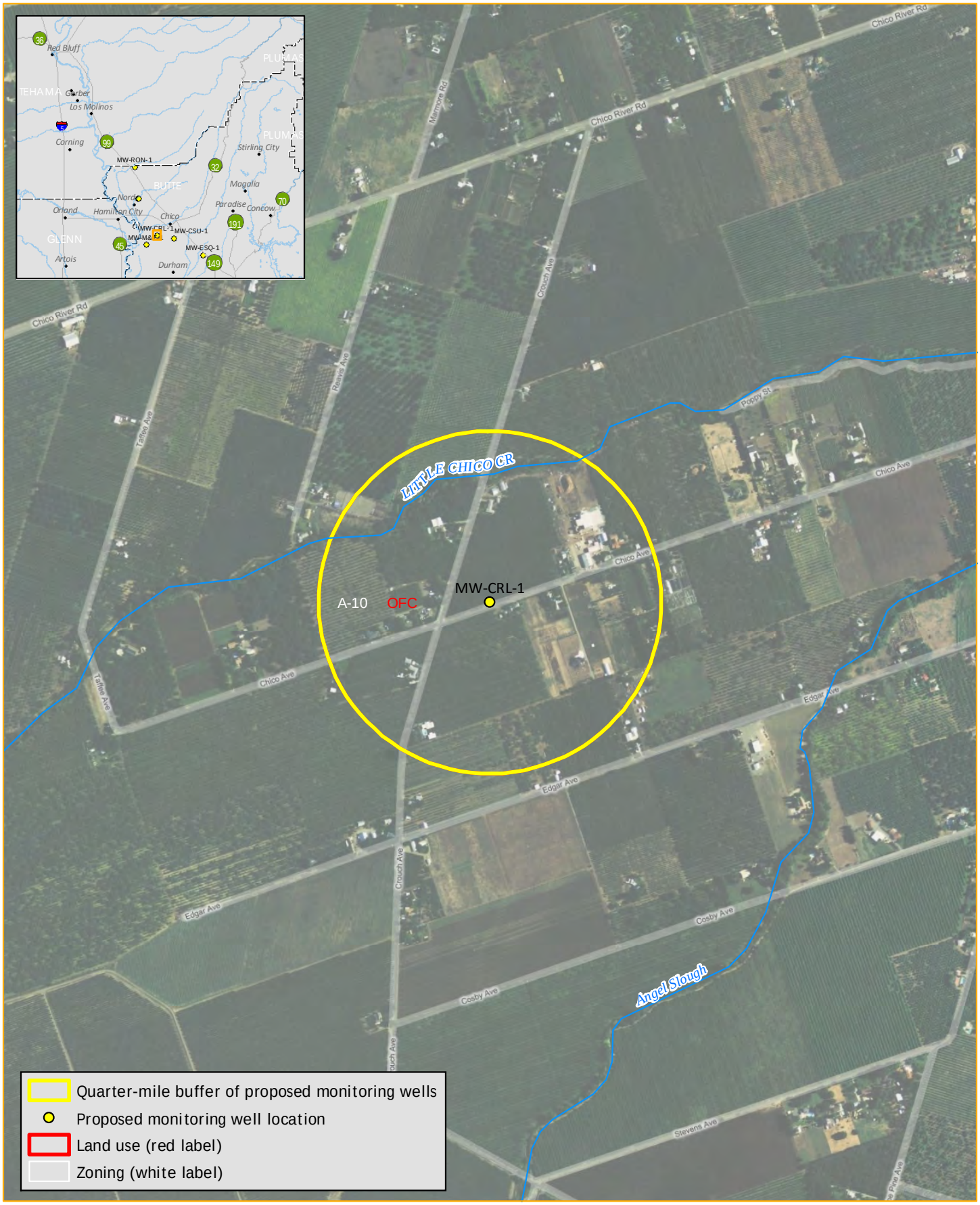
Appendix C
Monitoring Well Sites - Aerial Photos

Lower Tuscan

MW-CRL-1



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
0 500 1,000

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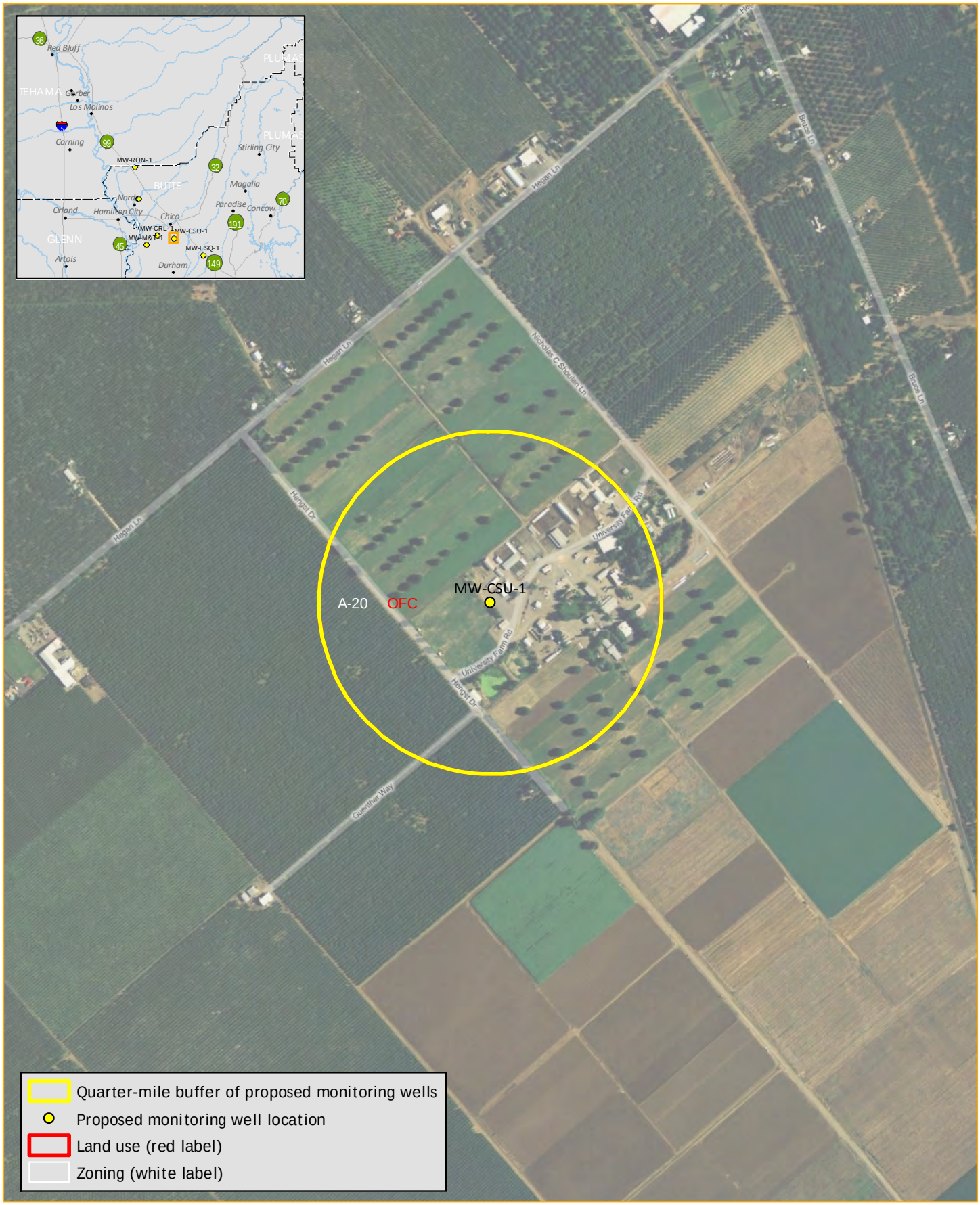
A DIVISION OF NORTHSTAR ENGINEERING

Lower Tuscan

MW-CSU-1



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
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GALLAWAY CONSULTING
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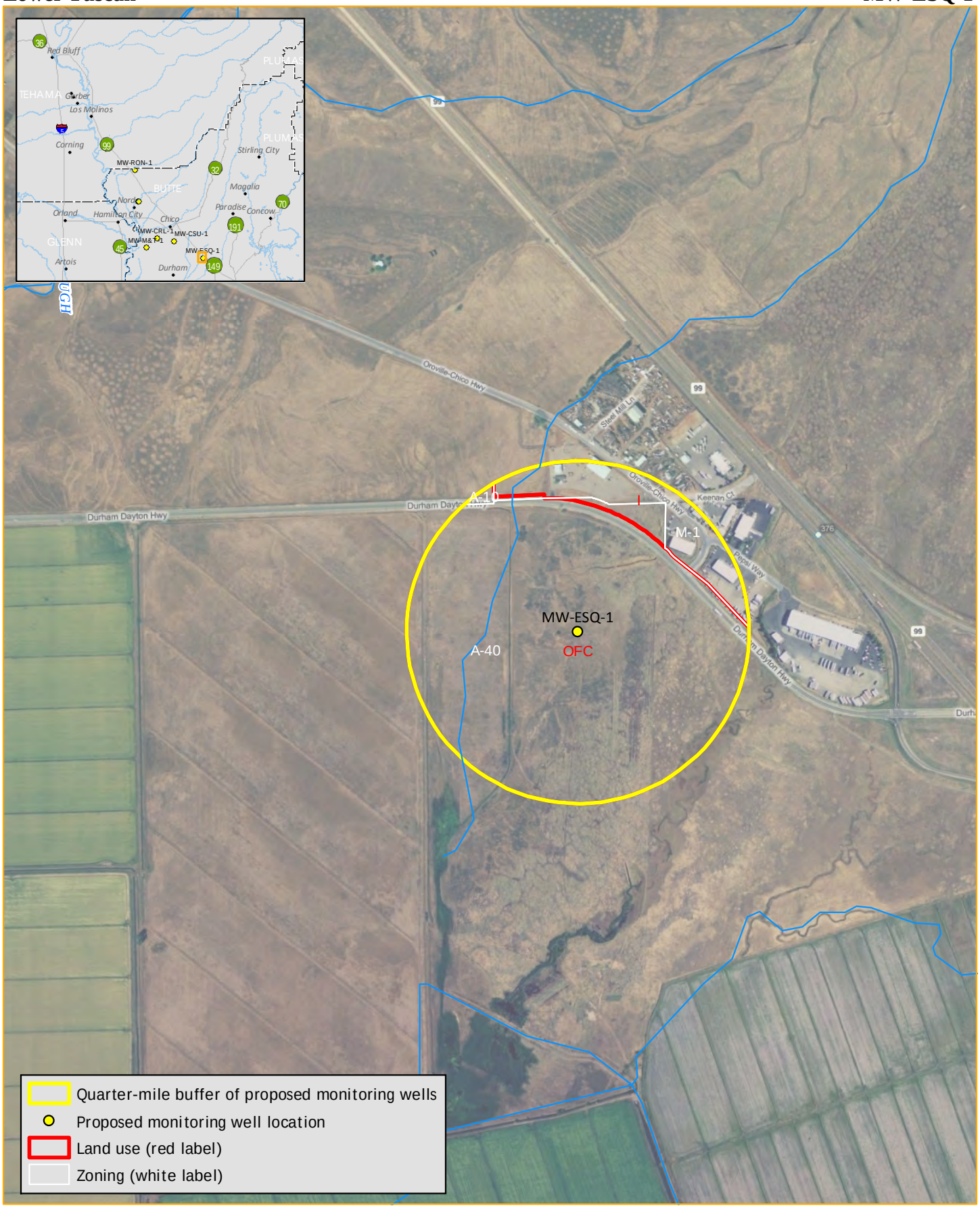
Lower Tuscan

MW-ESQ-1



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
0 500 1,000

GALLAWAY CONSULTING
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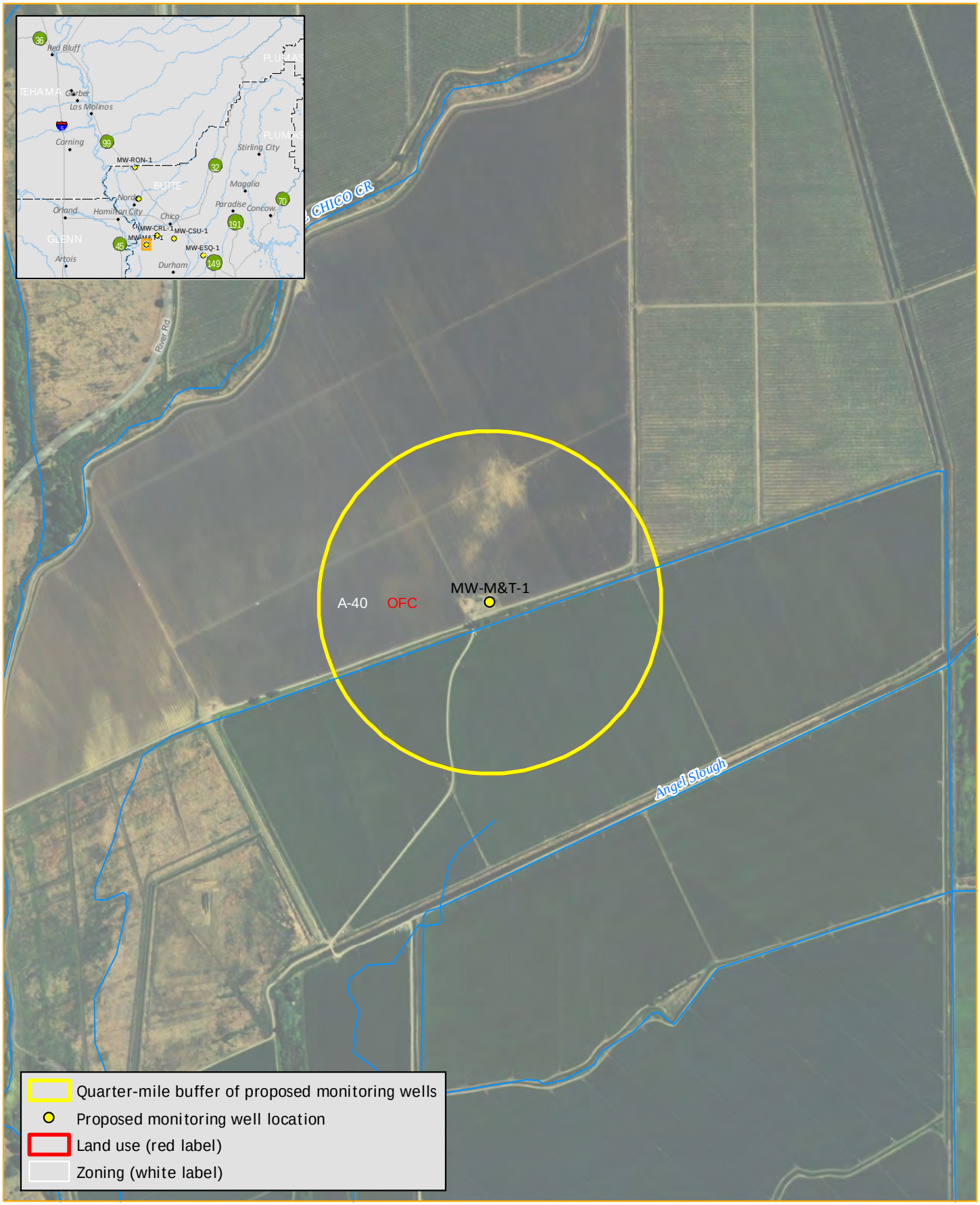
Lower Tuscan

MW-M&T-1



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
0 500 1,000

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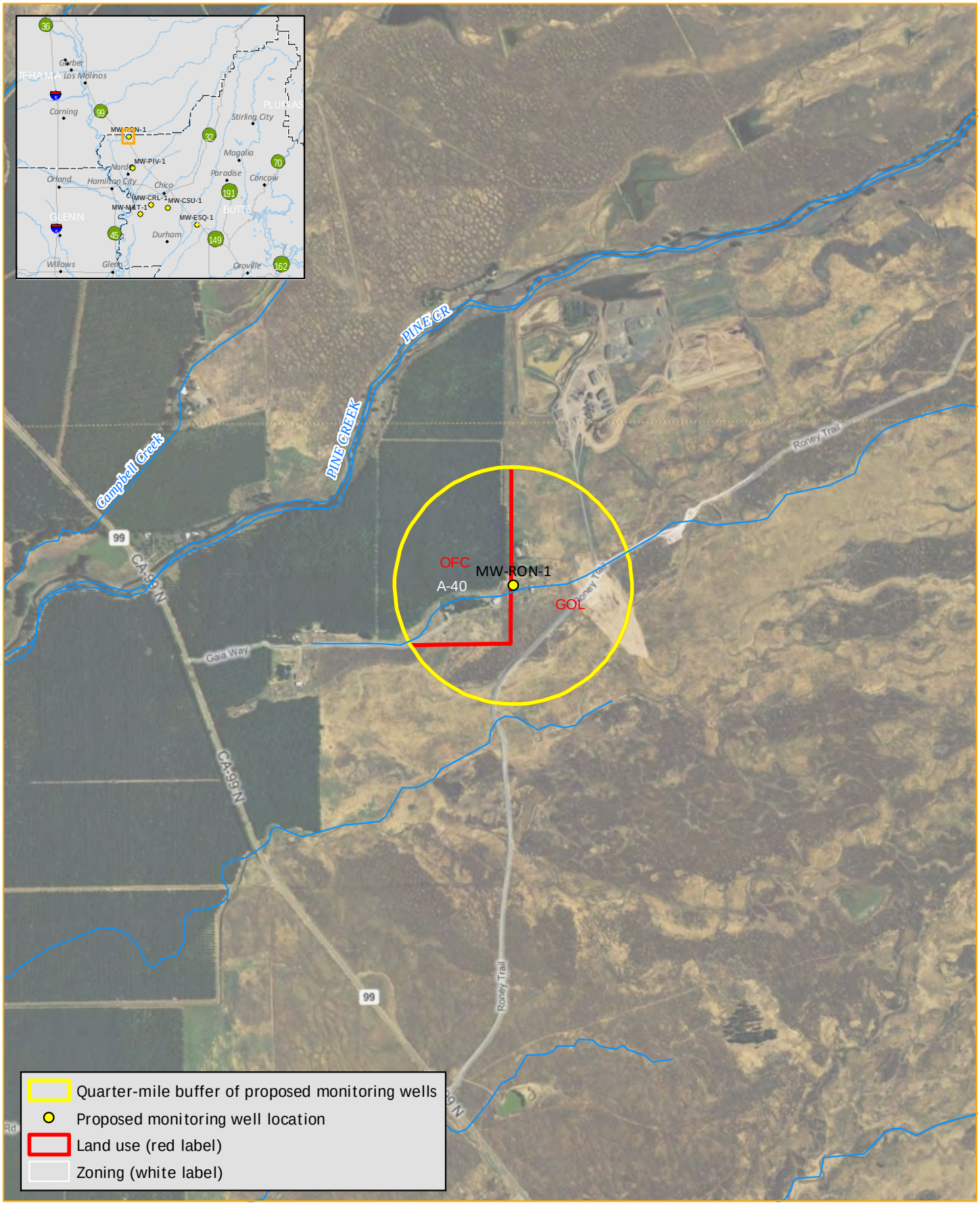
Lower Tuscan

MW-RON-1



Point locations provided by Brown & Caldwell
Zoning/Land Use data provided by Butte County
Map date: May 6, 2010

Feet
0 500 1,000

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Appendix D
Biological Resources Assessment and Biological Assessment

Biological Resources Assessment/
Biological Assessment

Lower Tuscan Aquifer Monitoring, Recharge, and Data Management

Butte and Tehama Counties, California

May 2010

Prepared for:

Butte County Department of Water and Resource Conservation
ATTN: Paul Gosselin, Director
308 Nelson Avenue
Oroville, CA 95965-3302

Prepared by:

GALLAWAY
CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING
111 MISSION RANCH BLVD, STE 100, CHICO CA 95926
PHONE (530) 343-8327 • FAX (530) 893-2113

Biological Resources Assessment/
Biological Assessment

Lower Tuscan Aquifer Monitoring, Recharge, and Data Management

May 2010

Location:

Butte, and Tehama Counties, California

Acorn Hollow, Campbell Mound, Cherokee, Chico, Cohasset, Hamlin Canyon, Nord, Ord Ferry, Orland, Oroville, Palermo, Paradise West, Richardson Springs, Richardson Springs NW, Shippee, and Tuscan Springs USGS Quadrangles

Contact:

Kamie Loeser, Project Manager
Gallaway Consulting: A Division of NorthStar Engineering
(530) 343-8327
kloeser@gallawayconsulting.net

Prepared for:

Butte County Department of Water and Resource Conservation
ATTN: Paul Gosselin, Director
308 Nelson Avenue
Oroville, CA 95965-3302

Prepared by:

GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING
111 MISSION RANCH BLVD, STE 100, CHICO CA 95926
PHONE (530) 343-8327 • FAX (530) 893-2113

Summary

The proposed Lower Tuscan Aquifer Monitoring, Recharge, and Data Management project (project) is a three year scientific study to evaluate the recharge and recovery capabilities of the Tuscan Aquifer system. This project will study the Tuscan Aquifer system by running existing production wells on existing farms/ranches, monitoring the aquifer drawdown through monitoring wells, and monitoring recharge of the aquifer in portions of stream channels where the Tuscan formation is exposed, up-gradient of the well locations. Due to the multi-faceted nature of this project, the locations of these production wells and monitoring sites are spread throughout northern Butte County, and into Tehama County. Project activities will include soil infiltration testing/infiltrometer testing, stream gauging, stream aquifer temperature gradient measuring, installation of additional groundwater monitoring infrastructure, and aquifer performance testing as the methods of data acquisition.

No potential impacts to natural resources will occur during the project activities utilizing existing wells. However, a variety of special-status plant and animal species do have potential to occur within or in close proximity to the portions of the project where proposed monitoring and data collection equipment will be installed. These species include:

Federally Listed Species	
Species Name	**Status**
Valley elderberry longhorn beetle	federally threatened
Giant garter snake	federally threatened
Central valley Spring-run Chinook salmon	federally threatened
Central valley steelhead	federally threatened
State Listed Species	
Species Name	**Status**
Northwestern pond turtle	state species of special concern
Hardhead	state species of special concern
Townsend's big-eared bat	state species of special concern
Western red bat	state species of special concern
Burrowing owl	state species of special concern
Loggerhead shrike	state species of special concern
Northern harrier	state species of special concern
Yellow warbler	state species of special concern
Bald eagle	state endangered

State Listed Species	
Species Name	**Status**
Swainson's hawk	state threatened
Giant garter snake	state threatened
Central valley Spring-run Chinook salmon	state threatened
Ahart's dwarf rush	CNPS List 1b
Ahart's paronychia	CNPS List 1b
Red Bluff dwarf rush	CNPS List 1b
Round-leaved filaree	CNPS List 1b
Butte County checkerbloom	CNPS List 1b
Brown fox sedge	CNPS List 2
Butte County fritillary	CNPS List 3

There is also a high potential for migratory bird and raptor species protected under the Migratory Bird Treaty Act (MBTA) to utilize the proposed project areas for nesting.

Avoidance measures have been incorporated in the project implementation to prevent impacts to all of the special-status plant and wildlife species with potential to occur in the project areas. Prior to any project activities including data collection and the installation of equipment and monitoring wells, a qualified biologist/botanist will survey each area for special-status species and assist in identifying the actual installation locations. Thus, this project is not anticipated to impact any special-status species.

Sensitive natural communities, as designated by the California Department of Fish and Game, including Great Valley cottonwood riparian forest, Great Valley mixed riparian forest, and Great Valley/ Valley Oak Riparian forest may occur along the banks of the streams where recharge monitoring will take place. To avoid potential impacts to these sensitive natural communities, access to the streams will be by vehicles where existing roads occur or by foot if no roads are present. Minimal vegetation clearing would be necessary for installation of soil infiltrometers and piezometers. All native tree and shrub species will be avoided to the greatest extent feasible. No tree species 5 inches in diameter at breast height or larger will be removed during the installation or monitoring activities.

Due to the installation of monitoring and testing equipment in and in close proximity to intermittent streams, the project will likely be allowed to operate under the general conditions of the Nationwide Permit 5 from the U.S. Army Corps of Engineers (USACE). If more than 1/10 of an acre of impacts will occur to the stream or

jurisdictional riparian wetland or more than 10 cubic yards of dredge material is extracted, then authorization from the USACE will be required. Additionally, the project will need to comply with the general conditions of a Central Valley Regional Water Quality Control Board (RWQCB) Section 401 Clean Water Certification and a California Department of Fish and Game (CDFG) Section 1600 Lake and Streambed Alteration Agreement.

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Table 1: Listed, Candidate Species, and Critical Habitat Potentially Occurring or Known to Occur in the Action Areas..... 12

List of Abbreviated Terms

AA	Action Areas
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
DBH	Diameter at breast height (~4 ft)
DW&RC	Department of Water and Resource Conservation
ESA	Endangered Species Act
ft	foot/feet
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Marine Fisheries Service
SNC	Sensitive Natural Communities
USACE	Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

Chapter 1. Introduction

The proposed Lower Tuscan Aquifer Monitoring, Recharge, and Data Management project (project) is a three year scientific study of the recharge and recovery capabilities of the Lower Tuscan Aquifer system to provide water resource agencies the data needed to sustainably manage this resource. The project will focus on the Lower Tuscan Aquifer located in Butte and Tehama Counties.

1.1. Project History

The Tuscan Aquifer system is the water bearing portion of the Sacramento Valley groundwater basin that extends from the Redding Basin in the north to the Sutter Buttes in the south, and from the eastern edge of the Sacramento Valley westward. The Tuscan Formation consists of four units, Units A through D. This study focuses on Units A and B, which contain the majority of the groundwater in the Tuscan Formation and is referred to as the Lower Tuscan Aquifer. In the subsurface, the Lower Tuscan Formation covers an area of approximately 850 square miles and has an estimated average thickness of about 500 feet.

The Lower Tuscan Aquifer system is a critical water resource to the region. It is hypothesized that under current hydrologic conditions, the Lower Tuscan Aquifer system recharges along the eastern margin of the northern Sacramento Valley, where the Lower Tuscan Formation is exposed (crops-out) at the ground surface, particularly along each of the six perennial streams crossing the Tuscan Formation: Antelope Creek, Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek. However, regional studies to identify the groundwater drawdown and general soil infiltration rates of the Lower Tuscan Aquifer system have been limited. This proposed scientific study will provide a greater understanding of the aquifer system by assessing the recharge along the Lower Tuscan Aquifer outcrops and fluctuations between aquifer gradients based on the influence of groundwater withdrawal.

1.2. Project Description

The County of Butte has been awarded grant funds from the Department of Water Resources through Proposition 50 to conduct the Lower Tuscan Aquifer Monitoring,

Recharge and Data Management Project. Project activities will take place in Butte and Tehama Counties (**Appendix A**). The three year project is being managed by the Butte County Department of Water and Resource Conservation (DW&RC) in cooperation with four additional counties including Glenn, Colusa, Tehama and Sutter County (Four County Group).

The proposed project involves the collection and analysis of technical data and the development of needed analytical investigative tools to help further the scientific understanding of the Lower Tuscan Aquifer system and its interaction with other aquifer systems. The ultimate purpose of this project is to assess the recharge and recovery capabilities of the Lower Tuscan Aquifer system to provide water resource agencies the data needed to sustainably manage this resource. Project activities will include soil infiltration testing/infiltrometer testing, stream gauging, stream aquifer temperature gradient measuring, installation of additional groundwater monitoring infrastructure, and aquifer performance testing as the methods of data acquisition.

1.2.1. Soil Infiltration Testing

Soil infiltration testing will measure the rate at which soil is able to absorb water and will be used to assess the passive and active water infiltration capacity of the Lower Tuscan Aquifer. Passive infiltration capacity refers to the potential for water to infiltrate the exposed Lower Tuscan Aquifer soils across the study area; active infiltration capacity refers to potential for water to infiltrate areas near active streams that could serve as active groundwater recharge areas (that is, areas where surface water would be spread and allowed to percolate down into the aquifer). A total of 12 soil infiltration testing areas have been identified for this project (10 sites to be installed, 2 alternative sites). Access to sites will be by vehicles where a road is present or by foot if no road is present. Site preparation associated with installing the monitoring equipment includes the use of hand tools to clear the 8 square foot area and digging a 3-foot test hole in order to install one 24 inch diameter double-ring infiltrometer at each site. If access allows, a backhoe may be used to dig the 3-foot test hole. Once installed, the infiltrometer tests will be conducted at each site for up to 12 hours. Immediately adjacent to the infiltrometer test location, a complete soil profile and soil log will be generated from a hand augured 2-inch diameter borehole to a depth of 5-feet below the ground surface. Soil infiltration sites are identified as “SI” on **Appendix A**.

1.2.2. Stream Gauging and Monitoring

Stream gauging along perennial streams will be used to determine the volume and rate of surface water that recharges into or is discharged from exposures of the Tuscan Formation. The project proposes to use existing stream gauge facilities, when available, or install temporary staff gauges to gather this data. Staff gauges consist of a long ruler attached to a mounting pole. The resulting data will provide a quantitative assessment of the water exchange relationship between the Tuscan Formation Aquifer system and overlying streams at selected sites. Six streams have been identified as part of the project including Antelope, Mill, Deer, Big Chico, Butte, and Little Dry creeks. Within each of these streams, "stream reaches" have been designated where project activities would potentially occur (**Appendix A**). A stream gauge will be established at either end of each stream reach (a total of 12 stream gauging stations). Access to sites will be by vehicles where a road is present or by foot if no road is present. Installation of staff gauges will consist of either hand-driving a 2-inch diameter galvanized steel post into the stream bed or attaching the gauge to an existing structure, such as a bridge. Each gauge will also consist of a temporary stilling well, within the mounting post, in which a pressure transducer and temperature data logger will be placed. The staff gauge installation process would take approximately 2 to 6 hours and will be conducted during the summer months when flows are low. Following the installation or retrofitting activities, monitoring will be conducted bi-weekly from April to November and will consist of visually reading the staff gauge and downloading the transducer data to a field computer (approximately 20 to 40 minutes). Stream gauging sites are identified as "SG" on **Appendix A**.

1.2.3. Stream-Aquifer Interation Sites/Temperature Gradient Measurements

The stream-aquifer interaction sites are areas where measurement of the stream aquifer temperature gradient will be inventoried. This measurement is used to determine how groundwater is influenced by the influx of surface waters into the aquifer or, conversely, the movement of groundwater towards the surface. The temperature gradient adjacent to the streams provides information regarding the vertical direction of water movement and the amount of water a stream is losing or gaining from an aquifer. Data will be used to create aquifer depth-temperature tables for a report analyzing the interaction of surface waters in the stream bed with the movement of water into and out of the aquifer system to assess overall recharge. A total of 24 stream-aquifer interaction sites will be located outside the stream channel

within each of the six stream reaches. Each stream reach will contain four stream-aquifer interaction sites where piezometer wells will be installed. The piezometers will be installed either by a hand-auger and roto-hammer or small auger on a limited access mobile drill rig (only if existing access road are available) to depths of up to 50 feet. Site preparation for installation of the piezometer wells will include the clearing of an 8 square foot area, drilling a 4 to 6 inch borehole up to 50 feet in depth, and performing an elevation and coordinate survey. The piezometer wells will be removed following the conclusion of the monitoring period.

Slug testing will be performed on a minimum of two piezometer wells within each stream reach and seepage meter testing will be conducted where the streambed is thin in the vicinity of each piezometer well. The slug testing will not require additional instrumentation to be installed. Three seepage meter tests will be conducted one time during the summer months in the vicinity of each piezometer well. The seepage meter tests will consist of submerging a small bucket (1 foot in diameter) and/or a drum (2 feet in diameter) into the surface-water of the stream and pressing it up to 4 inches into the streambed to calculate the seepage rate over a period of 1 hour. The bucket or drum is removed following the completion of the test.

1.2.4. Groundwater Monitoring Well Installation

Dedicated groundwater monitoring wells have been installed over the past years throughout the northern Sacramento Valley to provide data regarding the depths of different aquifers. A total of 10 monitoring wells will be used to evaluate groundwater recharge and recovery. The project has identified 7 proposed monitoring well sites and 3 existing well sites. The proposed monitoring wells cannot be used for the pumping or production of water. Small diameter PVC pipes with perforations at varying depths are placed near a production well and measurements of groundwater depth and quantity are made at different times to assess local groundwater recharge and recovery. Three of the existing monitoring wells will need to be retrofitted with transducers to monitor the groundwater level and temperature data. Once the monitoring project is complete, the newly constructed monitoring wells will be integrated into the cooperative Department of Water Resources-Butte County DW&RC groundwater monitoring network. The location of these monitoring well sites are identified as “MW” on **Appendix A**. Due to the lack of impacts associated with using existing wells to monitor groundwater, no further biological analysis of these sites is necessary. Where the installation of new monitoring wells is proposed, a 100 foot by 100 foot square area will be identified and a 6 to 8 inch diameter pilot

borehole will be drilled up to 1,000 feet deep. The soil cores produced will be analyzed and an elevation and coordinate survey will be conducted at each site. The pilot borehole will then be enlarged to a diameter of 12 to 16 inches to install the groundwater monitoring well. Approximately 35 cubic yards of material/drilling spoils will be produced during installation activities.

1.2.5. Aquifer Performance Testing

Production/test wells will be used to determine the affect of pumping groundwater on the Lower Tuscan Aquifer. All production/test wells will be existing wells currently used by landowners for agricultural purposes. During the project, these existing wells will be pumped for approximately 10 days and then shut down for a period of 10 days. The water extracted during these tests will be assimilated into the daily water needs/uses of the farms on which the wells are located. No action or construction will be necessary other than coordination with land owners. The location of all of these existing production/test wells are identified as “PW” or “IW” on **Appendix A**. Due to the lack of impacts associated with this portion of the project, no further biological analysis of these sites is necessary.

Chapter 2. Study Methods

Biological surveys were conducted within ¼ mile surrounding each area of potential impact (Action Area) to determine what biological and natural resources may occur and if any of these resources could be impacted by the proposed project. These include areas in which new data measuring equipment and monitoring wells need to be installed.

2.1.1. Special Status Species

Gallaway Consulting obtained lists of special-status species that potentially occur in the vicinity of the Action Areas from the U.S. Fish and Wildlife Service (USFWS, **Appendix B**), the California Department of Fish and Game's (CDFG) Natural Diversity Database (CNDDB, **Appendix C**), and the California Native Plant Society's (CNPS) list of rare and endangered plants (**Appendix D**). Special-status species are those that fall into one of the following categories:

- Listed as threatened or endangered, or are proposed or candidates for listing under the California Endangered Species Act (CESA, 14 California Code of Regulations 670.5) or the federal Endangered Species Act (ESA, 50 Code of Federal Regulations 17.12);
- Listed as a Species of Special Concern by CDFG or protected under the California Fish and Game Code (CFGC, §3503.5);
- Included on the CNPS List 1A, 1B, or 2;
- Protected under the Migratory Bird Treaty Act (MBTA); or
- Species that are otherwise protected under policies or ordinances at the local or regional level as required by the California Environmental Quality Act (CEQA, §15380).

2.1.2. Sensitive Natural Communities

Gallaway Consulting consulted the CNDDB to identify Sensitive Natural Communities (SNC) occurring on the Acorn Hollow, Richardson Springs NW, Campbell Mound, Richardson Springs, Cohasset, Paradise West, Hamlin Canyon, Cherokee, Shippee, Oroville, Orland, Chico, Ord Ferry, Nord, Palermo, and Tuscan

Springs and eight surrounding USGS quadrangles. The State Resources Agency define project effects that substantially diminish habitat for fish, wildlife or plants, or that disrupt or divide the physical arrangement of an established community as significant impacts under the California Environmental Quality Act (CEQA, Public Resources Code §21083 and CEQA Guidelines §15382). This definition applies to certain SNC because of their scarcity and ecological values and because the remaining occurrences are vulnerable to elimination. The CNDDB identifies SNC based on classifications created by Holland, R.F. (1986), which includes those communities that, if eliminated or substantially degraded, would sustain a significant adverse impact as defined under CEQA. Sensitive Natural Communities are important ecologically because their degradation and destruction could threaten populations of dependent plant and wildlife species and significantly reduce the regional distribution and viability of the community. If the number and extent of SNC continue to diminish, the status of rare, threatened, or endangered species could become more precarious, and populations of common species (i.e., non special-status species) could become less viable. Loss of SNC also can eliminate or reduce important ecosystem functions, such as water filtration by wetlands and bank stabilization by riparian woodlands.

2.1.3. Wild and Scenic Rivers

Gallaway Consulting determined if any of the project areas occur in or in close proximity to any federally or state designated Wild and Scenic Rivers. The National Wild and Scenic River System was developed by Congress through the Wild and Scenic Rivers Act of 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) with the purpose of protecting and preserving certain rivers that exhibit outstanding natural, cultural, and recreational values and are in a free-flowing condition in perpetuity. The state of California has also developed a statewide Wild and Scenic Rivers System per Public Resources Code Section 5093.70 in order to further identify rivers that contain special resources, provide exceptional natural, cultural, or recreational values, and are free-flowing.

2.1.4. Critical Habitat

Gallaway Consulting determined if USFWS-designated critical habitat for special-status species occurs in the project area. When the USFWS lists a species as threatened or endangered under the federal ESA, areas of habitat considered essential to its conservation and survival may be designated as critical habitat. These areas

may require special consideration and/or protection due to their ecological importance. Although critical habitat may be designated on state or private lands, activities on them are not restricted unless there is federal involvement or direct impacts to listed species are expected.

2.2. Waters of the United States

Formal Delineations of Waters of the U.S. have not been performed within the project areas. This is because many of the sites were void of waters of the U.S. Where waters of the U.S. are located in close proximity to the project areas, a qualified biologist will survey the specific installation locations and ensure no impacts to waters of the U.S. occur. Therefore, a verified delineation of waters of the U.S. will not be required for the proposed project. However, the project proponent will need to abide by the general conditions of Nationwide Permit 5.

2.3. Personnel and Survey Dates

The field surveys were conducted by biologist Brooks Taylor and botanist Elena Gregg. Field surveys were conducted on February 9, 2010 to identify sensitive natural resources and their potential for occurrence, and to determine if any of these resources could be impacted by the proposed project.

2.4. Agency Coordination and Professional Contacts

The USFWS was contacted on February 3 and 19, 2010 for lists of special-species with potential to occur within the vicinity of the Action Areas. The CNPS and CNDDB were also contacted for similar special-status species lists on February 3 and 19, 2010.

2.5. Limitations That May Influence Results

Protocol-level plant and wildlife surveys as identified by the CDFG and USFWS were not conducted for plant or animal species identified as having potential to occur within the vicinity of the project areas due to the time of year of the surveys. However, site specific habitat assessments were used to determine if potential habitat for these plant and animal species occurred within the project areas.

Chapter 3. Results: Environmental Setting

The majority of the testing and monitoring sites are located in Butte County, with 3 sites located in Tehama County, CA. All site locations occur in either the Northern Central Valley or in the adjacent foothills of the Sierra Nevada and Cascade ranges. This region is characterized by a Mediterranean climate with cool, wet winters and hot dry summers. Due to the nature of the project goals, the Action Areas include testing locations along Mill Creek, Little Dry Creek, Butte Creek, Big Chico Creek, Deer Creek, and Antelope Creek to the east, and continue down gradient to monitoring wells on existing agricultural land to the west. With the exception of the monitoring well sites, all of the Action Areas are located within outcroppings of the Tuscan formation.

3.1. Description of the Existing Biological and Physical Conditions

The project will occur within a variety of habitat types including annual grassland, riparian, oak woodlands, and adjacent to active agricultural/crop land.

Annual grasslands are described as open grasslands composed primarily of annual plant species. Species commonly found within annual grasslands include wild oats, ripgut brome, red brome, soft chess, wild barely, foxtail fescue, filaree, and various clovers among others. Vernal pools occur within annual grasslands adjacent to some of the project areas. They provide unique habitats for several endemic California plants and invertebrates, as well as amphibians. Wildlife species that use annual grasslands include the western fence lizard, garter snake, western rattlesnake, black-tailed jackrabbit, California ground squirrel, burrowing owl, short-eared owl, horned lark, western meadowlark, northern harrier, and American kestrel.

Riparian habitats typically contain a mix of cottonwood, sycamore and valley oak with a canopy cover of 20 to 80 percent. The subcanopy often includes various willows, alders and buttonbush. In addition to a subcanopy, a vine understory often occurs, which includes blackberry, grapes, poison oak, and wild rose. Occasionally an herbaceous layer with various shade tolerant grasses exists. Riparian habitat supports highly diverse wildlife and is important for foraging and nesting for many songbirds, mammals, reptiles and amphibians including flycatchers, warblers, bushtit,

scrub jay, red-shouldered hawk, Cooper's hawk, striped skunk, raccoon, squirrels, and western pond turtle.

Oak woodlands generally have an overstory of scattered trees, but the canopy can be nearly closed on better quality sites. Blue oak is the dominant species within the survey areas, comprising 85-100 percent of the trees present. Common associates in the canopy include coast live oak and valley oak. Associated shrub species include poison oak, California coffeeberry, buckbrush, redberry, California buckeye and manzanita species. The ground cover usually consists of annual grasses. Common wildlife species observed in blue oak woodlands can include scrub jays, yellow-billed magpies, western gray squirrels, California ground squirrels, and western fence lizards.

Croplands are located on flat to gently rolling terrain, in fertile soils, and are usually leveled to facilitate the management and irrigation of food or material crops. Crops typically planted in the Northern Central Valley include fruit and nut orchards, corn, wheat, rice, strawberries, tomatoes, cotton, alfalfa, and sunflowers. These crops are planted as moncultures, using tillage or herbicides to remove unwanted vegetation. Weedy annual herb and grass species often invade along the periphery of the croplands or when the land is left fallow. Wildlife species that have adapted to utilize croplands include waterfowl, deer, pheasant, black-tailed jackrabbit, doves, scrub jays, some raptor species, and mice. During the field survey, plants observed growing adjacent to crops included milk thistle, wall-hare barley, clovers, prickly lettuce, old-man-in-the-spring, common chickweed, filaree, wild radish, Johnsongrass, Bermuda grass, black mustard, checker mallow, pineapple weed, and annual bluegrass.

3.1.1. Action Areas

Action Areas are located in northern Butte County and southern Tehama County (**Appendix A**). The physical conditions within each of these Action Areas are described below.

3.1.1.1. SOIL INFILTRATION SITES

Soil infiltration sites would be located within ¼ mile of the areas identified as "SI" on **Appendix A**. These designated sites are located within or in close proximity to annual grassland, oak woodland, and riparian habitats that may support wetlands. Thus, the siting of each soil infiltration site will be conducted by a qualified biologist and botanist in order to ensure the complete avoidance of wetlands and other special-status biological and natural resources.

3.1.1.2. STREAM REACHES

The stream gauges and stream-aquifer interaction sites (piezometer wells) are all located within the designated stream reaches along Antelope Creek, Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek as depicted on **Appendix A**. Each of these stream reaches incorporate the open water within the stream channel, a corridor of riparian vegetation as well as associated upland habitat characterized as annual grassland and oak woodland.

3.1.1.3. MONITORING AND PERFORMANCE WELL SITES

The monitoring well and performance well locations are all located either within active agricultural land or within previously disturbed areas. One proposed new monitoring well, MW-RON-1 is located in close proximity to annual grassland habitat that may support vernally wet features (**Appendix A**).

3.2. Regional Species and Habitats of Concern

Based on species lists gathered from the CNPS, CNDDB, and USFWS, field surveys, aerial photographs, and extensive knowledge of the region, 21 special-status plant and wildlife species were determined to have potential to occur within the Action Areas (**Table 1**). Additionally, bird and raptor species protected under the Migratory Bird Treaty Act (MBTA) were found to occur within the Action Areas. Species that require chaparral, conifer forest, rocky, or marsh/fen habitats were determined to not have potential to occur, since these habitat types do not occur within the Action Areas.

Species that require vernal pool habitat were considered to not have potential to occur within the Action Areas, since wetland features will be avoided during the field siting of equipment. However, due to the close proximity of vernal features to monitoring well MW-RON-1 and soil infiltration sites SI-DR-2, SI-DR-4, SI-DR-7, and SI-DR-9, minimization measures and best management practices (BMPs) will be incorporated in these areas to ensure no indirect impacts occur to the vernal features or any vernal pool-reliant species. These minimization measures and BMPs will include, but not be limited to, installing orange barrier fencing around all vernal features to prevent access, installing silt fencing and straw wattles around all vernal features to prevent runoff or silt from entering the features, and limiting the installation activities to the smallest practicable area. .

Table 1: Listed, Candidate Species, and Critical Habitat Potentially Occurring or Known to Occur in the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
SENSITIVE NATURAL COMMUNITIES			
Coastal and Valley Freshwater Marsh	_/SNC/_	Occurs near river mouths, oxbows, and other areas in the floodplain, and along margins of lakes and springs, where water is quiet and permanently flooded by freshwater. Dominated by perennial, emergent monocots 4-5 meters tall.	None. This habitat type does not occur within the Action Areas.
Essential Fish Habitat for Central Valley Steelhead, and Spring Run Chinook Salmon	Federally Protected	EFH is defined as those waters and substrate necessary to Pacific salmon for spawning, breeding, feeding, or growth to maturity.	**Known**. Occurs within Antelope, Deer, Mill, Big Chico, and Butte Creeks
Great Valley Cottonwood Riparian Forest	_/SNC/_	Perennial creeks and rivers in the Central Valley.	High. This habitat type may occur within the Action Areas located along stream reaches.
Great Valley Mixed Riparian Forest	_/SNC/_	A tall, dense, winter-deciduous, broadleafed riparian forest. The tree canopy is usually fairly well closed and moderately to densely stocked with several species including *Acer negundo*, *Juglans hindsii*, *Platanus racemosa*, *Populus fremontii*, and *Salix* spp.	High. This habitat type may occur within the Action Areas located along stream reaches.
Great Valley Valley Oak Riparian Forest	_/SNC/_	Occurs on the deep alluvial soils of higher floodplain terraces in association with river systems. Can also be found in other upland communities.	High. This habitat type may occur within the Action Areas located along stream reaches.
Great Valley Willow Scrub	_/SNC/_	Pioneer riparian community found on depositional areas near the edge of intermittent and perennial creeks and rivers.	Low. This habitat type is not likely to occur within the stream reaches due to high stream velocities present.
Northern Basalt Flow Vernal Pool	_/SNC/_	Associated with low- to mid-elevation seasonally flooded depressions on impermeable soils.	None. This habitat type does not occur within the Action Areas.
Northern Hardpan Vernal Pool	_/SNC/_	Seasonally flooded depressions on impermeable soils or rock.	Low. This habitat type is not likely to occur within any Action Areas but may occur in close proximity.
Northern Interior Cypress Forest	_/SNC/_	Associated with dry, rocky, sterile, often ultramafic soils and frequently associated with serpentine chaparral habitats.	None. This habitat type does not occur within the Action Areas.
Northern Volcanic Mud Flow Vernal Pool	_/SNC/_	Seasonally flooded depressions on impermeable soils or rock.	None. This habitat type does not occur within the Action Areas.
Valley Needlegrass Grassland	_/SNC/_	Open grassland dominated by tussock-forming *Nassella pulchra* (2 ft. tall). Usually occurs on fine-textures soils.	None. This habitat type does not occur within the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
PLANTS			
Adobe Lily (*Fritillaria pluriflora*)	__/__/1B	Chaparral, cismontane woodland, valley and foothill grassland (typically adobe soils). (Feb-Apr)	Low. Sub marginal habitat occurs within Action Areas.
Ahart's Dwarf Rush (*Juncus leiospermus var. ahartii*)	__/__/1B	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools / vernally mesic areas. (Mar-May)	Moderate. Potentially suitable habitat occurs within Action Areas.
Ahart's Paronychia *(Paronychia ahartii)*	__/__/1B	Cismontane woodland, valley and foothill grassland, and vernal pools. (Mar-Jun)	Moderate. Potentially suitable habitat occurs within Action Areas.
Baker's Navarretia (*Navarretia leucocephala* ssp. *bakeri*)	__/__/1B	Woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. (Apr-Jul)	Low. Sub marginal habitat occurs within Action Areas.
Bogg's Lake Hedge-hyssop (*Gratiola heterosepala*)	__/SE/1B	Marshes and swamps. Vernal pools. (Apr-Aug)	None. No suitable habitat occurs within the Action Areas.
Brandegee's Clarkia (*Clarkia biloba* ssp. *brandegeeae*)	__/__/1B	Chaparral. Cismontane woodlands/often along roadcuts. (May-July)	None. No suitable habitat occurs within the Action Areas.
Brazilian Watermeal (*Wolffia brasiliensis*)	__/__/ 2	Marshes and swamps (shallow freshwater). (Apr-Dec)	None. No suitable habitat occurs within the Action Areas.
Brittlescale (*Atriplex depressa*)	__/__/1B	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools (alkaline, clay). (May-Oct)	None. No suitable habitat occurs within the Action Areas.
Brown Fox Sedge (*Carex vulpinoidea*)	__/__/2	Marshes and swamps, riparian woodland. (May-Jun)	Moderate. Potentially suitable habitat occurs within Action Areas.
Brownish Beaked-Rush (*Rhynchospora capitellata*)	__/__/ 2	Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest (mesic), 455-2000 meters. (Jul-Aug)	Low. Sub marginal habitat occurs within Action Areas.
Butte County Checkerbloom (*Sidalcea robusta*)	__/__/1B	Chaparral and cismontane woodland. (Apr-Jun)	Moderate. Potentially suitable habitat occurs within Action Areas.
Butte County Fritillaria (*Fritillaria eastwoodiae*)	__/__/3	Chaparral, cismontane woodland, openings in lower montane coniferous forests, sometimes serpentinite. (Mar-Jun)	Moderate. Potentially suitable habitat occurs within Action Areas.
Butte County Golden Clover (*Trifolium jokerstii*)	__/__/1B	Valley and foothill grassland, vernal pools. (Mar-May)	Low. Sub marginal habitat occurs within Action Areas.
Butte County Meadowfoam (*Limnanthes floccosa* ssp. *californica*)	FE/SE/1B	Valley and foothill grassland, vernal pools. (Mar-May)	None. No suitable habitat occurs within the Action Areas.
Butte County Morning-glory (*Calystegia atriplicifolia ssp. buttensis*)	__/__/1B	Chaparral and rocky lower montane coniferous forest, sometimes roadsides. (May-Jul)	None. No suitable habitat occurs within the Action Areas.
California Beaked-rush (*Rhynchospora californica*)	__/__/1B	Bogs and fens, lower montane coniferous forest, meadows and seeps, and marshes and swamps. (May-Jul)	None. No suitable habitat occurs within the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
California Satintail (*Imperata brevifolia*)	__/__/ 2	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and mesic riparian scrub, 0-500 meters. (Sep-May)	None. No suitable habitat occurs within the Action Areas.
Cantelow's Lewisia (*Lewisia cantelovii*)	__/__/1B	Broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest (mesic, granitic, serpentinite seeps). (May-Oct)	None. No suitable habitat occurs within the Action Areas.
Caper-fruited Tropidocarpum (*Tropidocarpum capparideuma*)	__/__/1B	Valley and foothill grassland (alkaline hills). (Mar-Apr)	None. No suitable habitat occurs within the Action Areas.
Clifton's Eremogone (*Eremogone cliftonii*)	__/__/1B	Chaparral, lower montane coniferous forest, and openings in upper montane coniferous forests (usually granitic soils). (Apr-Sep)	None. No suitable habitat occurs within the Action Areas.
Close-throated Beardtongue (*Penstemon personatus*)	__/__/1B	Chaparral and montane coniferous forest. (Jun-Sep)	None. No suitable habitat occurs within the Action Areas.
Dissected-leaved Toothwort (*Cardamine pachystigma* var. *dissectifolia*)	__/__/3	Chaparral and lower montane coniferous forests, usually serpentinite and rocky. (Feb-May)	None. No suitable habitat occurs within the Action Areas.
Dwarf Downingia (*Downingia pusilla*)	__/__/2	Valley and foothill grasslands. Vernal pools. (Mar-May)	Low. Sub marginal habitat occurs within Action Areas.
Feather River Stonecrop (*Sedum albomarginatum*)	__/__/1B	Chaparral, lower montane coniferous forest (serpentinite). (May-Jun)	None. No suitable habitat occurs within the Action Areas.
Ferris's Milk-vetch (*Astralagus tener* var. *ferrisaes*)	__/__/1B	Meadows and seeps, valley and foothill grassland. (Apr-May)	Low. Sub marginal habitat occurs within Action Areas.
Flagella-like Atractylocarpus (*Campylopodiella stenocarpa*)	__/__/ 2	Cismontane woodland, 100-500 meters.	Low. Sub marginal habitat occurs within Action Areas.
Greene's Tuctoria (*Tuctoria greenei*)	FE/__/1B	Vernal pools. (May-Jul/Sept)	None. No suitable habitat occurs within the Action Areas.
Hairy Orcutt Grass (*Orcuttia pilosa*)	FE/SE/1B	Deep vernal pools. (May-Sept)	None. No suitable habitat occurs within the Action Areas.
Hall's Rupertia (*Rupertia hallii*)	__/__/1B	Cismontane woodland, lower montane coniferous forest, 545-2250 meters. (Jun-Aug)	None. No suitable habitat occurs within the Action Areas.
Henderson's Bent Grass (*Agrostis hendersonii*)	__/__/3	Vernal pools in valley and foothill grasslands. (Apr-May)	Low. Sub marginal habitat occurs within Action Areas.
Hoover's Spurge (*Chamaesyce hooveri*)	FT/__/1B	Vernal pools. (Jul-Sep/Oct)	None. No suitable habitat occurs within the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
Jepson's Onion (*Allium jepsonii*)	__/__/1B	Chaparral, cismontane woodland, and serpentine or volcanic lower montane coniferous forest. (May-Aug)	None. No suitable habitat occurs within the Action Areas.
Legenere (*Legenere limosa*)	__/__/1B	Vernal pools, 1-880 meters. (Apr-Jun)	None. No suitable habitat occurs within the Action Areas.
Lewis Rose's Ragwort (*Packera eurycephala var. lewisrosei*)	__/__/1B	Chaparral, cismontane woodland, and serpentine lower montane coniferous forest. (Mar-Jul/Sep)	None. No suitable habitat occurs within the Action Areas.
Long-leaved Starwort (*Stellaria longifolia*)	__/__/2	Bogs and fens, mesic meadows and seeps, riparian woodlands, and upper montane coniferous forests (May-Aug)	None. No suitable habitat occurs within the Action Areas.
Long-stiped Campion (*Silene occidentalis* ssp. *longistipitata*)	__/__/1B	Chaparral, lower montane coniferous forests, and upper montane coniferous forests (Jun-Aug)	None. No suitable habitat occurs within the Action Areas.
Mildred's Clarkia (*Clarkia mildrediae ssp. mildrediae*)	__/__/1B	Cismontane woodland and sandy, usually granitic lower montane coniferous forest. (May-Aug)	None. No suitable habitat occurs within the Action Areas.
Mingan Moonwort (*Botrychium minganense*)	__/__/2	Bogs and fens, lower montane coniferous forest, upper montane coniferous forest/mesic. (Jul-Sep)	None. No suitable habitat occurs within the Action Areas.
Mosquin's Clarkia (*Clarkia mosquinii*)	__/__/1B	Cismontane woodland, lower montane coniferous forest (rocky), and roadsides. (May-Jul)	None. No suitable habitat occurs within the Action Areas.
Mud Sedge (*Carex limosa*)	__/__/2	Bogs and fens, meadows and seeps, and marshes and swamps in lower and upper montane coniferous forests (Jun-Aug)	None. No suitable habitat occurs within the Action Areas.
Norris' Beard Moss (*Didymodon norrisii*)	__/__/2	Cismontane woodland and lower montane coniferous forest (intermittently mesic, rocky)	Low. Sub marginal habitat occurs within Action Areas.
Pink Creamsacs (*Castilleja rubicundula* ssp. *rubicundula*)	__/__/1B	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (serpentine). (Apr-Jun)	Low. Sub marginal habitat occurs within Action Areas.
Recurved Larkspur (*Delphinium recurvatum*)	__/__/1B	Chenopod scrub, cismontane woodland, valley and foothill grassland (alkaline). (Mar-Jun)	Low. Sub marginal habitat occurs within Action Areas.
Red Bluff Dwarf Rush (*Juncus leiospermus* var. *leiospermus)*	__/__/1B	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland and vernal pools/vernally mesic habitats. (Mar-May)	Moderate. Potentially suitable habitat occurs within Action Areas.
Red-flowered Bird's-foot Trefoil (*Lotus rubriflorus*)	__/__/1B	Rocky/shale soils in cismontane woodlands and valley and foothill grasslands (Apr-Jun)	None. No suitable habitat occurs within the Action Areas.
Round-leaved Filaree (*California macrophylla*)	__/__/1B	Cismontane woodland, valley and foothill grassland (clay). (Mar-May)	Moderate. Potentially suitable habitat occurs within Action Areas.
San Joaquin Spearscale (*Atriplex joaquiniana*)	__/__/1B	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland (alkaline). (Apr-Oct)	None. No suitable habitat occurs within the Action Areas.
Sanford's Arrowhead (*Sagittaria sanfordii*)	__/__/1B	Marshes and swamps, assorted shallow freshwater. (May-Oct)	None. No suitable habitat occurs within the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
Scalloped Moonwort (*Botrychium crenulatum*)	__/__/2	Bogs and fens, meadows and seeps, and freshwater marshes and swamps in lower and upper montane coniferous forests. (Jun-Sep)	None. No suitable habitat occurs within the Action Areas.
Shasta Clarkia (*Clarkia borealis* ssp. *arida*)	__/__/1B	Cismontane woodlands and openings in lower montane coniferous forests. (Jun-Aug)	None. No suitable habitat occurs within the Action Areas.
Silky Cryptantha *(Cryptantha crinita)*	__/__/1B	Cismontane woodland, lower montane coniferous forest, riparian forest and woodland, gravelly streambeds in valley and foothill grassland. (Apr-May)	Low. Sub marginal habitat occurs within Action Areas.
Slender-leaved Pondweed (*Potamogeton filiformis*)	__/__/2	Marshes and swamps (assorted shallow freshwater). (May-July)	None. No suitable habitat occurs within the Action Areas.
Slender Orcutt Grass *(Orcuttia tenuis)*	FT/SE/1B	Drying beds of vernal pools and borrow pits. (May-Sep/Oct)	None. No suitable habitat occurs within the Action Areas.
Slender Silver Moss (*Anomobryum julaceum*)	__/__/2	Broadleaved upland forest, lower montane coniferous forest, and damp rock and soil on outcrops in north coast coniferous forests. Usually on roadcuts.	None. No suitable habitat occurs within the Action Areas.
Stony Creek Spurge (*Chamaesyce ocellata* ssp. *rattanii)*	__/__/1B	Chaparral. Valley and foothill grasslands. (May-Oct)	None. No suitable habitat occurs within the Action Areas.
Veiny Monardella (*Monardella douglasii* ssp. *venosa*)	__/__/1B	Cismontane woodlands. Valley and foothill grasslands in heavy clay soils. (May-July)	Low. Sub marginal habitat occurs within Action Areas.
White-stemmed Clarkia (*Clarkia gracilis ssp. Albicaulis*)	__/__/1B	Chaparral and cismontane woodland (sometimes serpentine). (May-Jul)	Low. Sub marginal habitat occurs within Action Areas.
Wooly Rose-mallow (*Hibiscus lasiocarpus*)	__/__/2	Marshes and swamps (freshwater). (Jun-Sep)	None. No suitable habitat occurs within the Action Areas.
INVERTEBRATES			
Conservancy Fairy Shrimp (*Branchinecta conservatio*)	FE/__/__	Moderately turbid, deep, cool-water vernal pool	None No suitable habitat occurs within the Action Areas.
Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus)*	FT/__/__	Blue elderberry shrubs usually associated with riparian areas.	High. Suitable habitat may occur within the Action Areas located along stream reaches.
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)	FT/__/__	Vernal pools, swales, and ephemeral freshwater habitat.	None No suitable habitat occurs within the Action Areas.
Vernal Pool Tadpole Shrimp *(Lepidurus packardi)*	FE/__/__	Vernal pools, swales, and ephemeral freshwater habitat.	None No suitable habitat occurs within the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
REPTILES AND AMPHIBIANS			
California Red-legged Frog *(Rana aurora draytonii)*	FT/__/__	Inhabits quiet pools of streams, marshes, and occasionally ponds.	Low. Potentially suitable habitat may occur within the Action Areas located along stream reaches, but no known occurrences in the Sacramento Valley.
Cascades Frog (*Rana cascadae*)	_/CSC/_	Mountain lakes, small streams, and ponds in meadows up to timber line. Hibernates in muddy bottoms of water bodies.	None. No suitable habitat occurs within the Action Areas.
Coast Horned Lizard (*Phrynosoma coronatum*)	_/CSC/_	Occurs in openings in valley foothill hardwood, coniferous, riparian habitats, pine-cypress, juniper, and annual grassland habitats with sandy soils and presence of ants.	Low. Potentially suitable habitat may occur within the Action Areas.
Foothill Yellow-legged Frog (*Rana boylii*)	__/CSC/_	Partly-shaded, shallow streams and riffles with cobble-sized substrate for egg-laying.	Low. Potentially suitable habitat may occur within the Action Areas located along stream reaches.
Giant Garter Snake (*Thamnophis gigas*)	FT/ST/__	Agricultural wetlands and other wetlands such as irrigation and drainage canals, low gradient streams, marshes, ponds, sloughs, small lakes, and their associated uplands.	Moderate. Suitable habitat may occur within the Action Areas adjacent to known corridors or rice fields
Mountain Yellow-legged Frog (*Rana muscosa*)	FC/ CSC /__	Alpine reaches of streams, tarns and alpine lakes.	None. No suitable habitat occurs within the Action Areas.
Northwestern Pond Turtle *(Actinemys marmorata marmorata)*	_/CSC/_	Associated with permanent ponds, lakes, streams, and irrigation ditches or permanent pools along intermittent streams.	High. Suitable habitat may occur within the Action Areas located along stream reaches.
Western Spadefoot (*Spea hammondii*)	_/CSC/_	Grassland and woodland and vernal pools without aquatic predators for breeding.	None. No suitable habitat occurs within the Action Areas.
FISH			
Central Valley Spring-run Chinook Salmon *(Oncorhynchus tshawytscha)*	FT/ST/__	Sacramento River and tributaries.	High. Known to occur in Mill, Big Chico, Antelope, Butte, and Deer Creeks.
Central Valley Steelhead (*Oncorhynchus mykiss*)	FT/__/__	Sacramento and San Joaquin Rivers and their tributaries.	High. Known to occur in Mill, Big Chico, Antelope, Butte, and Deer Creeks.
Delta Smelt *(Hypomesus transpacificus)*	FT/ST/__	Sacramento-San Joaquin Estuary	None. No suitable habitat occurs within the Action Areas.
Green Sturgeon (*Acipenser medirostris*)	FT/CSC/_	Sturgeon enter freshwaters to spawn. The only recently-documented green sturgeon spawning locations are in the Klamath, Sacramento, and Rogue rivers along the west coast of North America.	None. No suitable habitat occurs within the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
Hardhead (*Mylopharodon conocephalus*)	_/CSC/_	Well oxygenated undisturbed areas of larger middle and low elevation streams with clear, deep, slow water velocity pools and sand-gravel-boulder substrates.	High. Known to occur in the Mill, Deer, Mill-Big Chico, and Upper and Lower Butte Creek watersheds.
Sacramento River Winter-run Chinook Salmon *(Oncorhynchus tshawytscha)*	FE/SE/__	Sacramento River and tributaries.	None. No suitable habitat occurs within the Action Areas.
MAMMALS			
American Badger (*Taxidae taxus*)	__/CSC/_	Grasslands, savannahs, and mountain meadows with friable soils.	None. No suitable habitat occurs within the Action Areas.
Pallid Bat (*Antrozous pallidus*)	_/CSC/_	Arid and semi-arid habitats; roosts in rock crevices, caves, and mine shafts.	Low. Sub-marginal habitat occurs within Action Areas.
Ringtail *(Bassariscus atutus)*	__/CFP/_	Chaparral, rocky hillsides and riparian forests.	High. Likely to occur within the Action Areas.
Sierra Nevada Red Fox (*Vulpes vulpes necator*)	__/ST/__	Prefer dense forests interspersed with meadows or alpine fell-fields for cover and den sites. Found in alpine dwarf-shrub, wet meadow, sub-alpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer, and ponderosa pine habitats typically above 2200m (7000 feet). Open areas are used for hunting.	None. No suitable habitat occurs within the Action Areas.
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	_/CSC/_	Coniferous forests and woodlands, deciduous riparian woodland, semi-desert and montane shrub lands – prefers caves, mines and buildings.	Moderate. Potentially suitable habitat occurs within Action Areas along stream reaches.
Western Mastiff Bat (*Eumops perotis californicus*)	_/CSC/_	Common species of low elevations in California. Crevices in steep cliff faces or in the roof eaves of buildings of two or more stories (needs vertical faces to take flight).	Low. Sub-marginal habitat occurs within Action Areas.
Western Red Bat (*Lasiurus blossevillii*)	_/CSC/__	Roosting habitat includes forest and broadleaf woodlands from sea level to coniferous forest. Feeds over grasslands, shrublands, open woodlands, and croplands. Known to occur from Shasta County to the Mexican border – often in riparian habitats.	Moderate. Potentially suitable habitat occurs within Action Areas along stream reaches.
BIRDS			
Bald Eagle *(Haliaeetus leucocephalus)*	__/SE/__	Lakes, rivers, estuaries, reservoirs and some coastal habitats.	High. Suitable nesting and foraging habitat occurs within the Action Areas along stream reaches.
Bank Swallow *(Riparia riparia)*	__/ST/__	Nests in steep riverbank cliffs, gravel pits, and highway cuts.	None. No suitable habitat occurs within the Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
Burrowing Owl (*Athene cunicularia*)	_/CSC/_	Nests in burrows in the ground, often in old ground squirrel burrows or badger, within open dry grassland and desert habitat.	Moderate. Suitable nesting and foraging habitat occurs within Action Areas.
California Black Rail (*Laterallus jamaicensis coturniculus*)	__/ST/__	Yearlong resident of saline, brackish, and fresh emergent wetlands in the San Francisco Bay Area, Sacramento-San Joaquin Delta, coastal Southern California, the Salton Sea and lower Colorado River area.	None. No suitable habitat occurs within the Action Areas.
Greater Sandhill Crane (*Grus canadensis tabida*)	_/ST/_ CFP	Wet meadows, shallow lacustrine, and fresh emergent wetland habitats. Winters in the Sacramento and San Joaquin Valleys.	Low. Sub-marginal nesting habitat present within Action Areas, but suitable foraging habitat may occur in adjacent land.
Loggerhead Shrike *(Lanius ludovicianus)*	_/CSC/_	Open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover	Moderate. Potentially suitable habitat occurs within Action Areas.
Northern Goshawk (*Accipiter gentilis*)	_/CSC/_	Mature old-growth stands of conifer and deciduous forests interspersed with meadows, openings and riparian areas. Nest on north-facing slopes near water.	None. No suitable habitat occurs within the Action Areas.
Northern Harrier (*Circus cyaneus*)	_/CSC/_	Meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands	High. Suitable nesting and foraging habitat occurs within Action Areas.
Peregrine Falcon (*Falco peregrinus anatum*)	__/SE/__	Woodland, forest and costal habitats including riparian and wetland areas. Requires bodies of water in open areas with cliffs and canyons nearby.	None. No suitable habitat occurs within the Action Areas.
Swainson's Hawk (*Buteo swainsoni*)	__/ST/__	Nests in isolated trees or riparian woodlands adjacent to suitable foraging habitat including grasslands or suitable grain or alfalfa fields, or livestock pastures.	High. Suitable foraging habitat and marginal nesting habitat occurs within Action Areas.
Tri-colored Blackbird (*Agelaius tricolor*)	_/CSC/_	Nests in dense blackberry, cattail, tule, willow, or wild rose within emergent wetlands throughout the Central valley and foothills surrounding the valley.	None. No suitable habitat occurs within the Action Areas.
Western Yellow-billed Cuckoo *(Coccyzus americanus occidentalis)*	FC/SE/__	Structured dense riparian forest, generally willows.	Low. Sub-marginal nesting habitat present within Action Areas along stream reaches, but suitable foraging habitat may occur in adjacent land.
White Tailed Kite *(Elanus leucurus)*	__/CFP/_	Uses herbaceous lowlands with variable tree growth and dense population of voles. Substantial groves of dense, broad-leafed deciduous trees used for nesting and roosting.	High. Suitable foraging habitat nesting habitat occurs within Action Areas.

Common Name (*Scientific Name*)	**Status** Fed/State/ CNPS	**Associated Habitats**	**Potential for Occurrence***
Yellow-breasted Chat (*Icteria virens*)	_/CSC/_	Riparian thickets of willow and other brushy tangles near watercourses	Low. Sub-marginal nesting habitat present within Action Areas along stream reaches, but suitable foraging habitat may occur in adjacent land.
Yellow Warbler (*Dendroica petechia*)	_/CSC/_	Very partial to riparian woodlands of the lowlands and foothill canyons.	Moderate. Potentially suitable habitat occurs within the Action Areas along the stream reaches.
Migratory Birds and Raptors	MBTA	Nest and forage in a variety of habitats including hardwood woodlands, coniferous forests, meadows, grasslands and riparian.	**Known**. Migratory bird species were observed within the Action Areas.

CODE DESIGNATIONS

FE = Federally-listed Endangered
FT = Federally-listed Threatened
FC = Federal Candidate Species
BCC = Federal Bird of Conservation Concern
MBTA = protected by the federal Migratory Bird Treaty Act

SE = State-listed Endangered
ST = State-listed Threatened

CSC = CDFG Species of Special Concern

CFP = CDFG Fully Protected Species
SNC= CDFG Sensitive Natural Community

CNPS 1B = Rare or Endangered in California or elsewhere
CNPS 2 = rare or Endangered in California, more common elsewhere
CNPS 3 = More information is needed
CNPS 4 = Plants with limited distribution

***Potential for occurrence:** for plants it is considered the potential to occur during the survey period; for birds and bats it is considered the potential to breed, forage, roost, over-winter, or stop-over in the survey area during migration. Any bird or bat species could fly over the survey area, but this is not considered a potential for occurrence. The categories for the potential for occurrence include:
None: The species or natural community is known not to occur, and has no potential to occur in the survey area based on sufficient surveys, the lack of suitable habitat, and/or the survey area is well outside of the known distribution of the species.
Low: Potential habitat in the survey area is sub-marginal and the species is not known to occur in the vicinity of the survey area. Protocol-level surveys are not recommended.
Moderate: Suitable habitat is present in the survey area and the species is known to occur in the vicinity of the survey area.
High: Habitat in the survey area is highly suitable for the species and there are reliable records close to the survey area, but the species was not observed.
Known: Species was detected in the survey area or a recent reliable record exists for the survey area.

Species with a moderate to high potential to occur or were observed within the Action Areas are discussed in further detail in **Section 4.2** and **4.3** below. Species designated as having a low potential to occur were determined to not have a significant enough potential to occur to necessitate further discussion. Maps depicting CNDDB species

occurrences and Swainson's hawk nests located within 5 miles of the project areas are provided in **Appendix E**.

3.2.1. Sensitive Natural Communities

Sensitive natural communities (SNC) may occur within the Action Areas located adjacent to the stream reaches of Antelope, Deer, Mill, Big Chico, Butte, and Little Dry Creeks. The SNC with potential to occur along these stream reaches include Great Valley cottonwood riparian forest, Great Valley mixed riparian forest, and Great Valley valley oak riparian forest. Impacts to these SNC may occur if vegetation removal in riparian habitat is necessary during the project activities located at and adjacent to the stream reaches (see **Section 4.1** below).

3.2.2. Essential Fish Habitat

Essential Fish Habitat (EFH) for listed anadromous fish species, as designated by NOAA Fisheries, occurs within the Action Areas in the stream reaches of Antelope, Deer, Mill, Big Chico, and Butte Creeks. Impacts to EFH may occur if vegetation removal along the stream banks is necessary during project activities. Vegetation will only be removed if existing access to the streams is not available. If vegetation removal is necessary, it will be limited to the smallest practicable area and impacts to EFH would be temporary. No tree species 5 inches or greater in dbh will be removed, thus, shade, an important aspect of EFH, within the river will not be impacted. Additionally, all areas along the stream banks where vegetation is removed will be re-vegetated with similar native riparian plant species.

3.2.3. Wild and Scenic Rivers

The portions of both Mill Creek and Deer Creek located within the Action Areas are designated by the state as special Wild and Scenic Rivers. These two rivers are considered special due to the presence of one of the last remaining viable populations of federally listed spring-run Chinook salmon, and the high level of water quality. Therefore, any construction activities within these Creeks are regulated by the state. Due to the nature of the proposed project, however, no impacts to these creeks will occur. Thus, the project will not adversely impact any wild and scenic rivers.

3.2.4. Critical Habitat

The Action Areas occur in close proximity to vernal pool critical habitat. However, no impact to vernal pool critical habitat is expected to occur since the project areas

will occur in previously disturbed areas whenever feasible, and a biologist will be on-site during the siting of the installation locations to further ensure no impacts to vernal pools will occur.

Critical habitat for listed anadromous fish species including central valley steelhead, and spring run Chinook salmon, as designated by NOAA Fisheries, occurs within the Action Areas in the stream reaches of Antelope, Deer, Mill, Big Chico, and Butte Creeks. Impacts to salmon and steelhead critical habitat may occur if vegetation removal along the stream banks is necessary during project activities. Vegetation will only be removed if existing access to the streams is not available. If vegetation removal is necessary, it will be limited to the smallest practicable area and impacts to critical habitat would be temporary. No tree species 5 inches or greater in dbh will be removed, and all areas along the stream banks where vegetation is removed will be re-vegetated with similar native riparian plant species.

Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Natural Communities of Special Concern

Impacts to Great Valley cottonwood riparian forest, Great Valley mixed riparian forest, and/or Great Valley valley oak riparian forest may occur if vegetation removal in riparian habitat is necessary during the project activities located at and adjacent to the stream reaches.

4.1.1. Discussion of Great Valley Cottonwood Riparian Forest

Riparian forests are associated with alluvial fans in the floodplains and along the banks of streams and drainages throughout California's Central Valley and foothills. Soils in riparian forests are intermittently or seasonally flooded. Riparian habitats are critical for many species, even those that primarily use surrounding oak woodlands and annual grasslands. This habitat-type provides food, water, migration, dispersal corridors, and escape, nesting and thermal cover for a very high density of California's wildlife. The dominant tree species in this particular type of riparian forest is Fremont's cottonwood. Other vegetation in the canopy layer can include black willow, California sycamore, Oregon ash, and valley oak. Subcanopy tree species include Arroyo willow, boxelder, red willow, silver-leaf maple, and white alder. Typical understory plants include wild grape, wild rose, California blackberry, blue elderberry, poison oak, and a variety of willow species. The herbaceous layer consists of a variety of sedges, rushes, and grasses.

4.1.1.1. SURVEY RESULTS

The Great Valley cottonwood riparian forest SNC may occur along any portion of Antelope Creek, Big Chico Creek, Butte Creek, Deer Creek, Little Dry Creek, and Mill Creek within the Action Areas.

4.1.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

Great Valley cottonwood riparian forest vegetation will be avoided to the greatest extent feasible. No trees 5 inches greater diameter at breast height (DBH) or greater will be removed. Any disturbed areas due to piezometer installation activities will be

temporary, and following the completion of the scientific study, the piezometers will be removed and the disturbed land will be re-vegetated, as needed, with similar native riparian vegetation.

4.1.1.3. PROJECT IMPACTS

Due to the proposed avoidance measures discussed in **Section 4.1.1.2** above, no impacts to Great Valley cottonwood riparian forests will occur due to the proposed project.

4.1.1.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the proposed project.

4.1.1.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects on Great Valley cottonwood riparian forests are anticipated due to the proposed project.

4.1.1.6. CUMULATIVE IMPACTS

No cumulative impacts to Great Valley cottonwood riparian forests will occur due to the proposed project.

4.1.2. Discussion of Great Valley Mixed Riparian Forest

Riparian forests are associated with alluvial fans in the floodplains and along the banks of streams and drainages throughout California's Central Valley and foothills. Soils in riparian forests are intermittently or seasonally flooded. Riparian habitats are critical for many species, even those that primarily use surrounding oak woodlands and annual grasslands. This habitat-type provides food, water, migration, dispersal corridors, and escape, nesting and thermal cover for a very high density of California's wildlife similar to those found in valley-foothill riparian habitat types. The tree species in this particular type of riparian forest is co-dominated by any combination of Fremont's cottonwood, black willow, California sycamore, Oregon ash, and valley oak. Subcanopy tree species can include Arroyo willow, boxelder, red willow, silver-leaf maple, and white alder. Typical understory plants include wild grape, wild rose, California blackberry, blue elderberry, poison oak, and a variety of willow species. The herbaceous layer consists of a variety of sedges, rushes, and grasses including pacific rush, Santa Barbara sedge, slender rush, Dallisgrass, barnyard grass, and iris-leaved rush.

4.1.2.1. SURVEY RESULTS

The Great Valley mixed riparian forest SNC may occur along any portion of Antelope Creek, Big Chico Creek, Butte Creek, Deer Creek, Little Dry Creek, and Mill Creek within the Action Areas.

4.1.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

Great Valley mixed riparian vegetation will be avoided to the greatest extent feasible. No trees 5 inches DBH or greater will be removed. Any disturbed areas due to piezometer installation activities will be temporary, and following the completion of the scientific study, the piezometers will be removed and the disturbed land will be re-vegetated, as needed, with similar native riparian vegetation.

4.1.2.3. PROJECT IMPACTS

Due to the implementation of avoidance measures discussed in **Section 4.1.2.2** above, no impacts to Great Valley mixed riparian forests will occur due to the proposed project.

4.1.2.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, since no impacts will occur to Great Valley mixed riparian forests due to the proposed project.

4.1.2.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects to Great Valley mixed riparian forest will occur due to the proposed project.

4.1.2.6. CUMULATIVE IMPACTS

No cumulative impacts to Great Valley mixed riparian forest will occur due to the proposed project.

4.1.3. Discussion of Great Valley Valley Oak Riparian Forest

Riparian forests are associated with alluvial fans in the floodplains and along the banks of streams and drainages throughout California's Central Valley and foothills. Soils in riparian forests are intermittently or seasonally flooded. Riparian habitats are critical for many species, even those that primarily use surrounding oak woodlands and annual grasslands. This habitat-type provides food, water, migration, dispersal corridors, and escape, nesting and thermal cover for a very high density of California's wildlife similar to those found in valley-foothill riparian habitat types. The tree species in this particular type of riparian forest is dominated by valley oak. The canopy layer can also contain sparse Fremont's cottonwood, black willow,

California sycamore, and Oregon ash. Subcanopy tree species can include Arroyo willow, boxelder, and red willow. Typical understory plants include wild grape, wild rose, California blackberry, blue elderberry, poison oak, and a variety of willow species. The herbaceous layer consists of a variety of sedges, rushes, and grasses including pacific rush, Santa Barbara sedge, slender rush, Dallisgrass, barnyard grass, and iris-leaved rush.

4.1.3.1. SURVEY RESULTS

The Great Valley valley oak riparian forest SNC may occur along any portion of Antelope Creek, Big Chico Creek, Butte Creek, Deer Creek, Little Dry Creek, and Mill Creek within the Action Areas.

4.1.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

Great Valley valley oak riparian vegetation will be avoided to the greatest extent feasible. No trees 5 inches DBH or greater will be removed. Any disturbed areas due to piezometer installation activities will be temporary, and following the completion of the scientific study, the piezometers will be removed and the disturbed land will be re-vegetated, as needed, with similar native riparian vegetation.

4.1.3.3. PROJECT IMPACTS

Due to the proposed avoidance measures discussed in **Section 4.1.3.2** above, no impacts to Great Valley valley oak riparian forests will occur within any of the Action Areas.

4.1.3.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, since no impacts to Great Valley valley oak riparian forests will occur due to the proposed project.

4.1.3.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects to Great Valley valley oak riparian forests will occur due to the proposed project.

4.1.3.6. CUMULATIVE IMPACTS

No cumulative impacts will occur to Great Valley valley oak riparian forests due to the proposed project.

4.1.4. Discussion of Essential Fish Habitat and Critical Habitat for Central Valley Steelhead and Chinook Salmon

Essential Fish Habitat, as well as Designated Critical Habitat for central valley steelhead, spring run Chinook salmon and winter run Chinook salmon occurs within the reaches of Antelope, Deer, Mill, Big Chico, and Butte Creeks associated with this project. Congress defined EFH for federally managed fish species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Any habitat utilized by Central Valley steelhead and Central valley Spring-run Chinook salmon is considered EFH and guidelines to protect these areas are put forth by the Magnuson-Stevens Fisheries Conservation & Management Act. Pursuant to this Act, direct impacts may occur to EFH due to the presence of potential spawning and rearing habitat in the Action Area.

4.1.4.1. PROJECT IMPACTS

There will be no loss or negative affect to EFH, critical habitat or existing migration habitat, which NOAA Fisheries (2005) defines as "migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival."

4.1.4.2. COMPENSATORY MITIGATION

No compensatory mitigation will be required, since no impacts to EFH or critical habitat will occur due to the proposed project.

4.1.4.3. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects to EFH or critical habitat will occur due to the proposed project.

4.1.4.4. CUMULATIVE IMPACTS

No cumulative impacts will occur to EFH or critical habitat due to the proposed project.

4.2. Special Status Plant Species

Five CNPS list 1B, one List 2, and one List 3 plant species have a moderate potential to occur within the Action Areas. These plant species include Ahart's dwarf rush, Ahart's paronychia, Red Bluff dwarf rush, round-leaved filaree, Butte County checkerbloom, brown fox sedge, and Butte County fritillary, respectively.

4.2.1. Discussion of Ahart's Dwarf Rush

Ahart's dwarf rush is endemic to northern California in Butte, Calaveras, Placer, Sacramento, and Yuba Counties. Current information indicates that there are seven extant occurrences and two possibly extirpated occurrences throughout its range. Half of the known occurrences are located in Butte County. Ahart's dwarf rush occurs on vernal pool margins, vernally mesic areas, and in clay flat wetlands within valley and foothill grasslands. Information in the CNDDB indicates that the species prefers vernal pools with short inundation durations (i.e., "flashy" vernal pools) and/or the upper margins of deeper vernal pools.

4.2.1.1. SURVEY RESULTS

Ahart's dwarf rush may occur within vernally mesic or moist areas in or adjacent to the Action Areas located in intact annual grassland habitats. A CDFG protocol-level survey for this plant species was not conducted.

4.2.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

Any occurrences of Ahart's dwarf rush in or in close proximity to the Action Areas will be completely avoided. Construction/installation activities will be limited to areas of past disturbance and gravel fill wherever feasible. In order to ensure complete avoidance, a qualified botanist shall be present during final siting and/or initial installation activities for fieldwork tasks to determine the presence of Ahart's dwarf rush or suitable habitat. If necessary, project sites shall be shifted to avoid special-status plant species. If no Ahart's dwarf rush or suitable habitat is identified, no further action is required.

4.2.1.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed above, no impacts to Ahart's dwarf rush are expected to occur.

4.2.1.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, due to the implementation of the avoidance and minimization efforts as discussed in **Section 4.2.1.2** above.

4.2.1.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects are anticipated to occur to Ahart's dwarf rush due to the proposed project.

4.2.1.6. CUMULATIVE EFFECTS

No cumulative effects are anticipated to occur to Ahart's dwarf rush due to the proposed project.

4.2.2. Discussion of Ahart's Paronychia

Ahart's paronychia is a California endemic and a CNPS list 1B plant species. It has only been found in Butte, Shasta, and Tehama Counties at elevations ranging between 30 and 510 meters above sea level. This small, low-growing, annual herb occurs in cismontane woodland, valley and foothill grassland and vernal pool habitats where there is little competition from other plant species. Its blooming period lasts from March to June and produces inconspicuous, white, papery flowers.

4.2.2.1. SURVEY RESULTS

Ahart's paronychia may occur within vernally mesic or moist areas located in or adjacent to the Action Areas located in intact annual grassland habitats. California Department of Fish and Game protocol-level surveys for this plant species were not conducted.

4.2.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

Any occurrences of Ahart's paronychia in or in close proximity to the Action Areas will be completely avoided. Construction/installation activities will be limited to areas of past disturbance and gravel fill wherever feasible. In order to ensure complete avoidance, a qualified botanist shall be present during final siting and/or initial installation activities for fieldwork tasks to determine the presence of Ahart's paronychia or suitable habitat. If necessary, project sites shall be shifted to avoid special-status plant species. If no Ahart's paronychia or suitable habitat is identified, no further action is required.

4.2.2.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed above, no impacts to Ahart's paronychia are expected to occur.

4.2.2.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, due to the implementation of the avoidance and minimization efforts as discussed in **Section 4.2.2.2** above.

4.2.2.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects are anticipated to occur to Ahart's paronychia due to the proposed project.

4.2.2.6. CUMULATIVE EFFECTS

No cumulative effects are anticipated to occur to Ahart's paronychia due to the proposed project.

4.2.3. Discussion of Red Bluff Dwarf Rush

Red Bluff dwarf rush is a CNPS list 1B and a Northern California endemic plant species. This inconspicuous annual herb has only been found in Butte, Placer, Shasta, and Tehama Counties. It occurs in meadows, seeps, vernal pools, and other vernally mesic areas in chaparral, cismontane woodland and valley and foothill grassland habitats. The dwarf rush can be found at elevations ranging between 35 to 1020 meters above sea level and blooms from March to May.

4.2.3.1. SURVEY RESULTS

Red Bluff dwarf rush may occur within vernally mesic areas located in or in close proximity to the Action Areas located in intact annual grassland habitats. California Department of Fish and Game protocol-level surveys for this plant species were not conducted.

4.2.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

Any occurrences of Red Bluff dwarf rush in or in close proximity to the Action Areas will be completely avoided. Construction/installation activities will be limited to areas of past disturbance and gravel fill wherever feasible. In order to ensure complete avoidance, a qualified botanist shall be present during final siting and/or initial installation activities for fieldwork tasks to determine the presence of Red Bluff dwarf rush or suitable habitat. If necessary, project sites shall be shifted to avoid special-status plant species. If no Red Bluff dwarf rush or suitable habitat is identified, no further action is required.

4.2.3.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed above, no impacts to Red Bluff dwarf rush are expected to occur.

4.2.3.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, due to the implementation of the avoidance and minimization efforts as discussed in **Section 4.2.3.2** above.

4.2.3.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects are anticipated to occur to Red Bluff dwarf rush due to the proposed project.

4.2.3.6. CUMULATIVE EFFECTS

No cumulative effects are anticipated to occur to Red Bluff dwarf rush due to the proposed project.

4.2.4. Discussion of Round-leaved Filaree

The round-leaved filaree is a California endemic and a CNPS list 1B plant species which has recently been re-named due to new molecular data to form a new mono typic genus. The filaree occurs in cismontane woodlands and valley and foothill grasslands with clay soils at elevations ranging from 15 to 1200 meters above sea level. It historically occurs throughout California into Baja California to the south and Oregon to the north, however, most collections and occurrences are historical and more information is needed on the filaree's current status and distribution.

4.2.4.1. SURVEY RESULTS

Round-leaved filaree may occur within heavy clay soils in the Action Areas located in intact annual grassland habitats. California Department of Fish and Game protocol-level surveys for this plant species were not conducted.

4.2.4.2. AVOIDANCE AND MINIMIZATION EFFORTS

Any occurrences of round-leaved filaree in or in close proximity to the Action Areas will be completely avoided. Construction/installation activities will be limited to areas of past disturbance and gravel fill wherever feasible. In order to ensure complete avoidance, a qualified botanist shall be present during final siting and/or initial installation activities for fieldwork tasks to determine the presence of round-leaved filaree or suitable habitat. If necessary, project sites shall be shifted to avoid special-status plant species. If no round-leaved filaree or suitable habitat is identified, no further action is required.

4.2.4.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed above, no impacts to round-leaved filaree are expected to occur.

4.2.4.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, due to the implementation of the avoidance and minimization efforts as discussed in **Section 4.2.4.2** above.

4.2.4.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects are anticipated to occur to round-leaved filaree due to the proposed project.

4.2.4.6. CUMULATIVE EFFECTS

No cumulative effects are anticipated to occur to round-leaved filaree due to the proposed project.

4.2.5. Discussion of Brown Fox Sedge

Brown fox sedge is a CNPS list 2 perennial herb. It is known from populations in Butte, Kern, Los Angeles, Shasta, Siskiyou, San Joaquin, Tehama, and Trinity Counties in California and in other states including Arizona and Oregon. It can be found in freshwater marshes and swamps and riparian woodlands at elevations ranging from 30 to 1200 meters above sea level. Brown fox sedge blooms from May to June.

4.2.5.1. SURVEY RESULTS

Brown fox sedge may occur along stream banks or in riparian habitats located within the Action Areas. California Department of Fish and Game protocol-level surveys for this plant species were not conducted.

4.2.5.2. AVOIDANCE AND MINIMIZATION EFFORTS

Any occurrences of brown fox sedge in or in close proximity to the Action Areas will be completely avoided. In order to ensure complete avoidance, a qualified botanist shall be present during final siting and/or initial installation activities for fieldwork tasks to determine the presence of brown fox sedge or suitable habitat. If necessary, project sites shall be shifted to avoid special-status plant species. If no brown fox sedge or suitable habitat is identified, no further action is required.

4.2.5.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed above, no impacts to brown fox sedge are expected to occur.

4.2.5.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, due to the implementation of the avoidance and minimization efforts as discussed in **Section 4.2.5.2** above.

4.2.5.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects are anticipated to occur to brown fox sedge due to the proposed project.

4.2.5.6. CUMULATIVE EFFECTS

No cumulative effects are anticipated to occur to brown fox sedge due to the proposed project.

4.2.6. Discussion of Butte County Checkerbloom

The Butte County checkerbloom is a California endemic plant species and a CNPS list 1B plant. This tall rhizomatous herb is known only from populations in Butte County. It occurs in chaparral and cismontane woodland habitats at elevations ranging from 90 to 1600 meters above sea level. It can be observed flowering from April to June producing multiple delicate, five-petaled, light pink flowers on one terminal raceme.

4.2.6.1. SURVEY RESULTS

Butte County checkerbloom may occur within the Action Areas located in cismontane oak woodland habitats and the upland habitat surrounding the stream reaches. California Department of Fish and Game protocol-level surveys for this plant species were not conducted.

4.2.6.2. AVOIDANCE AND MINIMIZATION EFFORTS

Any occurrences of Butte County checkerbloom in or in close proximity to the Action Areas will be completely avoided. In order to ensure complete avoidance, a qualified botanist shall be present during final siting and/or initial installation activities for fieldwork tasks to determine the presence of Butte County checkerbloom or suitable habitat. If necessary, project sites shall be shifted to avoid special-status plant species. If no Butte County checkerbloom or suitable habitat is identified, no further action is required.

4.2.6.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed above, no impacts to Butte County checkerbloom are expected to occur.

4.2.6.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, due to the implementation of the avoidance and minimization efforts as discussed in **Section 4.2.6.2** above.

4.2.6.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects are anticipated to occur to Butte County checkerbloom due to the proposed project.

4.2.6.6. CUMULATIVE EFFECTS

No cumulative effects are anticipated to occur to Butte County checkerbloom due to the proposed project.

4.2.7. Discussion of Butte County Fritillary

Butte County fritillaria is a California endemic species known to occur in chaparral, cismontane woodland, and openings in lower montane coniferous forests in Northern California. It is a CNPS list 3 plant that has been documented to occur in Butte, Shasta, Tehama, Yuba, Placer, El Dorado, and Nevada Counties. Butte County fritillaria is a perennial herb that inhabits dry benches and slopes between 500 to 1500 meters above sea level, and can be observed blooming with nodding, greenish-white to reddish flowers between March and June.

4.2.7.1. SURVEY RESULTS

Butte County fritillary may occur within the Action Areas located in cismontane oak woodland habitats and the upland surrounding the stream reaches. California Department of Fish and Game protocol-level surveys for this plant species was not conducted.

4.2.7.2. AVOIDANCE AND MINIMIZATION EFFORTS

Any occurrences of Butte County fritillary in or in close proximity to the Action Areas will be completely avoided. In order to ensure complete avoidance, a qualified botanist shall be present during final siting and/or initial installation activities for fieldwork tasks to determine the presence of Butte County fritillary or suitable habitat. If necessary, project sites shall be shifted to avoid special-status plant species. If no Butte County fritillary or suitable habitat is identified, no further action is required.

4.2.7.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed above, no impacts to Butte County fritillary are expected to occur.

4.2.7.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, due to the implementation of the avoidance and minimization efforts as discussed in **Section 4.2.6.2** above.

4.2.7.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects are anticipated to occur to Butte County fritillary due to the proposed project.

4.2.7.6. CUMULATIVE EFFECTS

No cumulative effects are anticipated to occur to Butte County fritillary due to the proposed project.

4.3. Special Status Animal Species Occurrences

Eight state species of special concern, two federally threatened, one state threatened, one state endangered, and two state and federally threatened species have high to moderate potential to occur within the Action Areas. These special-status species include the northwestern pond turtle, hardhead, Townsend's big-eared bat, western red bat, burrowing owl, loggerhead shrike, northern harrier, yellow warbler, valley elderberry longhorn beetle, Central Valley steelhead, Swainson's hawk, bald eagle, giant garter snake, and Central Valley Chinook salmon, respectively. Additionally, migratory bird and raptor species protected under the MBTA were observed within the Action Areas and have potential to nest and forage on the sites. These special-status species are discussed in detail below.

4.3.1. Discussion of Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB) is federally listed as threatened and critical habitat has been designated by the USFWS. The beetle is endemic to riparian systems along the margins of rivers and streams, and in adjacent grassy savannas in California's Central Valley. The VELB occurs in the Central Valley of California below 3,000 feet. It is distributed primarily within riparian habitats from Shasta County to Kern County. Valley elderberry longhorn beetles feed and reproduce exclusively on two species of elderberry, including blue elderberry (*Sambucus mexicana*) and red elderberry (*S. racemosa*). The adult female beetles deposit eggs in the bark crevices of living plants. Larvae bore into the pith (plant tissue in the center of the stem) of larger elderberry stems upon hatching, where the majority of the animal's life-span occurs. Following pupation in the spring, the adult beetle emerges, creating a hole in the bark of the stem or branch. Adults feed on foliage and are present from March through early June. Because the adult stage is short lived, survey techniques focus on the presence of emergence holes for evidence of VELB. Valley elderberry longhorn beetle emergence holes have been observed in shoots or branches with diameters as small as 0.5 inches (13 mm) but are more common in older, larger branches. Besides exhibiting a preference for "stressed" elderberry shrubs, VELB prefer shrubs with stems of a certain size class. Exit holes have been found more frequently in trunks or branches that are 5 to 20 cm (2-8 in) in diameter, or at least 1.0 inch or greater at ground height (USFWS 1999) and less than one meter off the ground (Collinge et al. 2001). Research also shows that exit holes more consistently occur in clusters or stands of elderberry shrubs surrounded by associate riparian vegetation, rather than in isolated shrubs (Collinge et al. 2001). Exit holes are

circular to slightly oval and are usually 7-10 mm in diameter. Valley elderberry longhorn beetles are the only insect species known to inhabit live elderberry shrubs and/or make exit holes of a similar size and shape in the Central Valley (USFWS 1991).

4.3.1.1. SURVEY RESULTS

The VELB may occur along stream banks or in riparian habitats within the Action Areas. United States Fish and Wildlife protocol-level surveys for VELB have not been conducted.

4.3.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

Due to the VELB's reliance on elderberry plants, a qualified biologist shall be present during final siting and/or initial installation activities for fieldwork tasks. If necessary, installation sites shall be shifted to avoid VELB and its suitable habitat. All elderberry plants shall be avoided to the maximum extent practicable. Where complete avoidance within 100 feet of elderberry bushes is not practicable best management practices will be incorporated to prevent direct impacts including the use of barrier fencing constructed by erecting 4-foot by 8-foot sections of plywood around the dripline of the elderberry bushes and orange ESA fencing within 100 feet of all other elderberry plants. Worker awareness classes describing VELB life history and avoidance measures will be required for all construction workers.

4.3.1.3. PROJECT IMPACTS

Due to the avoidance of all elderberry plants, no impacts to VELB will occur as a result of the proposed project

4.3.1.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the implementation of the avoidance measures discussed in **Section 4.3.1.2** above.

4.3.1.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects to VELB will occur due to the proposed project.

4.3.1.6. CUMULATIVE EFFECTS

No cumulative effects to VELB will occur due to the proposed project.

4.3.2. Discussion of Giant Garter Snake

Habitat requirements of GGS consist of adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; grassy banks and openings in waterside vegetation for basking; and, higher elevation uplands for cover and refuge from floodwaters during the snake's dormant season in the winter. The GGS inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period. Giant garter snakes typically select burrows with sunny exposure along south and west facing slopes. The breeding season extends through March and April, and females give birth to live young from late July through early September. Brood size is variable, ranging from 10 to 46 young, with a mean of 23. Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own. Although growth rates are variable, young typically more than double in size within their first year.

4.3.2.1. SURVEY RESULTS

Giant garter snakes have a low potential to occur in the stream reaches in and south of Chico and a moderate potential to occur in the Action Areas located in the valley near active agricultural land. The stream reaches north of Chico occur outside of the known range of GGS, and thus, there is no potential for GGS to occur there. The stream reaches in and south of Chico have a low potential for GGS since they occur in the foothills, typically do not provide dense fresh emergent habitat, and are up-stream of agricultural areas. Thus these areas do not provide suitable nesting or foraging habitat and would not be used as travel corridors since they are up-stream of known occurrences. The Action Areas located in the valley and adjacent to active agricultural land, especially rice fields, irrigation ditches, and sloughs, have a moderate potential for GGS to occur.

4.3.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

Monitoring Well Sites MW-RON-1, MW-PIV-1, MW-PIV-2 and the stream reaches and soil infiltration test sites are located outside GGS habitat range. The remaining Monitoring Well Sites are located within the GGS habitat range. To avoid GGS habitat, a qualified biologist shall be present during final siting and/or initial installation activities to ensure that monitoring wells are placed 200 feet or greater from potential GGS habitat and there is no presence of GGS. If necessary, installation sites shall be shifted to avoid GGS or suitable habitat. Therefore, there would be no potential direct or indirect impacts to GGS generated by the proposed project. No

well drilling will occur in wetland habitat, as such no direct impacts to GGS aquatic habitat will occur.

4.3.2.3. PROJECT IMPACTS

The proposed project will not impact GGS habitat, since all aquatic habitat will be avoided and a buffer of 200 feet will be maintained from all potential GGS aquatic habitat.

4.3.2.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the avoidance measures implemented, as discussed in **Section 4.3.2.2** above.

4.3.2.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects will occur to GGS due to the proposed project.

4.3.2.6. CUMULATIVE EFFECTS

No cumulative effects to GGS will occur due to the proposed project.

4.3.3. Discussion of Northwestern Pond Turtle

The northwestern pond turtle can be found throughout California and is the only abundant native turtle in California. They are associated with permanent or nearly permanent water in a wide variety of habitats at elevations ranging from near sea level to 1430 meters. They require basking sites including partially submerged logs, rocks, mats of floating vegetation, or open mud banks. The northwestern pond turtle hibernates in colder areas underwater on muddy bottoms. Nesting sites are typically constructed along the banks of permanent water in soils at least 10 cm deep and must have high internal humidity for eggs to develop and hatch.

4.3.3.1. SURVEY RESULTS

The northwestern pond turtle may occur within the portions of Antelope Creek, Big Chico Creek, Butte Creek, Deer Creek, Little Dry Creek, and Mill Creek within the Action Areas.

4.3.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

The Northwest pond turtle may occur along stream reaches within the project area, although no construction activities will occur within or along the banks of the stream reaches. Access to the stream banks may disrupt pond turtle nests, if present. Therefore, a qualified biologist shall be present during final siting and/or initial

installation activities for fieldwork within stream reaches to determine if nests are present. If the nests of turtles are found, the access to the stream will be shifted to avoid nests. If no nests are identified, no further actions are required.

4.3.3.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed in **Section 4.3.3.2** above, no impacts to the northwestern pond turtle will occur due to the proposed project.

4.3.3.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, since no impacts to the northwestern pond turtle are expected during the project instillation or monitoring activities.

4.3.3.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects will occur to the northwestern pond turtle due to the proposed project.

4.3.3.6. CUMULATIVE EFFECTS

No cumulative effects to the northwestern pond turtle will occur due to the proposed project.

4.3.4. Discussion of Central Valley Chinook Salmon

Spring-run Chinook salmon were historically the second most abundant run of Central Valley Chinook salmon (Fisher, 1994). Adults returning to spawn ascended the tributaries to the upper Sacramento River, including the Pit, McCloud, and Little Sacramento Rivers. They also occupied Cottonwood, Battle, Antelope, Mill, Deer, Stony, Big Chico, and Butte Creeks, and the Feather, Yuba, American, Mokelumne, Stanislaus, Tuolumne, Merced, San Joaquin, and Kings Rivers. Spring-run Chinook salmon, similar to steelhead, migrated into headwater streams where cool, well-oxygenated water is available year-round.

Current surveys indicate that remnant; non-sustaining spring-run Chinook salmon populations may be found in Cottonwood, Battle, Antelope, and Big Chico Creeks (California Department of Water Resources, 1977). More sizeable, consistent runs of naturally produced fish are found in Mill, Deer, and Butte Creeks. The Feather River Fish Hatchery sustains the spring-run population on the Feather River, but the genetic integrity of that run is questionable (California Department of Water Resources, 1977). Feather River water has been diverted to Butte Creek for many years. However, the degree of straying of Feather River spring-run Chinook salmon into

Butte Creek is unknown. Spring-run Chinook salmon may occur in the Yuba River; however, the size of the run and the level of possible hybridization with fall-run Chinook salmon are unknown (California Department of Fish and Game, 1998). No spring-run Chinook salmon occur in the San Joaquin River or any of its tributaries.

On March 9, 1998 (68 FR 11481), NOAA Fisheries issued a proposed rule to list spring-run Chinook salmon, and on September 16, 1999 (64 FR 50393), NOAA Fisheries listed spring-run Chinook salmon as threatened. NOAA Fisheries designated critical habitat for spring-run Chinook salmon of February 16, 2000 (65 FR 7764). On February 5, 1999, the California Fish and Game Commission listed spring-run Chinook salmon as threatened under the California ESA.

4.3.4.1. SURVEY RESULTS

Spring-run Chinook salmon are known to occur within the portions of Big Chico Creek, Antelope Creek, Butte Creek, Mill Creek, and Deer Creek within the Action Areas.

4.3.4.2. AVOIDANCE AND MINIMIZATION EFFORTS

All project activities proposed to occur within the creeks will be temporary and will only impact a small surface area as required for installation of the staff gauges and seepage meter tests. A qualified biologist shall be present during final siting and/or initial installation activities to ensure that project work will not impact Chinook salmon or their spawning habitat. Additionally, all installation activities will occur when the fish are not spawning, incubating or before juveniles have emerged (typically September - March). Thus, impacts to Chinook salmon will be avoided.

4.3.4.3. PROJECT IMPACTS

No impacts to spring-run Chinook salmon will occur due to the proposed project since all activities within the stream bed will be conducted when salmon adults and juveniles are mobile and can avoid hazards.

4.3.4.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the lack of impacts to spring-run Chinook salmon.

4.3.4.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects were identified for the project.

4.3.4.6. CUMULATIVE EFFECTS

No cumulative effects to spring-run Chinook salmon will occur due to the proposed project.

4.3.5. Discussion of Central Valley Steelhead

The Central Valley steelhead is listed as threatened (63 FR 13347, March 19, 1998), and critical habitat was designated to include rivers and streams of the Sacramento-San Joaquin River system (65 FR 7764, February 16, 2000). Within California's Central Valley, only winter steelhead are known to remain. Peak spawning of steelhead occurs from December to April in the cool, well-oxygenated streams and tributaries. In the Feather River in particular, most steelhead adults travel from the ocean to the river from September through January, where spawning takes place rather quickly. Steelhead use gravel-sized material for spawning, however, they are also known to use a mixture of sand-gravel and gravel-cobble. The gravel must be permeable to keep the eggs well oxygenated (McEwan, 2001). It is presumed that soon after spawning, those that survive the journey return to the ocean. Eggs typically hatch in 30 days depending on the water temperature, and fry typically emerge 4 to 6 weeks after hatching, however, gravel size, siltation, and temperature can be controlling factors. Soon after emerging from the gravel, a small percentage of the fry appears to emigrate. The remainder of the population typically remains in the river for at least six months to 1 year. Fry and juveniles tend to inhabit shallow protected areas including stream margins and in-stream areas with large woody debris and/or areas with overhead cover and low light levels.

4.3.5.1. SURVEY RESULTS

Central Valley steelhead are known to occur within the portions of Big Chico Creek, Antelope Creek, Butte Creek, Mill Creek, and Deer Creek within the Action Areas.

4.3.5.2. AVOIDANCE AND MINIMIZATION EFFORTS

All project activities proposed to occur within the Creeks will be temporary and non-invasive due to the small surface area required for installation of the staff gauges and seepage meter tests. A qualified biologist shall be present during final siting and/or initial installation activities to ensure that project work will not impact steelhead or their spawning habitat. Additionally, all installation activities will occur when the fish are not spawning or before juveniles have emerged (typically September - March). Thus, impacts to steelhead will be avoided.

4.3.5.3. PROJECT IMPACTS

Due to the nature of the proposed project, no impacts to Central Valley steelhead will occur. Additionally, all work in the stream will stop once steelhead begin spawning until the juveniles emerge to avoid impacts to Central Valley steelhead.

4.3.5.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the lack of impacts to Central Valley steelhead.

4.3.5.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects were identified for this project.

4.3.5.6. CUMULATIVE EFFECTS

No cumulative effects to Central Valley steelhead will occur due to the proposed project.

4.3.6. Discussion of Hardhead

Hardhead are a California species of special concern. They are bottom feeders that forage for benthic invertebrates, aquatic plants in quiet water, and occasionally plankton. The small fish feed on mayfly larvae, caddis fly larvae, and small snails while the larger fish eat aquatic plants, including filamentous algae, and crayfish and large invertebrates. Hardheads are found in larger middle- and lower-elevation streams and prefer water temperatures ranging from 17 to 28° C. Hardhead prefer clear, deep, well oxygenated pools with sand, gravel, or boulder substrates and slow water velocities. In rivers, the adult hardhead mostly occur more toward the lower half of the water column, not near the surface, while the juveniles concentrate in the shallow waters close to stream edges.

4.3.6.1. SURVEY RESULTS

Hardheads are known to occur within the Mill-Big Chico Creek, upper and lower Butte Creek, and Mill Creek watersheds (University of California Cooperative Extension 2003) as well as Deer Creek (Moyle and Baltz 1985). Therefore, hardheads may occur within the portions of Mill, Butte, Deer, and Big Chico Creeks within the Action Areas.

4.3.6.2. AVOIDANCE AND MINIMIZATION EFFORTS

All project activities proposed to occur within the Creeks will be non-invasive due to the small surface area required for installation of the staff gauges and seepage meter tests. A qualified biologist shall be present during final siting and/or initial

installation activities to ensure that project work will not impact hardheads or their spawning habitat. Additionally, all installation activities will occur when the fish are not spawning or before juveniles have emerged (typically September - March). Thus, impacts to hardhead will be avoided.

4.3.6.3. PROJECT IMPACTS

Due to the nature of the proposed project, no impacts to hardheads will occur. Additionally, all work within the streams will stop once hardheads have laid eggs until juveniles have emerged.

4.3.6.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the proposed project, since no impacts to hardheads will occur.

4.3.6.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects were identified for this project.

4.3.6.6. CUMULATIVE EFFECTS

No cumulative effects to hardheads will occur due to the proposed project.

4.3.7. Discussion of Townsend's Big-eared Bat

The Townsend's big-eared bat is found throughout California, but their distribution is not well known. They are not found in subalpine or alpine habitats. They are mostly found in mesic habitats with access to water sources. They feed mostly on small moths and also eat beetles and soft-bodied insects. The require caves, mines, tunnels, buildings, and/or other human-made structures for roosting. Maternity roosts are typically warm and hibernation sites tend to be cool, but not below freezing. They are a relatively sedentary species and tend to make only short movements/migrations to hibernation sites. Females and young tend to make up the maternity roosts with males usually solitary in the spring and summer. In California the numbers of Townsend's big-eared bat have declined steeply due to human disturbance and injury from wing banding. They appear to be extremely sensitive to human disturbance and have been known to abandon a roost after a single human visit. Additionally, all known nursery colonies in limestone caves in California have been abandoned.

4.3.7.1. SURVEY RESULTS

The Townsend's big-eared bat has potential to roost within the riparian corridor along the stream reaches and within any abandoned structures within the Action Areas.

4.3.7.2. AVOIDANCE AND MINIMIZATION EFFORTS

No abandoned structures or trees 5 inches DBH or greater will be removed during the project activities. However, due to the sensitivity of the Townsend's big-eared bat to human disturbance, a qualified biologist shall conduct surveys for bat roosts during final siting and/or initial installation activities. If a bat roost is observed within the Action Area, the roost will be avoided to the greatest extent feasible and the installation area will be shifted to avoid impacting the roost. If no bat roosts are identified, no further actions are required.

4.3.7.3. PROJECT IMPACTS

No impacts to the Townsend's big-eared bat will occur due to the implementation of the avoidance measures discussed in **Section 4.3.7.2** above.

4.3.7.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the lack of impacts to the Townsend's big-eared bat.

4.3.7.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects were identified for the proposed project.

4.3.7.6. CUMULATIVE EFFECTS

No cumulative effects to the Townsend's big-eared bat will occur due to the proposed project.

4.3.8. Discussion of Western Red Bat

The western red bat is found in California from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts. Winter range includes western lowlands and coastal habitats south of San Francisco. The western red bat roosts primarily in trees within forests and woodlands in edge habitats from sea level to mixed conifer forests. However, the western red bat may have an association with riparian habitats with dense stands of cottonwood and sycamore, and orchards (Bolster, 1998). Family groups are known to roost together, forming nursing colonies. They forage in open areas and feed on a variety of insects including moths, crickets, beetles, and cicadas. Migrations typically occur in the spring from March to May and in the autumn from September to October. The western red bat has been seen at temperatures as low as 44ºF, however, in these cold climates the bat spends winter in hibernation.

4.3.8.1. SURVEY RESULTS

The western red bat may utilize trees in the riparian corridors along Antelope Creek, Big Chico Creek, Butte Creek, Deer Creek, Little Dry Creek, and Mill Creek for roosting habitat.

4.3.8.2. AVOIDANCE AND MINIMIZATION EFFORTS

No trees 5 inches DBH or greater will be removed during the project activities, thus, any roosts present within or in close proximity to the Action Areas will be completely avoided. A qualified biologist shall conduct surveys for bat roosts during final siting and/or initial installation activities. If a bat roost is observed within the Action Area, the roost will be avoided to the greatest extent feasible and project activities will be shifted to avoid impacting the roost. If no bat roosts are identified, no further actions are required.

4.3.8.3. PROJECT IMPACTS

Due to the proposed avoidance measures discussed in **Section 4.3.8.2** above, no impacts to the western red bat will occur during project activities.

4.3.8.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, since no impacts to the western red bat are expected to occur during project activities.

4.3.8.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects to the western red bat will occur due to the proposed project.

4.3.8.6. CUMULATIVE EFFECTS

No cumulative effects will occur to the western red bat due to the proposed project.

4.3.9. Discussion of Bald Eagle

The bald eagle is known from Alaska to California and in California it is a permanent resident, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. Bald eagles are also found in a few favored inland waters in Southern California. They are more common at lower elevations, and are not found in the high Sierra Nevada. They require large bodies of water or free flowing rivers with abundant fish, and adjacent snags or other perches. Bald eagles will occasionally forage in flooded fields for displaced voles or other small mammals. They will also scavenge dead fish, water birds, and mammals, and have been known to steal from osprey. Typically nests within 1.6 km (1 mile) of water in

large, old-growth, or dominant live trees with open branchwork (less than 40% canopy). Nests are usually located 16-61 m (50-200 feet) above the ground. Breeding occurs from February to July, however, they don't begin nesting if human disturbance is evident.

4.3.9.1. SURVEY RESULTS

The bald eagle may utilize trees in the riparian corridors along Antelope Creek, Big Chico Creek, Butte Creek, Deer Creek, Little Dry Creek, and Mill Creek for nesting and perching habitat.

4.3.9.2. AVOIDANCE AND MINIMIZATION EFFORTS

No trees 5 inches DBH or greater will be removed during the project activities, thus, any nests present within or in close proximity to the Action Areas will be completely avoided. To ensure complete avoidance, a qualified biologist shall be present during final siting and/or initial installation activities for proposed monitoring wells. Additionally, surveys for nests will be conducted prior to the start of the project activities by a qualified biologist. If a raptor nest is observed within the Action Area, the nest will be avoided to the greatest extent feasible and the installation area will be shifted to avoid impacting the nest. If any occupied nests are identified, avoidance shall be consistent with the following standards: 1) no disturbances shall occur within one-half mile, at a minimum, of any occupied nests and 2) no project-related activities result in nest abandonment, forced fledging or other forms of potential take.

4.3.9.3. PROJECT IMPACTS

Due to the proposed avoidance measures discussed in **Section 4.3.8.2** above, no impacts to the bald eagle will occur during project activities.

4.3.9.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, since no impacts to the bald eagle are expected to occur during project activities.

4.3.9.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects to the bald eagle will occur due to the proposed project.

4.3.9.6. CUMULATIVE EFFECTS

No cumulative effects will occur to the bald eagle due to the proposed project.

4.3.10. Discussion of Burrowing Owl

Burrowing owls inhabit dry, open grasslands. Nests are usually in small burrows that have been constructed and abandoned by small mammals such as ground squirrels or badgers, however, they have also been known to use man-made structures including cement culverts, cement, asphalt or wood piles, and openings under pavement. The breeding season for burrowing owls is from late March through May, and they often reuse burrows year after year. They perch on top of the burrows and other low structures to forage and watch for other predators. Their diet consists of insects, small reptiles or amphibians and small mammals.

4.3.10.1. SURVEY RESULTS

Burrowing owls may occur within the Action Areas located in annual grassland habitat.

4.3.10.2. AVOIDANCE AND MINIMIZATION EFFORTS

Wintering burrows shall be considered potentially present between December 1 and January 31. Nesting burrows shall be considered potentially present between April 15 and July 15. To ensure complete avoidance, a qualified biologist shall be present during final siting and/or initial installation activities for fieldwork tasks. Any occupied burrows shall be avoided with project activities shifted, as necessary, to avoid active burrows. If any occupied burrows are identified, avoidance shall be consistent with the DFG Staff Report on Burrowing Owl Mitigation, as follows: 1) no disturbances shall occur within 50 meters of any occupied burrows, 2) no burrows, whether natural or artificial, shall be damaged or destroyed and 3) no foraging habitat shall be destroyed or degraded within 100 meters of any occupied burrows.

4.3.10.3. PROJECT IMPACTS

No impact to burrowing owl nest will occur due to the avoidance measures discussed in **Section 4.3.9.2** above. Vegetation disturbance will only occur within a 8 foot square area, thus, no significant impact to burrowing owl foraging habitat will occur. Also, the location of the concrete pads will be isolated to areas of gravel fill, which is not suitable habitat for burrowing owl prey.

4.3.10.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the lack of significant impacts to burrowing owls or their foraging habitat.

4.3.10.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects to burrowing owls were identified.

4.3.10.6. CUMULATIVE EFFECTS

No cumulative effects to burrowing owls will occur due to the proposed project.

4.3.11. Discussion of Loggerhead Shrike

Loggerheaded shrikes are common residence and winter visitors in lowlands and foothills throughout California. They can be found in open habitats with scattered shrubs, trees, posts, fences, utility lines or other perches. Typically they occur in open canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. They rarely occur in heavily urbanized areas but are often found in open croplands. Loggerheaded shrikes mainly eat large insects, but also take small birds, mammals, amphibians, reptiles, fish , carrion, and various other invertebrates. They nest in shrubs or trees at heights ranging from 0.4 to 15 meters above the ground. Adults lay eggs from March to May with male and females tending their young into July or August.

4.3.11.1. SURVEY RESULTS

The loggerhead shrike may forage and nest within the oak and riparian woodland habitats present in the Action Areas.

4.3.11.2. AVOIDANCE AND MINIMIZATION EFFORTS

To ensure avoidance of nesting loggerhead shrikes, a survey for nesting special-status bird species, including the loggerhead shrike, will be conducted by a qualified biologist prior to the removal of any vegetation within the Action Areas. No trees 5 inches DBH or greater will be removed, however, smaller tree and shrub species may be removed during the project installation activities. If the nests of loggerhead shrikes are found, they will be avoided and installation activities will be shifted, as necessary, to avoid all active bird nests.

4.3.11.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed in **Section 4.3.10.2** above, no impacts to the loggerhead shrike will occur.

4.3.11.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required since no impacts to loggerhead shrikes will occur.

4.3.11.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects were identified for this project.

4.3.11.6. CUMULATIVE EFFECTS

No cumulative effect to loggerhead shrikes will occur due to the proposed project activities.

4.3.12. Discussion of Northern Harrier

The northern harrier is a raptor species commonly found near wetlands and open grasslands perched on or flying close to the ground. The northern harrier is one of the few birds of prey that are frequently polygynous when ecological conditions permit. Nests are constructed on the ground, typically in dense, low vegetation that provides a visual barrier and cover. In drier habitats, the nest consists of a loose, thin layer of sticks. In wetter situations, nests are larger, more substantial structures. Nests are built by the female and typically consist of grass, reeds, and small sticks. Breeding activity begins in April, concluding in September, with a peak in activity from June to July. A single brood of four to six eggs are incubated by the female. Incubation begins with the last egg and lasts about 29–39 days. The female broods the young for about 4 weeks while the male provisions the female and young with prey items. Young begin to leave the nest, moving around into the surrounding vegetation, at about 2 weeks of age. The amount of time spent at the nest steadily decreases after this point until fledging. First flight generally occurs at 29–34 days of age. Young remain in the vicinity of the nest until dispersal.

4.3.12.1. SURVEY RESULTS

Northern harriers may utilize the annual grassland habitat within the Action Areas for nesting and foraging.

4.3.12.2. AVOIDANCE AND MINIMIZATION EFFORTS

To ensure avoidance of nesting northern harriers, a survey for nesting special-status raptor species, including the northern harrier, will be conducted by a qualified biologist prior to the removal of any vegetation within the Action Areas. No trees 5 inches DBH or greater will be removed, however, small tree and shrub species may be removed during the project installation activities. If the nests of northern harriers are found, they will be avoided and installation activities will be shifted, as necessary, to avoid all active nests.

4.3.12.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed in **Section 4.3.11.2** above, no impacts to northern harriers will occur due to project activities.

4.3.12.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required, since no impacts to northern harriers are expected to occur due to the proposed project.

4.3.12.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effect were identified for this project.

4.3.12.6. CUMULATIVE EFFECTS

No cumulative effects to the northern harrier will occur due to the proposed project.

4.3.13. Discussion of Swainson's Hawk

The Swainson's hawk is a long-distance migrant with nesting grounds in western North America. The Swainson's hawk population that nests in the Central Valley winters primarily in Mexico, while the population that nests in the interior portions of North America winters primarily in Argentina. Swainson's hawks arrive in the Central Valley between March and early April to establish breeding territories, and breeding occurs from late March to late August, peaking in late May through July. In the Central Valley, Swainson's hawks nest in isolated trees, small groves, or large woodlands, next to open grasslands or agricultural fields. This species typically nests near riparian areas; however, it has been known to nest in urban areas as well. Nest locations are usually in close proximity to suitable foraging habitats, which include fallow fields, irrigated pastures, alfalfa and other hay crops, and low-growing row crops. Swainson's hawks leave their breeding grounds to return to their wintering grounds in late August or early September (Bloom and DeWater 1994). Swainson's hawks' largest threats are loss of habitat and poisoning due to pesticide use in South America, where they winter.

4.3.13.1. SURVEY RESULTS

Swainson's hawks may utilize the Action Areas for foraging and may nest within tall trees in and adjacent to the Action Areas. A number of known Swainson's hawk nests occur within 5 miles of the Action Areas (**Appendix E**).

4.3.13.2. AVOIDANCE AND MINIMIZATION EFFORTS

No trees 5 inches DBH or greater will be removed during the project activities, thus, any Swainson's hawk nests present within or in close proximity to the Action Areas will be completely avoided. To ensure complete avoidance, a qualified biologist shall be present during final siting and/or initial installation activities for proposed monitoring wells. Active nests shall be considered potentially present between March 1 and September 15. Any occupied nests shall be avoided with installation sites

shifted, as necessary, to avoid all project-related disturbances. If any occupied nests are identified, avoidance shall be consistent with the DFG Staff Report regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California, as follows: 1) no disturbances shall occur within one-half mile, at a minimum, of any occupied nests and 2) through consultation with the qualified biologist, the applicant shall ensure that no project-related activities result in nest abandonment, forced fledging or other forms of potential take.

4.3.13.3. PROJECT IMPACTS

No impacts to Swainson's hawk nests will occur due to the implementation of the avoidance measures discussed in **Section 4.3.12.2** above. Vegetation disturbance will only occur within an 8-foot square area, thus, no significant impact to Swainson's hawk foraging habitat will occur. Also, the location of the concrete pads will be isolated to areas of gravel fill, which is not suitable habitat for Swainson's hawk prey.

4.3.13.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the lack of significant impacts to Swainson's hawk nests or foraging habitat.

4.3.13.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects were identified for the project.

4.3.13.6. CUMULATIVE EFFECTS

No cumulative effects to Swainson's hawks will occur due to the proposed project.

4.3.14. Discussion of Yellow Warbler

The yellow warbler is a summer resident found throughout California in riparian woodlands from costal and desert lowlands up to 2500 meters in the Sierra Nevada Mountain Range. They can also be found in montane chaparral, open ponderosa pine forest and mixed conifer habitats with substantial amounts of brush. They mainly eat insects and spiders and typically glean and hover in the upper canopy of deciduous trees and shrubs. The yellow warbler requires riparian deciduous habitats and montane habitats with tall trees for singing and foraging and a dense under story of shrubs for nesting. They are active diurnally and migrants typically arrive in California in April and remain until October. A small number of yellow warblers are known to over-winter in Southern California lowlands. Breeding occurs from mid-April into early August. The female will incubate the eggs for 11 days and once hatched, both parents will tend to the young until fledging at 9-12 days. In recent

years, the numbers of breeding pairs have declined drastically in many lowland areas where they were formerly common.

4.3.14.1. SURVEY RESULTS

The yellow warbler may occur within the riparian corridors along Antelope Creek, Big Chico Creek, Butte Creek, Deer Creek, Little Dry Creek, and Mill Creek.

4.3.14.2. AVOIDANCE AND MINIMIZATION EFFORTS

To ensure avoidance of nesting yellow warblers, a survey for nesting special-status bird species, including the yellow warbler, will be conducted by a qualified biologist prior to the removal of any vegetation within the Action Areas. No trees 5 inches DBH or greater will be removed, however, smaller tree and shrub species may be removed during the project installation activities. If the nests of yellow warblers are found, they will be avoided and installation activities will be shifted, as necessary, to avoid all active bird nests.

4.3.14.3. PROJECT IMPACTS

Due to the implementation of the avoidance measures discussed in **Section 4.3.13.2** above, no impacts to yellow warblers will occur due to the proposed project.

4.3.14.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required since no impacts to the yellow warbler will occur due to project activities.

4.3.14.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

No interrelated or interdependent effects were identified for the project.

4.3.14.6. CUMULATIVE EFFECTS

No cumulative effects to the yellow warbler will occur due to the proposed project.

4.3.15. Discussion of Migratory Bird and Raptor Species

Migratory birds and raptors in the orders Falconiformes (hawks, eagles, and falcons) and Strigiforms (owls) are protected in varying degrees under California Fish and Game Code, Section 3503.5, the Migratory Bird Treaty Act (MBTA), and CEQA. The Action Areas currently provide suitable nesting and/or foraging habitat for several of these species. Direct take of active nests, eggs, or birds is prohibited by CDFG and measures must be taken to minimize disturbance.

4.3.15.1. SURVEY RESULTS

During the field surveys numerous bird species protected under the MBTA were observed within the Action Areas. The Action Areas currently provide suitable nesting and/or foraging habitat for several species not detected during field surveys.

4.3.15.2. AVOIDANCE AND MINIMIZATION EFFORTS

A qualified biologist should conduct a pre-construction migratory bird/raptor survey during April-May, or no more than 30 days prior to construction activities, to determine the presence/absence of nesting birds in the Action Areas. Should nesting migratory birds or raptors be observed, appropriate spatial and temporal buffers will be required by MBTA and/or CDFG.

4.3.15.3. PROJECT IMPACTS

All active migratory bird and raptor nests will be avoided, as discussed in **Section 4.3.14.2** above. Thus, no impacts to migratory bird or raptor species will occur due to the proposed project.

4.3.15.4. COMPENSATORY MITIGATION

No compensatory mitigation will be required due to the avoidance measures that will be enforced as mentioned in **Section 4.3.14.2** above.

4.3.15.5. INTERRELATED AND/OR INTERDEPENDENT EFFECTS

There will be no interrelated or interdependent effects of the proposed project on migratory bird or raptor species. No other projects are planed in the vicinity of the project's Action Areas, and the project itself will only be a conducted for 3 years and then ceased.

4.3.15.6. CUMULATIVE EFFECTS

No cumulative effects on migratory bird or raptor species will occur due to the proposed project. The amount of vegetation planned for removal and the timing of vegetation removal will not affect nesting habitat for any migratory bird or raptor species.

Chapter 5. Regulatory Framework

5.1. Federal Endangered Species Act

The United States Congress passed the federal ESA in 1973 to protect those species that are endangered or threatened with extinction. The ESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

Under the ESA, species may be listed as either "endangered" or "threatened." Endangered means a species is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. All species of plants and animals, except non-native species and pest insects, are eligible for listing as endangered or threatened. The USFWS also maintains a list of "candidate" species. These are species for which there is enough information to warrant proposing them for listing, but that have not yet been proposed. "Proposed" species are those that have been proposed for listing, but have not yet been listed. The ESA makes it unlawful to "take" a listed animal without a permit. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Through regulations, the term "harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."

5.2. California Endangered Species Act

The CESA is similar to the ESA, but pertains to state-listed endangered and threatened species. The CESA requires state agencies to consult with the CDFG when preparing documents to comply with the CEQA. The purpose is to ensure that the actions of the lead agency do not jeopardize the continued existence of a listed species or result in the destruction, or adverse modification of habitat essential to the continued existence of those species. In addition to formal listing under the federal and state endangered species acts, "species of special concern" receive consideration

by CDFG. Species of special concern are those whose numbers, reproductive success, or habitat may be threatened.

5.3. Migratory Bird Treaty Act

The MBTA (16 USC §703) prohibits the killing of migratory birds or the destruction of their occupied nests and eggs except in accordance with regulations prescribed by the USFWS. The bird species covered by the MBTA includes nearly all of those that breed in North America, excluding introduced (i.e. exotic) species (50 Code of Federal Regulations §10.13). Activities that involve the removal of vegetation including trees, shrubs, grasses, and forbs or ground disturbance has the potential to affect bird species protected by the MBTA. Thus, vegetation removal and ground disturbance in areas with breeding birds should be conducted outside of the breeding season (approximately March 1 through August 31 in the Central Valley). If vegetation removal or ground disturbance activities are conducted during the breeding season, then a qualified biologist must determine if there are any nests of bird species protected under the MBTA present in the construction area prior to commencement of construction. If active nests are located or presumed present, then appropriate avoidance measures (e.g. spatial or temporal buffers) must be implemented.

5.4. California Fish and Game Code

The CFGC (§3503) states that "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." "Take" includes the disturbance of an active nest resulting in the abandonment or loss of young. The CFGC (§3503) also states that "it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto."

5.5. Rare and Endangered Plants

The CNPS maintains a list of plant species native to California with low population numbers, limited distribution, or otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California (CNPS 2001). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The CNPS listings categorize plants as follows:

- List 1A: Plants presumed extinct in California;
- List 1B: Plants rare, threatened, or endangered in California or elsewhere;
- List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere;
- List 3: Plants about which we need more information; and
- List 4: Plants of limited distribution.

The California Native Plant Protection Act (CFGC §1900-1913) prohibits the taking, possessing, or sale within the state of any plants with a state designation of rare, threatened, or endangered as defined by CDFG. An exception to this prohibition allows landowners, under specific circumstances, to take listed plant species, provided that the owners first notify CDFG and give the agency at least 10 days to retrieve (and presumably replant) the plants before they are destroyed. Fish and Game Code §1913 exempts from the "take" prohibition "the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way."

5.6. CEQA Guidelines §15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines §15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled based on the definition in the ESA and the section of the CFGC dealing with rare, threatened, and endangered plants and animals. The CEQA Guidelines (§15380) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or CDFG (e.g. candidate species, species of concern) would occur. Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

5.7. Waters of the United States

The USACE and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredged or fill material into jurisdictional waters of the United States, under the Clean Water Act (§404). The term "waters of the United States" is an encompassing term that includes "wetlands" and "other waters." Wetlands have been defined for regulatory purposes as follows: "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3, 40 CFR 230.3). Wetlands generally include swamps, marshes, bogs, and similar areas." Other waters of the United States are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (i.e., hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4).

The USACE may issue either individual permits on a case-by-case basis or general permits on a program level. General permits are pre-authorized and are issued to cover similar activities that are expected to cause only minimal adverse environmental effects. Nationwide permits are general permits issued to cover particular fill activities. All nationwide permits have general conditions that must be met for the permits to apply to a particular project, as well as specific conditions that apply to each nationwide permit.

5.8. Clean Water Act §401

The Clean Water Act (§401) requires water quality certification and authorization for placement of dredged or fill material in wetlands and Other Waters of the United States. In accordance with the Clean Water Act (§401), criteria for allowable discharges into surface waters have been developed by the State Water Resources Control Board (SWRCB), Division of Water Quality. The resulting requirements are used as criteria in granting National Pollutant Discharge Elimination System (NPDES) permits or waivers, which are obtained through the Regional Water Quality Control Board (RWQCB). Any activity or facility that will discharge waste (such as soils from construction) into surface waters, or from which waste may be discharged, must obtain an NPDES permit or waiver from the RWQCB. The RWQCB evaluates

an NPDES permit application to determine whether the proposed discharge is consistent with the adopted water quality objectives of the basin plan.

5.9. Streambed Alteration

The CDFG is a trustee agency that has jurisdiction under the CFGC (§1600 et seq.). The California Fish and Game Code (§1602), requires that a state or local government agency, public utility, or private entity must notify CDFG if a proposed project will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds… except when the department has been notified pursuant to §1601." If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFG may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into an agreement with CDFG identifying the approved activities and associated mitigation measures.

5.10. Other Applicable Regulations

Additional approvals, including informal consultation and permits, that may be required for the installation of scientific measuring devices/equipment for monitoring and data collection, include:

- Informal Consultation may be necessary with NOAA Fisheries and the USFWS for actions that have no adverse affects on listed species. Department of Fish and Game consistency determination for species listed under both the federal Endangered Species Act (ESA) and California ESA.

- Department of Water Resources (DWR): maintenance or upgrades to stream gauge stations that may be used as part of this project.

- Central Valley Flood Protection Board may require approval for portions of streams that may be designated floodways.

- County of Butte: Monitoring Well Permit, per Butte County Code, Chapter 23B.

- Temporary access easements/agreements at project sites.

Chapter 6. Recommendations and Determinations

6.1. Federal Listed Species

Based on the analysis as documented in this BA/BRA, the proposed Lower Tuscan Aquifer Monitoring, Recharge, and Data Management project will not adversely affect federally listed plant or animal species. Though VELB, GGS, Spring-run Chinook salmon and Central Valley steelhead have potential to occur within the Action Areas, avoidance measures will be implemented in order to prevent any impacts to these species. Best Management Practices (BMPs) used to avoid impacts include limiting construction to the smallest practical area, staging the equipment and the excavated material in designated areas at a minimum of 100 feet away from sensitive resources wherever practicable, and using erosion control methods such as silt fencing and straw wattles.

6.2. State and CNPS Listed Species

Based on the analysis as documented in this BA/BRA, the proposed Lower Tuscan Aquifer Monitoring, Recharge, and Data Management project will not adversely affect state listed or special-status plant or animal species. Though Ahart's dwarf rush, Ahart's paronychia, Red Bluff dwarf rush, round-leaved filaree, Butte County checkerbloom, brown fox sedge, Butte County fritillary, northwestern pond turtles, hardheads, Townsend's big-eared bat, western red bat, burrowing owls, loggerhead shrike, northern harrier, Swainson's hawks, and yellow warblers have potential to occur within the Action Areas, avoidance measures will be implemented in order to prevent any significant impacts to these species. Qualified biologists/botanists will conduct surveys prior to installation activities for these species and will be on-hand to help direct the location of installation activities to prevent impacts to special-status species. Pre-installation surveys for migratory bird and raptor species protected under the MBTA will also be conducted in order to determine the presence of any active nests. Installation activities will occur only where complete avoidance of special-status species is determined following the abovementioned surveys.

6.3. Other Protected Natural Resources

Based on the analysis as documented in this BA/BRA, the proposed project will not adversely affect state wild and scenic rivers including Mill and Deer Creeks since the methods of data collection within these creeks will not impede fish migration or water quality.

In addition, the proposed project will not adversely affect any sensitive natural communities. Great Valley cottonwood riparian forest, Great Valley mixed riparian forest, and Great Valley valley oak riparian forest may occur along the banks of the streams where recharge monitoring will take place. To minimize potential impacts to these sensitive natural communities, access to the streams will occur on-foot if existing access roads are not available. Additionally, no tree species 5 inches DBH or greater will be removed.

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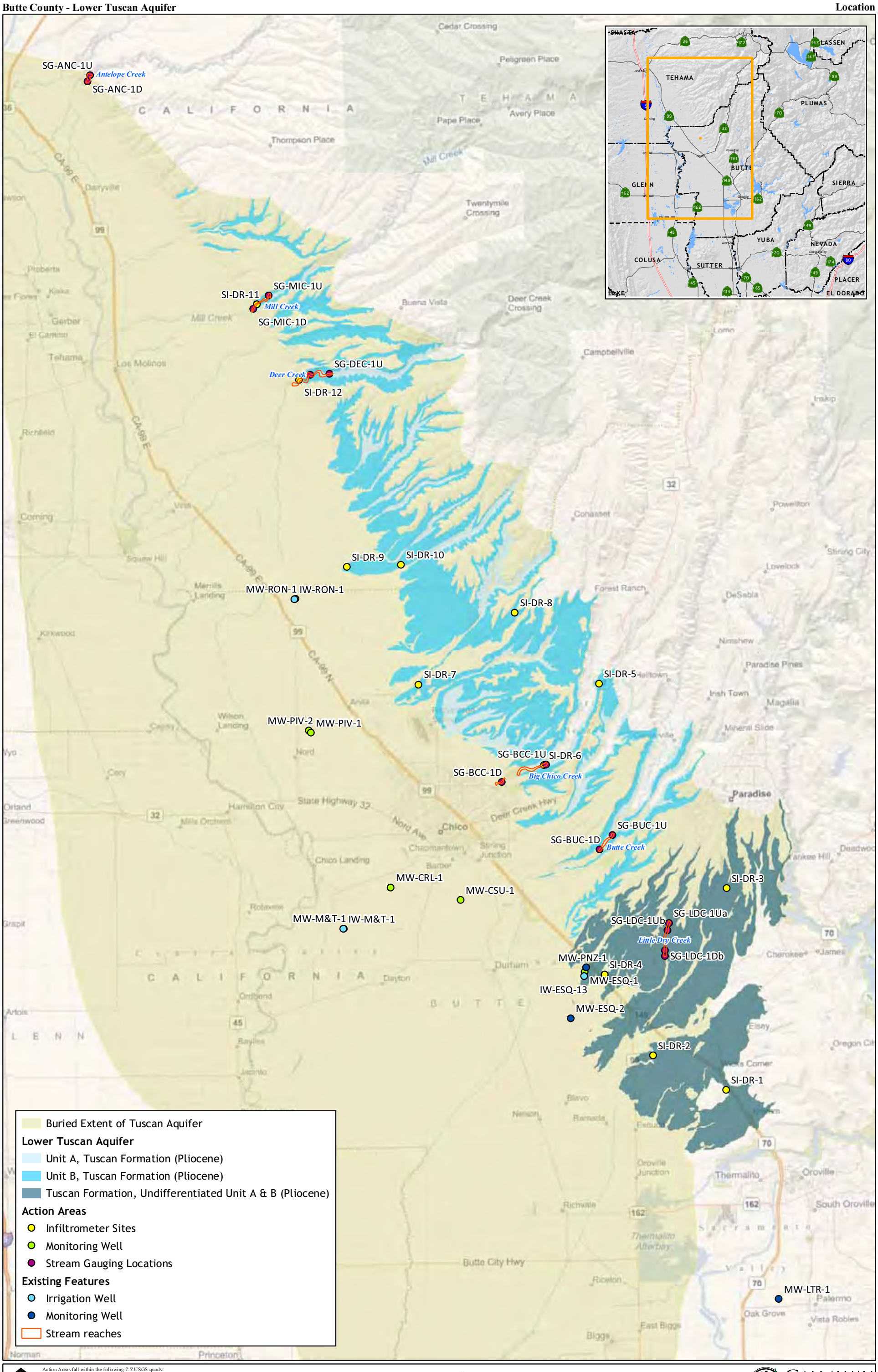
Appendix A Project Location Map

Butte County - Lower Tuscan Aquifer **Location**



Action Areas fall within the following 7.5' USGS quads:
Tuscan Springs, Acorn Hollow, Richardson Springs NW,
Campbell Mound, Nord, Richardson Springs, Paradise West,
Ord Ferry, Chico, Hamlin Canyon, Cherokee, Shippee, Oroville, Palermo.
Base data: Microsoft
Map Date: April 23, 2010.

GALLAWAY CONSULTING
A DIVISION OF NORTHSTAR ENGINEERING

Appendix B USFWS Species Lists

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: 100203102443

Database Last Updated: December 1, 2009

Quad Lists

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)

Hypomesus transpacificus

delta smelt (T)

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)

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

Birds

Coccyzus americanus occidentalis

Western yellow-billed cuckoo (C)

Quads Containing Listed, Proposed or Candidate Species:

BANGOR (559B)

LOMA RICA (559C)

PALERMO (560A)

BIGGS (560B)

GRIDLEY (560C)

HONCUT (560D)

OROVILLE DAM (575C)

HAMLIN CANYON (576B)

SHIPPEE (576C)

OROVILLE (576D)

CHICO (577A)

ORD FERRY (577B)

LLANO SECO (577C)

NELSON (577D)

HAMILTON CITY (578A)

ORLAND (578B)

WILLOWS (578C)

GLENN (578D)

FRUTO NE (579A)

STONE VALLEY (579D)

PARADISE WEST (592C)

CAMPBELL MOUND (593A)

RICHARDSON SPRINGS NW (593B)

NORD (593C)

RICHARDSON SPRINGS (593D)
VINA (594A)
KIRKWOOD (594C)
FOSTER ISLAND (594D)
BLACK BUTTE DAM (595D)

County Lists

Butte 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

Ambystoma californiense
California tiger salamander, central population (T)

Rana aurora draytonii
California red-legged frog (T)
Critical habitat, California red-legged frog (X)

Reptiles

Thamnophis gigas
giant garter snake (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
slender Orcutt grass (T)

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

Proposed Species

Amphibians

Rana aurora draytonii
Critical habitat, California red-legged frog (PX)

Candidate Species

Amphibians

Rana muscosa
mountain yellow-legged frog (C)

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Mammals

Martes pennanti
fisher (C)

Glenn County

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

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

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Oncorhynchus kisutch
coho salmon, So OR/No CA (T) (NMFS)
Critical habitat, coho salmon, So OR/No CA (X) (NMFS)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)
Critical habitat, Northern California steelhead (X) (NMFS)
Northern California steelhead (T) (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
Hoover's spurge (T)

Orcuttia pilosa
hairy Orcutt grass (E)

Tuctoria greenei
Greene's tuctoria (=Orcutt grass) (E)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (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 May (2010.

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: 100219030137

Database Last Updated: December 1, 2009

Quad Lists

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)

Hypomesus transpacificus

delta smelt (T)

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

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

Critical habitat, California red-legged frog (X)

Reptiles

Thamnophis gigas

giant garter snake (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)

Proposed Species

Amphibians

Rana aurora draytonii

Critical habitat, California red-legged frog (PX)

Candidate Species

Amphibians

Rana muscosa

mountain yellow-legged frog (C)

Birds

Coccyzus americanus occidentalis

Western yellow-billed cuckoo (C)

Mammals

Martes pennanti

fisher (C)

Quads Containing Listed, Proposed or Candidate Species:

BANGOR (559B)

PALERMO (560A)

BIGGS (560B)

WEST OF BIGGS (561A)

BERRY CREEK (575B)

OROVILLE DAM (575C)

CHEROKEE (576A)

HAMLIN CANYON (576B)

SHIPPEE (576C)

OROVILLE (576D)
CHICO (577A)
ORD FERRY (577B)
NELSON (577D)
PULGA (591C)
STIRLING CITY (592A)
COHASSET (592B)
PARADISE WEST (592C)
PARADISE EAST (592D)
CAMPBELL MOUND (593A)
RICHARDSON SPRINGS NW (593B)
NORD (593C)
RICHARDSON SPRINGS (593D)
VINA (594A)
FOSTER ISLAND (594D)
DEVILS PARADE GROUND (608C)
BUTTE MEADOWS (608D)
PANTHER SPRING (609A)
DEWITT PEAK (609B)
ACORN HOLLOW (609C)
ISHI CAVES (609D)
TUSCAN SPRINGS (610A)
LOS MOLINOS (610D)

County Lists

Butte 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

Ambystoma californiense
California tiger salamander, central population (T)

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California red-legged frog (T)
Critical habitat, California red-legged frog (X)

Reptiles

Thamnophis gigas
giant garter snake (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
slender Orcutt grass (T)

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

Proposed Species

Amphibians

Rana aurora draytonii

Critical habitat, California red-legged frog (PX)

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:

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Candidate Species

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Wetlands

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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 May 2 2010.

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: 100219091719

Database Last Updated: December 1, 2009

Quad Lists

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)

Hypomesus transpacificus

delta smelt (T)

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)

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)

Quads Containing Listed, Proposed or Candidate Species:

CHEROKEE (576A)

HAMLIN CANYON (576B)

SHIPPEE (576C)

OROVILLE (576D)

CHICO (577A)

ORD FERRY (577B)

NELSON (577D)

COHASSET (592B)

PARADISE WEST (592C)

PARADISE EAST (592D)

CAMPBELL MOUND (593A)

RICHARDSON SPRINGS NW (593B)

NORD (593C)

RICHARDSON SPRINGS (593D)

VINA (594A)

PANTHER SPRING (609A)

DEWITT PEAK (609B)

ACORN HOLLOW (609C)

ISHI CAVES (609D)

TUSCAN SPRINGS (610A)

RED BLUFF EAST (610B)

GERBER (610C)
LOS MOLINOS (610D)
INSKIP HILL (627C)
BEND (628C)
DALES (628D)

County Lists

Butte 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

Ambystoma californiense
California tiger salamander, central population (T)

Rana aurora draytonii
California red-legged frog (T)
Critical habitat, California red-legged frog (X)

Reptiles

Thamnophis gigas
giant garter snake (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)
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Orcuttia tenuis
slender Orcutt grass (T)

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

Proposed Species

Amphibians

Rana aurora draytonii
Critical habitat, California red-legged frog (PX)

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

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Updates

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Appendix C CNDDB Species Lists

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Ahart's dwarf rush *Juncus leiospermus var. ahartii*	PMJUN011L1			G2T1	S1.2	1B.2
2	Ahart's paronychia *Paronychia ahartii*	PDCAR0L0V0			G3	S3	1B.1
3	American badger *Taxidea taxus*	AMAJF04010			G5	S4	SC
4	American peregrine falcon *Falco peregrinus anatum*	ABNKD06071	Delisted	unknown code...	G4T3	S2	
5	Antioch Dunes anthicid beetle *Anthicus antiochensis*	IICOL49020			G1	S1	
6	Baker's navarretia *Navarretia leucocephala ssp. bakeri*	PDPLM0C0E1			G4T2	S2.1	1B.1
7	Boggs Lake hedge-hyssop *Gratiola heterosepala*	PDSCR0R060		Endangered	G3	S3.1	1B.2
8	Brandegee's clarkia *Clarkia biloba ssp. brandegeeae*	PDONA05053			G4G5T3	S3	1B.2
9	Brazilian watermeal *Wolffia brasiliensis*	PMLEM03020			G5	S1.3	2.3
10	Butte County checkerbloom *Sidalcea robusta*	PDMAL110P0			G2	S2.2	1B.2
11	Butte County fritillary *Fritillaria eastwoodiae*	PMLIL0V060			G3Q	S3	3.2
12	Butte County golden clover *Trifolium jokerstii*	PDFAB40310			G1	S1.2	1B.2
13	Butte County meadowfoam *Limnanthes floccosa ssp. californica*	PDLIM02042	Endangered	Endangered	G4T1	S1.1	1B.1
14	Butte County morning-glory *Calystegia atriplicifolia ssp. buttensis*	PDCON04012			G5T3	S3	4.2
15	California beaked-rush *Rhynchospora californica*	PMCYP0N060			G1	S1.1	1B.1
16	California black rail *Laterallus jamaicensis coturniculus*	ABNME03041		Threatened	G4T1	S1	
17	California linderiella *Linderiella occidentalis*	ICBRA06010			G3	S2S3	
18	California satintail *Imperata brevifolia*	PMPOA3D020			G2	S2.1	2.1
19	Central Valley Drainage Fall Run Chinook	CARA2442CA			G?	SNR	
20	Central Valley Drainage Hardhead/Squawfish Stream	CARA2443CA			G?	SNR	
21	Central Valley Drainage Valley Floor River	CARA2441CA			G?	SNR	
22	Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1	
23	Conservancy fairy shrimp *Branchinecta conservatio*	ICBRA03010	Endangered		G1	S1	
24	Ferris' milk-vetch *Astragalus tener var. ferrisiae*	PDFAB0F8R3			G1T1	S1.1	1B.1

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25	Great Valley Cottonwood Riparian Forest	CTT61410CA			G2	S2.1	
26	Great Valley Mixed Riparian Forest	CTT61420CA			G2	S2.2	
27	Great Valley Valley Oak Riparian Forest	CTT61430CA			G1	S1.1	
28	Great Valley Willow Scrub	CTT63410CA			G3	S3.2	
29	Greene's tuctoria *Tuctoria greenei*	PMPOA6N010	Endangered	Rare	G2	S2.2	1B.1
30	Hoover's spurge *Chamaesyce hooveri*	PDEUP0D150	Threatened		G2	S2.1	1B.2
31	Mosquin's clarkia *Clarkia mosquinii*	PDONA050S0			G2	S2	1B.1
32	Norris' beard moss *Didymodon norrisii*	NBMUS2C0H0			G2G3	S2.2	2.2
33	Northern Basalt Flow Vernal Pool	CTT44131CA			G3	S2.2	
34	Northern Hardpan Vernal Pool	CTT44110CA			G3	S3.1	
35	Northern Volcanic Mud Flow Vernal Pool	CTT44132CA			G1	S1.1	
36	Red Bluff dwarf rush *Juncus leiospermus var. leiospermus*	PMJUN011L2			G2T2	S2.2	1B.1
37	Sacramento anthicid beetle *Anthicus sacramento*	IICOL49010			G1	S1	
38	San Joaquin spearscale *Atriplex joaquiniana*	PDCHE041F3			G2	S2	1B.2
39	Sanford's arrowhead *Sagittaria sanfordii*	PMALI040Q0			G3	S3.2	1B.2
40	Sierra Nevada red fox *Vulpes vulpes necator*	AMAJA03012		Threatened	G5T3	S1	
41	Stony Creek spurge *Chamaesyce ocellata ssp. rattanii*	PDEUP0D1P1			G4T3	S3.3	1B.2
42	Swainson's hawk *Buteo swainsoni*	ABNKC19070		Threatened	G5	S2	
43	Valley Needlegrass Grassland	CTT42110CA			G1	S3.1	
44	Yuma myotis *Myotis yumanensis*	AMACC01020			G5	S4?	
45	adobe-lily *Fritillaria pluriflora*	PMLIL0V0F0			G3	S3	1B.2
46	bald eagle *Haliaeetus leucocephalus*	ABNKC10010	Delisted	Endangered	G5	S2	
47	bank swallow *Riparia riparia*	ABPAU08010		Threatened	G5	S2S3	
48	black-crowned night heron *Nycticorax nycticorax*	ABNGA11010			G5	S3	
49	brittlescale *Atriplex depressa*	PDCHE042L0			G2Q	S2.2	1B.2
50	brown fox sedge *Carex vulpinoidea*	PMCYP03EN0			G5	S2.2	2.2

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
51	brownish beaked-rush *Rhynchospora capitellata*	PMCYP0N080			G5	S2S3	2.2
52	burrowing owl *Athene cunicularia*	ABNSB10010			G4	S2	SC
53	caper-fruited tropidocarpum *Tropidocarpum capparideum*	PDBRA2R010			G1	S1.1	1B.1
54	chinook salmon - Central Valley spring-run ESU *Oncorhynchus tshawytscha*	AFCHA0205A	Threatened	Threatened	G5	S1	
55	chinook salmon - Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	AFCHA0205B	Endangered	Endangered	G5	S1	
56	coast horned lizard *Phrynosoma blainvillii*	ARACF12100			G4G5	S3S4	SC
57	dwarf downingia *Downingia pusilla*	PDCAM060C0			G3	S3.1	2.2
58	flagella-like atractylocarpus *Campylopodiella stenocarpa*	NBMUS84010			G5	S1.2	2.2
59	giant garter snake *Thamnophis gigas*	ARADB36150	Threatened	Threatened	G2G3	S2S3	
60	great blue heron *Ardea herodias*	ABNGA04010			G5	S4	
61	great egret *Ardea alba*	ABNGA04040			G5	S4	
62	greater sandhill crane *Grus canadensis tabida*	ABNMK01014		Threatened	G5T4	S2	
63	hairy Orcutt grass *Orcuttia pilosa*	PMPOA4G040	Endangered	Endangered	G2	S2.1	1B.1
64	hoary bat *Lasiurus cinereus*	AMACC05030			G5	S4?	
65	loggerhead shrike *Lanius ludovicianus*	ABPBR01030			G4	S4	SC
66	northern harrier *Circus cyaneus*	ABNKC11010			G5	S3	SC
67	osprey *Pandion haliaetus*	ABNKC01010			G5	S3	
68	pallid bat *Antrozous pallidus*	AMACC10010			G5	S3	SC
69	pink creamsacs *Castilleja rubicundula ssp. rubicundula*	PDSCR0D482			G5T2	S2.2	1B.2
70	recurved larkspur *Delphinium recurvatum*	PDRAN0B1J0			G2	S2.2	1B.2
71	round-leaved filaree *California macrophylla*	PDGER01070			G3	S3.1	1B.1
72	silky cryptantha *Cryptantha crinita*	PDBOR0A0Q0			G1	S1.1	1B.2
73	silver-haired bat *Lasionycteris noctivagans*	AMACC02010			G5	S3S4	

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
74	slender Orcutt grass *Orcuttia tenuis*	PMPOA4G050	Threatened	Endangered	G3	S3.1	1B.1
75	slender-leaved pondweed *Potamogeton filiformis*	PMPOT03090			G5	S1S2	2.2
76	snowy egret *Egretta thula*	ABNGA06030			G5	S4	
77	tricolored blackbird *Agelaius tricolor*	ABPBXB0020			G2G3	S2	SC
78	valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	IICOL48011	Threatened		G3T2	S2	
79	veiny monardella *Monardella douglasii ssp. venosa*	PDLAM18082			G5T1	S1.1	1B.1
80	vernal pool fairy shrimp *Branchinecta lynchi*	ICBRA03030	Threatened		G3	S2S3	
81	vernal pool tadpole shrimp *Lepidurus packardi*	ICBRA10010	Endangered		G3	S2S3	
82	western mastiff bat *Eumops perotis californicus*	AMACD02011			G5T4	S3?	SC
83	western pond turtle *Actinemys marmorata*	ARAAD02030			G3G4	S3	SC
84	western red bat *Lasiurus blossevillii*	AMACC05060			G5	S3?	SC
85	western spadefoot *Spea hammondii*	AAABF02020			G3	S3	SC
86	western yellow-billed cuckoo *Coccyzus americanus occidentalis*	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
87	white-stemmed clarkia *Clarkia gracilis ssp. albicaulis*	PDONA050J1			G5T2	S2.2?	1B.2
88	woolly meadowfoam *Limnanthes floccosa ssp. floccosa*	PDLIM02043			G4T4	S3.2	4.2
89	woolly rose-mallow *Hibiscus lasiocarpos*	PDMAL0H0Q0			G4	S2.2	2.2
90	yellow warbler *Dendroica petechia brewsteri*	ABPBX03018			G5T3?	S2	SC

California Department of Fish and Game
Natural Diversity Database
Infiltrometer Sites 9 Quad List

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Ahart's dwarf rush *Juncus leiospermus var. ahartii*	PMJUN011L1			G2T1	S1.2	1B.2
2	Ahart's paronychia *Paronychia ahartii*	PDCAR0L0V0			G3	S3	1B.1
3	American badger *Taxidea taxus*	AMAJF04010			G5	S4	SC
4	American peregrine falcon *Falco peregrinus anatum*	ABNKD06071	Delisted	unknown code...	G4T3	S2	
5	Antioch Dunes anthicid beetle *Anthicus antiochensis*	IICOL49020			G1	S1	
6	Baker's globe mallow *Iliamna bakeri*	PDMAL0K010			G4	S3.2	4.2
7	Boggs Lake hedge-hyssop *Gratiola heterosepala*	PDSCR0R060		Endangered	G3	S3.1	1B.2
8	Brandegee's clarkia *Clarkia biloba ssp. brandegeeae*	PDONA05053			G4G5T3	S3	1B.2
9	Brazilian watermeal *Wolffia brasiliensis*	PMLEM03020			G5	S1.3	2.3
10	Butte County checkerbloom *Sidalcea robusta*	PDMAL110P0			G2	S2.2	1B.2
11	Butte County fritillary *Fritillaria eastwoodiae*	PMLIL0V060			G3Q	S3	3.2
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13	Butte County meadowfoam *Limnanthes floccosa ssp. californica*	PDLIM02042	Endangered	Endangered	G4T1	S1.1	1B.1
14	Butte County morning-glory *Calystegia atriplicifolia ssp. buttensis*	PDCON04012			G5T3	S3	4.2
15	California beaked-rush *Rhynchospora californica*	PMCYP0N060			G1	S1.1	1B.1
16	California black rail *Laterallus jamaicensis coturniculus*	ABNME03041		Threatened	G4T1	S1	
17	California linderiella *Linderiella occidentalis*	ICBRA06010			G3	S2S3	
18	California red-legged frog *Rana draytonii*	AAABH01022	Threatened		G4T2T3	S2S3	SC
19	California satintail *Imperata brevifolia*	PMPOA3D020			G2	S2.1	2.1
20	Cantelow's lewisia *Lewisia cantelovii*	PDPOR04020			G3	S3.2	1B.2
21	Cascades frog *Rana cascadae*	AAABH01060			G3G4	S3	SC
22	Central Valley Drainage Fall Run Chinook	CARA2442CA			G?	SNR	
23	Central Valley Drainage Hardhead/Squawfish Stream	CARA2443CA			G?	SNR	
24	Central Valley Drainage Spring-Run Chinook Stream	CARA2431CA			G?	SNR	

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25	Central Valley Drainage Valley Floor River	CARA2441CA			G?	SNR	
26	Clifton's eremogone *Eremogone cliftonii*	PDCAR17010			G3	S3	1B.3
27	Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1	
28	Conservancy fairy shrimp *Branchinecta conservatio*	ICBRA03010	Endangered		G1	S1	
29	Feather River stonecrop *Sedum albomarginatum*	PDCRA0A030			G2	S2.2	1B.2
30	Ferris' milk-vetch *Astragalus tener var. ferrisiae*	PDFAB0F8R3			G1T1	S1.1	1B.1
31	Great Valley Cottonwood Riparian Forest	CTT61410CA			G2	S2.1	
32	Great Valley Mixed Riparian Forest	CTT61420CA			G2	S2.2	
33	Great Valley Valley Oak Riparian Forest	CTT61430CA			G1	S1.1	
34	Great Valley Willow Scrub	CTT63410CA			G3	S3.2	
35	Greene's tuctoria *Tuctoria greenei*	PMPOA6N010	Endangered	Rare	G2	S2.2	1B.1
36	Hall's rupertia *Rupertia hallii*	PDFAB62010			G3	S3.2	1B.2
37	Hoover's spurge *Chamaesyce hooveri*	PDEUP0D150	Threatened		G2	S2.1	1B.2
38	Jepson's onion *Allium jepsonii*	PMLIL022V0			G1	S1.2	1B.2
39	Lewis Rose's ragwort *Packera eurycephala var. lewisrosei*	PDAST8H182			G4T2	S2.2	1B.2
40	Mildred's clarkia *Clarkia mildrediae ssp. mildrediae*	PDONA050Q2			G3T3	S3.3	1B.3
41	Mosquin's clarkia *Clarkia mosquinii*	PDONA050S0			G2	S2	1B.1
42	Norris' beard moss *Didymodon norrisii*	NBMUS2C0H0			G2G3	S2.2	2.2
43	Northern Basalt Flow Vernal Pool	CTT44131CA			G3	S2.2	
44	Northern Hardpan Vernal Pool	CTT44110CA			G3	S3.1	
45	Northern Volcanic Mud Flow Vernal Pool	CTT44132CA			G1	S1.1	
46	Red Bluff dwarf rush *Juncus leiospermus var. leiospermus*	PMJUN011L2			G2T2	S2.2	1B.1
47	Sacramento anthicid beetle *Anthicus sacramento*	IICOL49010			G1	S1	
48	Sanford's arrowhead *Sagittaria sanfordii*	PMALI040Q0			G3	S3.2	1B.2
49	Sierra Nevada red fox *Vulpes vulpes necator*	AMAJA03012		Threatened	G5T3	S1	
50	Swainson's hawk *Buteo swainsoni*	ABNKC19070		Threatened	G5	S2	
51	Townsend's big-eared bat *Corynorhinus townsendii*	AMACC08010			G4	S2S3	SC

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
52	Yuma myotis *Myotis yumanensis*	AMACC01020			G5	S4?	
53	adobe-lily *Fritillaria pluriflora*	PMLIL0V0F0			G3	S3	1B.2
54	bald eagle *Haliaeetus leucocephalus*	ABNKC10010	Delisted	Endangered	G5	S2	
55	bank swallow *Riparia riparia*	ABPAU08010		Threatened	G5	S2S3	
56	brown fox sedge *Carex vulpinoidea*	PMCYP03EN0			G5	S2.2	2.2
57	brownish beaked-rush *Rhynchospora capitellata*	PMCYP0N080			G5	S2S3	2.2
58	burrowing owl *Athene cunicularia*	ABNSB10010			G4	S2	SC
59	chinook salmon - Central Valley spring-run ESU *Oncorhynchus tshawytscha*	AFCHA0205A	Threatened	Threatened	G5	S1	
60	chinook salmon - Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	AFCHA0205B	Endangered	Endangered	G5	S1	
61	closed-throated beardtongue *Penstemon personatus*	PDSCR1L4Y0			G2	S2.2	1B.2
62	coast horned lizard *Phrynosoma blainvillii*	ARACF12100			G4G5	S3S4	SC
63	flagella-like atractylocarpus *Campylopodiella stenocarpa*	NBMUS84010			G5	S1.2	2.2
64	foothill yellow-legged frog *Rana boylii*	AAABH01050			G3	S2S3	SC
65	fringed myotis *Myotis thysanodes*	AMACC01090			G4G5	S4	
66	giant garter snake *Thamnophis gigas*	ARADB36150	Threatened	Threatened	G2G3	S2S3	
67	great blue heron *Ardea herodias*	ABNGA04010			G5	S4	
68	great egret *Ardea alba*	ABNGA04040			G5	S4	
69	greater sandhill crane *Grus canadensis tabida*	ABNMK01014		Threatened	G5T4	S2	
70	hairy Orcutt grass *Orcuttia pilosa*	PMPOA4G040	Endangered	Endangered	G2	S2.1	1B.1
71	hardhead *Mylopharodon conocephalus*	AFCJB25010			G3	S3	SC
72	hoary bat *Lasiurus cinereus*	AMACC05030			G5	S4?	
73	loggerhead shrike *Lanius ludovicianus*	ABPBR01030			G4	S4	SC
74	long-eared myotis *Myotis evotis*	AMACC01070			G5	S4?	

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
75	long-leaved starwort *Stellaria longifolia*	PDCAR0X0M0			G5	S1.2	2.2
76	long-stiped campion *Silene occidentalis ssp. longistipitata*	PDCAR0U161			G4T2	S2	1B.2
77	merlin *Falco columbarius*	ABNKD06030			G5	S3	
78	mingan moonwort *Botrychium minganense*	PPOPH010R0			G4	S1.2	2.2
79	mud sedge *Carex limosa*	PMCYP037K0			G5	S3?	2.2
80	northern goshawk *Accipiter gentilis*	ABNKC12060			G5	S3	SC
81	northern harrier *Circus cyaneus*	ABNKC11010			G5	S3	SC
82	obtuse starwort *Stellaria obtusa*	PDCAR0X0U0			G5	S3.3	4.3
83	osprey *Pandion haliaetus*	ABNKC01010			G5	S3	
84	pallid bat *Antrozous pallidus*	AMACC10010			G5	S3	SC
85	pink creamsacs *Castilleja rubicundula ssp. rubicundula*	PDSCR0D482			G5T2	S2.2	1B.2
86	prairie falcon *Falco mexicanus*	ABNKD06090			G5	S3	
87	recurved larkspur *Delphinium recurvatum*	PDRAN0B1J0			G2	S2.2	1B.2
88	round-leaved filaree *California macrophylla*	PDGER01070			G3	S3.1	1B.1
89	scalloped moonwort *Botrychium crenulatum*	PPOPH010L0			G3	S2.2	2.2
90	silky cryptantha *Cryptantha crinita*	PDBOR0A0Q0			G1	S1.1	1B.2
91	silver-haired bat *Lasionycteris noctivagans*	AMACC02010			G5	S3S4	
92	slender Orcutt grass *Orcuttia tenuis*	PMPOA4G050	Threatened	Endangered	G3	S3.1	1B.1
93	slender silver moss *Anomobryum julaceum*	NBMUS80010			G4G5	S1.3	2.2
94	slender-leaved pondweed *Potamogeton filiformis*	PMPOT03090			G5	S1S2	2.2
95	tricolored blackbird *Agelaius tricolor*	ABPBXB0020			G2G3	S2	SC
96	valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	IICOL48011	Threatened		G3T2	S2	
97	veiny monardella *Monardella douglasii ssp. venosa*	PDLAM18082			G5T1	S1.1	1B.1

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
98	vernal pool fairy shrimp *Branchinecta lynchi*	ICBRA03030	Threatened		G3	S2S3	
99	vernal pool tadpole shrimp *Lepidurus packardi*	ICBRA10010	Endangered		G3	S2S3	
100	western mastiff bat *Eumops perotis californicus*	AMACD02011			G5T4	S3?	SC
101	western pond turtle *Actinemys marmorata*	ARAAD02030			G3G4	S3	SC
102	western red bat *Lasiurus blossevillii*	AMACC05060			G5	S3?	SC
103	western spadefoot *Spea hammondii*	AAABF02020			G3	S3	SC
104	western yellow-billed cuckoo *Coccyzus americanus occidentalis*	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
105	white-stemmed clarkia *Clarkia gracilis ssp. albicaulis*	PDONA050J1			G5T2	S2.2?	1B.2
106	woolly meadowfoam *Limnanthes floccosa ssp. floccosa*	PDLIM02043			G4T4	S3.2	4.2
107	woolly rose-mallow *Hibiscus lasiocarpos*	PDMAL0H0Q0			G4	S2.2	2.2
108	yellow warbler *Dendroica petechia brewsteri*	ABPBX03018			G5T3?	S2	SC
109	yellow-breasted chat *Icteria virens*	ABPBX24010			G5	S3	SC

California Department of Fish and Game
Natural Diversity Database
Stream Reaches 9 Quad List

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Ahart's dwarf rush *Juncus leiospermus var. ahartii*	PMJUN011L1			G2T1	S1.2	1B.2
2	Ahart's paronychia *Paronychia ahartii*	PDCAR0L0V0			G3	S3	1B.1
3	American badger *Taxidea taxus*	AMAJF04010			G5	S4	SC
4	American peregrine falcon *Falco peregrinus anatum*	ABNKD06071	Delisted	unknown code...	G4T3	S2	
5	Antioch Dunes anthicid beetle *Anthicus antiochensis*	IICOL49020			G1	S1	
6	Blennosperma vernal pool andrenid bee *Andrena blennospermatis*	IIHYM35030			G2	S2	
7	Boggs Lake hedge-hyssop *Gratiola heterosepala*	PDSCR0R060		Endangered	G3	S3.1	1B.2
8	Brandegee's clarkia *Clarkia biloba ssp. brandegeeae*	PDONA05053			G4G5T3	S3	1B.2
9	Brazilian watermeal *Wolffia brasiliensis*	PMLEM03020			G5	S1.3	2.3
10	Butte County checkerbloom *Sidalcea robusta*	PDMAL110P0			G2	S2.2	1B.2
11	Butte County fritillary *Fritillaria eastwoodiae*	PMLIL0V060			G3Q	S3	3.2
12	Butte County golden clover *Trifolium jokerstii*	PDFAB40310			G1	S1.2	1B.2
13	Butte County meadowfoam *Limnanthes floccosa ssp. californica*	PDLIM02042	Endangered	Endangered	G4T1	S1.1	1B.1
14	Butte County morning-glory *Calystegia atriplicifolia ssp. buttensis*	PDCON04012			G5T3	S3	4.2
15	California beaked-rush *Rhynchospora californica*	PMCYP0N060			G1	S1.1	1B.1
16	California black rail *Laterallus jamaicensis coturniculus*	ABNME03041		Threatened	G4T1	S1	
17	California linderiella *Linderiella occidentalis*	ICBRA06010			G3	S2S3	
18	California satintail *Imperata brevifolia*	PMPOA3D020			G2	S2.1	2.1
19	Central Valley Drainage Fall Run Chinook	CARA2442CA			G?	SNR	
20	Central Valley Drainage Hardhead/Squawfish Stream	CARA2443CA			G?	SNR	
21	Central Valley Drainage Spring-Run Chinook Stream	CARA2431CA			G?	SNR	
22	Central Valley Drainage Valley Floor River	CARA2441CA			G?	SNR	
23	Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1	
24	Conservancy fairy shrimp *Branchinecta conservatio*	ICBRA03010	Endangered		G1	S1	

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25	Ferris' milk-vetch *Astragalus tener var. ferrisiae*	PDFAB0F8R3			G1T1	S1.1	1B.1
26	Great Valley Cottonwood Riparian Forest	CTT61410CA			G2	S2.1	
27	Great Valley Mixed Riparian Forest	CTT61420CA			G2	S2.2	
28	Great Valley Valley Oak Riparian Forest	CTT61430CA			G1	S1.1	
29	Great Valley Willow Scrub	CTT63410CA			G3	S3.2	
30	Greene's tuctoria *Tuctoria greenei*	PMPOA6N010	Endangered	Rare	G2	S2.2	1B.1
31	Hall's rupertia *Rupertia hallii*	PDFAB62010			G3	S3.2	1B.2
32	Henderson's bent grass *Agrostis hendersonii*	PMPOA040K0			G1Q	S1.1	3.2
33	Hoover's spurge *Chamaesyce hooveri*	PDEUP0D150	Threatened		G2	S2.1	1B.2
34	Jepson's onion *Allium jepsonii*	PMLIL022V0			G1	S1.2	1B.2
35	Klamath sideband *Monadenia churchi*	IMGASC7010			G2	S2	
36	Lewis Rose's ragwort *Packera eurycephala var. lewisrosei*	PDAST8H182			G4T2	S2.2	1B.2
37	Mildred's clarkia *Clarkia mildrediae ssp. mildrediae*	PDONA050Q2			G3T3	S3.3	1B.3
38	Mosquin's clarkia *Clarkia mosquinii*	PDONA050S0			G2	S2	1B.1
39	Norris' beard moss *Didymodon norrisii*	NBMUS2C0H0			G2G3	S2.2	2.2
40	Northern Basalt Flow Vernal Pool	CTT44131CA			G3	S2.2	
41	Northern Hardpan Vernal Pool	CTT44110CA			G3	S3.1	
42	Northern Interior Cypress Forest	CTT83220CA			G2	S2.2	
43	Northern Volcanic Mud Flow Vernal Pool	CTT44132CA			G1	S1.1	
44	Red Bluff dwarf rush *Juncus leiospermus var. leiospermus*	PMJUN011L2			G2T2	S2.2	1B.1
45	Sacramento anthicid beetle *Anthicus sacramento*	IICOL49010			G1	S1	
46	Sanford's arrowhead *Sagittaria sanfordii*	PMALI040Q0			G3	S3.2	1B.2
47	Shasta clarkia *Clarkia borealis ssp. arida*	PDONA05061			G3T1	S1.2	1B.1
48	Sierra Nevada red fox *Vulpes vulpes necator*	AMAJA03012		Threatened	G5T3	S1	
49	Stony Creek spurge *Chamaesyce ocellata ssp. rattanii*	PDEUP0D1P1			G4T3	S3.3	1B.2
50	Swainson's hawk *Buteo swainsoni*	ABNKC19070		Threatened	G5	S2	

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
51	Townsend's big-eared bat *Corynorhinus townsendii*	AMACC08010			G4	S2S3	SC
52	Yuma myotis *Myotis yumanensis*	AMACC01020			G5	S4?	
53	adobe-lily *Fritillaria pluriflora*	PMLIL0V0F0			G3	S3	1B.2
54	bald eagle *Haliaeetus leucocephalus*	ABNKC10010	Delisted	Endangered	G5	S2	
55	bank swallow *Riparia riparia*	ABPAU08010		Threatened	G5	S2S3	
56	brown fox sedge *Carex vulpinoidea*	PMCYP03EN0			G5	S2.2	2.2
57	brownish beaked-rush *Rhynchospora capitellata*	PMCYP0N080			G5	S2S3	2.2
58	burrowing owl *Athene cunicularia*	ABNSB10010			G4	S2	SC
59	chinook salmon - Central Valley spring-run ESU *Oncorhynchus tshawytscha*	AFCHA0205A	Threatened	Threatened	G5	S1	
60	chinook salmon - Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	AFCHA0205B	Endangered	Endangered	G5	S1	
61	closed-throated beardtongue *Penstemon personatus*	PDSCR1L4Y0			G2	S2.2	1B.2
62	coast horned lizard *Phrynosoma blainvillii*	ARACF12100			G4G5	S3S4	SC
63	dwarf downingia *Downingia pusilla*	PDCAM060C0			G3	S3.1	2.2
64	flagella-like atractylocarpus *Campylopodiella stenocarpa*	NBMUS84010			G5	S1.2	2.2
65	foothill yellow-legged frog *Rana boylii*	AAABH01050			G3	S2S3	SC
66	giant garter snake *Thamnophis gigas*	ARADB36150	Threatened	Threatened	G2G3	S2S3	
67	great blue heron *Ardea herodias*	ABNGA04010			G5	S4	
68	great egret *Ardea alba*	ABNGA04040			G5	S4	
69	hairy Orcutt grass *Orcuttia pilosa*	PMPOA4G040	Endangered	Endangered	G2	S2.1	1B.1
70	hoary bat *Lasiurus cinereus*	AMACC05030			G5	S4?	
71	legenere *Legenere limosa*	PDCAM0C010			G2	S2.2	1B.1
72	loggerhead shrike *Lanius ludovicianus*	ABPBR01030			G4	S4	SC
73	long-eared myotis *Myotis evotis*	AMACC01070			G5	S4?	

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
74	long-legged myotis *Myotis volans*	AMACC01110			G5	S4?	
75	osprey *Pandion haliaetus*	ABNKC01010			G5	S3	
76	pallid bat *Antrozous pallidus*	AMACC10010			G5	S3	SC
77	pink creamsacs *Castilleja rubicundula ssp. rubicundula*	PDSCR0D482			G5T2	S2.2	1B.2
78	prairie falcon *Falco mexicanus*	ABNKD06090			G5	S3	
79	recurved larkspur *Delphinium recurvatum*	PDRAN0B1J0			G2	S2.2	1B.2
80	red-flowered bird's-foot-trefoil *Lotus rubriflorus*	PDFAB2A150			G1	S1.1	1B.1
81	round-leaved filaree *California macrophylla*	PDGER01070			G3	S3.1	1B.1
82	silky cryptantha *Cryptantha crinita*	PDBOR0A0Q0			G1	S1.1	1B.2
83	silver-haired bat *Lasionycteris noctivagans*	AMACC02010			G5	S3S4	
84	slender Orcutt grass *Orcuttia tenuis*	PMPOA4G050	Threatened	Endangered	G3	S3.1	1B.1
85	slender-leaved pondweed *Potamogeton filiformis*	PMPOT03090			G5	S1S2	2.2
86	tricolored blackbird *Agelaius tricolor*	ABPBXB0020			G2G3	S2	SC
87	valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	IICOL48011	Threatened		G3T2	S2	
88	veiny monardella *Monardella douglasii ssp. venosa*	PDLAM18082			G5T1	S1.1	1B.1
89	vernal pool fairy shrimp *Branchinecta lynchi*	ICBRA03030	Threatened		G3	S2S3	
90	vernal pool tadpole shrimp *Lepidurus packardi*	ICBRA10010	Endangered		G3	S2S3	
91	western mastiff bat *Eumops perotis californicus*	AMACD02011			G5T4	S3?	SC
92	western pond turtle *Actinemys marmorata*	ARAAD02030			G3G4	S3	SC
93	western red bat *Lasiurus blossevillii*	AMACC05060			G5	S3?	SC
94	western spadefoot *Spea hammondii*	AAABF02020			G3	S3	SC
95	western yellow-billed cuckoo *Coccyzus americanus occidentalis*	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
96	white-stemmed clarkia *Clarkia gracilis ssp. albicaulis*	PDONA050J1			G5T2	S2.2?	1B.2

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
97	white-tailed kite *Elanus leucurus*	ABNKC06010			G5	S3	
98	woolly meadowfoam *Limnanthes floccosa ssp. floccosa*	PDLIM02043			G4T4	S3.2	4.2
99	woolly rose-mallow *Hibiscus lasiocarpos*	PDMAL0H0Q0			G4	S2.2	2.2
100	yellow warbler *Dendroica petechia brewsteri*	ABPBX03018			G5T3?	S2	SC
101	yellow-breasted chat *Icteria virens*	ABPBX24010			G5	S3	SC

Appendix D CNPS Species Lists

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 5, 2010, 13:29 b

{QUADS_123} =~ m/609C|593A|593B|610D|610A|594A|609D|609/ Search

Tip: Word fragments must be completed with a wildcard, e.g., esch* hyp* for Eschscholzia hypecoides.[all tips and help.][search history]

Your Quad Selection: Acorn Hollow (609C) 4012118, Campbell Mound (593A) 3912187, Richardson Springs NW (593B) 3912188, Los Molinos (610D) 4012211, Tuscan Springs (610A) 4012221, Vina (594A) 3912281, Ishi Caves (609D) 4012117, Panther Spring (609A) 4012127, Dewitt Peak (609B) 4012128

Hits 1 to 14 of 14

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	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Scrophulariaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 16:26 c

{QUADS_123} =~ m/593A|609C|609D|592B|592C|608C|593B|593(Search

Tip: Words meant to be searched as a unit should be wrapped in quotes, e.g., "coastal dunes".[all tips and help.][search history]

Your Quad Selection: Campbell Mound (593A) 3912187, Acorn Hollow (609C) 4012118, Ishi Caves (609D) 4012117, Cohasset (592B) 3912186, Paradise West (592C) 3912176, Devils Parade Ground (608C) 4012116, Richardson Springs NW (593B) 3912188, Nord (593C) 3912178, Richardson Springs (593D) 3912177

Hits 1 to 28 of 28

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	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mildrediae ssp. mildrediae**	Mildred's clarkia	Onagraceae	List 1B.3
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Scrophulariaceae	List 1B.2
		1	**Hesperolinon tehamense**	Tehama County western flax	Linaceae	List 1B.3

		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Rhynchospora capitellata**	brownish beaked-rush	Cyperaceae	List 2.2
		1	**Rupertia hallii**	Hall's rupertia	Fabaceae	List 1B.2
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 16:36 c

{QUADS_123} =~ m/576A|592C|592D|575B|575C|591C|576B|576(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: Cherokee (576A) 3912165, Paradise West (592C) 3912176, Paradise East (592D) 3912175, Berry Creek (575B) 3912164, Oroville Dam (575C) 3912154, Pulga (591C) 3912174, Hamlin Canyon (576B) 3912166, Shippee (576C) 3912156, Oroville (576D) 3912155

Hits 1 to 31 of 31

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	**Allium jepsonii**	Jepson's onion	Liliaceae	List 1B.2
		1	**Anomobryum julaceum**	slender silver moss	Bryaceae	List 2.2
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia biloba ssp. brandegeeae**	Brandegee's clarkia	Onagraceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mildrediae ssp. mildrediae**	Mildred's clarkia	Onagraceae	List 1B.3
		1	**Clarkia mosquinii**	Mosquin's clarkia	Onagraceae	List 1B.1
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Eremogone cliftonii**	Clifton's eremogone	Caryophyllaceae	List 1B.3
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos**	woolly rose-	Malvaceae	List

			var. occidentalis	mallow		1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Lewisia cantelovii**	Cantelow's lewisia	Portulacaceae	List 1B.2
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Packera eurycephala var. lewisrosei**	Lewis Rose's ragwort	Asteraceae	List 1B.2
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Penstemon personatus**	closed-throated beardtongue	Scrophulariaceae	List 1B.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Rhynchospora capitellata**	brownish beaked-rush	Cyperaceae	List 2.2
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Sedum albomarginatum**	Feather River stonecrop	Crassulaceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Trifolium jokerstii**	Butte County golden clover	Fabaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Wed, Feb. 3, 2010, 12:00 b

{QUADS_123} =~ m/577A|593C|593D|576B|576C|592C|577B|577(Search

Tip: `+Lathyrus +"coastal dunes"` returns only those Lathyrus in coastal dunes. Note the "+" and quotes.[all tips and help.][search history]

Your Quad Selection: Chico (577A) 3912167, Nord (593C) 3912178, Richardson Springs (593D) 3912177, Hamlin Canyon (576B) 3912166, Shippee (576C) 3912156, Paradise West (592C) 3912176, Ord Ferry (577B) 3912168, Llano Seco (577C) 3912158, Nelson (577D) 3912157

Hits 1 to 26 of 26

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	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Delphinium recurvatum**	recurved larkspur	Ranunculaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
			Juncus leiospermus	Red Bluff dwarf		List

		1	**var. leiospermus**	rush	Juncaceae	1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Rhynchospora capitellata**	brownish beaked-rush	Cyperaceae	List 2.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Trifolium jokerstii**	Butte County golden clover	Fabaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	List 1B.1
		1	**Wolffia brasiliensis**	Brazilian watermeal	Lemnaceae	List 2.3

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.

No more hits.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 16:28 c

{QUADS_123} =~ m/592B|608C|608D|593A|593D|609D|592A|592(Search

Tip: Want to search by habitat? Try the **Checkbox and Preset** search page.[all tips and help.] [search history]

Your Quad Selection: Cohasset (592B) 3912186, Devils Parade Ground (608C) 4012116, Butte Meadows (608D) 4012115, Campbell Mound (593A) 3912187, Richardson Springs (593D) 3912177, Ishi Caves (609D) 4012117, Stirling City (592A) 3912185, Paradise West (592C) 3912176, Paradise East (592D) 3912175

Hits 1 to 27 of 27

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	**Allium jepsonii**	Jepson's onion	Liliaceae	List 1B.2
		1	**Botrychium crenulatum**	scalloped moonwort	Ophioglossaceae	List 2.2
		1	**Botrychium minganense**	Mingan moonwort	Ophioglossaceae	List 2.2
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Carex limosa**	mud sedge	Cyperaceae	List 2.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mildrediae ssp. mildrediae**	Mildred's clarkia	Onagraceae	List 1B.3
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hesperolinon tehamense**	Tehama County western flax	Linaceae	List 1B.3
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
						List

		1	**Imperata brevifolia**	California satintail	Poaceae	2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Packera eurycephala var. lewisrosei**	Lewis Rose's ragwort	Asteraceae	List 1B.2
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Penstemon personatus**	closed-throated beardtongue	Scrophulariaceae	List 1B.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Rhynchospora capitellata**	brownish beaked-rush	Cyperaceae	List 2.2
		1	**Rupertia hallii**	Hall's rupertia	Fabaceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Silene occidentalis ssp. longistipitata**	long-stiped campion	Caryophyllaceae	List 1B.2
		1	**Stellaria longifolia**	long-leaved starwort	Caryophyllaceae	List 2.2

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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 5, 2010, 14:06 b

{QUADS_123} =~ m/576B|592C|592D|577A|577D|593D|576A|576(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: Hamlin Canyon (576B) 3912166, Paradise West (592C) 3912176, Paradise East (592D) 3912175, Chico (577A) 3912167, Nelson (577D) 3912157, Richardson Springs (593D) 3912177, Cherokee (576A) 3912165, Shippee (576C) 3912156, Oroville (576D) 3912155

Hits 1 to 29 of 29

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	**Allium jepsonii**	Jepson's onion	Liliaceae	List 1B.2
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia biloba ssp. brandegeeae**	Brandegee's clarkia	Onagraceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mildrediae ssp. mildrediae**	Mildred's clarkia	Onagraceae	List 1B.3
		1	**Clarkia mosquinii**	Mosquin's clarkia	Onagraceae	List 1B.1
		1	**Delphinium recurvatum**	recurved larkspur	Ranunculaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2

		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Packera eurycephala var. lewisrosei**	Lewis Rose's ragwort	Asteraceae	List 1B.2
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Rhynchospora capitellata**	brownish beaked-rush	Cyperaceae	List 2.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Trifolium jokerstii**	Butte County golden clover	Fabaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Wed, Feb. 3, 2010, 12:02 b

{QUADS_123} =~ m/593C|577A|577B|594D|594A|578A|593D|593/ Search

Tip: Want to search by county? Try the **county index**.[all tips and help.][search history]

Your Quad Selection: Nord (593C) 3912178, Chico (577A) 3912167, Ord Ferry (577B) 3912168, Foster Island (594D) 3912271, Vina (594A) 3912281, Hamilton City (578A) 3912261, Richardson Springs (593D) 3912177, Campbell Mound (593A) 3912187, Richardson Springs NW (593B) 3912188

Hits 1 to 26 of 26

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	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Scrophulariaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
			Limnanthes floccosa			

		1	**ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	List 1B.1
		1	**Wolffia brasiliensis**	Brazilian watermeal	Lemnaceae	List 2.3

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.

No more hits.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Wed, Feb. 3, 2010, 12:01 b

{QUADS_123} =~ m/577B|593C|593D|578A|578D|594D|577A|577(Search

Tip: Words meant to be searched as a unit should be wrapped in quotes, e.g., "coastal dunes".[all tips and help.][search history]

Your Quad Selection: Ord Ferry (577B) 3912168, Nord (593C) 3912178, Richardson Springs (593D) 3912177, Hamilton City (578A) 3912261, Glenn (578D) 3912251, Foster Island (594D) 3912271, Chico (577A) 3912167, Llano Seco (577C) 3912158, Nelson (577D) 3912157

Hits 1 to 22 of 22

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	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Delphinium recurvatum**	recurved larkspur	Ranunculaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa**	Butte County	Limnanthaceae	List

			ssp. californica	meadowfoam		1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	List 1B.1
		1	**Wolffia brasiliensis**	Brazilian watermeal	Lemnaceae	List 2.3

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.

No more hits.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Wed, Feb. 3, 2010, 11:57 b

{QUADS_123} =~ m/578B|594C|594D|579A|579D|595D|578A|578(Search

Tip: `+Lathyrus +"coastal dunes"` returns only those Lathyrus in coastal dunes. Note the "+" and quotes.[all tips and help.][search history]

Your Quad Selection: Orland (578B) 3912262, Kirkwood (594C) 3912272, Foster Island (594D) 3912271, Fruto NE (579A) 3912263, Stone Valley (579D) 3912253, Black Butte Dam (595D) 3912273, Hamilton City (578A) 3912261, Willows (578C) 3912252, Glenn (578D) 3912251

Hits 1 to 14 of 14

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	**Atriplex depressa**	brittlescale	Chenopodiaceae	List 1B.2
		1	**Atriplex joaquiniana**	San Joaquin spearscale	Chenopodiaceae	List 1B.2
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce ocellata ssp. rattanii**	Stony Creek spurge	Euphorbiaceae	List 1B.2
		1	**Delphinium recurvatum**	recurved larkspur	Ranunculaceae	List 1B.2
		1	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	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
		1	**Tropidocarpum capparideum**	caper-fruited tropidocarpum	Brassicaceae	List 1B.1
		1	**Wolffia brasiliensis**	Brazilian watermeal	Lemnaceae	List 2.3

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.

No more hits.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 16:38 c

{QUADS_123} =~ m/576D|560A|560B|575B|575C|559B|576A|576E Search

Tip: Want to search by county? Try the **county index**.[all tips and help.][search history]

Your Quad Selection: Oroville (576D) 3912155, Palermo (560A) 3912145, Biggs (560B) 3912146, Berry Creek (575B) 3912164, Oroville Dam (575C) 3912154, Bangor (559B) 3912144, Cherokee (576A) 3912165, Hamlin Canyon (576B) 3912166, Shippee (576C) 3912156

Hits 1 to 25 of 25

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	**Allium jepsonii**	Jepson's onion	Liliaceae	List 1B.2
		1	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia biloba ssp. brandegeeae**	Brandegee's clarkia	Onagraceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mildrediae ssp. mildrediae**	Mildred's clarkia	Onagraceae	List 1B.3
		1	**Clarkia mosquinii**	Mosquin's clarkia	Onagraceae	List 1B.1
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Juncus leiospermus var. ahartii**	Ahart's dwarf rush	Juncaceae	List 1B.2
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1

		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Packera eurycephala var. lewisrosei**	Lewis Rose's ragwort	Asteraceae	List 1B.2
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Trifolium jokerstii**	Butte County golden clover	Fabaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Wed, Feb. 3, 2010, 12:03 b

{QUADS_123} =~ m/560A|576C|576D|559B|559C|575C|560B|560(Search

Tip: `CNPS_LIST:"List 3"` (note the field name) returns only taxa on List 3. `"List 3"` by itself, matches the phrase wherever found. Browse the list of **field names**.[all tips and help.] [search history]

Your Quad Selection: Palermo (560A) 3912145, Shippee (576C) 3912156, Oroville (576D) 3912155, Bangor (559B) 3912144, Loma Rica (559C) 3912134, Oroville Dam (575C) 3912154, Biggs (560B) 3912146, Gridley (560C) 3912136, Honcut (560D) 3912135

Hits 1 to 17 of 17

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	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Clarkia biloba ssp. brandegeeae**	Brandegee's clarkia	Onagraceae	List 1B.2
		1	**Clarkia mosquinii**	Mosquin's clarkia	Onagraceae	List 1B.1
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Juncus leiospermus var. ahartii**	Ahart's dwarf rush	Juncaceae	List 1B.2
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1

		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Trifolium jokerstii**	Butte County golden clover	Fabaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 16:35 c

{QUADS_123} =~ m/592C|576A|576B|593D|593A|577A|592D|592A Search

Tip: Words meant to be searched as a unit should be wrapped in quotes, e.g., "coastal dunes".[all tips and help.][search history]

Your Quad Selection: Paradise West (592C) 3912176, Cherokee (576A) 3912165, Hamlin Canyon (576B) 3912166, Richardson Springs (593D) 3912177, Campbell Mound (593A) 3912187, Chico (577A) 3912167, Paradise East (592D) 3912175, Stirling City (592A) 3912185, Cohasset (592B) 3912186

Hits 1 to 26 of 26

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	**Allium jepsonii**	Jepson's onion	Liliaceae	List 1B.2
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mildrediae ssp. mildrediae**	Mildred's clarkia	Onagraceae	List 1B.3
		1	**Clarkia mosquinii**	Mosquin's clarkia	Onagraceae	List 1B.1
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1

		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Packera eurycephala var. lewisrosei**	Lewis Rose's ragwort	Asteraceae	List 1B.2
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Penstemon personatus**	closed-throated beardtongue	Scrophulariaceae	List 1B.2
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Rhynchospora capitellata**	brownish beaked-rush	Cyperaceae	List 2.2
		1	**Rupertia hallii**	Hall's rupertia	Fabaceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 5, 2010, 14:08 b

{QUADS_123} =~ m/593D|577A|577B|592B|592C|576B|593A|593E Search

Tip: Word fragments must be completed with a wildcard, e.g., esch* hyp* for Eschscholzia hypecoides.[all tips and help.][search history]

Your Quad Selection: Richardson Springs (593D) 3912177, Chico (577A) 3912167, Ord Ferry (577B) 3912168, Cohasset (592B) 3912186, Paradise West (592C) 3912176, Hamlin Canyon (576B) 3912166, Campbell Mound (593A) 3912187, Richardson Springs NW (593B) 3912188, Nord (593C) 3912178

Hits 1 to 30 of 30

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	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Cardamine pachystigma var. dissectifolia**	dissected-leaved toothwort	Brassicaceae	List 3
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mildrediae ssp. mildrediae**	Mildred's clarkia	Onagraceae	List 1B.3
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Scrophulariaceae	List 1B.2

		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Rhynchospora capitellata**	brownish beaked-rush	Cyperaceae	List 2.2
		1	**Rupertia hallii**	Hall's rupertia	Fabaceae	List 1B.2
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	List 1B.1
		1	**Wolffia brasiliensis**	Brazilian watermeal	Lemnaceae	List 2.3

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.

No more hits.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 16:24 c

{QUADS_123} =~ m/593B|609C|609D|594A|594D|610D|593A|593(Search

Tip: `Lathyrus Astragalus` returns species from both genera.[all tips and help.]
[search history]

Your Quad Selection: Richardson Springs NW (593B) 3912188, Acorn Hollow (609C) 4012118, Ishi Caves (609D) 4012117, Vina (594A) 3912281, Foster Island (594D) 3912271, Los Molinos (610D) 4012211, Campbell Mound (593A) 3912187, Nord (593C) 3912178, Richardson Springs (593D) 3912177

Hits 1 to 23 of 23

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	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Campylopodiella stenocarpa**	flagella-like atractylocarpus	Dicranaceae	List 2.2
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Scrophulariaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Imperata brevifolia**	California satintail	Poaceae	List 2.1
		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1

		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Rhynchospora californica**	California beaked-rush	Cyperaceae	List 1B.1
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 16:37 c

{QUADS_123} =~ m/576C|560A|560B|577D|577A|561A|576D|576/ Search

Tip: `CNPS_LIST:"List 3"` (note the field name) returns only taxa on List 3. `"List 3"` by itself, matches the phrase wherever found. Browse the list of **field names**.[all tips and help.] [search history]

Your Quad Selection: Shippee (576C) 3912156, Palermo (560A) 3912145, Biggs (560B) 3912146, Nelson (577D) 3912157, Chico (577A) 3912167, West Of Biggs (561A) 3912147, Oroville (576D) 3912155, Cherokee (576A) 3912165, Hamlin Canyon (576B) 3912166

Hits 1 to 26 of 26

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	**Allium jepsonii**	Jepson's onion	Liliaceae	List 1B.2
		1	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**California macrophylla**	round-leaved filaree	Geraniaceae	List 1B.1
		1	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Castilleja rubicundula ssp. rubicundula**	pink creamsacs	Scrophulariaceae	List 1B.2
		1	**Chamaesyce hooveri**	Hoover's spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia biloba ssp. brandegeeae**	Brandegee's clarkia	Onagraceae	List 1B.2
		1	**Clarkia gracilis ssp. albicaulis**	white-stemmed clarkia	Onagraceae	List 1B.2
		1	**Clarkia mosquinii**	Mosquin's clarkia	Onagraceae	List 1B.1
		1	**Delphinium recurvatum**	recurved larkspur	Ranunculaceae	List 1B.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Juncus leiospermus var. ahartii**	Ahart's dwarf rush	Juncaceae	List 1B.2

		1	**Juncus leiospermus var. leiospermus**	Red Bluff dwarf rush	Juncaceae	List 1B.1
		1	**Limnanthes floccosa ssp. californica**	Butte County meadowfoam	Limnanthaceae	List 1B.1
		1	**Monardella douglasii ssp. venosa**	veiny monardella	Lamiaceae	List 1B.1
		1	**Orcuttia pilosa**	hairy Orcutt grass	Poaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1
		1	**Packera eurycephala var. lewisrosei**	Lewis Rose's ragwort	Asteraceae	List 1B.2
		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
		1	**Sidalcea robusta**	Butte County checkerbloom	Malvaceae	List 1B.2
		1	**Trifolium jokerstii**	Butte County golden clover	Fabaceae	List 1B.2
		1	**Tuctoria greenei**	Greene's tuctoria	Poaceae	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.

Inventory of Rare and Endangered Plants

v7-10a 1-19-10

Status: search results - Fri, Feb. 19, 2010 10:51 c

{QUADS_123} =~ m/610A|628C|628D|609B|609C|627C|610B|610(Search

Tip: `+Lathyrus +"coastal dunes"` returns only those Lathyrus in coastal dunes. Note the "+" and quotes.[all tips and help.][search history]

Your Quad Selection: Tuscan Springs (610A) 4012221, Bend (628C) 4012232, Dales (628D) 4012231, Dewitt Peak (609B) 4012128, Acorn Hollow (609C) 4012118, Inskip Hill (627C) 4012138, Red Bluff East (610B) 4012222, Gerber (610C) 4012212, Los Molinos (610D) 4012211

Hits 1 to 17 of 17

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	**Carex vulpinoidea**	brown fox sedge	Cyperaceae	List 2.2
		1	**Chamaesyce ocellata ssp. rattanii**	Stony Creek spurge	Euphorbiaceae	List 1B.2
		1	**Clarkia borealis ssp. arida**	Shasta clarkia	Onagraceae	List 1B.1
		1	**Cryptantha crinita**	silky cryptantha	Boraginaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2.2
		1	**Fritillaria eastwoodiae**	Butte County fritillary	Liliaceae	List 3.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2
		1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Scrophulariaceae	List 1B.2
		1	**Juncus leiospermus var. ahartii**	Ahart's dwarf rush	Juncaceae	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	**Lotus rubriflorus**	red-flowered bird's-foot trefoil	Fabaceae	List 1B.1
		1	**Orcuttia tenuis**	slender Orcutt grass	Poaceae	List 1B.1

		1	**Paronychia ahartii**	Ahart's paronychia	Caryophyllaceae	List 1B.1
		1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2

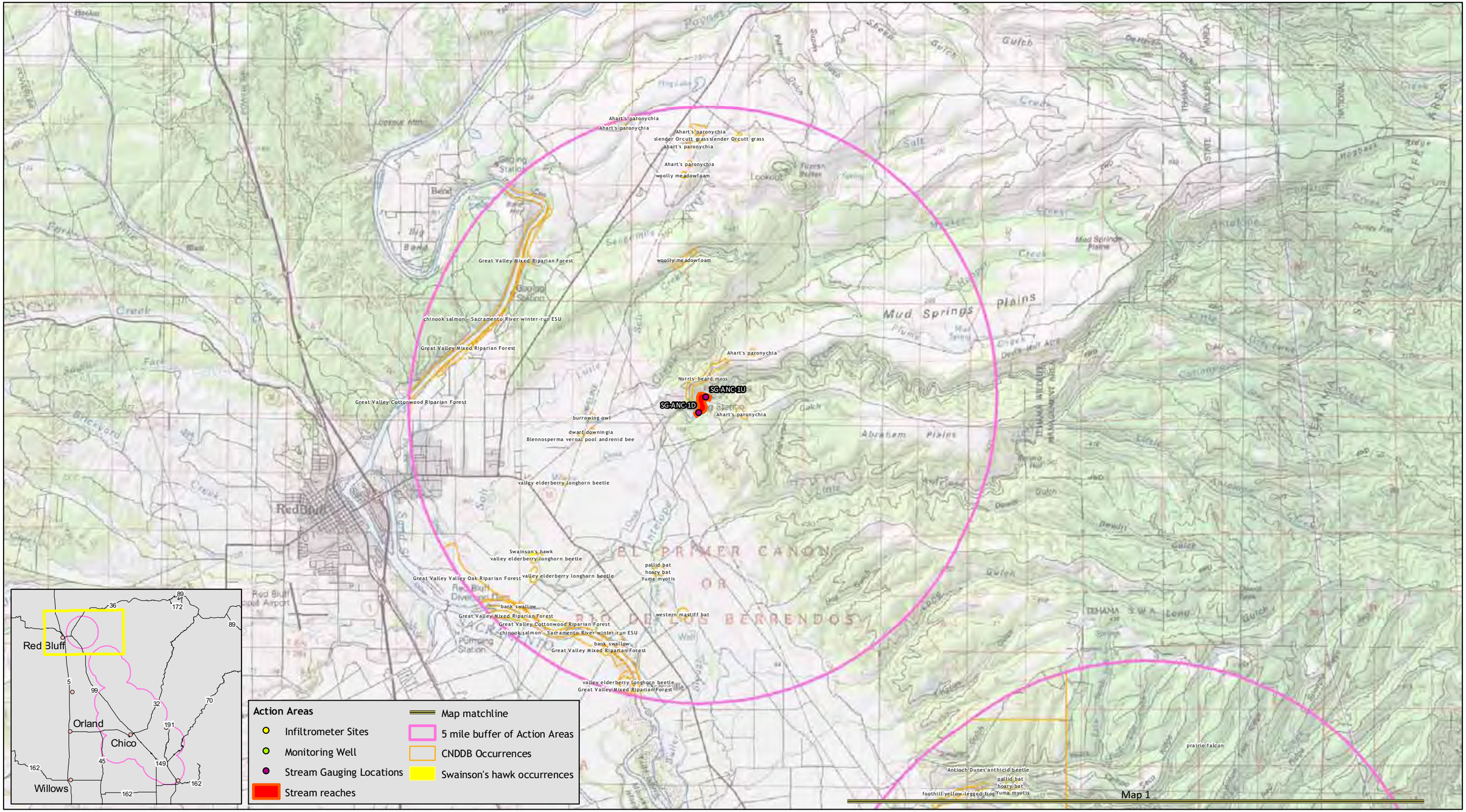
To save selected records for later study, click the ADD button.

ADD checked items to Plant Press check all check none

Selections will appear in a new window.

No more hits.

Appendix E CNDDB Occurrence Maps



CNDDB Occurrences provided by CDFG (Feb. 2010).
Action Areas fall within the following 7.5' USGS quads:
Tuscan Springs, Acorn Hollow, Richardson Springs NW,
Campbell Mound, Nord, Richardson Springs, Paradise West,
Ord Ferry, Chico, Hamlin Canyon, Cherokee, Shippee, Oroville, Palermo.
Map Date: April 23, 2010

Miles
0 1 2

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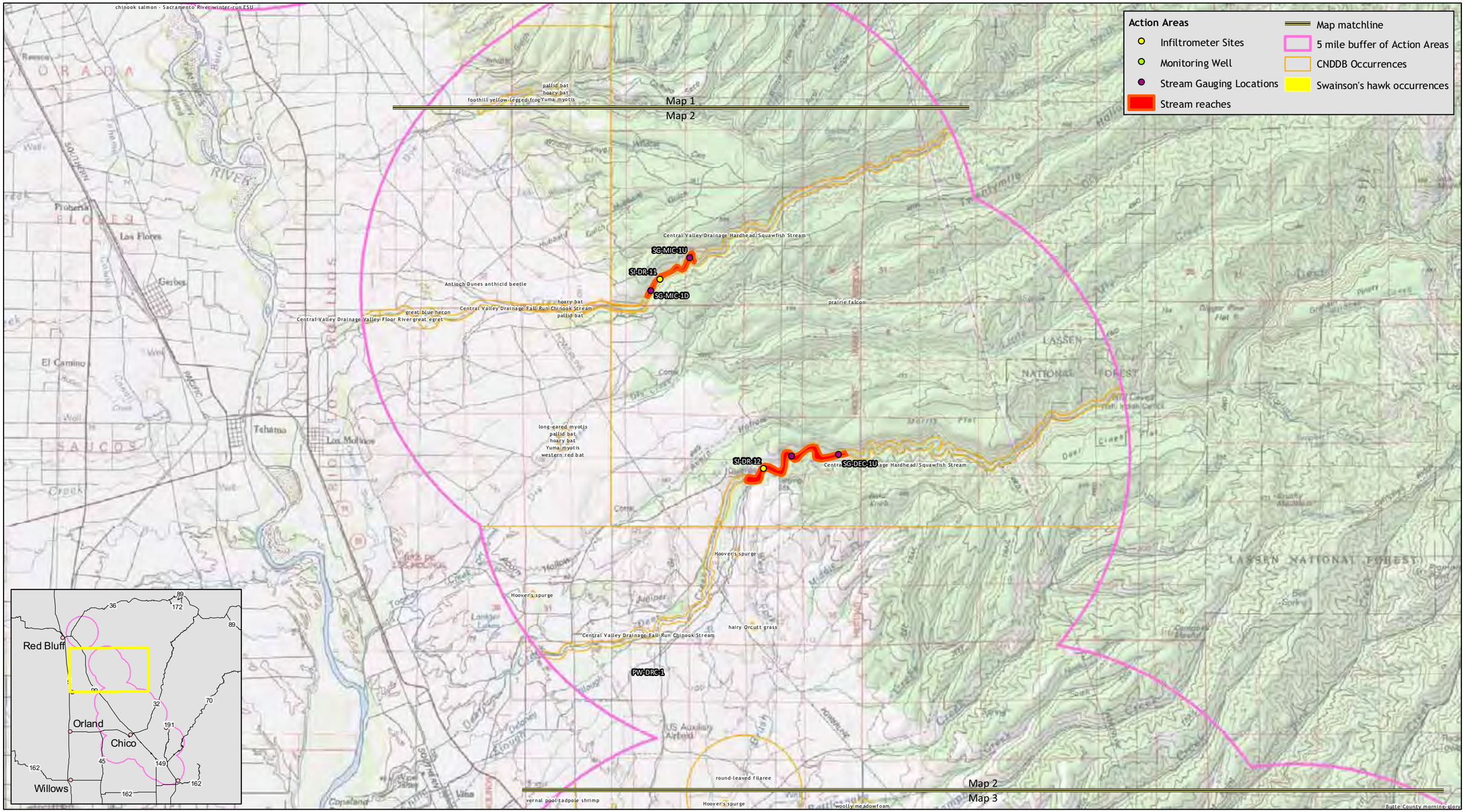

CNDDB Occurrences provided by CDFG (Feb. 2010).
Action Areas fall within the following 7.5' USGS quads:
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Map Date: April 23, 2010

Miles
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GALLAWAY CONSULTING
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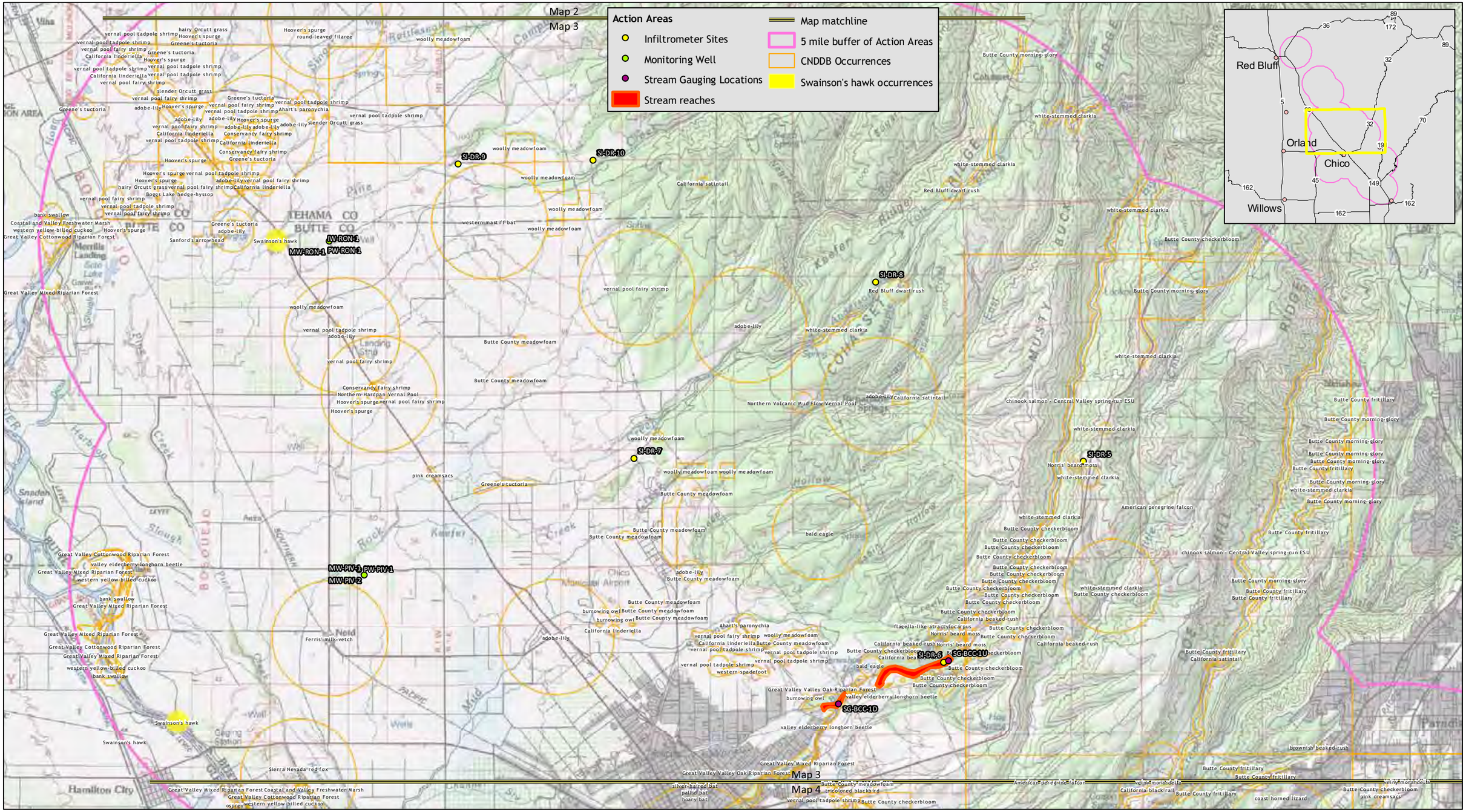

CNDDB Occurrences provided by CDFG (Feb. 2010).
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Map Date: April 23, 2010

Miles
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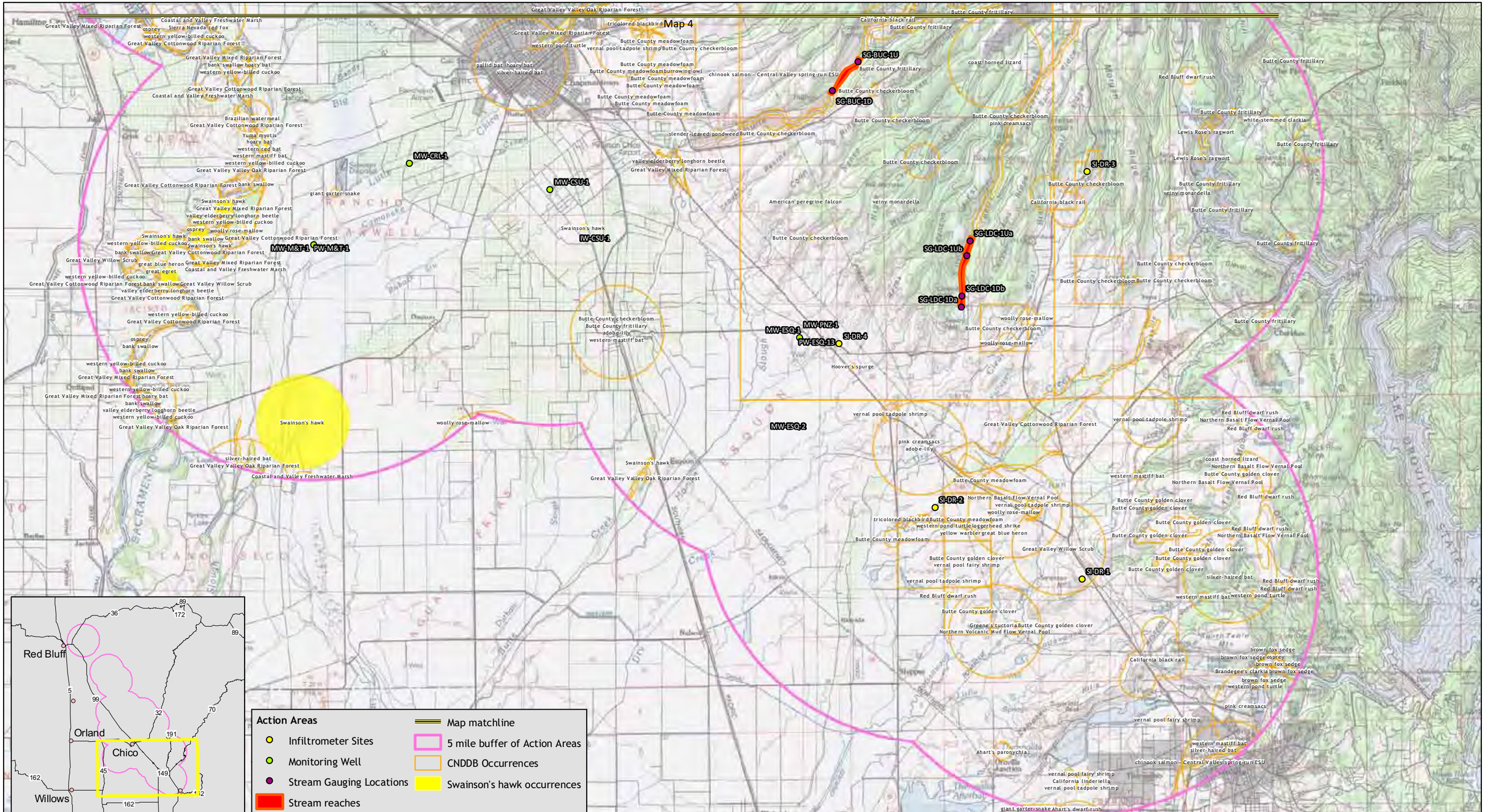
Lower Tuscan Aquifer

CNDDB Occurrences (4 of 4)



CNDDB Occurrences provided by CDFG (Feb. 2010).
Action Areas fall within the following 7.5' USGS quads:
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Campbell Mound, Nord, Richardson Springs, Paradise West,
Ord Ferry, Chico, Hamlin Canyon, Cherokee, Shippee, Oroville, Palermo.
Map Date: April 23, 2010

Miles
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Appendix E
Archaeological Survey Report
(Confidential, Not For Public Distribution)

CLASS I ARCHAEOLOGICAL SURVEY

Lower Tuscan Aquifer Monitoring,
Recharging and Data Management Project,
Butte and Tehama Counties, California.

Prepared for

Gallaway Consulting
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Keywords *for Information Center Use:*

Class I Archaeological Survey Report, Butte and Tehama Counties, California.

April 19, 2010

GENESIS SOCIETY - PARADISE, CALIFORNIA

ARCHAEOLOGICAL - HISTORICAL - CULTURAL RESOURCE MANAGEMENT SERVICES