SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Final Environmental Impact Report
FEIR Volume 1: Revisions to the Draft EIR Text

Prepared for
California Department
of Fish and Game

August 2009

ESA

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GLOSSARY

Terms Used in the EIR

The following definitions apply only to the terms used in this Environmental Impact Report.

ACTIVE DIVERSION: A surface water diversion that has been operated at least one out of the last five years.

ADAPTIVE MANAGEMENT: The process of adaptive management is defined with three basic elements: (i) an initial operational decision or program design made in the face of uncertainty about the impacts of the action; (ii) monitoring and research to determine impacts of actions; and (iii) changes to operations or program in response to new information.

AGGRADATION: The geologic process in which streambeds, floodplains, and the bottoms of other water bodies are raised in elevation by the deposition of material eroded and transported from other areas. It is the opposite of degradation.

AGRICULTURAL OPERATOR: Any natural person or any partnership, corporation, limited liability company, trust, or other type of association or any public agency, as defined in CEQA *Guidelines*, § 15379, who diverts water from a stream by means of an active diversion in the Program Area for an agricultural purpose, or is involved in an agricultural operation on property in the Program Area through which or adjacent to which a stream flows.

ALEVIN: Stage in the life cycle of salmon following emergence from the egg stage, characterized by the presence of a yolk sac attached to the body.

ALLUVIUM: A general term for all deposits resulting directly or indirectly from the sediment transport of streams, thus including the sediments laid down in riverbeds, floodplains, lakes, fans, and estuaries. *ALLUVIAL* adj.

ANADROMOUS: Pertaining to fish that spend part of their life cycle in the ocean and return to freshwater streams to spawn, such as salmon, steelhead, and American shad.

ANADROMY: Noun form of the term *anadromous* (see above), often used to refer to the special reach of anadromous fish in a watershed (e.g., fish barriers may represent the upstream extent of anadromy).

AQUIFER: A geological formation, group of formations, or portion of a formation capable of yielding significant quantities of groundwater to wells or springs.

BANKFULL DISCHARGE: The discharge corresponding to the stage at which the floodplain of a particular stream reach begins to be flooded; the point at which bank overflow begins. Also *Bankfull Flow*.

BEDLOAD: Sediment too large to be suspended that moves along or near the streambed by sliding, rolling, or hopping.

BED MATERIAL LOAD: Sediment found in the streambed.

BEST MANAGEMENT PRACTICES (BMPs): Methods, measures, or practices designed to reduce adverse impacts, usually applied as a system of practices rather than a single practice.

BIODIVERSITY/BIOLOGICAL DIVERSITY: The ensemble and the interactions of natural genetic, species, and ecological diversity in a given place at a given time.

BOULDER: Stream substrate particle larger than 10 inches (256 millimeters) in diameter.

BROOD YEAR: Population of coho salmon that perpetuates itself by spawning in three-year intervals. Due to the rigid three-year life cycle of coho salmon, any given stream may provide habitat for three temporally separated populations, or brood years, that are largely reproductively independent from each other (with the exception of precocious males and females, called jacks and jills, respectively, that engage in spawning after two years and thus provide gene flow between brood years). When the spawning season spans portions of more than one year, as it does for coho salmon, the brood year is identified by the year in which spawning began. For example, offspring of coho salmon that spawned in 1996-1997 are identified as "brood year 1996." Because most coho salmon of a brood year return to spawn after one summer of freshwater life and two summers of ocean life, a brood year tends to form a distinct genetic lineage.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA): California law requiring the disclosure of environmental effects of proposed projects before discretionary approval can be issued by a public or local agency (California Public Resources Code, Division 13, § 21000 - § 21177 and California code of Regulations, Title 14, Chapter 3, § 15000 – § 15387).

CDFG SPECIES OF SPECIAL CONCERN (SSC): Animals not listed under the California Endangered Species Act, but which nonetheless 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist. SSC share one or more of the following criteria:

1. They occur in small, isolated populations or in fragmented habitat, and are threatened by further isolation and population reduction.

2. They show marked population declines. Population estimates are unavailable for the vast majority of taxa. Species that show a marked population decline, yet are still abundant, do not meet the Special Concern definition, whereas marked population decline in uncommon or rare species is an inclusion criterion.

3. They depend on a habitat that has shown substantial historical or recent declines in size. This criterion infers the population viability of a species based on trends in the habitats upon which it specializes. Coastal wetlands, particularly in the urbanized San Francisco Bay and south-coastal areas, alluvial fan sage scrub and coastal sage scrub in the southern coastal basins, and arid scrub in the San Joaquin Valley, are examples of California habitats that have seen dramatic reductions in size in recent history. Species that specialize in these habitats generally meet the criteria for threatened or endangered status or special concern status.

4. They occur only in or adjacent to an area where habitat is being converted to land uses incompatible with the animal's survival.

5. They have few California records, or which historically occurred here but for which there are no recent records.

6. They occur largely on public lands, but where current management practices are inconsistent with the animal's persistence.

This designation is intended to result in special consideration for these animals by CDFG, land managers, consulting biologists, and others, and is intended to focus attention on the species to help avert the need for costly listing under CESA and/or the federal Endangered Species Act, and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them.

CDFG's Wildlife Branch, Nongame Wildlife Program is responsible for producing and updating SSC publications for mammals, birds, reptiles and amphibians. The Fisheries Branch is responsible for updates to the Fish Species of Special Concern document. Each report includes a methods, results and discussion section followed by species accounts which may include data on population and range trend, population size, threats, ecological considerations, management recommendations, taxonomic remarks, and life history information relevant to status. A range or distribution map accompanies each account.

Some CDFG species of special concern meet the definition of "endangered, rare, or threatened" in CEQA *Guidelines,* section 15380 defined below. For the purpose of this document these species are referred to as "special status species."

CEQA GUIDELINES: The regulations that implement CEQA (California Code of Regulations, title 14, § 15000 *et seq.*).

CHANNEL: A natural or artificial waterway of perceptible extent that periodically or continuously contains moving water. It has a definite bed and banks, which serve to confine the water.

COBBLE: Stream substrate particles between 2.5 and 10 inches (64 and 256 millimeters) in diameter.

COLLUVIUM: A general term for loose deposits of soil and rock moved by gravity, e.g., talus. *COLLUVIAL* Adj.

COVERED ACTIVITY: An activity the Program covers.

DISCHARGE: Volume of water flowing in a given stream at a given place and within a given period of time, usually expressed as cubic meters per second (m3/sec), or cubic feet per second (cfs). Often symbolized as *Q.*

ENDANGERED, RARE, OR THREATENED SPECIES: As defined in CEQA *Guidelines*, § 15380 (California Code of Regulations, title 14, § 15380),

> (a) “Species” . . . means a species or subspecies of animal or plant or a variety of plant.
>
> (b) A species of animal or plant is:
>
> (1) “Endangered” when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or
>
> (2) “Rare” when either:
>
> (A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or
>
> (B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.
>
> (c) A species of animal or plant shall be presumed to be endangered, rare or threatened, as it is listed in:
>
> (1) California Code of Regulations, Title 14, § 670.2 or 670.5, or
>
> (2) Title 50, Code of Federal Regulations Section 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.

(d) A species not included in any listing identified in subdivision (c) shall nevertheless be considered to be endangered, rare or threatened, if the species can be shown to meet the criteria in subdivision (b).

(e) This definition shall not include any species of the Class Insecta which is a pest whose protection under the provisions of CEQA would present an overwhelming and overriding risk to man as determined by:

(1) The Director of Food and Agriculture with regard to economic pests; or

(2) The Director of Health Services with regard to health risks.

EROSION: The group of natural processes, including weathering, dissolution, abrasion, corrosion, and transportation, by which material is worn away from the earth's surface. *EROSIONAL* adj.

ESCAPEMENT: In reference to Pacific salmon, the number of fish of a population that return to a stream to spawn (spawning escapement).

EVOLUTIONARILY SIGNIFICANT UNIT (ESU): A population or group of populations that is considered distinct, and hence a species, for purposes of the federal Endangered Species Act. An ESU must be reproductively isolated from other populations of the same species and must represent an important component in the evolutionary legacy of the species.

FEASIBLE: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors (CEQA *Statutes*, § 21061.1)

FINE SEDIMENT: The fine-grained particles in stream banks and substrate. The particles are defined by diameter, varying downward from 0.24 inch (6 millimeters). Also *Fines.*

FISH SCREEN: A porous barrier placed across the inlet or outlet of a lake or stream or across the opening of a water diversion structure in a stream to prevent the passage of fish.

FLOOD: Any flow that exceeds the bankfull capacity of a stream or channel and flows out of the floodplain; greater than bankfull discharge.

FLOODPLAIN: The area bordering a stream over which water spreads when the stream overflows its banks at flood stages.

FLOW: 1) The movement of a stream of water and/or other mobile substances from place to place; 2) the movement of water, and the moving water itself; or 3) the volume of water passing a given point per unit of time. Also *Discharge*.

FLUVIAL: Relating to or produced by a river or the action of a river. Situated in or near a river or stream.

FRY: Stage in the life cycle of salmon following the “alevin” stage (see above), characterized by the loss of the yolk sac and beginning of feeding on external prey.

GRADIENT: The slope of a streambed or hillside. For streams, gradient is quantified as the vertical distance of descent over the horizontal distance the stream travels.

GRAVEL: Substrate particle size between 0.08 and 2.5 inches (2 and 64 millimeters) in diameter.

GROUNDWATER: Water below the land surface.

GULLY: A deep ditch or channel cut in the earth by running water after a prolonged downpour.

INCIDENTAL TAKE PERMIT (ITP): A permit issued by CDFG that authorizes the take (see below) of a species listed as threatened, endangered, or candidate under the California Endangered Species Act (CESA) incidental to a lawful activity when specified criteria are met. For the purposes of this document “ITP” will typically be referring to the permit CDFG will issue to SVRCD in accordance with Fish and Game Code, § 2081(b) and (c) to provide take authorization for the watershed-wide permitting Program.

INTERMITTENT STREAM: A stream in contact with the groundwater table that flows only at certain times of the year when the groundwater table is high and/or when it receives water from springs or from some surface source such as melting snow in mountainous areas. It ceases to flow above the streambed when losses from evaporation or seepage exceed the available stream flow. Seasonal.

LARGE WOODY DEBRIS (LWD): Large, relatively stable woody material usually having a diameter greater than 30 cm (12 inches) and a length greater than 2 m (6 feet) that intrudes into the stream channel.

MAINSTEM: The principal, largest, or dominating stream or channel of any given area or drainage system.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM: Federal requirement under the Clean Water Act (CWA) that any discharge of a non-point source of pollution into waters of the United States be in conformance with any established water quality management plan developed under the CWA.

PERENNIAL STREAM: A stream that flows continuously throughout the year.

PROGRAM: The Program is the Shasta River Watershed-wide Permitting Program

PROGRAM AREA: The Program Area is the Shasta River watershed, including the Shasta River and its tributaries, in Siskiyou County.

POPULATION: A group of individuals of the same species that live in the same place at the same time and exhibit some level of reproductive isolation from other such groups. In some contexts, a randomly mating group of individuals that is reproductively isolated from other groups. A population may consist of a single isolated run or more than one connected run. Synonymous with “stock” in this document.

REDD: Nest of a salmon, usually a depression within the gravel substrate of a stream, into which the female deposits her eggs.

RIFFLE: A shallow rapids where the water flows swiftly over completely or partially submerged obstructions to produce surface agitation. Substrate is usually composed of gravel, pebble, and cobble-sized particles.

RILL: An erosion channel that typically forms where rainfall and surface runoff is concentrated on slopes. If the channel is larger than one square foot in size, it is called a gully.

RIPARIAN: Pertaining to anything connected with or immediately adjacent to the banks of a stream or other body of water.

SCOUR: The localized removal of material from the streambed by flowing water. This is the opposite of fill.

SEDIMENT: Fragmented material that originates from weathering of rocks and decomposition of organic material that is transported by, suspended in, and eventually deposited by water or air, or is accumulated in beds by other natural phenomena.

SMOLT: Stage in the life cycle of salmon following the "parr" stage, characterized by hormonal and other physiological changes that prepare the fish for its seaward migration and life in salt water, the loss of parr marks, and appearance of a silvery color.

SPECIAL-STATUS SPECIES For the purpose of this document it is any species that meets the definition of "endangered, rare, or threatened" in CEQA *Guidelines,* § 15380 defined above. Some CDFG species of special concern meet this definition. For the purpose of this document these species are referred to as "special status species."

STAGE: The elevation of a water surface above or below an established datum or reference.

STRANDING: As defined in the ITP, "stranding" is a situation in which coho salmon are in a location with poor aquatic habitat conditions due to a reduction in flow from which they cannot escape.

STREAM: A body of water that flows at least periodically or intermittently through a bed or channel having banks and supports, or could support, fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. "Stream" includes creeks and rivers.

STREAMBANK: The banks of a stream are the elevations of land that confine the waters of a stream when the waters rise to the highest point at which they remain confined to a definite course and channel. The top of bank boundary will contain the active channel, active floodplain, and the inner banks associated with these features. Bank applies to both that portion of the channel adjacent to the water and the lateral or horizontal distance necessary to protect the physical form and function of the bank.

STREAM REACH: A section of a stream between two points.

SUB-PERMIT: A permit based on the ITP issued by CDFG to an Agricultural Operator or DWR watermaster authorizing the take of coho salmon incidental to a Covered Activity.

SUB-PERMITTEE: An Agricultural Operator or DWR watermaster with a sub-permit issued by CDFG. All sub-permits will require the sub-permittee to comply with the specific avoidance and minimization measures included in the ITP and sub-permits for the Covered Activity the sub-permit covers.

SUBSTRATE: Particulate material comprising the bottom of a body of water, such as mud, silt, gravel, or rock.

SUB-WATERSHED: One of the smaller watersheds that combine to form a larger watershed.

SUSPENDED SEDIMENT: Material (usually clay, silt, and sand) carried for a considerable period of time in suspension without deposition on the bed of the body of water.

TAKE: As defined by Fish and Game Code section 86 “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.”

TRIBUTARY: A stream feeding, joining, or flowing into a larger stream. Also called a feeder stream or side stream.

TURBIDITY: Reduced clarity of a liquid due to the presence of suspended or dissolved matter.

VADOSE ZONE: Sub-surface zone between the ground surface and the groundwater level (water table) within the unsaturated zone. Soil voids in this zone contain air and water.

WATERSHED: The topographic region drained by or contributing water to a stream, river system, or lake. The total land area draining to any point in a stream, as measured on a map, aerial photograph or other horizontal plane. Also called catchment area, watershed, and basin.

WETLAND: 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. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas or lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

Acronyms Used in the EIR

5C Program:	Five Counties Salmonid Conservation Program
AB:	Assembly Bill
amsl:	Above mean sea level
AF:	Acre-feet
ASFMRA:	American Society of Farm Managers and Rural Appraisers
AST:	Aboveground storage tanks
BMPs:	Best management practices
Cal/OSHA:	California Occupational Safety and Health Administration
Cal-EPA:	California Environmental Protection Agency
Caltrans:	California Department of Transportation
CAO:	Corrective Action Order
CAP:	Clean Air Plan
CARB:	California Air Resources Board
CCAA:	California Clean Air Act
CCR:	California Code of Regulations
CDF:	California Department of Forestry and Fire Protection
CDFG:	California Department of Fish and Game
CDO:	Cease and Desist Order
CEQA:	California Environmental Quality Act
CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act
CESA:	California Endangered Species Act
CFR:	Code of Federal Regulations
CFS:	Cubic feet per second
CFSP:	California Forest Stewardship Program
CHP:	California Highway Patrol
CNDDB:	California Natural Diversity Data Base
CNPS:	California Native Plant Society
Corps:	U.S. Army Corps of Engineers
CRP:	Community-based Restoration Program
CUP:	Conditional Use Permit
CUPA:	Certified Unified Program Agency

CWA: Clean Water Act

CWHR: California Wildlife Habitat Relationships

dBA: Decibels (measured on the “A” scale of frequency)

Draft EIR: Draft Environmental Impact Report

DIRT: Direct Inventory of Roads and Treatments

DOT: U.S. Department of Transportation

DPS: Distinct Population Segment

DPW: Siskiyou County Department of Public Works

DTSC: California Department of Toxic Substances Control

DWR: California Department of Water Resources

EDD: California Employment Development Department

EIR: Environmental Impact Report

EIS: Environmental Impact Statement

ESA: Environmental Science Associates

ESA: Endangered Species Act

ESU: Evolutionarily Significant Unit

Fed/OSHA: Federal Occupational Safety and Health Administration

FEIR: Final Environmental Impact Report

FEMA: Federal Emergency Management Administration

FEMAT: Forest Ecosystem Management Assessment Team

FEPA: Federal Environmental Protection Act

FEW: Fresh Emergent Wetlands

FGSC Fruit Growers Supply Company

FMMP: Farmland Mapping and Monitoring Program

FRGP: Fisheries Restoration Grant Program

HCP: Habitat Conservation Plan

HWCL: Hazardous Waste Control Law

ITP: Incidental Take Permit

KMC: Klamath Mixed Conifer

KNF: Klamath National Forest

JITW: Jobs in the Woods

LWD: Large Woody Debris

LTED: Long term economic distress

LUST: Leaking underground storage tank

MLTC:	Master List of Terms and Conditions
MMRP:	Mitigation Monitoring and Reporting Program
MOU:	Memorandum of Understanding
MWAT:	Moving weekly average temperature
NAAQS:	National Ambient Air Quality Standards
NE/CHRIS:	Northeast Center of the California Historical Resources Information System, California State University, Chico
NECSBDC:	Northeastern California Small Business Development Center
NEPA:	National Environmental Policy Act
NESHAPs:	National Emission Standards for Hazardous Air Pollutants
NGVD:	National Geodetic Vertical Datum
NIOSH:	National Institute of Occupational Safety and Health
NMFS:	National Marine Fisheries Service (also known as “NOAA Fisheries”)
NOAA:	National Oceanic and Atmospheric Administration
NOP:	Notice of Preparation
NPDES:	National Pollutant Discharge Elimination System
NRCS:	Natural Resources Conservation Service
NWI:	National Wetlands Index
NWFP:	Northwest Forest Plan
NCRWQCB:	North Coast Regional Water Quality Control Board
OSHA:	Occupational Safety and Health Administration
PM10:	Particulate matter smaller than 10 microns
PPN:	Ponderosa pine
PPT:	Parts per thousand
RAP:	Roads Analysis Process
RCRA:	Resource Conservation and Recovery Act
REL:	NIOSH Recommended Exposure Limit
RM:	River mile
RWQCB:	Regional Water Quality Control Board
SAA:	Streambed Alteration Agreement
SAAQS:	State Ambient Air Quality Standards
SCEDC:	Siskiyou County Economic Development Center
SLC:	State Lands Commission
SONCC:	Southern Oregon/Northern California Coast

SQRCD: Siskiyou Resource Conservation District

SRWC: Shasta River Watershed Council

SSC: Species of Special Concern

SVAP: Shasta Valley Area Plan

SVID: Shasta Valley Irrigation District

SVRCD: Shasta Valley Resource Conservation District

SWPPP: Storm Water Pollution Prevention Plan

SWRCB: State Water Resources Control Board

TAC: Toxic Air Contaminant

TMDL: Total maximum daily load

UCCE: University of California Cooperative Extension

UBC: Uniform Building Code

USBR: United States Bureau of Reclamation

USEPA: United States Environmental Protection Agency

USFS: United States Forest Service

USFWS: United States Fish and Wildlife Service

USGS: United States Geological Survey

WY: Water year

WHR: Wildlife habitat relationships

SUMMARY

S.1 Introduction

This Draft Environmental Impact Report (Draft EIR) assesses the potential for adverse environmental impacts from implementing the Shasta River Watershed-wide Permitting Program (Program) proposed by the California Department of Fish and Game (CDFG) and the Shasta Valley Resource Conservation District (SVRCD). For purposes of this Draft EIR the "Program" is the "Project" being analyzed pursuant to CEQA. The Program Area is the Shasta River watershed, including the Shasta River and its tributaries, in Siskiyou County. **Figure S-1** identifies the Program Area, as well as nearby cities and major roadways in the vicinity of the Program Area.

This document has been prepared in accordance with the California Environmental Quality Act (CEQA) statute and CEQA *Guidelines*. [1] CDFG is the lead agency. Inquiries about the Program and this Draft EIR should be directed to:

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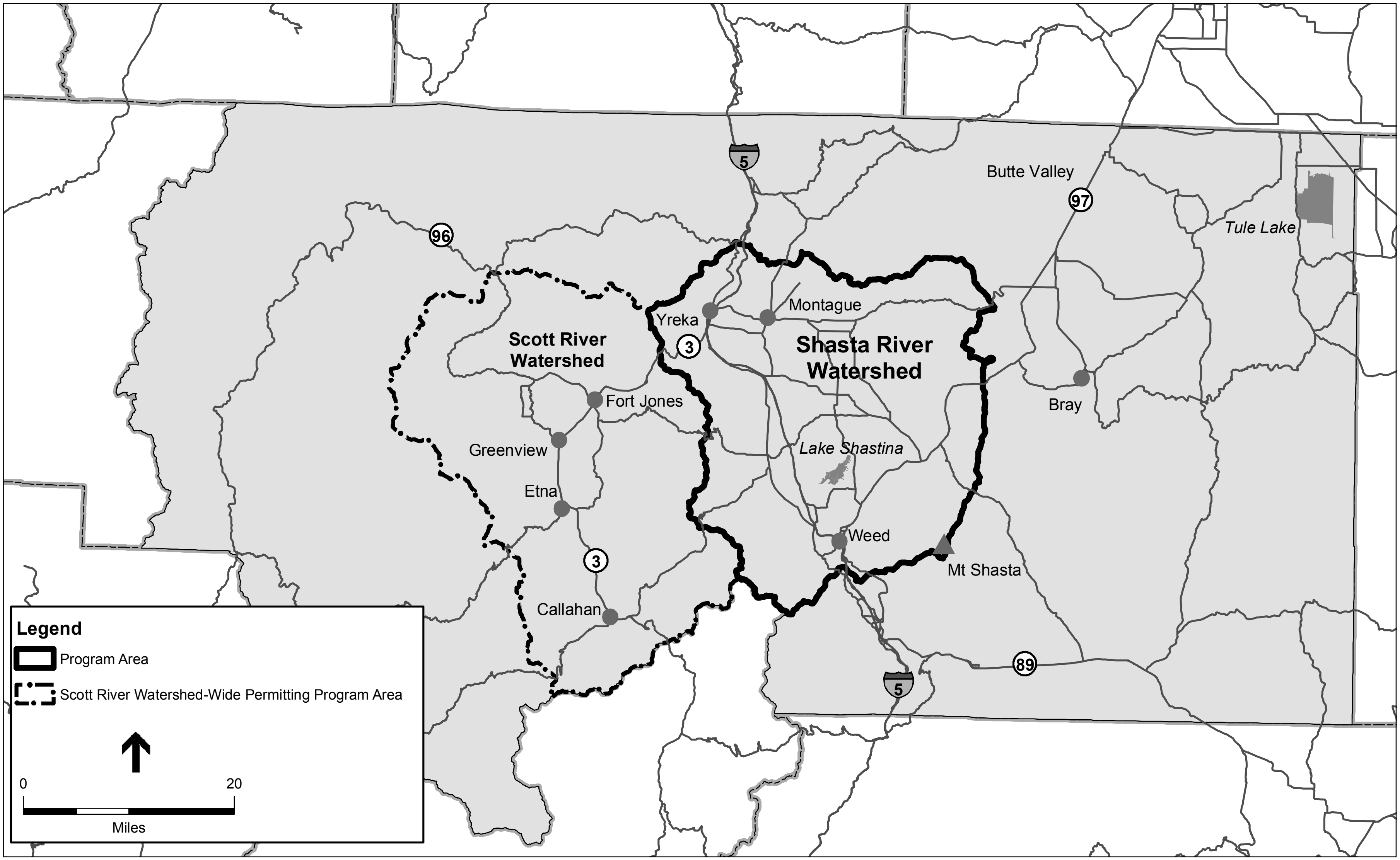
S.2 Background

In early 2002, the Salmon and Steelhead Recovery Coalition petitioned the California Fish and Game Commission (Commission) to list coho salmon (*Oncorhynchus kisutch*), north of San Francisco as an endangered species under the California Endangered Species Act (CESA) (Fish and Game Code, § 2050 *et seq.*).[2] In response, CDFG issued a coho salmon status report to the Commission, recommending that coho salmon from San Francisco north to Punta Gorda be listed as endangered, and that coho salmon from Punta Gorda north to the Oregon border be listed as threatened pursuant to CESA (CDFG, 2004). The Commission found that coho salmon warranted listing in accordance with CDFG's recommendations. Also, the Commission required CDFG to prepare a recovery strategy for coho salmon prior to their formal listing.

1 The CEQA *Guidelines* are the regulations that implement CEQA. They are in California Code of Regulations, title 14, § 15000 *et seq.* and cited as "CEQA *Guidelines*" in this document.
2 The symbol "§" represents "section," in reference to specific provisions in statutes and regulations.



SOURCE: ESRI, 2006; ESA 2007

Shasta River Watershed-Wide Permitting Program . 206063

Figure S-1
Program Area

In February 2004, the Commission adopted the Recovery Strategy for California Coho Salmon (Coho Recovery Strategy). The Coho Recovery Strategy emphasizes cooperation and collaboration, and recognizes the need for funding, public and private support for restoration actions, and maintaining a balance between regulatory and voluntary efforts to meet the goals of the Coho Recovery Strategy. The Shasta and Scott River watersheds were identified for a pilot program to address coho salmon recovery issues and solutions related to agriculture and agricultural water use in Siskiyou County. On March 30, 2005, the Commission formally designated coho salmon within the Program Area as a threatened species pursuant to CESA.[3] As a result, coho salmon within the Program Area may not be taken[4] except as authorized by CDFG in accordance with CESA.

As part of its efforts to develop the Coho Recovery Strategy, CDFG convened the Shasta-Scott Coho Recovery Team which, in addition to identifying recommendations for the pilot program, identified the need to develop a programmatic implementation framework that works toward the recovery of coho salmon, while providing authorization for the take coho salmon incidental to otherwise lawful routine agricultural activities in the Shasta and Scott River watersheds. The avoidance, minimization, and selected mitigation measures included in the proposed incidental take permit (ITP) for the Program, and the sub-permits that will be issued in accordance with the ITP, are consistent with the recovery tasks identified in the Shasta-Scott Pilot Program in the Coho Recovery Strategy.

S.3 Summary Program Description

CDFG and SVRCD have worked together to develop the Program for the Shasta River watershed. On March 29, 2005, SVRCD submitted an application to CDFG for a watershed-wide ITP pursuant to California Fish and Game Code, § 2081 (b) and (c).[5] In addition, on April 1, 2005**,** SVRCD submitted to CDFG an application for a streambed alteration agreement (SAA) pursuant to Fish and Game Code, § 1602, also referred to as a “notification.” In response to the application, CDFG in cooperation with SVRCD prepared the ITP and SAA Memorandum of Understanding (MOU) and Master List of Terms and Conditions (MLTC) between CDFG and SVRCD (Appendices A and B, respectively).

The Program is intended to facilitate compliance by Agricultural Operators, California Department of Water Resources (DWR), and SVRCD with CESA and Fish and Game Code, § 1602 by streamlining the process to obtain take authorization and SAAs for any activity the Program covers, referred to as a “Covered Activity.”[6] Under the Program, SVRCD will implement key coho salmon recovery projects identified in the Coho Recovery Strategy. Hence, the Program will also further the objectives of that strategy.

[3] Coho salmon north of Punta Gorda are within the Southern Oregon-Northern California Coast (SONCC) Coho Evolutionarily Significant Unit (ESU).
[4] “‘Take’ means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” (Fish and Game Code, § 86).
[5] CDFG deemed SVRCD’s ITP application complete on April 28, 2005.
[6] Covered Activities are described in Chapter 2 and Appendices A and B.

The Program consists of:

- **Watershed-wide Streambed Alteration Agreement Program (SAA Program)**

  The SAA component of the Program will consist of separate SAAs issued by CDFG to SVRCD and each Agricultural Operator. CDFG will include in each SAA the applicable terms and conditions from the MLTC developed as part of the Program. The terms and conditions protect existing fish and wildlife resources that the Covered Activity or Activities could substantially adversely affect. The MLTC will be an attachment to the MOU between CDFG and SVRCD that describes their roles and responsibilities in regard to the SAA component of the Program.

- **Watershed-wide Incidental Take Authorization for Coho Salmon**

  CDFG will issue an ITP to SVRCD in accordance with Fish and Game Code, § 2081(b) and (c) to provide take authorization in the course of implementing coho salmon restoration projects that are part of the Program. As mentioned above, the restoration projects implement certain tasks identified in the Coho Recovery Strategy and at the same time fully mitigate any take of coho salmon that may occur incidental to conducting a Covered Activity, as CESA requires. CDFG will issue separate take authorization to each Agricultural Operator who enrolls in the Program and DWR in the form of a "sub-permit." The Program uses the term "sub-permit" because each one will be based on SVRCD's ITP, but will still be enforceable as a "stand alone" permit. The separate obligations SVRCD will have under its ITP and those the "sub-permittees" will have under their sub-permits are discussed in Chapter 2, Project Description.

- **Monitoring Program**

  The ITP will require SVRCD to establish a monitoring program to track the implementation of the mitigation measures for which it is responsible, and to determine the effectiveness of those measures in improving conditions for coho salmon. ~~determine whether or not Agricultural Operators are fulfilling the terms and conditions required by their sub-permits, and to determine the effectiveness of the conditions in the ITP and sub-permits to avoid, minimize, and fully mitigate the incidental take of coho salmon in the Program Area.~~ Sub-permittees are responsible for monitoring the terms and condition of their sub-permit. SVRCD will be available to assist sub-permittees in fulfilling monitoring responsibilities related to the diversion of water and livestock or vehicle crossings. CDFG is responsible for any and all compliance monitoring.

Each of these components is described in greater detail in Chapter 2, Project Description.

CDFG and the Siskiyou Resource Conservation District have developed a watershed-wide permitting program for the Scott River watershed similar to the Program for the Shasta River watershed. CDFG is conducting a separate environmental review of that Program under CEQA. However, the potential for cumulative effects of the two programs combined is considered in Chapter 4.

Program Timeline

The term of the ITP will be ten years. During the first five years of the Program, the original term of any SAA CDFG issues under the Program will be five years. CDFG may extend the term one time for a period of up to five years if the SAA holder requests an extension prior to the SAA's expiration. All SAAs issued or extended after the first five years of the Program will expire on the expiration date of the ITP (i.e., the expiration date of the Program).

S.4 Summary of Impacts

Table S-1, at the end of this Chapter presents a summary of the impacts and mitigation measures identified for the Program. The complete impact statements and mitigation measures are presented in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, and Chapter 4, Cumulative Effects and Other Required Topics. The level of significance for each impact was determined using significance criteria (thresholds) developed for each category of impacts. These criteria are presented in the appropriate sections of Chapters 3 and 4. Significant impacts are adverse environmental impacts that meet or exceed the significance thresholds; less-than-significant impacts are impacts which do not exceed the significance thresholds. Table S-1 indicates the measures that will be implemented to avoid, minimize, or otherwise reduce (i.e., mitigate) significant impacts, and shows the level of significance after mitigation.

S.5 Summary of Alternatives

Alternatives to the Program are described in detail in Chapter 5. The potential impacts of each Alternative are compared with those of the Program. The following summarizes the description and conclusions regarding each Alternative.

No Program Alternative

Under the No Program Alternative, CDFG would not issue a watershed-wide ITP or enter into a watershed-wide SAA MOU and MLTC. Instead, SVRCD, DWR, and each Agricultural Operator would need to comply with Fish and Game Code, § 1600 *et seq.* and CESA on an individual basis. CDFG would prepare individual ITPs and SAAs as it received notifications and ITP applications. Under this approach, CDFG would need to conduct an appropriate level of CEQA review prior to issuing each individual ITP and SAA.

Individual applicants would be responsible for reimbursing CDFG for the cost of preparing the CEQA document for their ITPs and SAAs. The time required to prepare individual CEQA documents for a large number of agricultural diversions in the Shasta River watershed could cause delays and disruptions for Agricultural Operators. It is likely that many Agricultural Operators could not afford or would choose not to go through an individual permitting process, resulting in some Agricultural Operators operating either out of compliance with Fish and Game Code, § 1600 *et seq*. and CESA or terminating their usual operations.

Although the implementation of the No Program Alternative would meet several of the stated objectives of the Program (see Table 5-2 in Chapter 5), it would not be as effective or efficient at bringing existing agricultural water diverters into compliance with Fish and Game Code, § 1600 *et seq.* and CESA. Most importantly, the No Program Alternative would be less effective at accomplishing or implementing mitigation measures identified in the ITP, accomplishing watershed-wide coordination and implementation of selected key coho salmon recovery tasks, and would not be consistent with commitments identified in the Coho Recovery Strategy.

Instream Flow Alternative

The Instream Flow Alternative would include the Program as proposed and also include the development of surface-water storage reservoirs to capture winter runoff. The stored water would be used to benefit the cold water fisheries by increasing streamflow as necessary to assist fish migration, increase rearing habitat, maintain cooler water temperatures, and improve the potential for riparian vegetation survival. All of these issues are identified in the Limiting Factors Analysis in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat, as major factors limiting coho salmon production in the Shasta River watershed. Where practical, water may be piped or pumped from reservoirs directly into existing water conveyance systems in exchange for reductions in the volume of water diverted from the Shasta River and tributaries. The stored water would not be used to increase the existing irrigated acreage or allow for additional water to be diverted for agricultural purposes.

The Program already contains several provisions to increase instream flows, including SVRCD's ITP Flow Enhancement Mitigation Obligation (Article XIII.E.2(a)), Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation A: Water Management (Article XV), and MLTC Conditions 26 ~~25~~ (bypass flows at diversions).

The Shasta-Scott Pilot Program of the Coho Recovery Strategy contains additional recommendations for "water augmentation" actions for the Shasta River watershed, including the following:

- If feasible, construct large (off-stream) surface-water storage reservoirs;
- If feasible, raise the level of existing small lakes or create storage using small off-stream reservoirs rather than one large reservoir; and
- If legal and feasible, create a new diversion from the Klamath River above Irongate Dam to the Shasta Valley, to provide irrigation water to the Shasta Valley and reduce local surface water diversions and groundwater pumping.

The Instream Flow Alternative would be identical to the Program except that it would also include the additional measures from the Coho Recovery Strategy listed above. Specifically, this alternative would involve implementing those Coho Recovery Strategy recommendations regarding water augmentation which are found to be feasible and appropriate. While no single alternative water supply may be sufficient to result in significant gains in instream flows, a combination of the potential sources discussed above may provide for more suitable water flows and temperatures for rearing coho during the summer and fall months. Furthermore, until the studies are conducted to determine the feasibility of the various measures considered for development of new water supplies, the type and extent of physical impacts of this alternative cannot be determined. Therefore, the analysis in Chapter 5 assumes that all of the additional measures listed above would be found to be feasible and appropriate, and would be implemented under this alternative in addition to all of the flow enhancement provisions of the Program as proposed.

Under the Instream Flow Alternative, all of the objectives of the Program would be met and, if feasible, water augmentation measures identified in the Coho Recovery Strategy would be implemented. Where the potential for take of coho salmon still existed, such as ongoing surface water diversion and other agricultural activities and restoration actions undertaken by SVRCD, ITPs and SAAs still would be required. As discussed in Chapter 5, impacts from this alternative, particularly those associated with reservoir and Klamath pipeline construction would be greater than those of the Program.

Parks Creek - Upper Shasta River Fish Bypass Channel Alternative

This alternative would add to the Program the additional element of fish passage to the Shasta River above Lake Shastina. Under this alternative, the Montague Water Conservation District (MWCD) would be required to work with CDFG and other agencies and, if necessary, private landowners, to construct a fish bypass channel from Parks Creek to the Shasta River above the lake. The intent of this alternative is to provide a means for coho salmon and other anadromous fish to reach the upper Shasta River, while avoiding the technical and biological issues associated with providing fish passage at Dwinnell Dam.

The bypass channel could be in the vicinity and upstream of the existing Parks Creek diversion operated by MWCD, but would flow in the opposite direction. The Parks Creek Diversion flows from Parks Creek into the Shasta River; the fish bypass channel would flow from the Shasta River into Parks Creek. The channel would be operated during spawning migration and smolt out-migration, i.e., approximately October 1 to June 1. During spawning migration coho salmon and other anadromous species could migrate up Parks Creek to the point where the bypass channel would enter Parks Creek as a tributary. Fish would have the opportunity to continue up Parks Creek, or into the bypass channel and thence into the upper Shasta River. During smolt out-migration, fish would travel down the bypass channel into Parks Creek, and from there to the mainstem Shasta River below Dwinnell Dam. It would be necessary to place fish screens on the mainstem Shasta just downstream of the bypass channel to prevent smolts from entering Lake Shastina, and to prevent spawners from straying downstream. Assuming the channel would enter Parks Creek above the existing diversion, a fish screen would be necessary on the Parks Creek diversion to prevent smolts from returning to the Shasta River. MWCD is currently investigating the feasibility of installing a fish screen at this location. A preliminary conceptual alignment for the Parks Creek-Upper Shasta River Fish Bypass Channel is shown in Figure 5-1 in Chapter 5. In this figure, the channel crosses Interstate 5 at an existing underpass (at the Edgewood-Gazelle exit off of Interstate-5) and continues along Old Highway 99 for most of its length.

A determination of the technical feasibility of a Parks Creek-Upper Shasta River Fish Bypass Channel is beyond the scope of this Draft EIR. Preliminarily, there appear to be two major technical issues: 1) maintenance of an adequate flow through the channel during the fall spawning migration to attract fish and to sustain adequate conditions for fish survival and passage within the channel itself; and 2) screening both the mainstem Shasta below the bypass channel and also the existing Parks Creek diversion channel. In addition, this alternative would require establishment of a right-of-way for the channel; the land through which the by-pass would flow is in both public and private ownership. While these are potentially substantial impediments to the implementation of this alternative, they do not necessarily render it infeasible. While this alternative could affect existing water rights, it is assumed that water diverted out of the mainstem Shasta into Parks Creek would be diverted back to the mainstem Shasta through the existing diversion channel.

Because the Parks Creek-Upper Shasta River Fish Bypass Alternative would simply add a new element to the Program (i.e., a bypass channel), it would meet the same objectives as the Program, including reducing take while allowing for the continuation of agricultural operations. In addition, if the technical and legal hurdles could be overcome to implement this alternative, it would likely have a substantially greater benefit for coho salmon and other native fisheries in the Shasta River watershed by restoring access to habitat currently unavailable due to Dwinnell Dam and Lake Shastina.

These alternatives, along with seven other alternatives considered but rejected, are discussed further in Chapter 5, Analysis of Alternatives.

Environmentally Superior Alternative

As part of evaluation and comparison of alternatives, the CEQA *Guidelines* require that if the “no project” alternative is identified as the environmentally superior alternative, the EIR must also identify the environmentally superior alternative among the other alternatives (CEQA *Guidelines*, § 15126.6(e)(2)). The No Program Alternative is not identified in this Draft EIR as the environmentally superior alternative and, as a result, no environmentally superior alternative is identified. However, for the reasons highlighted in chapter 5, Alternatives to the Program, CDFG generally believes the Program is environmentally superior to the alternatives considered here.

Program Alternatives Considered and Rejected

CDFG considered and rejected seven other possible alternatives, as follows: 1) Rejected Alternative 1 – Consistency Determination; 2) Rejected Alternative 2 - Adjudication of Water Rights; 3) Rejected Alternative 3 – Hatcheries; 4) Rejected Alternative 4 – Expanded Program Area; 5) Rejected Alternative 5 – Trap and Truck; 6) Rejected Alternative 6 – Expanded Range of Covered Activities; and Rejected Alternative 7 – Dwinnell Dam Removal. The rejected alternatives and the specific reason they were rejected are discussed in Chapter 5.

S.6 Areas of Controversy

In the fall of 2006, CDFG prepared and released a Notice of Preparation (NOP) (Appendix C) of a Draft EIR and an initial study (Appendix D). Comments submitted during the NOP review period raised issues on the scope and content of the Draft EIR, including:

- alternatives to the Program such as re-adjudication of water rights, and removal of Dwinnell Dam;

- determination of the proper baseline for the environmental analysis;
- information gaps on minimum flow needs for coho salmon;
- information gaps on inter-connectivity between groundwater and surface water; and
- socio-economic effects of Program requirements on farming and ranching in the Shasta Valley.

Comments submitted during the NOP comment period are provided in Appendix E, Scoping Comments, and are addressed throughout this document.

TABLE S-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.1 Land Use and Agriculture		
3.1-1: The Program could result in the conversion of agricultural land within the Shasta River watershed to non-agricultural uses (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	
3.2 Geomorphology, Hydrology, and Water Quality		
3.2-1: Certain construction activities performed under the Program could result in increased erosion and sedimentation and/or pollutant (e.g., fuels and lubricants) loading to surface waterways, which could increase turbidity, suspended solids, settleable solids, or otherwise decrease water quality in surface waterways (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.2-1a:** ITP General Condition (b) (Article XIII.E.1) requires the immediate containment and clean-up of any fuel, lubricants, or other hazardous materials that leak or spill during a Covered Activity. **3.2-1b:** ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation F. – Push-Up Dams and Obligation G. - Other Temporary Diversion Structures (Article XV) requires preparation and adoption of a set of Best Management Practices (BMP) governing the construction, operation, and removal of push-up dams and other temporary diversion structures other than push-up dams. **3.2-1c:** The MLTC includes the following conditions which will reduce the potential for construction-related impacts to water quality: A. Water Diversions: Conditions 33, 36, and 41 ~~31, 34, and 39~~; C ~~B~~. Instream Structures: Conditions 62, 64-66 ~~58-60~~; E ~~C~~. Use of Vehicles in Wetted Portions of Streams: Conditions 73-75 ~~65-67~~; F ~~D~~. Pollution Control: Conditions 76-84 ~~68-75~~; G ~~E~~. Erosion and Sediment Control: Conditions 85-93 ~~76-84~~; I ~~F~~. Dewatering: Conditions 98-101, 103, 105-107 ~~89-92, 94, 96-98;~~ and J ~~G~~. Ground-Disturbing Activities: Condition 122 ~~108~~. ***Mitigation Measures Identified in this Draft EIR*** **3.2-1d:** The season for instream construction activities and equipment operations shall be limited to the period from July 1 to October 15. If weather conditions permit and the stream is dry or at its lowest flow, instream construction activities and equipment operations may continue after October 15, provided a written request is made to CDFG at least five days before the proposed work period variance. Written approval from CDFG for the proposed work period	Less-than-significant

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.2 Geomorphology, Hydrology, and Water Quality (cont.)		
3.2-1 (cont.)	variance must be received by the SVRCD or Agricultural Operator prior to the start or continuation of work after October 15. If work is performed after October 15 as provided above, the SVRCD or Agricultural Operator will do all of the following: A. Monitor the 72 hour forecast from the National Weather Service. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, the work shall cease. B. Stage erosion and sediment control materials at the work site. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, implement erosion and sediment control measures.	
3.2-2: Certain instream structures proposed to improve fish habitat as part of the Program would be installed within a flood hazard area and could impede or redirect flood flows (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	
3.2-3: Installation and operation of instream structures permitted under the Program could alter channel stability and degrade water quality by increasing turbidity downstream (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.2-3a:** ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation D.4. - Livestock and Vehicle Crossings (Article XV) requires annual monitoring of all livestock and vehicle crossings installed under the Program. If the crossing is exacerbating erosion and contributing fine sediment to the stream, SVRCD shall note that in its Annual Report and the sub-permittee shall be responsible for remediation of the problem. **3.2-3b:** MLTC Conditions <u>37, 43, 47, and 55</u> ~~35, 41, 45, and 53~~ would ensure that boulder weirs are sized to resist wash-out and do not create lifts in the stream channel that exceed twelve (12) inches, and that instream structures shall be designed and implemented in accordance with CDFG's Salmonid Stream Habitat Restoration Manual. ***Mitigation Measures Identified in this Draft EIR*** **3.2-3c:** CDFG and SVRCD shall establish performance criteria for new and replacement instream structures including boulder weirs, angular rock for bank protection, bioengineered habitat structures, large woody debris, fish ladders, and other channel restoration or protection measures, The performance criteria shall include, but not be limited to, the following:	Less-than-significant

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.2 Geomorphology, Hydrology, and Water Quality (cont.)		
3.2-3 (cont.)	• Sediment deposition upstream and erosion/scour and subsequent deposition downstream of these instream structures, during bankfull flow conditions, would be avoided to the extent feasible, unless the intent of the particular structure is to facilitate such processes (e.g., gravel trapping); • Instream structures shall not alter channel hydraulics such that the project reach can no longer move the imposed sediment load (e.g., upstream supply) with the available range of sediment-transporting flows; this criterion shall focus on the transport of bed-material load; • Instream structures shall not lead to a permanent increase in the downstream transport of sediments that is outside the historical range of sediment flux; and • Instream structures shall be designed to withstand a given range of flows (e.g., some structures are permanent, such as fish ladders, while other structures are "semi-permanent," such as placement of LWD). The range of flows that a particular structure will be designed to handle shall be quantified and rationalized. Engineered structures such as fish ladders, or boulder weirs designed for grade control or for fish passage in proximity of a water diversion, require design and assessment by a qualified hydrologist, geologist, engineer, or other similarly qualified individual using methods and levels of rigor that have been established in the engineering or scientific community. Based on the assessment, if the proposed structure would fail to meet the performance criteria, then the structure shall not be installed within that particular reach. The performance criteria shall be included in the SVRCD ITP Monitoring and Adaptive Management Plan (ITP Attachment 3) and their verification and effectiveness shall be included in the Monitoring (ITP Covered Activity 13) or Research (ITP Covered Activity 14) activities of the Program.	
3.2-4: The Program could result in an increase in the extraction of groundwater, which could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.3 Biological Resources: Fisheries and Aquatic Habitat		
3.3-1: Construction, maintenance, and other instream activities associated with various Covered Activities may result in impacts to fisheries resources and their habitat (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.3-1a:** Implementation of ITP General Conditions (g) Instream work period, (h) Instream equipment work period, and (i) Compliance with Fish and Game Code, § 1600 *et seq.* (Article XIII.E.1) would avoid or minimize potential direct and indirect impacts to coho salmon and CDFG fish species of special concern resulting from instream construction and maintenance activities. **3.3-1b:** Implementation of numerous applicable conditions in the MLTC would further avoid or minimize potential direct and indirect impacts to coho salmon and CDFG fish species of special concern resulting from instream and upland construction and maintenance activities. ***Mitigation Measures Identified in this Draft EIR*** **3.3-1c:** ITP General Conditions (g) and (h) (Article XIII.E.1) limit the season for instream equipment operations and work related to structural restoration projects to the period from July 1 to October 15 ~~31~~. Similarly, ITP Additional Avoidance and Minimization Measure D (Livestock and Vehicle Crossings) (Article XV.D.) and conditions in the MLTC limit the use of stream crossings to the same period. ~~However, based on documented adult coho salmon migration timing in the Shasta River (Hampton, 2006), coho salmon may enter the Shasta River prior to October 31. Furthermore, the Chinook salmon spawning season occurs even earlier in the season, depending on streamflows. Therefore, as specified under Mitigation Measure 3.2-1d (Chapter 3.2 Geomorphology, Hydrology, and Water Quality) the season for instream construction activities, equipment operations, and stream crossing utilization shall be limited to the period of July 1 through October 15.~~ If weather conditions permit and the stream is dry or at its lowest flow, instream construction activities and equipment operations may continue after October 15, provided a written request is made to CDFG at least five days before the proposed work period variance. Written approval from CDFG for the proposed work period variance must be received by SVRCD or Agricultural Operator prior to the start or continuation of work after October 15. If work is performed after October 15 as provided above, SVRCD or Agricultural Operator will do all of the following: • Monitor the 72 hour forecast from the National Weather Service. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, the work shall cease.	Less-than-significant

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.3 Biological Resources: Fisheries and Aquatic Habitat (cont.)		
3.3-1 (cont.)	• Stage erosion and sediment control materials at the work site. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, implement erosion and sediment control measures.	
3.3-2: Increased extraction of groundwater could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries, thereby impacting coldwater fish habitat (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	
3.4 Biological Resources: Botany, Wildlife, and Wetlands		
3.4-1: The Program could result in impacts to special-status plant or animal species (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.4-1a:** ITP General Conditions (g) and (h) (Article XIII.E.1) stipulate that instream work on structural restoration projects and instream equipment operations shall occur from July 1 to October 15 ~~31~~. This restricts noise and other sources of disturbance during most of the nesting season for special-status riparian birds. **3.4-1b:** ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation B.1 (Article XV) requires that water removed directly from the stream by means of a pump shall have inlets properly screened per CDFG/National Marine Fisheries Service (NMFS) fish screen standards (NMFS, 1997). These standards specify a mesh size that would avoid entrainment of special-status species in pumps. **3.4-1c:** Master List of Terms and Conditions (MLTC) Condition 109 ~~100~~ stipulates that, prior to ground-disturbing activities, work sites shall be surveyed for special-status plant species by a qualified botanist. Special-status plant surveys shall be conducted following the *Guidelines for Assessing Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities* (CDFG, 2000). The survey report, including the methodology and survey findings, shall be provided to CDFG for review and approval prior to any ground-disturbing activities. MLTC condition 110 ~~101~~ further states that if any special-status plant species are identified at a work site, CDFG shall identify one or more of the following protective measures, but not limited to these measures, to be implemented at the project site before work may proceed:	Less than significant

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.4 Biological Resources: Botany, Wildlife, and Wetlands (cont.)		
3.4-1 (cont.)	• Fencing to prevent accidental disturbance of special-status plants during construction; • On-site monitoring by a qualified botanist during construction to assure that special-status plants are not disturbed; and/or • Redesign of proposed work to avoid disturbance of special-status plant species. ***Mitigation Measures Identified in this Draft EIR*** **3.4-1d:** The permissible work window for individual work sites shall be further constrained as necessary to avoid the nesting or breeding seasons of special-status birds and terrestrial animals for which CDFG determines impacts could be significant. At most sites with the potential for significant impacts to nesting special-status birds work shall be conditioned to start after July 31 when the young have fledged, potential impacts will be avoided, and no surveys will be required. Where work after July 31 would still have the potential to significantly impact nesting special-status birds work shall not begin until the potential for impacts no longer exists. CDFG may advance the window at individual work sites if: • There is no suitable habitat present. "Suitable habitat" in this sense varies between species and would be determined by CDFG, for example for the willow flycatcher in accordance with Figura (2007); or, • Surveys determine nesting birds will not be affected, either because the animals are not present or the nests are safely distant or otherwise screened from the activity. In addition, to prevent impacts to bank swallow nesting areas, no fencing or planting action will be allowed to change the cross-sectional profile of the stream (e.g., lay a cutbank back to an angle of repose for riparian planting) until after a survey is conducted that establishes that bank swallows are not using the area to be affected. No area supporting bank swallows shall be manipulated in any way. To avoid potential impacts to sandhill crane nesting and rearing activities, surveys for active nests shall be performed by a qualified biologist prior to the start of a Covered Activity when a known sandhill crane nesting territory is located within 0.5 mile of the project site and the activity will occur during the typical nesting and rearing	

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.4 Biological Resources: Botany, Wildlife, and Wetlands (cont.)		
3.4-1 (cont.)	season (March 1 to August 15). If active nests are found, a no-disturbance buffer radius of up to 0.5 mile will be required around the nest. The actual size of the buffer may be modified based on an evaluation by a qualified biologist of the sensitivity of the birds to the level of project disturbance. The no-disturbance buffer may be lifted prior to August 15, if it is determined safe to do so by a qualified biologist and approved by CDFG. Any reduction in the 0.5 mile buffer radius will be approved in writing by CDFG. To avoid potential impacts to Swainson's hawk nesting and rearing activities, surveys for active nests within 0.5 miles of a project site shall be performed by a qualified biologist, when a Covered Activity will occur in known Swainson's hawk nesting territory during the typical nesting and rearing season (March 15 to August 15). If one or more active Swainson's hawk nests are present within the 0.5 mile survey area, the active nest(s) shall be monitored by a qualified biologist prior to and during project activities. If, in the professional opinion of the qualified biologist, the nesting pair's behavior suggests agitation or disturbance by project activities, all activities in the area shall immediately stop pending consultation with CDFG. Following a review of the breeding pair's behavior, both as reported by the biologist and independently verified by CDFG, CDFG will determine whether the Covered Activity may continue during the nesting season and, if so, the conditions under which they may continue. The no-disturbance buffer may be lifted prior to August 15, if it is determined safe to do so by a qualified biologist and approved by CDFG. Any reduction in the 0.5 mile buffer radius will be approved in writing by CDFG. If, during the non-breeding season, a Swainson's hawk nest is present in the project area and has been used within the past breeding season, the nest site shall not be disturbed pending consultation with CDFG. To avoid potential impacts to willow flycatchers during the typical nesting and rearing season (May 15 to August 30), no project related activities shall occur within 300 feet of potential nesting habitat. A Covered Activity may be performed within the 300-foot buffer zone if surveys for active nests are performed prior to the start of the Covered Activity and no active nests are present.	
3.4-2: Construction of new and maintenance and repair of existing stream access and crossings could result in impacts to special-status plant or animal species (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.4 Biological Resources: Botany, Wildlife, and Wetlands (cont.)		
3.4-3: ITP Covered Activity 10, the grazing of livestock within the riparian exclusion zone ~~bed, bank, or channel of a stream~~ different from current operations (i.e., not part of baseline conditions), could impact sensitive habitat and special-status species (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.4-3~~a~~:** ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation E.5 (Article XV) stipulates that livestock grazing be done in accordance with a grazing management plan prepared by the sub-permittee and approved by CDFG. The grazing management plan shall address the timing, duration, and intensity (number of livestock grazing per unit area [i.e., stocking rate]) of livestock grazing within the riparian zone and shall explain how the proposed management plan will result in improved riparian function and enhanced aquatic habitat. Grazing plans completed in accordance with the ITP shall include, in addition to other specified requirements, a means to prohibit livestock from entering live streams. ~~***Mitigation Measures Identified in this Draft EIR***~~ ~~**3.4-3b:** The ITP stipulation noted in Mitigation Measure 3.4-3a does not constitute complete mitigation because the actual restriction is not sufficiently specific. Mitigation Measure 3.4-3b clarifies "intensity" to stipulate the number of livestock allowable per unit area (i.e., stocking rate). Grazing plans completed in accordance with the ITP shall include, in addition to other specified requirements, a means to prohibit livestock from entering live streams.~~	Less than significant.
3.4-4: ITP Covered Activities may result in incidental discharge of fill into wetlands under federal jurisdiction causing temporary direct and indirect impacts to wetland function (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	
3.4-5: Water efficiency measures required by the Program could in some instances significantly impact nesting special-status birds (Significant).	***Mitigation Measures Proposed as Part of the Program*** None specified. ***Mitigation Measures Identified in this Draft EIR*** **3.4-5:** Where piping or lining of a diversion ditch is performed as a water efficiency measure under the Program, any required woody vegetation removal shall be considered an activity subject to the same mitigation measure as prescribed for other riparian impacts (Mitigation Measure 3.4-1d).	Less than significant.

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.5 Cultural Resources		
3.5-1: Impacts to known and unknown cultural resources may result either directly or indirectly during the implementation and operational phases of a Covered Activity under the Program (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.5-1a:** Master List of Terms and Conditions (MLTC) Condition 111c ~~102~~ states that prior to any ground-disturbing activities, the responsible party shall contract with at least one qualified archaeologist and paleontologist to complete cultural and paleontological resource surveys, to identify any previously recorded and unknown historical resources, unique archeological resources, or unique paleontological resources, using standard survey protocols. The survey report must be provided to the California Department of Fish and Game (CDFG) for review and approval prior to any ground-disturbing activities. **3.5-1b:** MLTC Condition 112 ~~103~~ notes that if any potentially significant historical resources, unique archaeological resources and/or paleontological resources are identified at the work site, CDFG shall consult with the consulting archaeologist or paleontologist to identify one or more of the following protective measures, or site specific measures, to be implemented at the project site before work may proceed: • Redesign of proposed work to avoid disturbance of cultural or paleontological resources; • Fencing to prevent accidental disturbance of cultural or paleontological resources during construction; and/or • On-site monitoring by a cultural and/or paleontological resource professional during construction to assure that resources are not disturbed. **3.5-1c:** MLTC Condition 116 ~~104~~ states that the responsible party shall report any previously unknown historical resources, unique archaeological resources, and paleontological remains discovered at the site to CDFG and other appropriate agencies. **3.5-1d:** MLTC Condition 117 ~~105~~ states that if cultural resources such as lithic debitage, groundstone, historic debris, building foundations, or bone are discovered during ground-disturbing activities, work shall cease within 20 meters (66 feet) of the discovery. Furthermore, work near archaeological finds shall not resume until a professional archaeologist has evaluated the materials and offered recommendations for further action.	Less than significant level.

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.5 Cultural Resources (cont.)		
3.5-1 (cont.)	**3.5-1e:** MLTC Condition 122 ~~108~~ states that the responsible party shall instruct all persons who will be completing any ground-disturbing activity at a worksite to comply with conditions set forth in the SAA MOU and to inspect each work site before, during and after completion of ground-disturbing activity at the work site.	
	Mitigation Measures Identified in this Draft EIR	
	3.5-1f: Prior to carrying out MLTC Condition 111c ~~102~~, the archaeologist/paleontologist shall; a.) contact the Native American Heritage Commission for a Sacred Lands File check and a list of appropriate Native American contacts for consultation concerning the project site and, if necessary, to assist with the development of mitigation measures; and b.) make a determination ~~shall first be made~~ as to whether the area has had an adequate archaeological survey by a professional archaeologist and whether any historic or prehistoric sites have been recorded within a ¼-mile radius of the project area. This records review may be conducted at NE/CHRIS on a case-by-case basis for each project. Alternatively, a professional archaeologist will be contracted to conduct a watershed-wide records search at NE/CHRIS and prepare a map showing the previous surveys and recorded sites. An update of this information would then be prepared at least every two years. This map, which will show the locations of archaeological sites, would be considered confidential and made available only to individuals on an as-needed basis.	
	3.5-1g: If none of the protective measures described in MLTC Condition 112 ~~103~~ can be implemented, then an archaeological data recovery program (ADRP) shall be implemented, unless the professional archaeologist determines that the archaeological resource is of greater interpretive use than research significance and that interpretive use of the resource is feasible. The project archaeologist and CDFG shall meet and consult to determine the scope of the ADRP, and the project archaeologist shall prepare a research design for the project which shall be submitted to CDFG for review and approval. This document shall identify how the proposed data recovery program would preserve the significant information the archaeological resource is expected to contain. The document will specifically identify the scientific/historical research questions being asked, the archaeological resources' expected data classes, and how the expected data classes would address the applicable research questions. Following approval of the plan by CDFG, the ADRP shall be implemented and a report prepared.	
	Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed	

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.5 Cultural Resources (cont.)		
3.5-1 (cont.)	project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical. All significant cultural materials recovered shall be, as necessary, subject to scientific analysis, professional museum curation, and a report shall be prepared by a qualified archaeologist according to current professional standards. If the recovered artifacts are from a prehistoric site, the local Native American groups will be consulted relative to the disposition of these materials. **3.5-1h:** If built historical resources (e.g., structures, buildings, or similar) that qualify for listing in the California Register of Historic Resources (CEQA *Guidelines,* § 15064.5)) are identified through the implementation of measure MLTC Condition 111c ~~102~~ and cannot be avoided through implementation of measure MLTC Condition112 ~~103~~, SVRCD or the Agricultural Operator will comply with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (Standards) which would, in accordance with CEQA *Guidelines,* § 15064.5(b)(3), reduce potential impacts associated with the alteration or modification of a historical resource (including historic districts and individually eligible resources) to a less-than-significant level. If both avoidance and compliance with the Standards are infeasible, the Covered Activity in question shall be changed or not pursued, such that the historical resource is not destroyed or altered. Activities that would result in such disturbance are not authorized under the Program because SVRCD or the Agricultural Operator would be unable to mitigate the impact to a point where clearly no significant effect on the environment would occur.	
3.5-2: Covered Activities could adversely affect known or unknown paleontological resources (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.5-2a:** Implement **Mitigation Measures 3.5-1a – 3.5-1e** (MLTC Conditions 111, 112, 116, 117, and 122 ~~102, 103, 104, 105, and 108~~), as described above. ***Mitigation Measures Identified in this Draft EIR*** **3.5-2b:** MLTC Condition 117 ~~10~~5 (see Mitigation Measure 3.5-1d) states that if cultural resources such as lithic debitage, groundstone, historic debris, building foundations, or bone are discovered during ground-disturbing activities, work shall cease within 20 meters (66 feet) of the discovery. Work near the archaeological finds shall not resume until a professional archaeologist has evaluated the materials and offered recommendations for further action. This measure does not, however, specify the criteria for protecting paleontological resources. Therefore, in the event of an unanticipated paleontological discovery during ground-disturbing activities, the following measure shall be implemented:	Less than significant

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.5 Cultural Resources (cont.)		
3.5-2 (cont.)	• Temporarily halt or divert work within 20 meters (66 feet) of the find until the discovery is examined by a qualified paleontologist (per Society of Vertebrate Paleontology standards (SVP, 1995 and SVP, 1996). • Document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines, § 15064.5. • Notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. • If CDFG determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important, and such plan shall be implemented. The plan shall be submitted to the CDFG for review and approval.	
3.5-3: Covered Activities could result in damage to previously unidentified human remains (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures are required.	
3.6 Hazards and Hazardous Materials		
3.6-1: Construction activities could result in discovery and release of previously unidentified hazardous materials into the environment (Significant).	***Mitigation Measures Proposed as Part of the Program*** **3.6-1a:** The Program's incidental take permit (ITP) General condition (b) (Article XIII.E.1) states that the Shasta Valley Resource Conservation District (SVRCD) "and any sub-permittee shall immediately stop, contain, and clean-up any fuel, lubricants, or other hazardous materials that leak or spill while engaged in a Covered Activity. SVRCD or the sub-permittee shall notify the Department immediately of any leak or spill of hazardous materials into a stream or in a place where it can pass into a stream. While engaged in a covered activity, SVRCD and all sub-permittees shall store and handle hazardous materials at least 150 feet away from the edge of mean high water elevation of any stream and properly dispose any unused or leftover hazardous materials offsite. Exceptions to this provision may be provided in individual sub-permits for pre-existing structures with adequate containment facilities." MLTC Conditions 76 through 84 ~~68 through 75~~ of the Programs streambed alteration agreement Master List of Terms and Conditions (MLTC) contain similar provisions.	Less than significant

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.6 Hazards and Hazardous Materials (cont.)		
3.6-1 (cont.)	***Mitigation Measures Identified in this Draft EIR***	
	3.6-1b: SVRCD shall prepare a standard Hazardous Substance Discovery Plan that shall include provisions that would be implemented if any subsurface hazardous materials are encountered during construction. Provisions outlined in the Plan shall be followed by SVRCD and/or any sub-permittee and shall include immediately stopping work in a contaminated area and contacting appropriate resource agencies, including the California Department of Fish and Game's (CDFG) designated monitor, upon discovery of subsurface hazardous materials. The plan shall include the phone numbers of county and state agencies and primary, secondary, and final cleanup procedures. The Hazardous Substance Discovery Plan shall be submitted to CDFG for review and approval prior to the commencement of Program construction activities.	
3.6-2: Program construction activities could ignite dry vegetation and start a wildland fire (Significant).	***Mitigation Measures Proposed as Part of the Program***	
	No mitigation measures are included in the proposed MLTC or ITP.	Mitigation Measure 3.6.2 would reduce this impact to a less-than-significant level.
	Mitigation Measures Identified in This Draft EIR	
	3.6-2: Water tanks and/or fire extinguishers shall be sited at Covered Activity construction sites and shall be available for fire protection during the fire season (approximately late spring to early fall). All construction vehicles shall have fire suppression equipment and construction personnel shall be required to park vehicles away from dry vegetation. SVRCD and/or sub-permittees shall contact and coordinate with CDF to determine the minimum amounts of fire equipment to be carried on the vehicles and appropriate locations for the water tanks/fire extinguishers. SVRCD and/or sub-permittees shall submit verification of its consultation with CDF to the CDFG.	
3.7 Public Utilities, Service Systems, and Energy		
3.7-1: The Program could result in the modification or expansion of existing water supply systems (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	
3.7-2: Construction activities could inadvertently contact underground utility lines and/or facilities during excavation and other ground disturbance, possibly leading to short-term utility service interruptions (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	
3.7-3: Replacement of gravity-based surface water diversions with diversions or wells utilizing pumps, would increase power consumption and air emissions (Less than Significant).	This potential impact was determined to be less than significant. No mitigation measures required.	

TABLE S-1 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

Impacts	Mitigation Measures	Significance after Mitigation
3.7 Public Utilities, Service Systems, and Energy (cont.)		
3.7-4: Construction activities and water pumping associated with Covered Activities and ITP mitigation measures would generate greenhouse gas emissions, which would make a contribution to global warming (Less than Significant).	***Mitigation Measures Proposed as Part of the Program*** This potential impact was determined to be less than significant. No mitigation measures required. ***Mitigation Measures Identified in This Draft EIR*** The mitigation measures discussed below were identified as part of this Draft EIR. While these measures are not required to reduce this impact to less than significant, they are technically feasible. Still, CDFG does not have the statutory or regulatory authority to impose these requirements. As a result, they will only be implemented voluntarily or by another regulatory agency (e.g., CARB) that has the authority to require them, whether now or in the future. **3.7-4a:** Program participants are encouraged to fuel all diesel equipment, including pumps, vehicles, and construction equipment, with a minimum 20 percent biodiesel (maximum 80 percent conventional diesel) blend (B-20). B-20 biodiesel is currently available commercially in Siskiyou County.[7] A blend of 20 percent biodiesel will reduce CO_2 emissions by approximately 15 percent (USDOE, 2005), although with a slight increase in NOx (the increase in NOx emissions would not exceed significance thresholds established by SQAPCD – see the emissions calculations in the technical appendix to the Initial Study in Appendix D). **3.7-4b:** Renewable energy sources such as photovoltaic or wind power could be used to power some pumps installed to meet Program requirements for stockwatering and moving points of diversion downstream.	

7 B-20 is currently available locally at Cross Petroleum, 1012 North Mount Shasta Boulevard, Mount Shasta, CA 96067.

CHAPTER 1
Introduction

1.1 Proposed Program

The California Department of Fish and Game (CDFG) and the Shasta Valley Resource Conservation District (SVRCD) are proposing a Watershed-wide Permitting Program for the Shasta River watershed (Program). The purpose of the Program is to provide a streamlined and comprehensive permitting framework to enable farmers and ranchers throughout the Shasta River watershed (Program Area) to continue their routine agricultural activities while complying with Fish and Game Code, § 1600 *et seq.* and the California Endangered Species Act (CESA) (Fish and Game Code, § 2050 *et seq.*).

The agricultural water diversions, activities related to the diversions, and the other activities the Program covers, referred to in the Program as the "Covered Activities,"[1] are subject to Fish and Game Code, § 1600 *et seq.* because they substantially divert or obstruct the natural flow of rivers, streams, or lakes in the Program Area; substantially change the beds, channels, or banks of rivers, streams, or lakes in the Program Area; and/or use material from the beds, channels, or banks of rivers, streams, or lakes in the Program Area. As discussed in greater detail below and in Chapter 2, Program participants will comply with Fish and Game Code, § 1600 *et seq.* by obtaining streambed alteration agreements (SAA).

CESA prohibits take[2] of endangered, threatened, and candidate species unless the take is authorized by CDFG. The Covered Activities are subject to CESA because they could result in take of coho salmon *(Oncorhynchus kisutch*). Coho salmon that occur in the Program Area are listed as threatened under CESA. As discussed in greater detail below and in Chapter 2 (Project Description[3]), Program participants will comply with CESA by obtaining incidental take authorization from CDFG pursuant to Fish and Game Code, § 2081(b) and (c).

Farmers and ranchers who are eligible to participate in the Program are referred to as "Agricultural Operators." An "Agricultural Operator" is defined in the Program as any natural person or any partnership, corporation, limited liability company, trust, or other type of association, or any public agency, as defined in CEQA *Guidelines*, § 15379, who diverts water from a stream by means of an active diversion in the Program Area for an agricultural purpose, or

1 Covered Activities are described fully in Chapter 2, Project Description.
2 "'Take' means hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture, or kill." (Fish and Game Code, 86.)
3 For purposes of this Draft EIR the "Program" is the "Project" being analyzed pursuant to CEQA.

is involved in an agricultural operation on property in the Program Area through which or adjacent to which a stream flows. “Active diversion” is defined as a surface water diversion that has been operated at least one out of the last five years.

SVRCD and the Department of Water Resources (DWR) will also participate in the Program. SVRCD will participate because, as part of the Program, it will be implementing coho salmon restoration projects that are subject to Fish and Game Code, § 1600 *et seq.* and those projects could result in take of coho salmon in the Program Area. DWR will participate in the Program because it currently provides watermastering service in the Program Area. Under the Program, the watermaster in some instances will need to take certain actions to avoid or minimize the take of coho salmon as it relates to operating water diversions and managing water in the Program Area.

The Program consists of:

- **Watershed-wide Streambed Alteration Agreement Program (SAA Program)**

  The SAA component of the Program will consist of separate SAAs issued by CDFG to SVRCD and each Agricultural Operator. CDFG will include in each SAA the applicable terms and conditions from the “Master List of Terms and Conditions” (MLTC) developed as part of the Program. The terms and conditions are intended to protect existing fish and wildlife resources that the Covered Activity or Activities could substantially adversely affect. The MLTC will be an attachment to a Memorandum of Understanding (MOU) between CDFG and SVRCD that describes their roles and responsibilities in regards to the SAA component of the Program.

- **Watershed-wide Incidental Take Authorization for Coho Salmon**

  CDFG will issue an “incidental take permit” (ITP) to SVRCD in accordance with Fish and Game Code, § 2081(b) and (c) to provide it take authorization in the course of implementing coho salmon restoration projects that are part of the Program. The restoration projects are intended to implement certain tasks identified in the Recovery Strategy for California Coho Salmon the Fish and Game Commission adopted in 2004 (Coho Recovery Strategy) and at the same time fully mitigate any take of coho salmon that occurs incidental to conducting a Covered Activity, as CESA requires. CDFG will issue separate take authorization to the Agricultural Operators who enroll in the Program and DWR in the form of a “sub-permit.” The Program uses the term “sub-permit” because each will be based on SVRCD’s ITP, but still enforceable as a “stand alone” permit. The separate obligations SVRCD will have under its ITP and those the “sub-permittees” will have under their sub-permits are discussed in Chapter 2, Project Description.

- **Monitoring Program**

  The ITP will require SVRCD to establish a monitoring program to track the implementation of the mitigation measures for which it is responsible, and to determine the effectiveness of those measures in improving conditions for coho salmon. ~~determine whether or not Agricultural Operators are fulfilling the terms and conditions required by their sub-permits, and to determine the effectiveness of the conditions in the ITP and sub-permits to avoid, minimize, and fully mitigate the incidental take of coho salmon in the Program Area.~~ Sub-permittees are responsible for monitoring the terms and conditions of their sub-permit. SVRCD will be available to assist sub-permittees in fulfilling monitoring responsibilities related to the diversion of water and livestock or vehicle crossings. CDFG is responsible for any and all compliance monitoring.

Each of these components is described in greater detail in Chapter 2, Project Description.

CDFG and the Siskiyou Resource Conservation District have developed a watershed-wide permitting program for the Scott River watershed similar to the Program for the Shasta River watershed. CDFG is conducting a separate environmental review of that Program under CEQA. However, the potential for cumulative effects of the two programs combined is considered in Chapter 4.

1.2 Environmental Review of the Program

1.2.1 Lead Agency

CDFG is the public agency with the principal responsibility for approving and administering the Program, and therefore as defined in CEQA and the CEQA *Guidelines*,[4] is the "lead agency" under CEQA for the purpose of preparing the Environmental Impact Report (EIR) for the Program (Public Resources Code, § 21067; CEQA *Guidelines*, § 15367). CDFG has identified the North Coast Regional Water Quality Control Board,[5] the State Water Resources Control Board (SWRCB), and the Office of Historic Preservation as potential "responsible agencies" under CEQA. A responsible agency is a state, local, or regional agency, or board or commission other than the lead agency that has discretionary approval power over a project for which the lead agency is preparing or has prepared an environmental document (Public Resources Code, § 21069; CEQA *Guidelines*, § 15381).

The Covered Activities could affect the beds of navigable waters and other "state owned 'sovereign' land," which are within the jurisdiction of the State Lands Commission (CEQA *Guidelines*, § 15386(b)). As a result, CDFG has identified the State Lands Commission as a "trustee agency" for the Program. A trustee agency is a state agency that has jurisdiction over natural resources held in trust for the people of the state that could be affected by a project or program (Public Resources Code, § 21070; CEQA *Guidelines*, § 15386).

Federal agencies that might have discretionary approval power over the Covered Activities include the U.S. Army Corps of Engineers under the Clean Water Act and the National Marine Fisheries Service and the U.S. Fish and Wildlife Service under the federal Endangered Species Act. However, if these or any other federal agencies must approve a Covered Activity, they will not rely on the EIR for the Program. Instead, they will need to comply with the National Environmental Policy Act (NEPA) either as the lead agency, in which case it will be responsible for preparing its own environmental document, or as a cooperating agency, in which case it will consider the NEPA lead agency's environmental document in approving the Covered Activity.

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4 The CEQA *Guidelines* are the regulations that implement CEQA. The CEQA *Guidelines* are in the California Code of Regulations, title 14, § 15000 *et seq.*

5 NCRWQCB informed CDFG that it may rely on this document as a responsible agency in issuing any required permits for Covered Activities that are required as part of the Shasta River Total Maximum Daily Loads discussed in Chapter 3.2. According to NCRWQCB, restoration activities that discharge waste to waters of the state will require water quality certifications under Clean Water Act section 401 and/or Porter-Cologne Water Quality Control Act waste discharge requirements, both of which are discretionary actions subject to CEQA. If possible, NCRWQCB staff intends to propose a general water quality certification/waste discharge requirements for restoration activities to further streamline and coordinate permitting in the Shasta River watershed (Leland, 2008).

1.2.2 Need for Environmental Review

The overall intent of the Program is to reduce the environmental impacts of historic, ongoing agricultural water diversions and activities related to those diversions, and coho salmon restoration projects in the Program Area. Nonetheless, CDFG determined it was necessary to prepare this Draft EIR for the Program to comply with CEQA because 1) establishing and implementing the Program by issuing SAAs, the ITP, and sub-permits for the Covered Activities constitute discretionary approvals by CDFG; and 2) based on the Initial Study for the Program, CDFG determined the Covered Activities have the potential to cause significant effects on the environment, as defined in the CEQA *Guidelines* (CEQA *Guidelines,* § 15382).

The four purposes of this Draft EIR are:

1. To describe the Program;

2. To determine whether the Program has the potential to cause significant adverse effects on the physical environment;

3. Where such effects are identified, to develop feasible mitigation measures to reduce or eliminate the environmental impacts;

4. To consider feasible alternatives to the Program that could attain most of the Program's objectives, while reducing its environmental impacts.

1.2.3 Scope of the Draft EIR

This Draft EIR analyzes the Program by describing the Program and the Covered Activities; the environmental setting where the Covered Activities will occur; an evaluation of the effects the Covered Activities could have on the physical environment; for those effects that CDFG determines could be significant, a description of any mitigation measures that can be incorporated into the Covered Activities through the MLTC and ITP to reduce those effects to less than significant; and a description of a reasonable range of potentially feasible alternatives to the Program. If CDFG approves the Program, any mitigation measures identified in this Draft EIR that are not in MLTC and ITP will be added to them.

Program EIR

This Draft EIR is a "program EIR," i.e., an EIR for the Program at a project-specific level. As described in CEQA *Guidelines,* § 15168(a), a program EIR is:

> "An EIR . . . prepared on a series of actions that can be characterized as one large project and are related either:
>
> (1) Geographically;
>
> (2) As logical parts in the chain of contemplated actions;

(3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or

(4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways."

A program EIR is appropriate in this case because the Program will comprise a series of actions that can be characterized as one large project (i.e., the issuance by CDFG of SAAs to SVRCD and Agricultural Operators and take authorization to SVRCD, Agricultural Operators, and DWR for only those activities the Program covers) that are related geographically (i.e., within the Shasta River watershed), carried out under the same authorizing statutory authority (i.e., Fish and Game Code, § 1600 *et seq.* and CESA), and have generally similar environmental impacts that can be mitigated in similar ways.

Before CDFG issues a SAA and sub-permit, it will 1) confirm that the activity is a Covered Activity, and, if so, 2) determine in light of the project-specific information whether the impacts of the Covered Activity are adequately addressed in the EIR for the Program and its related mitigation measures. CDFG will prepare subsequent or supplemental CEQA analysis if it determines that the Covered Activity will result in new significant or more substantially severe impacts than addressed in the EIR for the Program.

Effects Deemed Less Than Significant in the Initial Study

On October 20, 2006, CDFG published its Initial Study for the Program, a copy of which is included as Appendix D. Pursuant to CEQA *Guidelines*, § 15063(c), the Initial Study was used to focus this Draft EIR on the effects of the Program that CDFG determined could be significant, and to identify the effects of the Program determined to be less than significant or not significant. The Initial Study identifies the effects of the Program as less than significant (at both a project and cumulative level) on the environmental factors listed below. As a result, these factors are not further analyzed in this Draft EIR.

- Aesthetics
- Air Quality
- Geology, Soils, and Seismicity[6]
- Mineral Resources
- Noise
- Population and Housing
- Recreation
- Transportation and Traffic

[6] Geomorphic effects are considered in this Draft EIR with Hydrology and Water Quality.

Response to Comments

In comments on CDFG's Notice of Preparation for this Draft EIR, and in comments received during the scoping meetings CDFG held in October 2006 (Appendix E), several individuals suggested that the Program would be inadequate to restore coho salmon and other anadromous fish in the Shasta River watershed. In response, CDFG notes the following:

- The Program is not intended to substitute for the Coho Recovery Strategy, nor is it intended to be a vehicle for implementation of the full Coho Recovery Strategy. Overall, however, the Program is consistent with the "programmatic implementation framework" called for in the Coho Recovery Strategy. The restoration activities included as mitigation in the ITP are also consistent with elements of the Coho Recovery Strategy. As described in the Coho Recovery Strategy, the effort to restore coho salmon in California must go well beyond the mitigation measures that will be implemented as part of the Program.

- A primary purpose of the Program is to enable Agricultural Operators to continue routine farming and ranching activities in the Program Area and SVRCD's restoration project implementation, while avoiding, minimizing, and mitigating for take of coho salmon that might occur incidental to those activities, in accordance with Fish and Game Code, § 1600 *et seq.* and CESA.

- Because coho salmon is the only listed salmonid species in the Shasta River watershed, CDFG does not have the authority to issue incidental take authorization for Chinook salmon (*O. tschawytscha*) or steelhead (*O. mykiss*). Many of the minimization, avoidance, and mitigation measures included in the ITP and many of the conditions that will be included in the SAAs will, however, also serve to benefit other anadromous fish species and aquatic and riparian resources. Furthermore, pursuant to CEQA, CDFG must examine the potential impacts of the Program on both listed and non-listed fish species. Hence, this Draft EIR also examines such impacts on fish species in the Program Area other than coho salmon (see Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat).

- The Program does not in any way "challenge" existing legal water rights. CDFG is authorized to impose conditions on water diversions and other Covered Activities to protect fish and wildlife resources that could affect the exercise of such water rights under Fish and Game Code, § 1600 *et seq.*, CESA, and other state laws, but it does not have the authority to revoke those rights. That authority rests with the SWRCB. Therefore, the revocation of an existing legal water right by CDFG would not constitute a feasible mitigation measure, and therefore this Draft EIR does not include such a measure.

- The overall condition of the Shasta River's anadromous fishery is reviewed in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat. Conditions in the Klamath River are briefly described in the discussion of cumulative impacts in Chapter 4.

1.2.4 Comments on the Draft EIR

This Draft EIR will be circulated for a period of 60 days, during which time all interested parties will have the opportunity to review the document and provide CDFG with comments on its contents and analysis. During the 60-day period, CDFG will hold a public hearing to receive written and verbal comments.

Following the close of the 60-day comment period, CDFG will respond to all comments received within the 60-day period, and publish the responses, along with any revisions to this Draft EIR, in a final Environmental Impact Report (Final EIR). At that time, the Regional Manager of CDFG's Northern Region will decide whether to certify (i.e., adopt) the Final EIR. If it is certified, CDFG will take one of the following two actions:

1. Approve the Program as proposed, with mitigation measures identified in the Final EIR incorporated into the Program; or
2. Disapprove the Program.

1.3 Documents Attached and Incorporated by Reference in the Draft EIR

An EIR may "incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public" (CEQA *Guidelines*, § 15150). Portions of several documents relevant to the environmental analysis for the Program have been summarized in various chapters throughout this Draft EIR. The proposed SAA MOU and attached MLTC and ITP are attached to this Draft EIR as Appendices A and B, respectively. In addition, the following documents are essential to understanding the background, environmental setting, and regulatory context of the Program, and therefore are incorporated herein by reference:[7]

- CDFG, Initial Study for the Shasta River Watershed-wide Permitting Program. October, 2006 (attached as Appendix D). This document was the first step in the CEQA process for the Program. The Initial Study was used to identify those environmental factors that could be adversely affected by the Program. Those environmental factors that were found not to be potentially affected by the Program are not further considered in this Draft EIR.
- CDFG Report to the California Fish and Game Commission, *Recovery Strategy for California Coho Salmon*, February 2004. This document describes historic and current coho salmon population trends, examines the causes for the decline of the species, and lays out a strategy for recovering the species, including a pilot program that addresses agricultural activities the Shasta and Scott River watersheds. The Recovery Strategy is further reviewed in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat.
- North Coast Regional Water Quality Control Board, Staff Report for the Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads (TMDL), June 2006. This document lays out a plan for reduction of temperature and dissolved oxygen impairment of the Shasta River, in order to achieve water quality standards. It is further reviewed in Chapter 3.2, Geomorphology, Hydrology, and Water Quality. The full document is available at http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/shasta_river/staff_report.shtml

[7] All referenced documents are available at CDFG's Northern Region Office at 601 Locust Street, Redding, California 96001.

- Draft Shasta River TMDL Implementation Workplan, March 2007. This document lays out specific tasks and responsibilities for implementing the Shasta River TMDL. It is further described in Chapter 3.2, Geomorphology, Hydrology, and Water Quality. The full document is at: http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/shasta_river/070320/070320_shasta_workplan_draft.pdf

- SVRCD *Incidental Take Permit Application for Coho Salmon (Oncorhynchus kisutch)*, March 29, 2005. This document is the formal application by SVRCD for the ITP. It includes SVRCD's analysis of potential impacts on coho salmon of proposed Covered Activities, and proposed avoidance, minimization, and mitigation measures, many of which are incorporated in the draft ITP. It also includes as attachments extensive background information on the Shasta River and its watershed that is further reviewed and incorporated into the setting sections in Chapters 3.2 and 3.3.

- SVRCD SAA Notification, April 1, 2005. This document is the formal application for a Streambed Alteration Agreement, pursuant to Fish and Game Code, § 1602.

1.4 Organization of the Draft EIR

The Draft EIR is organized into six chapters, preceded by a Table of Contents and Summary, each of which is described briefly below.

Summary. The Draft EIR Summary, prepared in accordance with CEQA *Guidelines,* § 15123, contains an overview of key elements of the Draft EIR. This Summary includes a description of the Program (the full description is found in Chapter 2), as well as a description of Program alternatives as they compare to the Program (the full alternatives analysis is found in Chapter 5). Areas of controversy are also discussed. The Summary concludes with a comprehensive list of environmental impacts and mitigation measures identified in the Draft EIR, indicating the level of significance of each impact before and after mitigation, presented in table format.

Chapter 1 – Introduction. The Introduction briefly describes the CDFG permitting and environmental review processes for the Program, identifies the technical documents that are incorporated by reference into the Draft EIR, and describes the organization of the Draft EIR.

Chapter 2 – Project Description. The Project Description is prepared pursuant to CEQA *Guidelines,* § 15124, and contains a discussion of the Program attributes through text, figures, and tables. Specifically, Chapter 2 includes an overview of the Program; describes the need for, objectives, and benefits of the Program; describes in general the activities the Program covers (i.e., the Covered Activities); and describes in detail the terms and conditions in the MLTC (i.e., measures necessary to protect fish and wildlife resources) and ITP (i.e., avoidance, minimization, and mitigation measures).

Chapter 3 – Environmental Setting, Impacts, and Mitigation Measures. Chapter 3 begins with an introduction followed by seven "sub-chapters" (Chapters 3.1–3.7). The introduction discusses the environmental setting for the Program in broad terms and explains how the Chapter is organized. Following from the introduction, each sub-chapter includes a more focused discussion of the environmental setting pertinent to the resource the sub-chapter addresses (e.g., Land Use and Agriculture); a description of the criteria used to determine whether a particular impact could be significant; the environmental impacts the Covered Activities could have on the resource; a determination of whether they will be significant based on the significance criteria; and, where the impact is identified as potentially significant, a description of the mitigation measure(s) that will reduce the impact to less than significant. The social and economic effects of the Program are discussed in the context of its potential to induce changes in land use.

Chapter 4 – Cumulative Effects and Other Required Topics. Chapter 4 identifies and describes existing environmental statutes and regulations CDFG administers and enforces, as well as activities and programs under the jurisdiction of other agencies that could contribute to significant cumulative impacts. It also indicates the potential for the Program, in combination with other projects in the watershed, to contribute to significant cumulative impacts. This Chapter also discusses the potential the Program could have to induce growth and significant irreversible environmental changes if the Program is implemented.

Chapter 5 – Alternatives to the Program. In accordance with CEQA *Guidelines,* § 15126.6, Chapter 5 presents a reasonable range of potentially feasible alternatives designed to attain most of the basic objectives of the Program while avoiding or substantially reducing any potentially significant environmental impacts from the Program. Chapter 5 analyzes three alternatives, including their potential for reducing any adverse impacts associated with the Program, and their ability to meet Program objectives.

Chapter 6 – Draft EIR Authors, Persons and Organizations Contacted. Chapter 6 identifies the individuals who were involved in the preparation of the Draft EIR. Persons and organizations contacted in preparation of the Draft EIR are referenced at the end of each Chapter.

Appendices. The Draft EIR contains several appendices of technical and procedural materials that are pertinent to the analysis in the Draft EIR. The appendices are listed in the Table of Contents.

References

Leland, David, North Coast Regional Water Quality Control Board, Santa Rosa, California, written communication, February 6, 2008.

CHAPTER 2
Project Description

This Chapter describes the Shasta River Watershed-wide Permitting Program (Program) which for the purposes of this Draft Environmental Impact Report (EIR) is the “Project” analyzed and hereafter referred to as the “Program”. The environmental analysis of the Program in the following chapters is based on this description.

2.1 Program Overview

2.1.1 Program Objectives

The Program is intended to facilitate compliance with Fish and Game Code, § 1600 *et seq.* and the California Endangered Species Act (CESA) (Fish and Game Code, § 2050 *et seq*.) within the Shasta River watershed (Program Area) (see **Figure 2-1**) by the Shasta Valley Resource Conservation District (SVRCD) and Agricultural Operators[1] when conducting specified activities the Program covers. The Department of Water Resources (DWR) is also included in the Program because the current watermaster responsible for implementing the Siskiyou County Superior Court’s Judgment and Decree in the Shasta River Adjudication Proceeding entered December 30, 1932 (Shasta River Decree) is a DWR employee.[2]

In meeting that objective, the Program will also implement certain stream restoration projects in the Shasta River watershed identified in the Fish and Game Commission’s (Commission) Recovery Strategy for California Coho Salmon (February 2004) (Coho Recovery Strategy) as key coho salmon (*Oncorhynchus kisutch*) recovery projects. Under the Program, SVRCD will be responsible for implementing those recovery projects, which are among the activities the Program covers. The events culminating in the Commission’s adoption of the Coho Recovery Strategy and the Program’s relationship to it are described briefly below.

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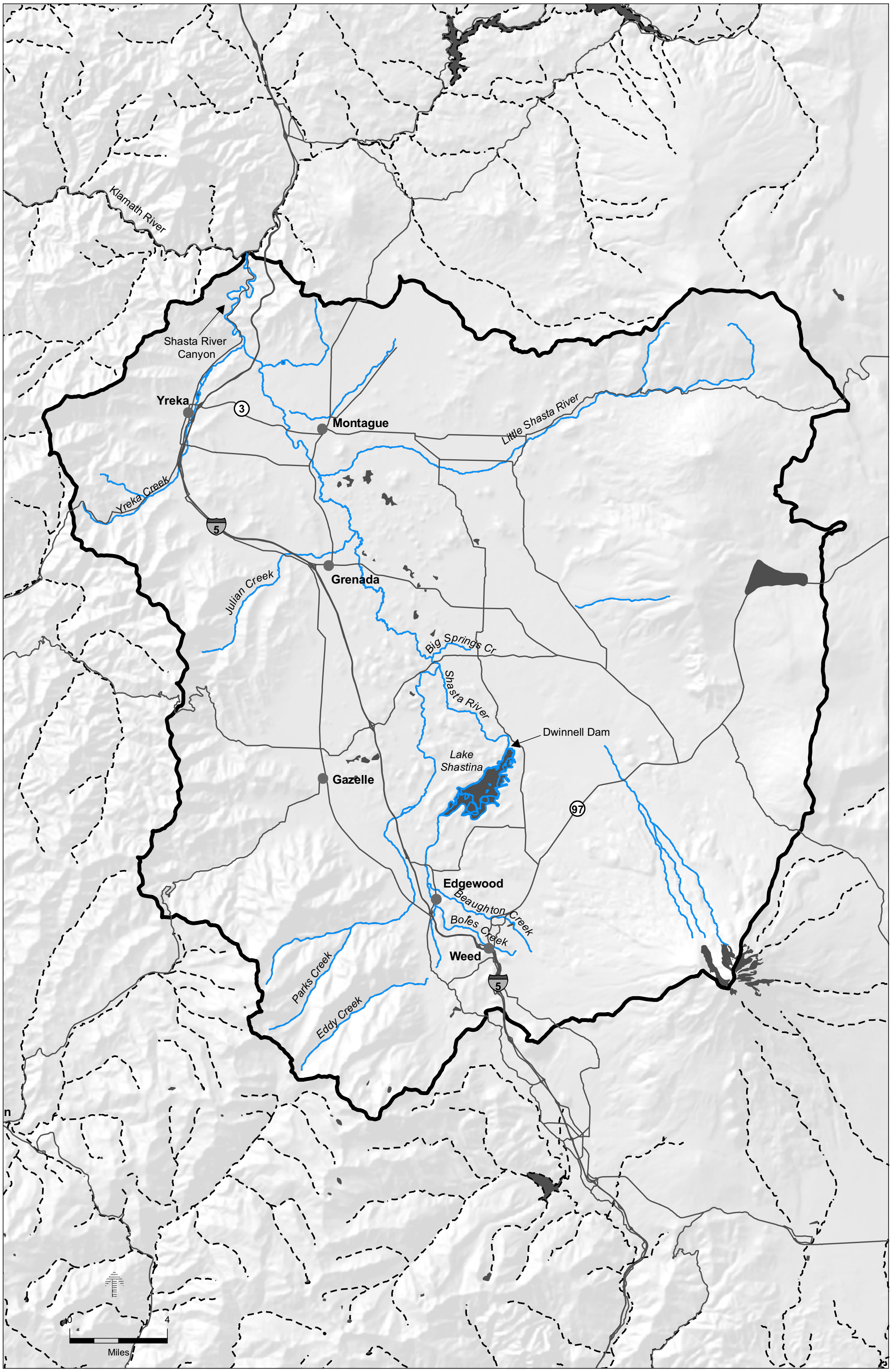
[1] The Program defines “Agricultural Operator” as any natural person or any partnership, corporation, limited liability company, trust, or other type of association or any public agency, as defined in CEQA *Guidelines*, § 15379, who diverts water from a stream by means of an active diversion in the Program Area for an agricultural purpose, or is involved in an agricultural operation on property in the Program Area through which or adjacent to which a stream flows. The Program defines “active diversion” as a surface water diversion that has been operated at least one out of the last five years.

[2] Interested stakeholders are exploring the possibility of developing and operating an alternative watermastering program to replace the current service provided by DWR. Additional information regarding this potential change in watermaster service is included in Chapter 4 under “Changes to the State Watermaster Program.”



SOURCE: ESA, 2007

Shasta River Watershed-Wide Permitting Program . 206063

Figure 2-1
Program Area

Status of and Recovery Strategy for Coho Salmon

In early 2002, the Salmon and Steelhead Recovery Coalition petitioned the Commission to list coho salmon north of San Francisco as an endangered species under CESA. In response, the California Department of Fish and Game (CDFG) issued a coho salmon status report to the Commission, recommending that coho salmon from San Francisco north to Punta Gorda be listed as endangered, and that coho salmon from Punta Gorda north to the Oregon border be listed as threatened pursuant to CESA (CDFG, 2004). The Commission found that coho salmon warranted listing in accordance with CDFG's recommendations. The Program Area is north of Punta Gorda. As a result of the Commission's finding, coho salmon within the Program Area are listed as a threatened species under CESA,[3] and may not be taken[4] except as authorized by CDFG in accordance with CESA.

In February 2004, the Commission adopted the Coho Recovery Strategy. The Coho Recovery Strategy emphasizes cooperation and collaboration, and recognizes the need for funding, public and private support for restoration actions, and maintaining a balance between regulatory and voluntary efforts to meet the goals of the Coho Recovery Strategy. The Shasta and Scott River watersheds were identified for a pilot program to address coho salmon recovery issues and solutions related to agriculture and agricultural water use in Siskiyou County. In addition to identifying recommendations for the pilot program, the Shasta-Scott Recovery Team identified the need to develop a programmatic implementation framework that works toward the recovery of coho salmon, while providing authorization to take coho salmon incidental to otherwise lawful routine agricultural activities in the Shasta and Scott River watersheds. The avoidance, minimization, and selected mitigation measures included in the proposed incidental take permit (ITP) for the Program, and the sub-permits that will be based on the ITP, are consistent with the recovery tasks identified in the Shasta-Scott Pilot Program in the Recovery Strategy.

2.1.2 Objectives of Program Participants

Shasta Valley Resource Conservation District

SVRCD is a non-profit public agency, organized under Division 9 of the Public Resources Code. The mission of SVRCD is to enhance the conservation and economic stability of natural resources by coordinating and supporting landowner activities, both public and private, and by providing information, education and project implementation to residents within all watersheds in the district's boundaries. SVRCD works closely with other public agencies, districts, private entities, and private individuals to accomplish its goals and objectives.

SVRCD's objectives for the Program are as follows:

- Support landowner activities (both private and public) in order to enhance the conservation and economic stability of Siskiyou County's natural resources;

[3] Coho salmon north of Punta Gorda are within the Southern Oregon-Northern California Coast (SONCC) Coho Evolutionarily Significant Unit (ESU).

[4] "'Take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (Fish and Game Code, § 86).

- Assist Agricultural Operators in completing projects consistent with the tasks identified in the Coho Recovery Strategy;
- Assist Agricultural Operators in meeting the requirements of Fish and Game Code, § 1600 *et seq.* and CESA by working with CDFG to develop a Program that streamlines the process to obtain streambed alteration agreements (SAA) under Fish and Game Code, § 1600 *et seq.* and incidental take authorization under CESA;
- Comply with Fish and Game Code, § 1600 *et seq.* and CESA while performing instream and/or near-stream coho salmon restoration activities;
- Provide incentives for Agricultural Operators in the Shasta River watershed to implement coho salmon recovery tasks;
- Increase the viability of coho salmon and other plant, fish, and wildlife resources in the Shasta River watershed by improving water quality and riparian habitat, minimizing any adverse effects from agricultural activities, and restoring habitat by providing a clear set of activities and conditions to Agricultural Operators;
- Protect and improve the biological functioning of the Shasta River watershed and natural resources while maintaining the economic viability of agriculture; and
- Implement the permit conditions identified in the Program for coho salmon and other stream resources in the Shasta River watershed.

California Department of Fish and Game

CDFG is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources, in part by administering and enforcing Fish and Game Code, § 1600 *et seq.* and CESA. In issuing SAAs to SVRCD, and Agricultural Operators, an ITP to SVRCD, and sub-permits to Agricultural Operators and DWR under the Program, CDFG intends to minimize impacts to biological resources within the Shasta River watershed, including coho salmon, from SVRCD's stream restoration projects and agricultural water diversions and activities related to those diversions in the Shasta River watershed. CDFG intends also to work with SVRCD to enhance coho salmon habitat in the Shasta River watershed through the implementation of key coho salmon recovery tasks. Hence, CDFG's objectives for the Program are as follows:

- Fulfill the commitment to develop a permitting framework within the context of the Shasta-Scott Pilot Program in the Coho Recovery Strategy;
- Work with SVRCD and Agricultural Operators to develop a watershed-wide permitting program that covers agricultural water diversions and other agricultural activities related to those diversions in the Shasta River watershed;
- Protect and conserve coho salmon when authorizing activities in the Shasta River watershed that may affect the species;
- Eliminate unauthorized take of coho salmon caused by water diversions in the Shasta River watershed and avoid, minimize, and fully mitigate take of coho salmon incidental to diverting water with a valid water right, recovery actions, and other lawful activities;

- Implement selected key coho salmon recovery tasks that are essential to improving habitat conditions for coho salmon in the Shasta River watershed; and
- Bring existing agricultural water diverters into compliance with Fish and Game Code, § 1600 *et seq.* and CESA.

Agricultural Operators

The objectives of the Agricultural Operators are as follows:

- Protect and conserve coho salmon and other plant, fish, and wildlife resources while maintaining the economic viability of their agricultural operations in the Shasta River watershed; and
- Comply with Fish and Game Code, § 1600 *et seq.* and CESA in conducting the activities the Program covers subject to those statutes.

Department of Water Resources

As mentioned above, the current watermaster responsible for administering and enforcing the Shasta River Decree is a DWR employee. The objectives of DWR are as follows:

- Implement the Shasta River Decree pursuant to applicable provisions in the California Water Code;
- Ensure watermastering activities are in compliance with CESA;
- Verify that watermastered diverters are in compliance with their respective adjudicated water right(s); and
- Work with CDFG to avoid or minimize the stranding[5] of coho salmon when CDFG determines that a permitted water diversion is causing or will cause stranding.

2.1.3 Program Advantages

Participation in the Program has many advantages, including the following:

- The Program implements selected key coho salmon recovery tasks on a watershed-wide level which also serve to meet the full mitigation requirement for incidental take authorization under CESA;
- SVRCD (through the ITP) and Agricultural Operators and DWR (through their sub-permits) will be authorized to take coho salmon if such take occurs incidental to conducting a Covered Activity;
- SVRCD will have one watershed-wide ITP for its coho salmon restoration projects, which will minimize the time and effort needed when compared to obtaining incidental take authorization on a project-by-project basis;

[5] The ITP defines “stranding” as a situation in which coho salmon are in a location with poor aquatic habitat conditions due to a reduction in flow from which they cannot escape.

- With the Master List of Terms and Conditions (MLTC) and the ITP, it will take much less time for CDFG to prepare individual SAAs for SVRCD projects subject to Fish and Game Code, § 1602 and SAAs and sub-permits for participating Agricultural Operators;
- Participating Agricultural Operators may receive assistance from SVRCD to prepare their SAA notifications, and will not be required to pay a notification fee to CDFG because SVRCD has paid that fee;
- Any take authorized under CESA must be fully mitigated. Because SVRCD will fully mitigate the take of coho salmon that might occur under the Program by implementing selected key coho salmon recovery projects, participating Agricultural Operators will not be responsible for meeting the full mitigation requirement.
- SVRCD and participating Agricultural Operators will not be responsible for CDFG's cost to prepare the EIR for the Program and any other CEQA-related costs; and
- The Program provides a coordinated approach to implement selected restoration projects critical for recovering coho salmon and bring existing agricultural water diverters into compliance with Fish and Game Code, § 1600 *et seq.* and CESA.

2.1.4 Program Permitting Structure

Authorization for Covered Activities

As explained below, the activities the Program covers, referred to in the Program as the "Covered Activities," are subject to Fish and Game Code, § 1600 *et seq.* and CESA, Fish and Game Code, § 1600 *et seq.* only, or CESA only. As a result, Agricultural Operators, SVRCD, and DWR must comply with one or both of those statutes before conducting a Covered Activity. The Covered Activities are described in detail below.

To comply with Fish and Game Code, § 1600 *et seq.* outside the Program, each of those entities would need to submit a notification and notification fee and obtain a SAA from CDFG in accordance with Fish and Game Code, § 1602. To be in compliance with CESA outside the Program, the entity would need to apply for and obtain an ITP from CDFG in accordance with Fish and Game Code, § 2081(b) and (c), which is part of CESA. Before CDFG could issue a SAA or an ITP, it would first need to comply with the California Environmental Quality Act (CEQA) (Public Resources Code, § 21000 *et seq.*). In permitting the activities the Program covers, CDFG would be the CEQA lead agency, and as such, would be entitled to recover from the applicant the costs it incurs to comply with CEQA.

Under the Program, CDFG will issue SVRCD and Agricultural Operators individual SAAs for purposes of complying with Fish and Game Code, § 1600 *et seq.* Similar to the standard notification process under Fish and Game Code, § 1602, Agricultural Operators will need to notify CDFG in order to obtain a SAA, but they will not be required to pay a notification fee because, as discussed above, SVRCD has paid that fee. As a condition of participating in the Program, SVRCD and Agricultural Operators must also obtain separate authorization from CDFG to authorize any take of coho salmon that may occur incidental to a Covered Activity within the Program Area for purposes of complying with CESA. The only exception to the requirement that

Agricultural Operators obtain both a SAA and take authorization from CDFG to participate in the Program is where CDFG determines that an Agricultural Operator's water diversion is in an area where a decrease in flow below the diversion will not have an effect on coho salmon downstream from the diversion, e.g., above Dwinnell Dam. In that case, the Agricultural Operator will not be required to obtain take authorization. DWR will obtain take authorization from CDFG, but will not need to obtain a SAA.

For Agricultural Operators and DWR, their take authorization will be based on the ITP that CDFG will issue to SVRCD. Because they will be based on SVRCD's ITP, they are referred to as "sub-permits" in the Program, but like the SAAs that CDFG issues under the Program, they will be fully enforceable by CDFG as separate, or "stand alone" permits. The structure and conditions of each SAA, ITP, and sub-permit CDFG will issue under the Program are described in greater detail below.

Streambed Alteration Agreements

On April 1, 2005, SVRCD submitted a notification for a watershed wide streambed alteration agreement program and notification fee to CDFG. At the time, CDFG and SVRCD expected that CDFG would use the notification to prepare one SAA that would apply to SVRCD and Agricultural Operators when conducting certain Covered Activities. By doing so, SVRCD and Agricultural Operators would not need to submit separate notifications to CDFG, and CDFG would not need to prepare a separate SAA for each of those entities. However, after further discussions, it became apparent to CDFG and SVRCD that this approach was not workable, and thereafter they adopted a different approach for the SAA component of the Program.

Under the Program, SVRCD and Agricultural Operators will be required to notify CDFG and in that notification describe the particular Covered Activity or Activities for which they are seeking authorization in order to comply with Fish and Game Code, § 1602. If the entity wants to complete an activity that is not one of the Covered Activities, the entity will need to notify CDFG pursuant to the standard procedure outside the Program. SVRCD may provide assistance to Agricultural Operators in preparing and submitting their notifications to CDFG pursuant to the Memorandum of Understanding (MOU) between CDFG and SVRCD, which is attached as Appendix B. The MOU identifies CDFG's and SVRCD's roles and responsibilities in administering and implementing the SAA (i.e., Fish and Game Code, § 1600 *et seq.*) component of the Program.

After CDFG determines the notification is complete and includes only those activities covered by the Program, it will prepare a SAA for the applicant. The conditions CDFG includes in the SAA will be based on the MLTC that is attached to the MOU. Those conditions are part of the Program. A copy of the proposed MLTC is attached as part of Appendix B. The MLTC includes general conditions that will be included in each SAA regardless of the Covered Activity or Activities the SAA authorizes and specific conditions from which CDFG will select and include in a SAA based on the Covered Activity or Activities the SAA authorizes.

The specific set of MLTC conditions in the SAA will be those measures necessary to protect fish and wildlife resources the Covered Activity or Activities may substantially adversely affect, as required in Fish and Game Code, § 1603. Under that section *outside* the Program, if an applicant disagrees with any conditions CDFG includes in a draft SAA, the entity may request a meeting with CDFG to resolve the disagreement informally. If that occurs but the applicant and CDFG cannot resolve the disagreement, the entity may request that a three-person arbitration panel be convened to resolve the dispute. By contrast, the conditions CDFG includes in a SAA issued under the Program may not be arbitrated. As a result, in the event an Agricultural Operator disagrees with any of those conditions, and the Agricultural Operator and CDFG cannot resolve the disagreement informally, the Agricultural Operator must either accept the Program SAA regardless of the disagreement, or apply for a SAA outside the Program like any other non-participant. In the latter case, if the Agricultural Operator disagrees with any condition CDFG includes in the draft non-Program SAA, the dispute resolution procedure under Fish and Game Code, § 1603 described above will be available to the Agricultural Operator. However, if an Agricultural Operator elects to obtain a SAA outside the Program, it may no longer participate in the Program having "opted out."

Also under the Program, in order for a SAA notification to be complete, the applicant must include a copy of an executed ITP or sub-permit (described below) issued by CDFG under the Program, unless CDFG has determined a sub-permit is not required as described above. Agricultural Operators must also include an agreement signed by the Agricultural Operator that will allow non-enforcement CDFG personnel and SVRCD personnel access to the sub-permittee's property ~~where the Covered Activity will occur for purposes of monitoring~~ to determine whether the terms and conditions of SVRCD's ITP and SAAs or the Agricultural Operator's SAA and sub-permit are fulfilled and are effective. If the Covered Activity will occur on property not owned by the Agricultural Operator, the access agreement must be signed by the owner of the property.

During the first five years of the Program, the term of any SAA CDFG issues under the Program will be five years. CDFG may extend the term one time for a period of up to five years, but not beyond the expiration date of the ITP, if the SAA holder requests an extension prior to the SAA's expiration. All SAAs issued or extended after the first five years of the Program will expire on the expiration date of the ITP (i.e., the expiration date of the Program).

Incidental Take Authorization

Under CESA, a person may not take a species that the Commission has accepted as a candidate species or listed as a threatened or endangered species unless the take is incidental to an otherwise lawful activity and the person obtains authorization from CDFG in the form of an ITP. Because coho salmon within the Program Area are listed as threatened under CESA, and CDFG has determined that the Covered Activities could result in take of coho salmon, SVRCD and DWR will be required to obtain take authorization under the Program. Agricultural Operators will also be required to obtain take authorization, except in limited circumstances where CDFG has determined a water diversion is located in an area where a decrease in flow below the diversion will not have an effect on coho salmon downstream of the diversion, e.g., above Dwinnell Dam. On March 29, 2005, SVRCD submitted an application to CDFG for an ITP pursuant to Fish and

Game Code, § 2081(b) and (c). Thereafter, CDFG and SVRCD worked together to develop a watershed-wide ITP as part of the CESA component of the Program.

As discussed above, for SVRCD, take authorization under the Program will be in the form of an ITP. A copy of the proposed ITP under the Program is attached as Appendix A. For Agricultural Operators and DWR, such authorization will be in the form of “sub-permits” that will be based on SVRCD’s ITP, but, like the ITP, each will be fully enforceable by CDFG as a separate permit, as explained in greater detail below. The avoidance, minimization, and mitigation measures included in the ITP and sub-permits are part of the Program.

Under the ITP, SVRCD will be required to comply with the avoidance, minimization, and mitigation measures included in the ITP for its own projects, which, as mentioned above, are key coho salmon recovery projects identified in the Coho Recovery Strategy. The sub-permits will include avoidance and minimization measures the “sub-permittees” (i.e., Agricultural Operators and DWR) must implement, in some cases with SVRCD’s assistance. SVRCD will meet the sub-permittees’ CESA obligation to fully mitigate for any take of coho salmon that occurs incidental to conducting their Covered Activities by implementing the key coho salmon recovery projects mentioned above. Those projects are described in the ITP as mitigation for any take of coho salmon that occurs incidental to the Covered Activities.

Although SVRCD will be responsible for implementing the coho salmon recovery projects described in the ITP, and therefore for meeting the full mitigation requirement under CESA as it applies to the sub-permittees’ Covered Activities, the sub-permittees’ take authorization is not solely contingent on their compliance with the avoidance and minimization measures for which they are responsible under their sub-permits. It is also contingent on SVRCD’s implementation of the key coho salmon recovery projects that apply to the sub-permittees’ Covered Activities. Hence, any failure by SVRCD to implement those projects and any other mitigation measures could result in the suspension or revocation by CDFG not just of SVRCD’s take authorization under the Program, but also the sub-permittees’ because, as mentioned above, those projects will serve to meet the full mitigation issuance criteria for take authorization pursuant to CESA.

SVRCD will also be required to conduct monitoring activities to determine whether or not the terms and conditions of <u>their ITP</u> ~~each sub-permit~~ are being fulfilled and are effective. In order to ensure that SVRCD will be able to meet this obligation, the sub-permits will include provisions that allow SVRCD and CDFG to enter a sub-permittee’s property and other private property Covered Activities might affect and/or where Covered Activities occur. <u>Sub-permittees will be responsible for monitoring the terms and conditions of their sub-permits by completing the appropriate implementation and effectiveness monitoring checklists for their Covered Activities and submitting them to CDFG. CDFG is responsible for any and all compliance monitoring.</u>

The term of the Program ITP will be10 years and all sub-permits will be written to expire on the expiration date of the Program ITP. As mentioned above, Program SAAs will also expire on or before the ITP expiration date.

Covered Activities

As mentioned above, the Program applies to various Covered Activities, which are described below. The first nine Covered Activities are subject to Fish and Game Code, § 1600 *et seq.*[6] and CESA, and therefore are included in the proposed MLTC and ITP. The remaining five Covered Activities are not subject to Fish and Game Code, § 1600 *et seq.*, and therefore they are not included in the MLTC. However, they are included in the ITP (along with the other nine Covered Activities) because like the other nine Covered Activities, they could result in take of coho salmon in the Program Area. By participating in the Program, SVRCD, through the ITP, and Agricultural Operators and DWR, through their sub-permits, will have authorization pursuant to CESA for take of coho salmon that might occur incidental to conducting a Covered Activity.

Below is a summary of the 14 Covered Activities, followed by a more detailed description of the conditions in the proposed MLTC and ITP which CDFG will include in SAAs and sub-permits. Again, the first nine Covered Activities are included in the proposed MLTC and ITP, and the remaining five are included only in the proposed ITP.

ITP and MLTC Covered Activity 1: Water Diversions. This activity includes only the diversion of surface water by an appropriative or riparian right through a conduit or opening from streams, channels, or sloughs within the Shasta River watershed by an Agricultural Operator for agricultural purposes in accordance with a valid water right.

ITP and MLTC Covered Activity 2: Water Diversion Structures. This category includes only the following activities relating to water diversion structures:

a) Ongoing management and/or maintenance of existing flashboard dams, including the placement of boards into concrete abutments across the wetted channel to build head to divert water, and the removal of the boards;

b) Ongoing maintenance, management, and repair of boulder weirs;

c) Installing, operating, maintaining, and removing push-up dams. “Push-up dam” is defined as a temporary diversion structure created by using motorized equipment (for example loaders, backhoes, or excavators) to move bedload within the stream channel to form a flow barrier that seasonally diverts the flow of the stream;[7]

d) Installing, operating, maintaining, and removing other temporary diversion structures that are not push-up dams. “Other temporary diversion structure” is defined as any temporary structure (other than a push-up dam) used to seasonally divert water seasonally from a stream and is typically made with materials such as hay bales, hand-stacked rocks and cobble, tarps, wood, and/or a combination of these materials placed in the channel with or without the use of motorized ~~heavy~~ equipment;

6 Fish and Game Code, § 1602 requires an entity to notify CDFG before substantially diverting or obstructing the natural flow of, or substantially changing or using any material from the bed, channel, or bank of, any river, stream, or lake, or depositing or disposing of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

7 A scoping comment requested that bulldozing be prohibited in streams. The MLTC and ITP will place several restrictions on use of heavy equipment in streams (see below). The impacts of the use of heavy equipment in streams are further analyzed in Chapters 3 and 4 of this Draft EIR.

e) Installing or placing pumps and sumps and maintaining existing pumps and sumps within or adjacent to the active channel of a stream, which sometimes requires the use of large machinery within or adjacent to the active channel; and

f) Installing headgates and measuring devices, sized appropriately for the authorized diversion, that meet CDFG's and/or DWR's standards on or in a diversion channel, which usually is done by excavating the site to proper elevation using large machinery, positioning the headgate and measuring device at the appropriate elevation, and installing rock or other "armoring" around the headgate to protect the structure. During installation, the streambank could be affected by the construction of concrete forms and other necessary construction activities. Where diversions are under the control of the State Watermaster Service, the headgate or valve and measuring device design shall also be approved by DWR.

ITP and MLTC Covered Activity 3: Fish Screens. This category includes only the installation, operation, and maintenance of the types of fish screens described below, provided they meet CDFG's and the National Marine Fisheries Service's ("NMFS") criteria for steelhead fry as they exist at the time the screen is installed. Installing a fish screen usually includes site excavation, forming and pouring a concrete foundation and walls, excavation and installation of a fish bypass pipe or channel, and installation of the fish screen structure. Heavy equipment is typically used for excavation of the screen site and bypass. If the fish screen is placed within or near flood prone areas, typically rock or other "armoring" is installed to protect the screen. The average size of the bed, channel, and/or bank area affected by the installation of a bypass pipe or channel ranges from 40 to 100 square feet. Fish screen types include:

a) Self-cleaning screens, including flat plate self-cleaning screens, and other self-cleaning designs, including, but not limited to, rotary drum screens and cone screens, with a variety of cleaning mechanisms, consistent with CDFG and NMFS screening criteria; and

b) Non-self cleaning screens, including tubular, box, and other screen designs consistent with CDFG and NMFS screening criteria.

ITP and MLTC Covered Activity 4: Stream Access and Crossings. This category includes only the moving of livestock and vehicles across flowing streams or intermittent channels and/or the construction, maintenance, and use of stream crossings at designated locations where potential spawning gravels, incubating eggs, and fry are not present based on repeated site specific surveys. Factors considered when selecting a crossing location include the stream gradient, channel width, and the ability to maintain the existing channel slope. Generally, to construct a crossing in a low gradient stream, a boulder weir is placed on the downstream side of the crossing at or near grade and angular quarry rock is placed in the crossing location; the width of the crossing does not exceed 25 feet; the crossing spans the entire width of the channel; the crossing is "keyed" into the bank on each side; the approaches on both sides do not exceed a slope of 3:1; and bank armoring (usually using quarry rock) is added where needed.

ITP and MLTC Covered Activity 5: Fencing. This activity includes only the installation and maintenance of livestock exclusion fencing to protect the riparian zones, including the construction of fencing along livestock and vehicle crossings and livestock watering lanes.

ITP and MLTC Covered Activity 6: Riparian Restoration and Revegetation. This activity includes only the restoration, including revegetation of riparian areas, consistent with the methods specified in the most current edition of CDFG's *Salmonid Stream Habitat Restoration Manual*, or as otherwise approved in writing by CDFG.[8] Typically, riparian vegetation is planted within or adjacent to the active channel, and often in or near the wetted channel. Plantings include herbaceous perennials, emergent species, native grasses, trees, and shrubs. Planting methods vary by species, site, and size of material planted, ranging from hand planting to using a backhoe or excavator. For riparian trees, planting densities range from 130 to 300 plantings per acre, depending on the restoration goals (e.g., shading, sediment trapping, and bank stabilization), substrate, and hydrology. Trees and cuttings range in size from small rooted plugs to large diameter pole plantings. When installing pole plantings, heavy equipment may be used to excavate to or below water table depth. Maintenance activities include the occasional use of hand tools, portable pumps, pick-up trucks and/or water trucks in or near the bed, bank, or channel, for irrigation, debris removal, and replanting of restoration sites.

ITP and MLTC Covered Activity 7: Instream Structures. This activity includes only the installation, maintenance, and repair of the following instream structures consistent with the methods specified in the most current edition of CDFG's *Salmonid Stream Habitat Restoration Manual:*

a) Structures to protect the bed and banks of streams;

b) Bioengineered habitat structures;

c) Deflectors;

d) Boulder clusters;

e) Boulder weirs for instream habitat or to replace flashboard dams, push up dams, and other temporary diversion structures;

f) Large woody debris; and

g) Spawning gravels to enhance spawning habitat.

ITP and MLTC Covered Activity 8: Stream Gages. This category includes the installation and maintenance of stream gages in the active stream channel, usually using pipe two inches or greater in diameter. Typically, the pipe is secured to the bank by notching it into the bank and by then attaching it to the bedrock, a boulder, or a concrete buttress. Generally, heavy equipment is not needed to install and maintain stream gages.

ITP and MLTC Covered Activity 9: Barrier Removal Projects/Fish Passage Projects. Activities required to perform the projects listed below are included, although CDFG may add others to the list in the future. Each project will provide access to historic fish spawning and rearing habitat.

a) Dam demobilization and water quality improvement project at Araujo Dam;

[8] The current edition of the manual is available at http://www.dfg.ca.gov/fish/Resources/HabitatManual.asp

b) Dam demobilization and water quality improvement project at Shasta Water Association's Dam; and

c) Fish barrier removal project by Grenada Irrigation District.

ITP Covered Activity 10: Grazing Livestock. This activity includes the grazing of livestock within the riparian exclusion zone ~~adjacent to the channel or within the bed, bank, or channel~~ of the Shasta River or its tributaries in accordance with a grazing management plan approved by CDFG. The grazing plan will address the timing, duration, and intensity (number of livestock allowable per unit area [i.e., stocking rate]) of livestock grazing within the riparian zone and will explain how the proposed management plan will result in improved riparian function and enhanced aquatic habitat. In addition, the grazing plan will describe the means by which the livestock will be prohibited from entering live streams.[9]

ITP Covered Activity 11: Water Management. This activity includes water management, water monitoring, and watermastering (either state or Special District ~~private~~) activities, including the operation of headgates in conjunction with measuring devices to assure that each diversion is operated in compliance with its associated water right or adjudicated volume.

ITP Covered Activity 12: Permit Implementation. This includes other activities associated with the implementation of avoidance, minimization, and mitigation measures required by the ITP, sub-permit, or a SAA.

ITP Covered Activity 13: Monitoring. This includes activities associated with the determination of whether or not the terms and conditions of the ITP, ~~each~~ a sub-permit, or a SAA are being fulfilled and are effective.

ITP Covered Activity 14: Research. This includes activities associated with conducting studies to improve the scientific understanding of salmonid distribution, natural history, and population dynamics, etc. in the Shasta River watershed.

2.2 Conditions in the Proposed MLTC

The MLTC contains 130 ~~114~~ separate conditions (see Appendix B for full language). These are divided into general and specific conditions.

9 A scoping comment requested that grazing be prohibited in streams. Grazing in streams and riparian corridors is a historic, ongoing activity in the Shasta River watershed that along with its impacts is part of the baseline. Although the Program will not prohibit such grazing, it will reduce its impacts by excluding livestock from some riparian zones by installing and maintaining fencing (see ITP and MLTC Covered Activity 5). Also, as stated above, under ITP Covered Activity 10, any grazing of livestock within the riparian exclusion zone ~~adjacent to the channel or within the bed, bank, or channel~~ of the Shasta River or its tributaries may only occur in accordance with a grazing management plan that will result in improved riparian function and enhanced aquatic habitat. In addition, a grazing management plan will describe the means by which livestock will be prohibited from entering live streams. The impacts of grazing in streams and riparian corridors are analyzed in Chapters 3 and 4 of this Draft EIR.

2.2.1 General Conditions in the MLTC

The proposed MLTC contains 20 ~~19~~ general conditions, primarily administrative, that will be included in all SAAs issued under the Program. General conditions are organized in the MLTC under the following sections: a. ~~1)~~ “Administrative”; b ~~2)~~ “Amendments”; c. ~~3)~~ “Suspension and Revocation”; d. ~~4)~~ “Liability”; e. ~~5)~~ “Access”; and f. ~~6)~~ “Other Laws.” The “Other Laws” section in the

MLTC requires the holder of a SAA issued by CDFG under the Program to comply with all local, state, and federal laws before commencing a Covered Activity, which includes CESA.

2.2.2 Specific Conditions in the MLTC

The remaining conditions in the proposed MLTC address the potential physical effects of the nine Covered Activities the MLTC includes. As mentioned above, the specific conditions CDFG includes in a SAA will depend on the particular Covered Activity or Activities described in the notification that the SAA will be authorizing. The specific conditions are intended to protect existing fish and wildlife resources the Covered Activity or Activities could substantially adversely affect.

The specific conditions are organized in the MLTC under the following sections: a. ~~1)~~ "Water Diversions"; b. ~~2)~~ "Riparian Restoration and Revegetation"; c. ~~3)~~ "Instream Structures"; d. ~~4)~~ "Habitat and Species Protection"; e. ~~5)~~ "Use of Vehicles in Wetted Portions of Streams"; f. ~~6)~~ "Pollution Control"; g. ~~7)~~ "Erosion and Sediment Control"; h. ~~8)~~ "Bank Stabilization"; i. ~~9)~~ "Dewatering"; j. ~~10)~~ "Ground-Disturbing Activities"; and k. ~~11)~~ "Monitoring."

Each holder of a SAA issued by CDFG under the Program will be responsible for complying with the general conditions and each specific condition that CDFG includes in the SAA.

2.3 Conditions in the Proposed ITP

The proposed ITP includes measures to avoid, minimize, and fully mitigate the take of coho salmon that might occur incidental to a Covered Activity, as Fish and Game Code, § 2081(b) and (c) require. As mentioned above, SVRCD and Agricultural Operators will be responsible for implementing the avoidance and minimization measures in the ITP and sub-permits, respectively, for their own Covered Activities. However, SVRCD, rather than Agricultural Operators, will be responsible for implementing the mitigation measures in the ITP. CDFG may also include measures in a sub-permit that are not included in the proposed ITP if it determines that the additional measures are necessary to avoid and minimize take of coho salmon incidental to the activity or activities the sub-permit covers.

2.3.1 General Conditions in the ITP

The proposed ITP contains the general conditions described below that will apply to SVRCD and, through their sub-permits, Agricultural Operators and DWR.

ITP General Condition a: This condition requires SVRCD to conduct an education program for all sub-permittees within 60 days of the close of each sub-permittee enrollment period. After the ITP takes effect, a 60-day sub-permittee enrollment period will begin. Any Agricultural Operator who wants to enroll in the Program after the initial enrollment period closes may do so from January 1 to February 28 each year. The education program will consist of a presentation by a person or persons knowledgeable about the biology of coho salmon, the terms of the ITP, and CESA. The education program will include a discussion of the biology of coho salmon, their habitat needs, their threatened status under CESA, and the avoidance, minimization, and mitigation measures required by the ITP.

ITP General Condition b: This condition requires SVRCD and any sub-permittee to stop, contain, and clean-up any fuel, lubricants, or other hazardous materials that leak or spill while engaged in a Covered Activity; to notify CDFG immediately of any leak or spill of hazardous materials into a stream or in a place where it can pass into a stream; and to store and handle hazardous materials at least 150 feet away from the edge of mean high water elevation of any stream, unless adequate containment for an existing facility is provided and approved by CDFG.

ITP General Condition c: This condition requires sub-permittees to provide non-enforcement CDFG representatives written consent to access the sub-permittee's property for the specific purpose of verifying compliance with, or the effectiveness of, required avoidance, minimization, and mitigation measures and/or for the purpose of fish population monitoring, provided CDFG notifies the sub-permittee at least 48 hours in advance. The sub-permittee is entitled to be present or have a representative present. Sworn peace officers may enter private lands if necessary for law enforcement purposes pursuant to Fish and Game Section 857 or as otherwise authorized by law.

ITP General Condition d: Under this condition, each sub-permittee will be solely responsible for any costs the sub-permittee incurs to implement any avoidance or minimization measures required under their a sub-permit and SVRCD shall be solely responsible for any costs it incurs to implement any mitigation and monitoring measures required under the ITP.

ITP General Condition e: This condition specifies that SVRCD's mitigation obligations under the ITP will end only when SVRCD has implemented the avoidance, minimization, and mitigation measures identified in the ITP, for which it is responsible, that are necessary to fully mitigate the authorized take of coho salmon that occurred while the ITP and all sub-permits were in effect, and the Final Report (described below) is deemed complete.

ITP General Condition f: This condition requires SVRCD to submit to CDFG an irrevocable letter of credit or another form of financial security, other than a bond (Security), approved by CDFG's Office of the General Counsel in the principal sum of $100,000. The Security must allow CDFG to draw on the principal sum if CDFG, in its sole discretion, determines that SVRCD or a sub-permittee has failed to comply with any of the avoidance, minimization, mitigation, or monitoring measures for which SVRCD or sub-permittee is responsible.

If CDFG draws on the Security, it must use the amount drawn to implement measures SVRCD or a sub-permittee has failed to implement, or, if CDFG determines the measure(s) can no longer be successfully implemented or will not be effective, some other measures within the Program Area that CDFG determines will more effectively avoid, minimize, or mitigate impacts on coho salmon caused by a Covered Activity.

ITP General Condition g: This condition allows instream work on structural restoration projects by SVRCD or a sub-permittee to occur only from July 1 to October 15 ~~31~~ when coho salmon are least likely to be present and/or when water temperatures exceed the tolerance levels of coho salmon. If the work needs to be completed before July 1 or after October 15 ~~31~~, SVRCD or the sub-permittee may request a variance from CDFG in writing. If CDFG grants the request, the work must be completed in accordance with the avoidance, minimization, mitigation, and monitoring measures CDFG might specify in granting the variance.

ITP General Condition h: Under this condition, instream equipment operations by SVRCD or a sub-permittee will occur when coho salmon are least likely to be present and/or when water temperatures exceed the tolerance levels of coho salmon, which is generally from July 1 to October 15 ~~31~~, except as otherwise provided in the Best Management Practices (BMPs) adopted pursuant to the ITP. SVRCD must contact CDFG to verify when such operations may begin each year prior to their commencement. If work needs to be completed before July 1 or after October 15, SVRCD is required to request, in writing, a variance from CDFG. If CDFG grants the variance, the work will be completed in accordance with the avoidance, minimization, mitigation, and monitoring measures CDFG specifies in granting the variance. The condition also specifies that to the extent possible, all such work must be done from outside the channel. All refueling of machinery must be done no less than 150 feet away from the edge of the mean high water elevation of any stream. Access without specific CDFG approval is allowed to correct emergency problems demanding immediate action (as defined in Public Resources Code, § 21060.3).

ITP General Condition i: This condition requires SVRCD and each sub-permittee to comply with Fish and Game Code, § 1600 *et seq*., if applicable.

2.3.2 Additional Obligations in the ITP to Avoid and Minimize Take of Coho Salmon

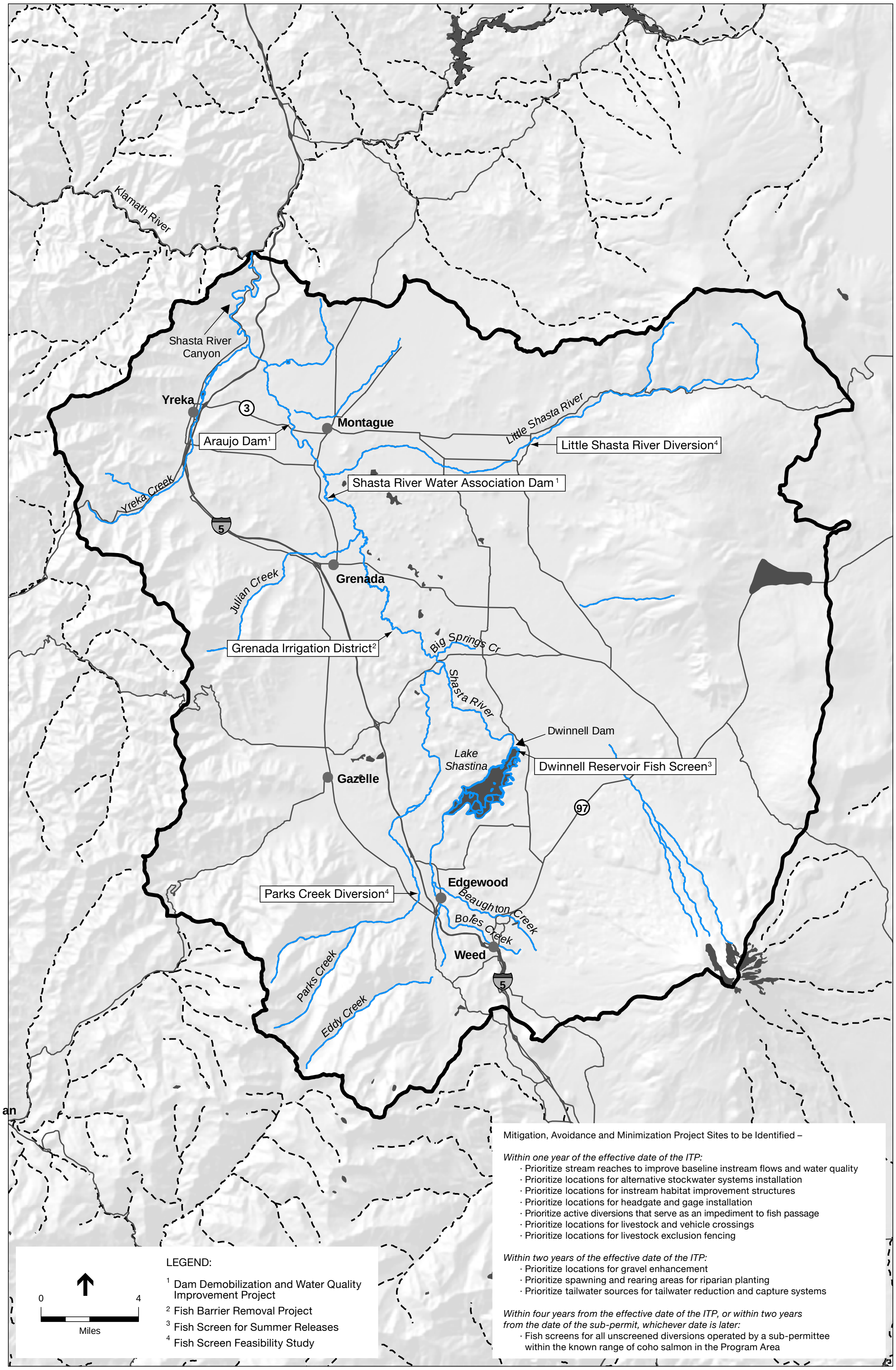
In addition to general conditions described above, the proposed ITP includes the specific obligations described below that SVRCD and/or each sub-permittee, except DWR, must implement in order to avoid and minimize the incidental take of all life stages of coho salmon in the Program Area when engaged in a Covered Activity (see **Figure 2-2**).

coho salmon in the Program Area when engaged in a Covered Activity (see **Figure 2-2**). DWR's sub-permit obligations are discussed in section 2.3.6.

ITP Additional Avoidance and Minimization Obligation A: Water Management. This includes compliance with water rights, verification of the quantity of water diverted, and a requirement to install headgates and water measuring devices on water diversion structures.

ITP Additional Avoidance and Minimization Obligation B: Fish Screens. This includes the requirement to fit diversions with fish screens that meet CDFG and NMFS screening criteria for steelhead fry, provide a bypass channel or device to enable fish to return to the main stream channel, cleaning and maintenance requirements, and high flow provisions.

ITP Additional Avoidance and Minimization Obligation C: Fish Passage Improvements. SVRCD and each sub-permittee with fish passage problems will implement specified requirements in an effort to eliminate all fish barriers. This obligation requires SVRCD to create a priority list of diversions that impede fish passage, and to submit this list to CDFG for review and approval within one year of the effective date of the ITP. The priority list will be used to focus efforts to remove fish barriers in the most critical areas early in the Program. SVRCD must also coordinate with CDFG to develop and conduct a fish passage workshop for those who own, operate, or use diversions that are likely to obstruct fish passage. The workshop will be held within one year of the effective date of the ITP.



SOURCE: ESA, 2007

Figure 2-2
Site-Specific Mitigation, Avoidance and Minimization Projects

In addition to the above requirements, each sub-permittee will be required to provide permanent volitional fish passage for both adult and juvenile coho salmon, both upstream and downstream, at each of their diversions within five years of the effective date of their sub-permit. Where such passage is determined by CDFG to be inadequate, the sub-permittee will be required to submit to CDFG plans to improve passage for CDFG's review and approval. As a part of the review, CDFG will make a determination regarding whether or not engineered drawings are necessary for the project. If engineered drawings are deemed necessary, they will be submitted to CDFG for review and approval prior to implementing the project. Annual reports that document progress to provide adequate fish passage at these diversions will be provided to SVRCD by the owner of the diversion which SVRCD will submit to CDFG with the Annual Report SVRCD will be required to submit under the ITP.

ITP Additional Avoidance and Minimization Obligation D: Livestock and Vehicle Crossings. The ITP contains provisions to reduce the potential for take of coho salmon from livestock and vehicles crossing streams. Those obligations include: a prohibition on livestock and vehicles crossing flowing streams between October 15 ~~31~~ and July 1, except in designated, CDFG-approved crossing lanes, and criteria for site selection and crossing design, construction, periodic inspection, and maintenance.

ITP Additional Avoidance and Minimization Obligation E: Riparian Fencing/Grazing of Livestock in Riparian Areas. The ITP includes several provisions for riparian fencing and restriction of livestock from riparian areas intended to improve the condition of the riparian vegetation for the benefit of coho salmon. These include a requirement that, within one year of the effective date of the ITP, SVRCD develop a Riparian Fencing Plan for CDFG review and approval that prioritizes areas for riparian protection; a requirement for sub-permittees to install, maintain, and repair exclusion fencing in accordance with the Riparian Fencing Plan; a requirement for sub-permittees to allow the planting of riparian revegetation and installation of livestock exclusion fencing along designated stream reaches located on their property, and restrictions on sub-permittees' grazing of livestock within a fenced riparian area. High priority areas identified in the priority plan will be addresses as soon as practical.

ITP Additional Avoidance and Minimization Obligation F: Push-Up Dams. The ITP requires SVRCD, within six months of the effective date of the ITP, to consult with CDFG to prepare and adopt a set of BMPs that govern the construction, operation, and removal of push-up dams. The BMPs will specify the conditions under which such dams may be constructed, including work windows and the type of equipment that may be used for construction and removal; provisions to allow fish passage; and measures to minimize stream sedimentation and other water quality impacts. Once they are approved by CDFG, sub-permittees who uses push-up dams will implement the BMPs to minimize dam-related impacts. Within five years of the effective date of their sub-permit, sub-permittees will replace their push-up dams with boulder ~~vortex~~ weirs or some other CDFG approved diversion method, unless CDFG determines that an alternative method is not feasible.

ITP Additional Avoidance and Minimization Obligation G: Other Temporary Diversion Structures. The ITP requires SVRCD to consult with CDFG to prepare and adopt a set of BMPs that govern the construction, operation, and removal of temporary diversion structures other than push-up dams. The BMPs will specify the conditions under which these other temporary diversion structures may be used, including work windows and a description of the construction methods which may be used to construct and remove them with or without the use of motorized ~~heavy~~ equipment; provisions to allow fish passage; and measures to minimize stream sedimentation and address other water quality issues.

Within two years of the effective date of the ITP, any sub-permittee who uses an "Other Temporary Diversion Structure" will request in writing that SVRCD and CDFG assess the structure. If CDFG determines the structure will not comply with the Fish and Game Code, even after implementation of the BMPs, the sub-permittee will replace the structures within five years of the determination with a boulder ~~vortex~~ weir or some other structure approved by CDFG.

ITP Additional Avoidance and Minimization Obligation H: Bioengineered Bank Stabilization. In areas where the slopes of streambanks on a sub-permittee's property have become unstable due to actions by the sub-permittee and re-stabilization measures are necessary to re-establish vegetation, the sub-permittee shall implement bioengineered bank stabilization techniques[10] to prevent additional erosion from occurring. The techniques to be implemented must be consistent with methods identified in the most recent version of CDFG's *Salmonid Stream Habitat Restoration Manual*, and must be approved by CDFG on a site-by-site basis. Any bank stabilization required pursuant to a sub-permit will be implemented within three years of the effective date of the sub-permit.

ITP Additional Avoidance and Minimization Obligation I: Irrigation Tailwater Reduction and/or Capture. Under the ITP, SVRCD will assist sub-permittees in the design and implementation of tailwater reduction and capture systems. SVRCD will inventory and prioritize tailwater sources for remediation and submit the priority list of sites to CDFG for its review and approval within two years of the effective date of the ITP. High priority areas identified in the priority plan will be addressed as soon as practical. Tailwater capture systems will be consistent with the standards contained in U.S. Department of Agriculture's Natural Resources Conservation Service guidelines. Any sub-permittee whose property is on the priority list must have tailwater reduction and capture systems in place by the expiration of their sub-permit.

ITP Additional Avoidance and Minimization Obligation J: Dwinnell Dam and the Montague Water Conservation District (MWCD). MWCD will be required to screen their summer discharge from Dwinnell Reservoir into the Shasta River, to prevent the release of non-native fish from Lake Shastina into the Shasta River. In addition, MWCD will be required to prepare a feasibility study to investigate the design and implementation of fish screens on MWCD's Parks Creek and Little Shasta River diversions. The feasibility study will evaluate the water budget for intake and delivery operations, proposed water management measures to improve coho habitat downstream, and investigate the possibility of providing fish passage at Dwinnell Dam.

ITP Additional Avoidance and Minimization Obligations: Stranding. The ITP includes additional avoidance and minimization obligations under Article XIII.E.2.a.iii; Article XVII.C, and Article XVIII to address any stranding of coho salmon that might occur. The ITP defines

[10] Bioengineered bank stabilization structures use a combination of living plants, such as willow or other riparian trees, shrubs, and inert materials such as gravel and rip-rap. Bioengineered structures tend to provide more aquatic and riparian habitat attributes than conventional bank stabilization structures.

"stranding" as a situation in which coho salmon are in a location with poor aquatic habitat conditions, due to a reduction in flow, from which they cannot escape.

ITP Article XIII.E.2.a.iii requires SVRCD to develop and implement a Contingency Plan for Dry and Critically-Dry Water Years (Contingency Plan). Among other elements, the Contingency Plan will include a strategy to avoid stranding and a Diversion Ramp-up Management Plan (Management Plan). The purpose of the Management Plan is to coordinate and monitor irrigation so as to minimize rapid reductions in instream flows and the possible stranding of coho salmon.

ITP Article XVII.C requires DWR to meet with CDFG on a weekly basis during the diversion season and inform CDFG of any points of diversion in the watermastered areas where stranding is probable. CDFG will then work with SVRCD and sub-permittees to correct or avoid such stranding by some means other than reducing or ceasing the diversion and/or changing the timing or manner of the diversion in accordance with ITP Article XVIII (see below). Under ITP Article XVII.E., ~~A~~as a last resort, CDFG will inform the sub-permittee of the required measures to be implemented to reduce stranding. CDFG will ~~instruct~~ work with DWR to implement such ~~to reduce or cease the diversion and/or change the timing or manner of the diversion and take any other~~ measures within DWR's control ~~that CDFG determines are necessary to correct or avoid stranding, which DWR will implement immediately~~.

Under ITP Article XVIII, if CDFG determines that a diversion covered by a sub-permit is causing or will cause the stranding of coho salmon, CDFG will take the steps in the order below to avoid or minimize such stranding:

a) CDFG will determine whether or not the sub-permittee is in compliance with the sub-permit.

b) If the sub-permittee is not in compliance with the sub-permit, CDFG will contact the sub-permittee to determine why they are not in compliance and take appropriate action.

c) In either case, CDFG will consult with SVRCD and the sub-permittee to determine whether there are any measures SVRCD and/or sub-permittee can take to avoid or minimize stranding.

d) If reducing or ceasing the diversion and/or changing the timing or manner of the diversion will avoid or minimize stranding, and that is determined by CDFG to be the only available measure to avoid or minimize stranding, CDFG will work with SVRCD and the sub-permittee and, if applicable, DWR to take such action.

2.3.3 Mitigation Obligations of SVRCD: Flow Enhancement, Habitat Improvement, and Fish Passage

The ITP contains mitigation obligations that SVRCD will be required to meet to compensate for take of coho salmon that may occur incidental to a Covered Activity, whether caused by SVRCD or an Agricultural Operator to whom CDFG has issued a sub-permit. The mitigation obligations also require the involvement of sub-permittees, and in some instances other entities. The mitigation obligations are summarized below.

Flow Enhancement Mitigation Obligations

To mitigate potential take of coho salmon from the diversion of water in streams where coho salmon occur, SVRCD will implement the programs described below to provide for or support the instream needs of coho salmon at specific life-cycle stages.

Flow Enhancement Mitigation 1: Development and Implementation of the Shasta River Water Trust. Immediately upon the effective date of the ITP, SVRCD will begin developing a locally-based Shasta River Water Trust (Water Trust). The Water Trust will lease or purchase water from sub-permittees for instream beneficial use in accordance with guidelines prepared by SVRCD and approved by CDFG.

Flow Enhancement Mitigation 2: Improve Baseline Instream Flows Via Water Efficiency Improvements. The ITP will require SVRCD to improve baseline instream flows and/or water quality within critical reaches of the Shasta River and its tributaries and at critical life stages of coho salmon by installing water efficiency improvement projects and/or water management improvement projects on sub-permittees' properties or by changing or adding points of diversion to keep flows instream to points of use. Within one year of the effective date of the ITP, SVRCD will provide to CDFG, for its review and approval, a list of priority stream reaches for flow enhancement and/or water quality based on coho salmon life stage need, and will work with sub-permittees to address their overall irrigation efficiency and delivery considerations to accomplish aquatic habitat improvement. Generally, a California Water Code, § 1707 water transfer/dedication for instream benefits will be pursued where the net water savings are consistent with the State Water Resources Control Board policy.[11]

Flow Enhancement Mitigation 3: Develop and implement a Contingency Plan for Dry and Critically-Dry Water Years. Under the ITP, SVRCD would be required to submit a detailed Contingency Plan for Dry and Critically-Dry Water Years to CDFG for review and approval within three years of the effective date of the ITP. The Contingency Plan will identify the criteria to determine when a year is dry or critically-dry and describe a process by which SVRCD will coordinate with sub-permittees to augment stream flows. SVRCD will determine whether the water year will be dry or critically-dry by April 1, based on the criteria in the Contingency Plan. Measures contained within the Contingency Plan will incorporate the best available information on both surface and groundwater (where relevant) to minimize the likelihood that critical coldwater flows to the Shasta River and its tributaries are impaired. In addition, the Contingency Plan will identify data gaps and will include a strategy to avoid stranding.

One component of the Contingency Plan shall be the Diversion Ramp-Up Management Plan (Management Plan). During the irrigation season, significant changes in stream flow occur when agricultural water users cease or begin diverting water at the same time. A rapid decrease in flow can result in the stranding of fish in shallow pools and side channels below diversions, as well as

[11] California Water Code, § 1707 authorizes the State Water Resources Control Board to approve a petition to change an existing water right specifically for the purpose of preserving or enhancing wetlands, fish and wildlife, or recreation in or on the water. Such a change requires that the original use under the existing right cease or be reduced in the amount of the change.

a loss of critical rearing habitat. To address this problem, SVRCD, in consultation with CDFG and DWR, will be required to develop and implement a Management Plan to coordinate and monitor irrigation so as to minimize rapid reductions in instream flows and the possible stranding of coho salmon. SVRCD will submit the Management Plan to CDFG for its review and approval within three ~~one~~ years from the effective date of the ITP. SVRCD and the sub-permittees would begin implementing the Management Plan immediately upon CDFG's approval.

Flow Enhancement Mitigation 4: Install Alternative Stock Water Systems. Water is diverted for stock watering purposes and/or off-stream storage in October, November, and December each year after diversions for irrigation cease. In those years when the seasonal rains arrive late, such stock water diversions can limit the ability of returning adult coho salmon to reach spawning areas. To address that problem, SVRCD will identify priority areas where additional instream flows in the fall will contribute significantly to adult coho migration. A priority plan will be established by SVRCD that identifies where alternative stock watering systems may be beneficial for coho salmon and the priority list will be submitted to CDFG for its review and approval within one year from the effective date of the ITP.

During the term of the ITP, SVRCD will install an average of two alternative stock watering systems per year. The watering systems will use groundwater, off stream storage, or other appropriate methods rather than surface water. Higher stream flows will facilitate adult coho salmon access to spawning areas. For purposes of the ITP, an alternative stock water system means the wells, pumps, water lines, watering troughs, and other physical components used to provide groundwater to livestock.[12] Sub-permittees will be reimbursed from the Water Trust or equivalent means if funds are available for the cost per day of running the alternative stock water system and no sub-permittee will be required to forego exercising a right to divert for stock water purposes for more than four consecutive years.

Habitat Improvement Mitigation Obligations

The ITP would obligate SVRCD to undertake various habitat improvement projects to mitigate the impacts to coho salmon habitat caused by the Covered Activities.

Habitat Improvement Mitigation 1: Spawning Gravel Enhancement. Under the ITP, SVRCD will work with CDFG to develop and implement a Spawning Gravel Enhancement Plan (Gravel Enhancement Plan). The Gravel Enhancement Plan will identify areas where gravel for coho salmon spawning could be placed effectively and where gravel can be recruited, and prioritize immediately-needed gravel enhancement projects throughout the Program Area. SVRCD will submit the Gravel Enhancement Plan to CDFG for review and approval within two years from the effective date of the ITP.

SVRCD will design and install constrictors and/or other spawning area enhancement structures at a total of five priority stream reaches where spawning gravels are not plentiful, if deemed

[12] A comment on the Notice of Preparation stated, in the context of Off-stream Stock Water Development, that setting a target date of November 15 for stockwater diversions ignores critical Chinoook salmon instream flow needs. However, the ITP does not set a target cutoff date of November 15, but rather sets the beginning of the stockwater diversion season as the end of the irrigation season, as specified in the Shasta River Decree.

necessary in the Gravel Enhancement Plan. SVRCD will complete all gravel enhancement projects prior to the expiration of the ITP.

Habitat Improvement Mitigation 2: Instream Habitat Improvement Structures. SVRCD, in consultation with CDFG and sub-permittees, will identify locations in the Program Area where instream habitat improvement structures would benefit coho salmon, and list those locations in order of priority. SVRCD will submit the priority list to CDFG for its review and approval within one year from the effective date of the ITP. SVRCD will install at least 20 instream habitat improvement structures at sites identified on the priority list.

Habitat Improvement Mitigation 3: Riparian Planting. The ITP will require SVRCD and the sub-permittees to prepare and submit to CDFG for its review and approval a priority list of areas currently being used by coho salmon for spawning and rearing. The list must be submitted within two years of the effective date of the ITP. Before the ITP expires, SVRCD will plant riparian habitat along eight linear miles of steambank (measured on one side of the river) in the areas included on the priority list to improve instream cover and shade canopy, improve channel stabilization, and trap or hold sediment. Three miles of streambank will be planted within five years of the effective date of the ITP.

Barrier Removal and Fish Passage Mitigation Obligations

Significant barriers exist in the Shasta River and its tributaries that prevent fish passage or limit access to historic spawning and rearing areas. Some fish migration barriers have been in existence for many years. Because removal of fish passage barriers can have short-term negative effects, possibly including take of coho salmon, these mitigation measures are also a Covered Activity (see ITP and MLTC Covered Activity 9 above). The ITP requires SVRCD to continue to work toward eliminating the fish passage barriers identified below.

Barrier Removal and Fish Passage Mitigation Obligation 1: Araujo Dam Demobilization and Water Quality Project. SVRCD shall continue to work with CDFG on the permanent removal of Araujo Dam, a seasonally-used flashboard dam built in 1856 that five landowners use to irrigate agricultural lands.[13]

Barrier Removal and Fish Passage Mitigation Obligations 2: Shasta Water Association's Dam Demobilization and Water Quality Improvement Project. SVRCD shall continue to work with CDFG on the removal of a flashboard dam built in 1912 that approximately 130 individual landowners use.[14]

Barrier Removal and Fish Passage Mitigation Obligations 3: Grenada Irrigation District Fish Barrier Removal Project. SVRCD will develop final engineered drawings for removal of the fish passage barrier at the Grenada Irrigation District diversion and construct the new diversion structure design within eight years of the execution date of the ITP.

[13] Work on the instream portion of the dam removal was completed in October 2007.
[14] Work on the instream portion of the dam removal was completed in October 2008.

2.3.4 Monitoring and Adaptive Management Program

The proposed ITP requires SVRCD to establish a monitoring program to track the implementation of the mitigation measures for which it is responsible, and to determine the effectiveness of those measures in improving conditions for coho salmon (Monitoring Program). In addition, SVRCD is available to assist the sub-permittees in fulfilling monitoring responsibilities related to the diversion of water and livestock or vehicle crossings. SVRCD will fund all monitoring activities it is responsible for performing. The Monitoring Program is summarized below and is more fully described in ITP Attachment 3. ~~the to determine whether the sub-permittees are fulfilling all sub-permit terms and conditions, the implementation of avoidance, minimization, and mitigation measures identified in the ITP and any sub-permit, and the effectiveness of those measures in improving conditions for coho salmon.~~

~~Under the terms of the ITP, SVRCD will be responsible for instituting a comprehensive monitoring program. Under this Program, SVRCD will be responsible for confirming and monitoring the implementation of the mitigation measures for which they are responsible. They will also be responsible for monitoring to determine whether the sub-permittee is fulfilling the terms and conditions of their sub-permits. The monitoring program will include a means to: 1) confirm and monitor the implementation of the minimization and avoidance measures for which the sub-permittees are responsible; and 2) identify sub-permittees who are not fulfilling the terms and conditions of their sub-permits. SVRCD will be required to notify CDFG immediately of sub-permittees who are not fulfilling a term or condition of their sub-permit.~~

~~SVRCD's monitoring program will also be used to determine the effectiveness of the avoidance, minimization, and mitigation measures identified in the ITP and sub-permits, and the extent to which the objectives of those measures are being or have been met. The results of the effectiveness monitoring will be used as a basis for an adaptive management program to refine future avoidance, minimization, and mitigation measures.~~

1. SVRCD shall be responsible for determining if it is fulfilling the terms and conditions of this Permit by instituting a comprehensive monitoring program. The program shall include a means to confirm and monitor the implementation of the mitigation measures for which it is responsible.

2. The sub-permittee shall be responsible for monitoring the terms and condition of their sub-permit by completing the appropriate implementation and effectiveness monitoring checklists for their Covered Activities and submitting them to the Department. SVRCD is available to assist the sub-permittee in completing the water diversion and livestock and vehicle crossings checklists.

3. The SVRCD shall inspect the screen, headgate, measuring device, diversion structure and livestock and vehicle crossings annually and is available to assist the sub-permittee in filling out the qualitative effectiveness monitoring checklists for those Covered Activities.

4 If during any field review of a sub-permittees water diversion facilities and/or livestock or vehicle crossing, the SVRCD identifies a sub-permittee who may not or has not implemented the terms and conditions of their sub-permits the SVRCD shall inform the sub-permittee and work with the sub-permittee to develop a strategy for implementing the terms and conditions of the sub-permit.

5. At the discretion of either the SVRCD or the sub-permittee, the Department will be notified in order to assist in the development of an implementation strategy.

6. If the SVRCD and the sub-permittee cannot agree upon an acceptable strategy for implementation of the terms and conditions of the sub-permit, or the implementation of a term or condition of this Permit which requires the SVRCD to implement certain mitigation measures on the property of sub-permittees, the Department shall be notified.

7. SVRCD shall summarize the results of its monitoring activities in each of its Annual Reports (described below). Analysis of the past year's monitoring activities and the monitoring data shall be provided to the Department at that time.

8. After revocation, relinquishment, expiration, or termination of the Permit, SVRCD shall deliver a Final Report (described below) to the Department analyzing all of the avoidance, minimization, and mitigation measures implemented pursuant to this Permit, including an evaluation of their effectiveness.

9. SVRCD's obligations under this Permit shall not end until the Final Report has been deemed complete by the Department (Section XVI.C), regardless of when the Permit expires, or is revoked, relinquished, or terminated.

10. SVRCD shall conduct photo monitoring to document the installation, operation, maintenance, and effectiveness of all avoidance, minimization, and mitigation activities (individually, "project") for which it is responsible under this Permit.

    Photo monitoring shall be used to document current conditions, implementation and effectiveness by:

    - documenting pre- and post-site conditions;
    - identifying key steps taken during and after the completion of a project;
    - determining whether a project was correctly implemented pursuant to SVRCD and Department guidelines; and
    - document ongoing maintenance of the project.

    Sequential photographs shall be taken over time in order to show changes in site conditions. At a minimum, photographs shall be taken at three different times: before project implementation, directly after project implementation, and again at a later date appropriate to the particular project.

11. SVRCD shall conduct monitoring activities prior to and immediately after project implementation for those projects for which it is responsible. Data collection shall include pre-project implementation checklists, implementation checklists and photo monitoring.

12. SVRCD and Department project evaluators shall have access to photographs and project files to take with them on site visits.

13. SVRCD shall conduct qualitative effectiveness monitoring after project implementation, and annually thereafter, for all mitigation measures for which it is responsible pursuant to this Permit by filling out the qualitative effectiveness monitoring checklist and conducting photo monitoring for those particular project types.

14. <u>SVRCD shall identify at least one specific objective for each project installed pursuant to this Permit. The objective shall be documented in project files by SVRCD and shall be reported to the Department in the Annual Report.</u>

15. <u>SVRCD shall conduct quantitative effectiveness monitoring of 10% of all instream measures implemented. For purposes of quantitative effectiveness monitoring instream measures shall include: spawning gravel enhancement (if determined necessary), instream habitat structures, livestock and vehicle crossings, fish passage improvements, and instream flow.</u>

2.3.5 SVRCD Reporting Requirements

The ITP includes several reporting requirements that apply to SVRCD. This includes an Annual Report for each year that the ITP is in effect, a Five-Year Report, and a Final Report.

Each Annual Report will include the following information: 1) a general description of the status of the Program, including a description of all avoidance, minimization, and mitigation measures that were implemented during the previous year; 2) a copy of an implementation database with notes showing the current implementation status of each avoidance, minimization, and mitigation measure; 3) the results of all monitoring conducted to determine whether the terms and conditions of the ITP are being meet and their effectiveness; and 4) all monitoring data.

Five years after the effective date of the ITP, SVRCD will be required to conduct a comprehensive review of the Program and submit its findings in the form of a Five-Year Report to CDFG. As part of its review, SVRCD will evaluate coho salmon recovery task implementation and community participation. The Five-Year Report will include an analysis of the Program beginning on the effective date of the ITP, as well as the activities that have been implemented since that time. The Five-Year Report will include recommended adaptive management actions to improve operations.

No later than six months after the ITP expires (or is relinquished, revoked, or terminated), SVRCD will be required to submit a Final Report to CDFG. The Final Report will include: 1) a copy of the implementation database with notes showing when each avoidance, minimization, and mitigation measure was implemented; 2) all available information about the incidental take of coho salmon the ITP covers; 3) information about the impacts the Covered Activities have had on coho salmon, notwithstanding the implementation of the avoidance, minimization, and mitigation measures; 4) the beginning and ending dates of all construction activities the ITP ~~or any sub-permit~~ covers; 5) an assessment of the effectiveness of the ITP's ~~and sub-permits'~~ terms and conditions to avoid, minimize, and mitigate impacts on coho salmon; 6) recommendations on how those terms and conditions might be changed to more effectively avoid, minimize, and mitigate such impacts in the future; and 7) any other pertinent information.

2.3.6 Department of Water Resources Obligations under Sub-Permit

The ITP includes special provisions for DWR, under the assumption that the current watermaster responsible for administering and enforcing the Shasta River Decree, who is a DWR employee, will be a sub-permittee.[15] As such, DWR would be responsible for complying with the following terms and conditions:

1. To assist with the implementation and compliance monitoring of the ITP and sub-permits, DWR will provide to CDFG water use data for all diversions with watermaster service in the Program Area, including, but not limited to, the name of the diverter, the location of the diversion, the quantity of water that may lawfully be diverted and used, the dates the watermaster visits each diversion, and the estimated or measured quantity of water diverted by the watermaster on each visit. DWR will provide the data in the form of a database on a monthly basis from April to November each year by the second week of each month following data collection.

2. DWR will implement the Shasta River Decree pursuant to provisions of the California Water Code in the adjudicated portions of the Shasta River watershed, unless CDFG instructs DWR otherwise as described below. As part of that responsibility, the DWR watermaster will verify that each sub-permittee is in compliance with their respective water right(s). The watermaster will create a database of all diversions visited on a monthly basis to verify compliance with water rights and will provide these data monthly to CDFG.

3. DWR will meet with CDFG in person or by telephone on a weekly basis during the diversion season in order to inform CDFG of any points of diversion in the watermastered areas where stranding is probable. CDFG will make a determination regarding whether or not any diversion is causing or will cause the stranding of coho salmon. For the purpose of this ITP, "stranding" is defined as a situation in which coho salmon are in a location with poor aquatic habitat conditions, due to a reduction in flow, from which they cannot escape. ~~CDFG will instruct DWR to reduce or cease the diversion and/or change the timing or manner of the diversion and take any other measures within DWR's control that CDFG determines are necessary to correct or avoid stranding and DWR will implement those measures immediately. However, before instructing DWR as described above, CDFG will make every effort to work with SVRCD and the sub-permittee to correct or avoid such take by some~~

[15] Any subsequent watermaster who is not a DWR employee will be required to obtain a sub-permit.

~~means other than reducing or ceasing the diversion and/or changing the timing or manner of the diversion.~~

4. CDFG will make every effort to work with SVRCD and sub-permittee to correct or avoid such take by some means other than reducing or ceasing the diversion and/or changing the timing or manner of the diversion.

5. If CDFG determines that reducing or ceasing the diversion and/or changing the timing or manner of the diversion will avoid or minimize stranding, and that is the only available measure to avoid or minimize stranding, CDFG will inform the sub-permittee of the required measures to be implemented to reduce stranding. CDFG will work with DWR to implement such measures within DWR's control.

As mentioned in footnote 2 above and explained in Chapter 4, DWR's watermaster responsibilities may be transferred to a newly established watermaster district. If that were to occur, CDFG would terminate DWR's sub-permit, in which case all of DWR's responsibilities under the sub-permit would also terminate. However, the new watermaster would be required to comply with CESA by obtaining authorization from CDFG for incidental take of coho salmon. This authorization would likely be obtained through a sub-permit issued by CDFG under the Program similar to DWR's or through an ITP outside the Program.

References

Shasta Valley Resource Conservation District (SVRCD), *Incidental Take Permit Application for Coho Salmon*, submitted to California Department of Fish and Game, March 29, 2005.

State of California, Department of Fish and Game (CDFG), *Recovery Strategy for California Coho Salmon*, report to the Fish and Game Commission, February 4, 2004.

State of California, Department of Public Works, Division of Water Resources, Shasta River Adjudication Proceeding: Judgment and Decree, December 1932.

CHAPTER 3

Environmental Setting, Impacts, and Mitigation Measures

This Chapter includes seven sub-chapters that evaluate the potential environmental impacts of the Program as they relate to: 1) Land Use and Agriculture (Chapter 3.1); 2) Geomorphology, Hydrology, and Water Quality (Chapter 3.2); 3) Biological Resources: Fisheries and Aquatic Habitat (Chapter 3.3); 4) Biological Resources: Botany, Wildlife, and Wetlands (Chapter 3.4); 5) Cultural Resources (Chapter 3.5); 6) Hazards and Hazardous Materials (Chapter 3.6); and 7) Public Utilities, Service Systems, and Energy (Chapter 3.7). As discussed in Chapter 1, the California Department of Fish and Game (CDFG) in its Initial Study determined that the effects of the Shasta River Watershed-wide Permitting Program (Program) on the following resources would be less than significant, and therefore are not analyzed further in this Draft Environmental Impact Report (EIR): 1) aesthetics; 2) air quality; 3) geology, soils, and seismicity; 4) mineral resources; 5) noise; 6) population and housing; 7) public services; 8) recreation; and 9) transportation and traffic.

Each sub-chapter includes a focused discussion of the environmental setting pertinent to the resource the sub-chapter addresses (e.g., Land Use and Agriculture); a description of the criteria used to determine whether a particular impact could be significant; the environmental impacts the Covered Activities could have on the resource; a determination of whether they will be significant based on the significance criteria; and where the impact is identified as potentially significant, a description of feasible mitigation measure(s) that will reduce the impact to less than significant. The mitigation measures in the subsequent sub-chapters are either part of the Program, and therefore included in the Master List of Terms and Conditions (MLTC) and Incidental Take Permit (ITP), or are identified in the Draft EIR. Mitigation measures identified in this Draft EIR will be incorporated into the Program by adding them to the MLTC and/or ITP, unless otherwise indicated. The social and economic effects of the Program are discussed in the context of its potential to induce changes in land use.

The environmental impacts identified in the sub-chapters are numbered sequentially beginning with the sub-chapter number. For example, the first impact in Chapter 3.3 (Biological Resources: Fisheries and Aquatic Habitat) is impact number 3.3-1, the second impact is 3.3-2, and so forth. Each mitigation measure is numbered to correspond with the impact it addresses. Hence, the mitigation measures to address Impacts 3.3-1 and 3.3-2 would be Mitigation Measures 3.3-1 and 3.3-2, respectively.

Environmental Setting

In order to evaluate the potential environmental impacts of approving and implementing the Program, this Chapter describes the physical environmental conditions in the Program Area as they existed at the time CDFG deemed Shasta Valley Resource Conservation District's (SVRCD's) ITP application complete on April 28, 2005. It is against this baseline which the potential environmental impacts of approving and implementing the Program were measured. This approach is consistent with CDFG's California Endangered Species Act (CESA) implementing regulations which is a certified regulatory program under California Environmental Quality Act (CEQA) (CEQA *Guidelines*, § 15251, subd. (o); California Code of Regulations, title 14, § 783.5.) Under those regulations, CDFG considers an ITP application it has deemed complete to be the project description for purposes of its required lead agency review under CEQA. This approach is also consistent with CEQA *Guidelines*, § 15125, which acknowledges the importance of identifying a baseline that best ensures meaningful environmental review. Important to the evaluation described above is an understanding of the Program's regional setting. The regional setting is described below.

Some of the activities the Program covers are historic, ongoing activities that over time have caused and will continue to cause environmental impacts within the Program Area, including, for example, take of coho salmon (*Oncorhynchus kisutch*). These activities and their impacts are part of the baseline and are expected to continue regardless of the Program; that is, they will not be caused by the Program. Chapters 3.1–3.7 describe these ongoing, historic activities and their impacts as part of their discussion on the existing environmental setting pertinent to the resource they address.

As CEQA requires, this Draft EIR analyzes the physical, project-related changes to the baseline the Program could cause, and for those changes that are determined to be significant, identifies feasible mitigation measures to reduce those impacts to less than significant. As mentioned above, such changes would not include the environmental impacts caused by historic, ongoing activities that are part of the baseline. As a result, under CEQA, mitigation for those activities will not be required. Nonetheless, the Program is expected to reduce the environmental impacts caused by historic, ongoing activities, and thereby improve existing environmental conditions in the Program Area compared to the baseline. The Program is expected to improve environmental conditions because under the Program, the Streambed Alteration Agreements (SAAs) and sub-permits CDFG will be issuing for these historic, ongoing activities will require Agricultural Operators to incorporate into those activities measures to protect fish and wildlife resources and to avoid, minimize, and fully mitigate any take of coho salmon that might occur incidental to those activities.

In summary, mitigation for these ongoing historic baseline activities will not be required pursuant to CEQA because the Program will not result in an increase in environmental impacts from these activities; rather, the mitigation for impacts to fish and wildlife resources from these activities will be identified in the SAA, ITP and/or sub-permit participants must obtain as a condition of participating in the Program.

Regional Setting

The Program Area analyzed in this Draft EIR is the Shasta River watershed, including the Shasta River and its tributaries, in Siskiyou County, as shown in **Figure 2-1** in Chapter 2 (Program Area). The locations of the site-specific mitigation projects specified in the ITP are shown in **Figure 2-2**.

The Shasta River is one of four main tributaries to the Klamath River in California, the others being the Trinity, Salmon, and Scott Rivers. The Klamath River drains a portion of the Cascade Province to the east and a portion of the Klamath Province to the west. The Shasta River flows roughly northwest, from its tributary streams on the northern flank of Mount Shasta and Mount Eddy, through the Shasta Valley, then through a bedrock canyon to its confluence with the Klamath River. Major tributaries to the Shasta River include Parks Creek, Big Springs Creek, Little Shasta River, and Yreka Creek.

The entire watershed, which covers about 792 square miles, is within Siskiyou County. There are several towns and cities in the watershed, including Weed, Yreka, Gazelle, Edgewood, Montague, and Grenada. Dwinnell Dam and Lake Shastina are major features located in the Shasta Valley. Interstate 5 runs through the Shasta Valley and is the main north-south transportation corridor. State Routes 3, 263, and 99, and US 97 also run through the watershed.

Most of the lands where the Covered Activities have been occurring or will occur are in the lowland, agricultural areas of the Shasta Valley. Field crops, including alfalfa and other hay crops, and stock-raising are the principal agricultural pursuits. Water rights in the Shasta River watershed are subject to the Shasta River Decree. The Department of Water Resources (DWR) provides watermastering services.

Additional information on the environmental setting, particularly regarding coho salmon habitat, is included in Chapter 3.2, Geomorphology, Hydrology, and Water Quality, and Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat. The Shasta River watershed's geology is described in the Geology section of the Initial Study (Appendix D).

Physical Changes Likely to Result from Program

The environmental impact analysis in the following chapters relies on several assumptions regarding the likely physical effects of Program implementation, relative to existing conditions. These include the following:

- Program implementation will result in less agricultural water being diverted, which in turn will result in increased streamflows in tributary streams and the mainstem Shasta River, particularly during summer and fall low-flow periods and during drought years;

- Requirements for bypass flows, fish passage, and fish screens at diversions will reduce mortality of coho salmon and other fish species at and downstream of diversions;

- Remediation of artificial barriers to fish passage, some of which have been in place for many years, will enable coho salmon and other anadromous fish to reoccupy historic spawning and rearing habitat that is currently inaccessible to them;

- Conditions placed on Covered Activities will reduce pollutant loads to streams, including heat gain, sediment, nutrients, and hazardous substances;

- Design requirements for diversion structures and other instream structures will improve geomorphic function of streams, including sediment transport;

- Conditions placed on grazing and vehicle access within riparian areas and at stream crossings, and required riparian fencing, revegetation, and stream restoration will result in improved riparian conditions and stream habitat;

- The required education program (ITP General Condition a) will likely result in a greater understanding among Agricultural Operators of the habitat needs and vulnerabilities of coho salmon and other aquatic species, which may encourage them to take additional measures not specified in the Program to protect and enhance these resources;[1]

- Conditions placed on ground-disturbing activities will reduce the potential for damage to or destruction of cultural and historical resources;

- Monitoring and reporting requirements, including the SVRCD ITP Monitoring and Adaptive Management Plan (ITP Attachment 3), will provide an opportunity to improve Program effectiveness over time.

[1] Such additional measures are considered speculative and not used as a basis for the environmental impact analysis in this Draft EIR.

CHAPTER 3.1
Land Use and Agriculture

This Chapter discusses the existing environment of the Shasta River watershed (**Figure 3.1-1**) (Program Area) with regards to land use and agriculture; identifies potential impacts the Shasta River Watershed-wide Permitting Program (Program) could have on those resources; and identifies mitigation measures for those impacts determined to be potentially significant. This evaluation is based on field reconnaissance, review of local land use information, adopted land use plans and policies, agricultural datasets from the Department of Conservation (DOC) and the Department of Water Resources (DWR), aerial photographs, and other sources.

3.1.1 Setting

Regional Agricultural Setting

Siskiyou County Socio-demographics and Economy

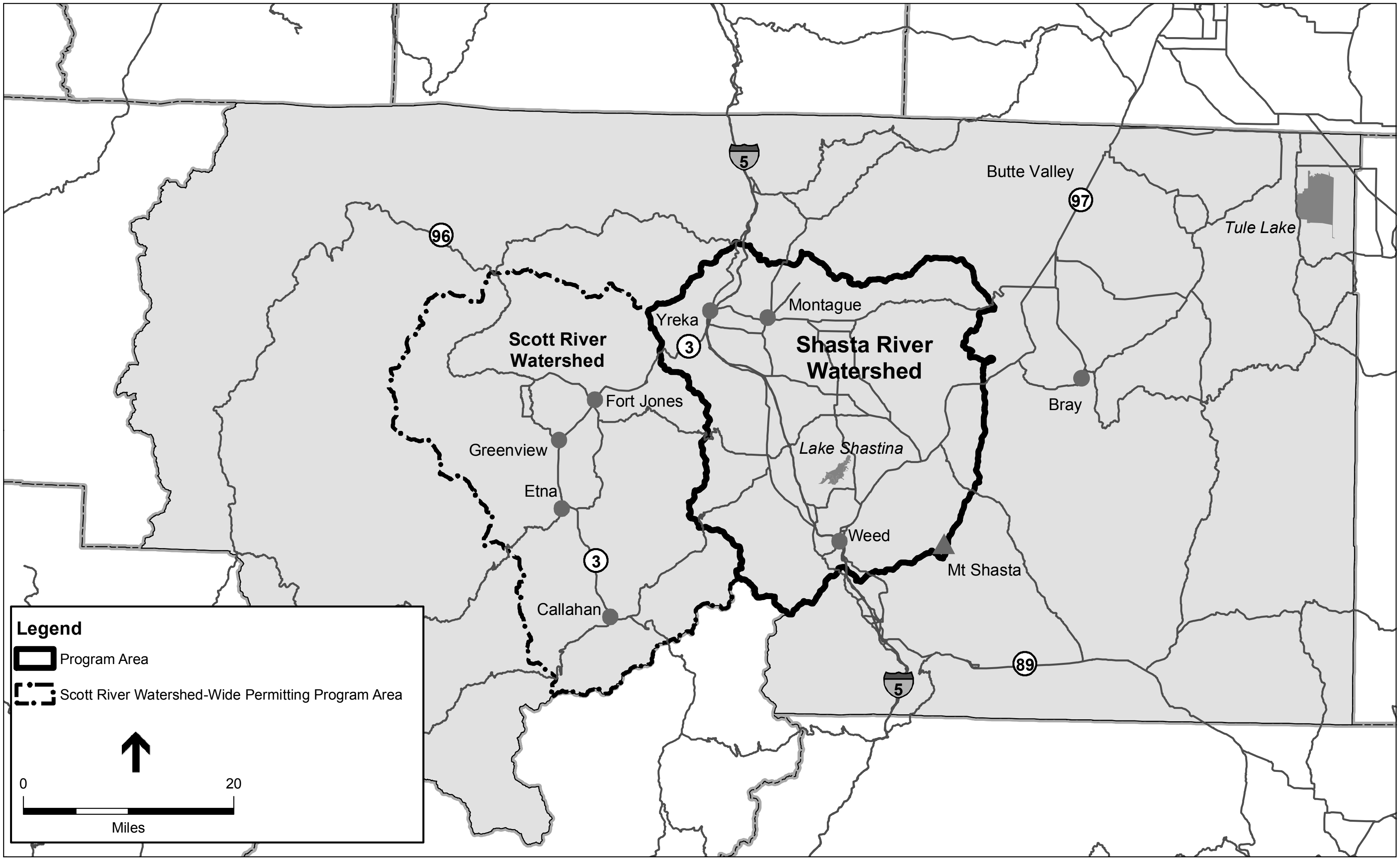
Population

Siskiyou County's total population in 2006 was estimated to be approximately 46,100. Over the last two decades, there has been little change to the County's population with a relatively low population growth rate of 0.6 percent per year on average (EDD, 2006). In recent years, the rate of population growth has declined.[1] Between 2000 and 2005, the County annual population growth has been just over 0.4 percent per year – a rate about a third of California's statewide average annual growth rate (U.S. Census, 2006).

Projections for Siskiyou County's population differ. The California Department of Finance estimates that the County's total population will remain nearly unchanged with 45,900 residents expected in 2020 (EDD, 2006). The California Department of Transportation's (Caltrans) 2006-2030 Economic Forecast, however, projects that there will be 50,175 Siskiyou County residents in 2020 (Caltrans, 2006).[2]

1 Population growth is defined as the increase in the number of people who inhabit an area or region. Population growth rate is defined as the rate at which the population is increasing or decreasing in a given year expressed as a percentage of the base population size. It takes into consideration all the components of population growth, namely births, deaths, and migration.

2 As a transportation planning agency, Caltrans' analysis and projections might be expected to be more aggressive in anticipating the region's future growth. Its projections appear to differ most in their future net migration changes and in new housing units for the County.



SOURCE: ESRI, 2006; ESA 2007

Shasta River Watershed-Wide Permitting Program . 206063

Figure 3.1-1
Regional Setting - Siskiyou County

Demographic analysis suggests that past and current demographic shifts toward a “graying” of Siskiyou County’s population will continue.[3,4] Forty-two percent of the County’s population is over 50, with 17 percent of the population being composed of 50-59 year olds and another 25 percent being 60 and over. Since 1990, the number of adults between the ages of 50-59 increased seven percent, while adults ages 30-39 decreased eight percent, and children ages 0-9 decreased five percent.

Siskiyou County’s natural population growth rate[5] is expected to remain negative for the foreseeable future as its younger residents are expected to continue leaving the area due to the limited job opportunities available locally. This demographic shift tends to reduce the number of children born and raised in the area. In contrast, population growth for the area is expected from a continuing influx of older and higher income new residents attracted to the area’s rural lifestyle and comparatively inexpensive housing (Caltrans, 2006).

Employment

Siskiyou County’s total employment was estimated to be 13,600 in 2005.[6] The major employers within Siskiyou County are Government (28.5 percent), the Trade, Transportation and Utilities sector (18.2 percent), Leisure and Hospitality industry (13.4 percent), and Education and Health Services sectors (12.2 percent). The Agriculture sector provides approximate 5.1 percent of the employment within Siskiyou County (EDD, 2006). Since 1998, Siskiyou County’s agriculture and manufacturing industries have suffered substantial job losses countywide. The County’s agricultural sector lost 420 jobs (nearly a 35 percent decrease) while its manufacturing businesses lost 260 jobs representing a 27 percent employment decrease (SCEDC, 2006). Between 1998 and 2002, most of the job growth within Siskiyou County occurred within the sectors of: financial activities; trade, transportation and utilities; and the leisure and hospitality industry (SCEDC, 2006).

In 2005, Siskiyou County’s total available labor force was an estimated 18,810. The County’s unemployment rate has consistently been substantially higher than the state average. After a recent peak unemployment rate of 9.5 percent in 2003 (when the statewide unemployment rate for California was 6.8 percent), the unemployment rate had decreased slightly to 8.9 percent in 2005 (EDD, 2006).

The most recent economic projections of Siskiyou County’s future economy predict that its unemployment rate will remain significantly above the statewide rate and will average approximately 9.7 percent through 2030 (Caltrans, 2006).

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3 A “graying population” refers to a decline in the birth rate. With a decline in the number of young people within a community, this means that the proportion of older people in the population will rise (Poole and Wheelock, 2005).

4 The U.S. Census defines an “older” population as ages 55+. The U.S. Census defines an “elderly” population as ages 65+ (U.S. Census, 2007).

5 Natural population growth includes births and deaths, without taking into account net migration.

6 Industrial employment does not include self-employed residents.

Income

The average income level for Siskiyou County residents is below the state average income level. In 2005, the per capita income of Siskiyou County residents averaged $25,730. This was approximately 75 percent of the per capita income of all California residents which averaged $34,264 (Caltrans, 2006). Siskiyou County residents' median household income was proportionately lower than the comparable statewide median household income level. In 2004, estimated median household income for County residents was $32,531 – approximately 65 percent of the corresponding statewide median income level of $49,894. On a related note, the proportion of the County's population in poverty is estimated to have been 15.1 percent in 2004 which was greater than the state average poverty rate of 13.2 percent (US Census, 2007).

The County's low personal income and related high unemployment levels are key indicators of an economically depressed area. The U.S. Department of Commerce's Economic Development Administration has recognized Siskiyou County as being in Long Term Economic Distress (SRWC, 2005). Similarly, the State of California's Enterprise Zone Program also established a major section of the Shasta Valley as a State Enterprise Zone (**Figure 3.1-2**).[7] The State Enterprise Zone Program targets 39 economically distressed areas throughout California. This designation helps provide and attract state and local incentives which both encourage business investments and promote new job creation (SCEDC, 2007).

Siskiyou County Agricultural Sector

Agricultural Sector Revenues

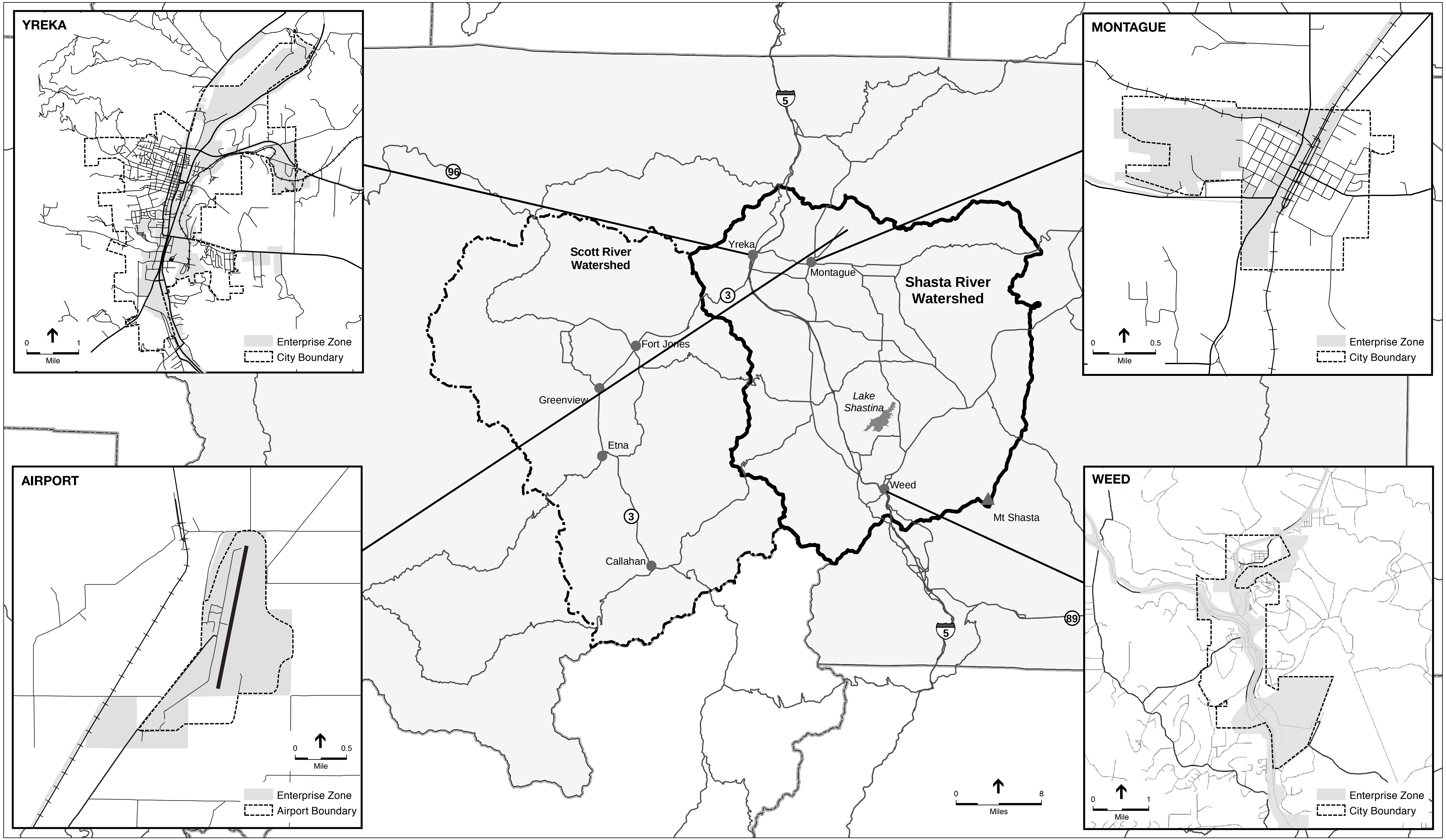
Siskiyou County depends on alfalfa hay production as one of its staple agricultural commodities, as well as Irish potatoes, wheat, nursery plants and livestock (CED, 2006). Various types of seed are sold for the highest prices per ton in the County, while hay and cattle bring in some of the highest total value (CED, 2006).

Field crop farming (consisting primarily of forage crops including pasture land, alfalfa, and other hays or grains for livestock feed) is the primary farming activity in Siskiyou County. In 2006, it yielded approximately $72.55 million worth of agricultural production. Combined with related livestock production activities, these two farming categories together generated approximately $95.15 million, which accounts for 56 percent of Siskiyou County's agricultural revenues.

Table 3.1-1 shows Siskiyou County's estimated value of agricultural production in 2005 and 2006 by major crop types (Siskiyou County Department of Agriculture, 2007). Excluding timber, agricultural activities generated $170 million last year (Siskiyou County, 2007).

Agricultural production affects many areas of a county's economy, including jobs, income and the economic input of related industries (CED, 2006). When agricultural production declines, so do purchases from local businesses (such as fuel, seed, and equipment). Recent analyses of the

[7] The Shasta Valley Enterprise Zone encompasses the City of Weed, the Siskiyou County Airport Industrial Park, as well as most of the commercial and industrial areas within the cities of Yreka and Montague.



SOURCE: ESA

Shasta River Watershed-Wide Permitting Program . D206063
Figure 3.1-2
Shasta Valley Enterprise Zone

TABLE 3.1-1
AGRICULTURAL PRODUCTION IN SISKIYOU COUNTY (2005 & 2006)

	2005 (in Millions [m] of Dollars)	Percentage	2006 (in Millions [m] of Dollars)	Percentage
Field Crops	$61.75 m	41.83%	$72.55 m	42.66%
Seed Crops	$1.55 m	1.05%	$1.13 m	0.66%
Livestock	$24.11 m	16.33%	$22.60 m	13.29%
Vegetable Crops	$11.84 m	8.02%	$11.92 m	7.01%
Milk and Wool	$4.42 m	2.99%	$2.82 m	1.66%
Nursery Crops	$40.46 m	27.41%	$54.83 m	32.24%
Organic	$3.50 m	2.37%	$4.20 m	2.47%
Timber	$47.57 m	~	$47.90 m	~
Total	$195.20 m	~	$217.95 m	~
Total (excluding Timber)	**$147.63 m**	**100%**	**$170.05 m**	**100%**

SOURCE: Siskiyou County Department of Agriculture (2006, 2007)

County's agricultural sector's future performance forecast a sustained decline for future farm crop values in real dollar terms (i.e., adjusting for inflation). A 14 percent decrease in real terms by 2015 is predicted for the County's future farm crop values (Caltrans, 2006).

Agricultural Employment in Siskiyou County

Employment is another key indicator of an industry sector's contribution to the greater economy. In 2006, total employment within Siskiyou County was estimated to be 22,306 of which the County's farm proprietors[8] employment was 779 (3.5%) and total farm employment[9] was 1,210 (5.4%) (BEA, 2008). Between 1998 and 2005 Siskiyou County's agricultural sector employment declined an estimated 35 percent (SCEDC, 2007).

Crop Production in Siskiyou County

While nursery and vegetable crops are another important component of the local agricultural sector, most of this production occurs primarily outside the Program Area. For example, nearly 2,000 acres of strawberry bedding plant production occurs in the Butte Valley and Tule Lake areas of the County, where the colder climate is well suited for growing young strawberry plants. This production, which accounts for most nursery crop sales, is shipped out of the County. Similarly, the majority of the County's vegetable crop acreage is potato farming that occurs primarily on leased lands in the Tule Lake Basin. These potato sales typically account for the

8 Farm self-employment is defined as the number of non-corporate farm operators, consisting of sole proprietors and partners. A farm is defined as an establishment that produces, or normally would be expected to produce, at least $1,000 worth of farm products—crops and livestock—in a typical year.

9 Farm employment is the number of workers engaged in the direct production of agricultural commodities, either livestock or crops; whether as a sole proprietor, partner, or hired laborer.

majority of Siskiyou County's vegetable crop revenues (Thornhill, 2007). Most of the potato production is for fresh market sales.

Siskiyou County's principal field crops, acreages, and yields are shown in **Table 3.1-2** below.[10] Alfalfa hay and irrigated pasture is farmed on nearly 130,000 acres County-wide, and together account for more than 75 percent of the County's field crop value. Nearly all of the alfalfa grown in Siskiyou County is grown under irrigation (Thornhill, 2007). Grain production within the County primarily occurs as part of the crop rotation for irrigated alfalfa which after six or seven years of harvesting is typically rotated out of production.

TABLE 3.1-2
FIELD CROP ACREAGES AND PRODUCTION VALUE IN SISKIYOU COUNTY (2006)

Field Crop Type	Harvested Acreage	Yield per Acre	Price / unit	Value
Alfalfa Hay	58,494 ac	5.5 / Ton	$135 / Ton	$43.43 m
Other Hay	12,928 ac	4.3 / Ton	$110 / Ton	$6.11 m
All Wheat	15,269 ac	2.45 / Ton	$130 / Ton	$5.231 m
Other Grains[a]	15,308 ac	1.0 – 2.3 / Ton	$110 - $120 / Ton	$8.69 m
Misc. Crops[b]	>1,156 ac	Na	Na	$1.79 m
Pasture (Irrigated)	75,000 ac	Na	$125 / ac	$9.38 m
Pasture (Non Irrigated)	145,000 ac	Na	$12 / ac	$1.74 m
Rangeland Pasture	445,000 ac	Na	$3 / ac	$1.34 m
Total – Field Crops	**767,055 ac**			**$72.55 m**

[a] Includes Oats, Barley and Rye production
[b] Includes Mint production and an unspecified acreage of stubble pasture, straw and silage.

SOURCE: Siskiyou County Department of Agriculture (2007)

Alfalfa and hay production within Siskiyou County is a primary agricultural activity both as a cash crop sold and transported out of the regions for livestock and for other animal feed. Siskiyou County alfalfa generally commands a premium price due to its typically higher nutrient content, which is a result of the local growing conditions. Although the amount of alfalfa and other feed crops that are sold out of the County is not known, local agricultural experts estimate that approximately 70 percent of the County's production is likely for cash sales (Thornhill, 2007).

Alfalfa and other animal feed crops are also important for local livestock farmers who rely on supplemental feed both for wintering of their herds and fattening of calves before they go to market. As Table 3.1-1 shows, livestock production within Siskiyou County generated revenues of approximately $22.6 million in 2006.

[10] Crop production acreages specific to the Program Area are discussed later in this chapter.

Livestock production within Siskiyou County is predominantly cow-calf operations. In 2006, there were approximately 62,000 head of cattle in the County. Of these, 1,800 were "dairy heifers on feed" and 1,000 were milk cows two years and over. Besides cattle livestock, there is sizable amount of horse ranching (13,000 head), and sheep rearing (4,600 head), but relatively little hog and pig raising (500 head) (Siskiyou County Department of Agriculture, 2007).

Ranching and Farming in Siskiyou County

In 2002, 796 farms were operating within Siskiyou County, which represented a 10 percent decrease from the 883 farms estimated to have been operating in 1997. During this same period, farmland acreage was estimated to have declined countywide by an estimated five percent from 639,819 acres to 610,388 in 2002 (USDA, 2002), and average farm size increased by six percent to 767 acres in 2002. However, due to the wide variance in the acreages of farms within the County, the median farm size reported for Siskiyou County falls within the U.S. Census category of 50 to 179 acres.

Approximately 60 of the farms reported that they were less than 10 acres in size while approximately 210 stated their farms were between 10 to 49 acres in size. Sixty-seven percent of these farms' principal operators reported that farming was their primary occupation. The average sales per farm in 2002 was approximately $137,000 per farm. The reported average net cash farm income was $29,747 while the average farm production expenses were $107,386 (USDA, 2002).

Recent cost studies for alfalfa farming and discussions with the U.C. Farm Advisor and Agricultural Inspector with the Siskiyou County Agriculture Commissioner's Office in Siskiyou County show the low profitability of existing local agricultural production (Orloff, 2007; Herman, 2007). The declining viability of small agricultural operations has also increasingly encouraged consolidation of many farmland properties into larger farm operations. In such cases, the farmsteads are often sold separately as residences with small acreages of adjoining farmland. Therefore, many of these properties might be better characterized as rural residential homes. The small farm acreages and incomes reported by the Census of Agriculture may also be reflective of landowners who lease out their farmlands to other local farmers (Orloff, 2007).

In the rural communities of Siskiyou County, many Agricultural Operators accept a very low rate of return on their equity investment in their properties and also take below market rate wages for their labor, management, and operating risk. Similarly, many own their land (either having inherited the land or having acquired it from relatives) and their land costs are minimal. Otherwise, the mortgage payments can be a major cost burden. Many Agricultural Operators may also rely on additional sources of income such as part-time work doing custom farming on other farm owners' lands or spousal income (Orloff, 2007).

Important Farmland in Siskiyou County

Important Farmland Maps produced by the DOC's Farmland Mapping and Monitoring Program (FMMP) quantify and characterize Siskiyou County's regional agricultural land base. Important Farmland Maps show categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-up Land, Other Land,

and Water. Prime Farmland and Farmland of Statewide Importance Map categories are based on qualifying soil types, as determined by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), as well as current land use. Map categories are defined by the FMMP as follows:

> **Prime Farmland:** Land which has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods.
>
> **Farmland of Statewide Importance:** Land that is similar to *Prime Farmland* but with minor shortcomings, such as greater slopes or less ability to hold and store moisture.
>
> **Unique Farmland:** Land of lesser quality soils used for the production of specific high economic value crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality or high yields of a specific crop when treated and managed according to current farming methods. It is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Examples of crops include oranges, olives, avocados, rice, grapes, and cut flowers.
>
> **Farmland of Local Importance:** Land of importance to the local agricultural economy, as determined by each county's board of supervisors and local advisory committees. Examples include dairies, dryland farming, aquaculture, and uncultivated areas with soils qualifying for *Prime Farmland* and *Farmland of Statewide Importance*.
>
> **Grazing Land:** Land on which the existing vegetation, whether grown naturally or through management, is suitable for grazing or browsing of livestock.

Table 3.1-3 shows the acres of agricultural land within Siskiyou County inventoried by DOC under its FMMP program in 2002 and 2004.

Between 2002 and 2004, "important farmland" decreased by 26,047 acres countywide, which is equivalent to approximately a three percent decrease in farmland resources. Between 1996 and 2004, the acreage of "important farmland" decreased by 48,383 acres, which is equivalent to approximately a six percent decrease. During this period (1996-2004), the greatest proportional loss of farmland occurred to the County's prime farmland resources, which decreased by 13.6 percent from the loss of 12,551 acres (DOC, 2006). While these past trends of agricultural land reductions indicate existing land use conversion pressure on the Siskiyou County's agricultural sector, much of the converted acreage in Table 3.1-3 was characterized as being primarily due to wildlife refuge systems additions and documentation of grazing leases.

Regional Real Estate Trends

Demand for "rural residential" properties continues to grow throughout the North Intermountain Region (i.e., Lassen, Modoc, Shasta, and Siskiyou Counties) as a result of the general appreciation in residential real estate market (both from strong urban housing markets and recent low interest rates) and increasing interest among many retirees in rural living opportunities.

TABLE 3.1-3
FARMLAND CONVERSION FROM 2002–2004 IN SISKIYOU COUNTY

	Total Acres Inventoried		2002–2004 Acreage Changes		
Land Use Category	**2002**	**2004**	**Acres Lost**	**Acres Gained**	**Net Change**
Prime Farmland	93,046	79,822	-13,351[a,b]	127	-13,224
Farmland of Statewide Importance	31,525	28,747	-2,796[a]	18	-2,778
Unique Farmland	34,691	33,714	-1,143	166	-977
Farmland of Local Importance[c]	626,964	620,164	-8,757[a]	1,957	-6,800
Important Farmland	786,226	762,447	-26,047	2,268	-23,779
Grazing Land	393,253	386,315	-13,123[a]	6,185[b]	-6,938
Agricultural Land	**1,179,479**	**1,148,762**	**-39,170**	**8,453**	**-30,717**

[a] Conversion to Other Land is characterized by farmland left idle for three or more update cycles, primarily due to additions made to the refuge systems in the Lower Klamath and Tule Lake Wildlife Refuge, Butte Valley, and Shasta Valley Wildlife Area.
[b] Conversion to Grazing Land was reported primarily due to land left idle for three or more update cycles and documentation of grazing leases within the Lower Klamath Wildlife Refuge, Butte Valley Wildlife Area and Butte Valley Grasslands.
[c] Overall acreage change in this category showed a significant jump between the years of 1994 and 1996, from 64,532 to 658,134 respectively when the definition for the classification of land of local importance changed.

SOURCE: DOC (2006)

Currently, demand for rural ranchette properties in Siskiyou County and the Program Area is strongest for smaller agricultural properties typified by livestock farms within the lower hillside or upstream watershed areas rather than the larger alfalfa farming properties located within the more centrally located valley areas (Orloff, 2007).

This growing demand for rural residential real estate is resulting in upward price pressure that is influencing the upper end of the price range for all agricultural land categories. In recent years, land prices for smaller rural residential sites have almost doubled (ASFMRA, 2005). In addition, there are ongoing trends of farm consolidation in both the Shasta and Scott Valleys as some of the larger local farm operators increasingly purchase or lease agricultural properties of more marginal farm operators in the area for custom farming (Orloff, 2007). The amount of new sales and lease activity have been relatively stable except for rangeland and dry pasture properties where an increasing amount of new purchases and transactions are occurring (ASFMRA, 2005).

Siskiyou County Rural Residential Land Conversion Trends

Currently, the greatest amount of development in Siskiyou County is occurring in the southern part of the County, particularly in Mt. Shasta and McCloud, and around Lake Shastina in Shasta Valley (DePree, 2007). Most of the agricultural land conversion to residential use is occurring on properties within the areas of lower elevation along the Interstate 5 corridor and near Lake Shastina, although the majority of Lake Shastina development is on existing residential lots (DePree, 2007). Agricultural properties are being converted to rural residential uses especially among the smaller and lower hillside farm properties.

There was a record high of home building in Siskiyou County in 2005 (Diehm, 2007). In 2006, the rate of development slowed but was still much above historical averages. These numbers were attributed to Lake Shastina's building permit applications (117 in 2005, 52 in 2006). Mike Crawford, Chief Building Inspector of Siskiyou County, noted that if these numbers were removed, the County would be demonstrating its historic level of growth, rather than a building boom (Diehm, 2007; DePree, 2007).

While Siskiyou County has begun to see more developers take interest in large-scale subdivision projects in the Scott and Shasta Valleys, no applications have been submitted in either area (DePree, 2007). In the Program Area, the Siskiyou County General Plan contains development restrictions which prevent subdivision of prime agricultural lands (see Local Regulations, below). Minimum parcel size for prime agricultural lands is limited to 80 acres, while minimum parcel size for non-prime agricultural lands is 40 acres.

Shasta River Watershed

Important Farmland in the Shasta River Watershed

Table 3.1-4 shows the acres of agricultural land within Shasta River watershed. Only 2.3 percent of Shasta River watershed "Important Farmlands" lands are classified as Prime Farmland using FMMP criteria, while 89 percent are classified as Farmland of Local Importance. **Figure 3.1-3** shows the distribution of FMMP–classified "Important Farmlands" in the Shasta River watershed.

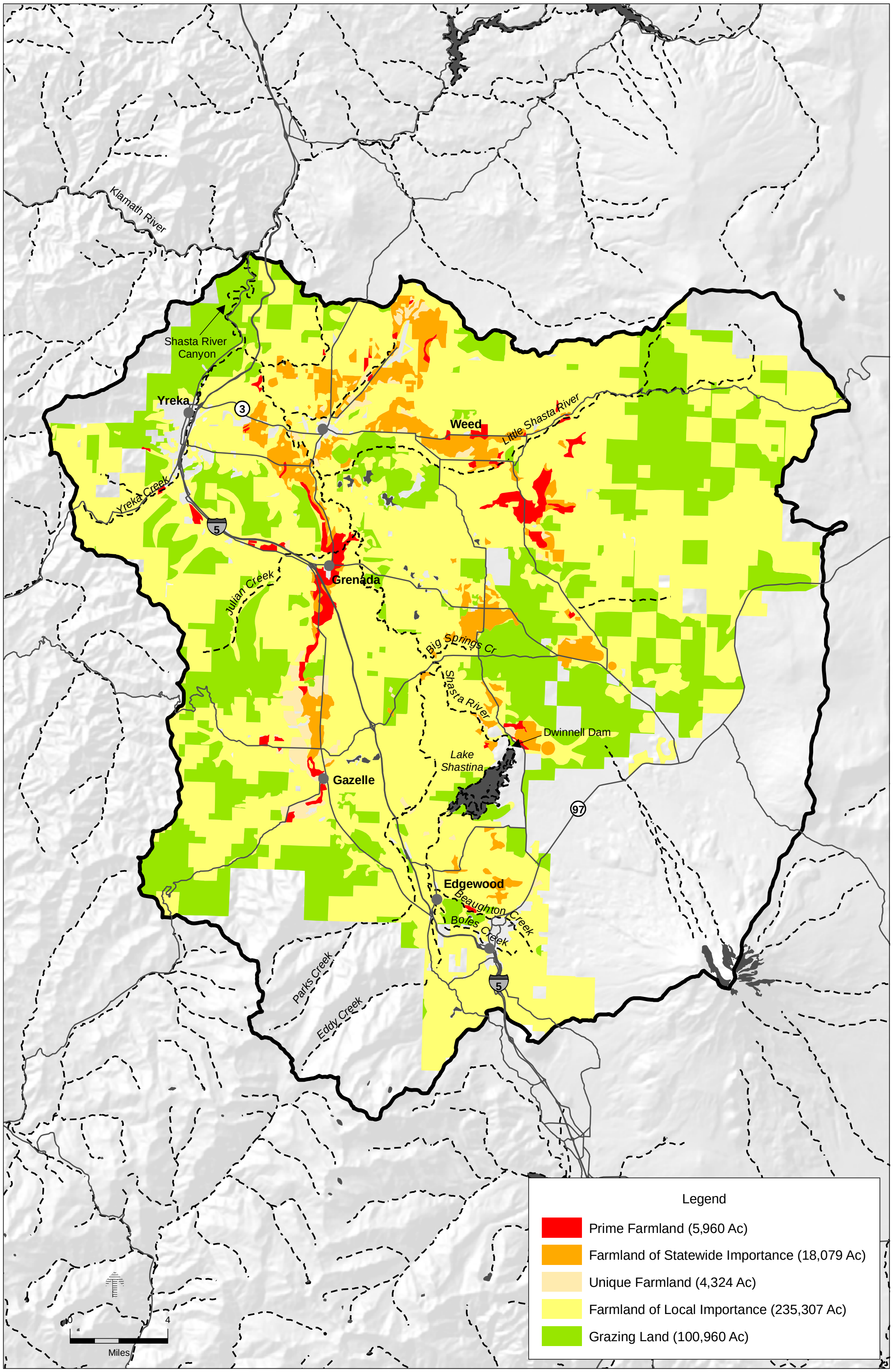
TABLE 3.1-4
CURRENT COMPOSITION OF IMPORTANT FARMLAND IN THE SHASTA RIVER WATERSHED

Land Use Category	Total Acres
Prime Farmland	5,960
Farmland of Statewide Importance	18,079
Unique Farmland	4,324
Farmland of Local importance	235,307
Important Farmland Subtotal	**263,670**
Grazing Land	100,960
Agricultural Land Subtotal	**364,630**

SOURCE: DOC (2003)

Williamson Act Farmland in the Shasta River Watershed

Williamson Act contracts are a tool used by local governments in California to preserve agricultural and open space lands by discouraging premature and unnecessary conversion to urban uses. The Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict land to agricultural and open space uses. Under the Williamson Act, an agricultural preserve must consist of no less than 100 acres, and any development on the



SOURCE: California Department of Conservation, 2003

Shasta River Watershed-Wide Permitting Program . 206063

Figure 3.1-3
Composition of Important Farmland
in the Shasta River Watershed

property must be related to the primary use of the land for agricultural purposes and be in compliance with local uniform rules or ordinances.[11] Williamson Act contracts are estimated to save agricultural landowners from 20 percent to 75 percent in property tax liability each year. Within the Program Area (see **Figure 3.1-4**), there are two categories of farmland under contract: Prime and Non-Prime (see **Table 3.1-5**).

> **Prime Williamson Act Farmland** is classified as land which is enrolled under California Land Conservation Act contract and meets any of several productivity criteria (as set forth in Government Code, § 51201).[12]
>
> **Non-Prime Williamson Act Farmland** is classified as land which is enrolled under California Land Conservation Act contract and does not meet any of the criteria for classification as Prime Agricultural Land. Non-Prime Land is defined as Open Space Land of Statewide Significance under the California Open Space Subvention Act (see Government Code, § 16143), and may be identified as such in other documents. Most Non-Prime Land is in agricultural uses, such as grazing or non-irrigated crops. However, Non-Prime Land may also include other open space uses which are compatible with agriculture and consistent with local general plans.

TABLE 3.1-5
FARMLAND UNDER WILLIAMSON ACT CONTRACT IN THE SHASTA RIVER WATERSHED

	Applicable Farmland Category			
	Prime	**Prime Non-Renewal**	**Non-Prime**	**Non-Prime Non-Renewal**
Total Acres Inventoried	77,230	328	87,463	133
			Total Acreage Under Contract	165,154
			Lost Acreage at end of 9-Year Contract	461

SOURCE: DOC (2004)

The vehicle for the Williamson Act agreements is a rolling-term, 10-year contract (i.e., unless either party files a “notice of nonrenewal,” the contract is automatically renewed annually for an additional year). In return, restricted parcels are assessed for property tax purposes at a rate consistent with their actual use, rather than potential market value (DOC, 2006). If a “notice of nonrenewal” is filed by a landowner, a 9-year nonrenewal period commences. Over this period of time, the annual tax assessment gradually increases. At the end of the 9-year nonrenewal period, the contract is terminated. Currently less than 0.01 percent of the 165,154 acres under Williamson Act contracts in the Shasta River watershed has a notice of nonrenewal filed.

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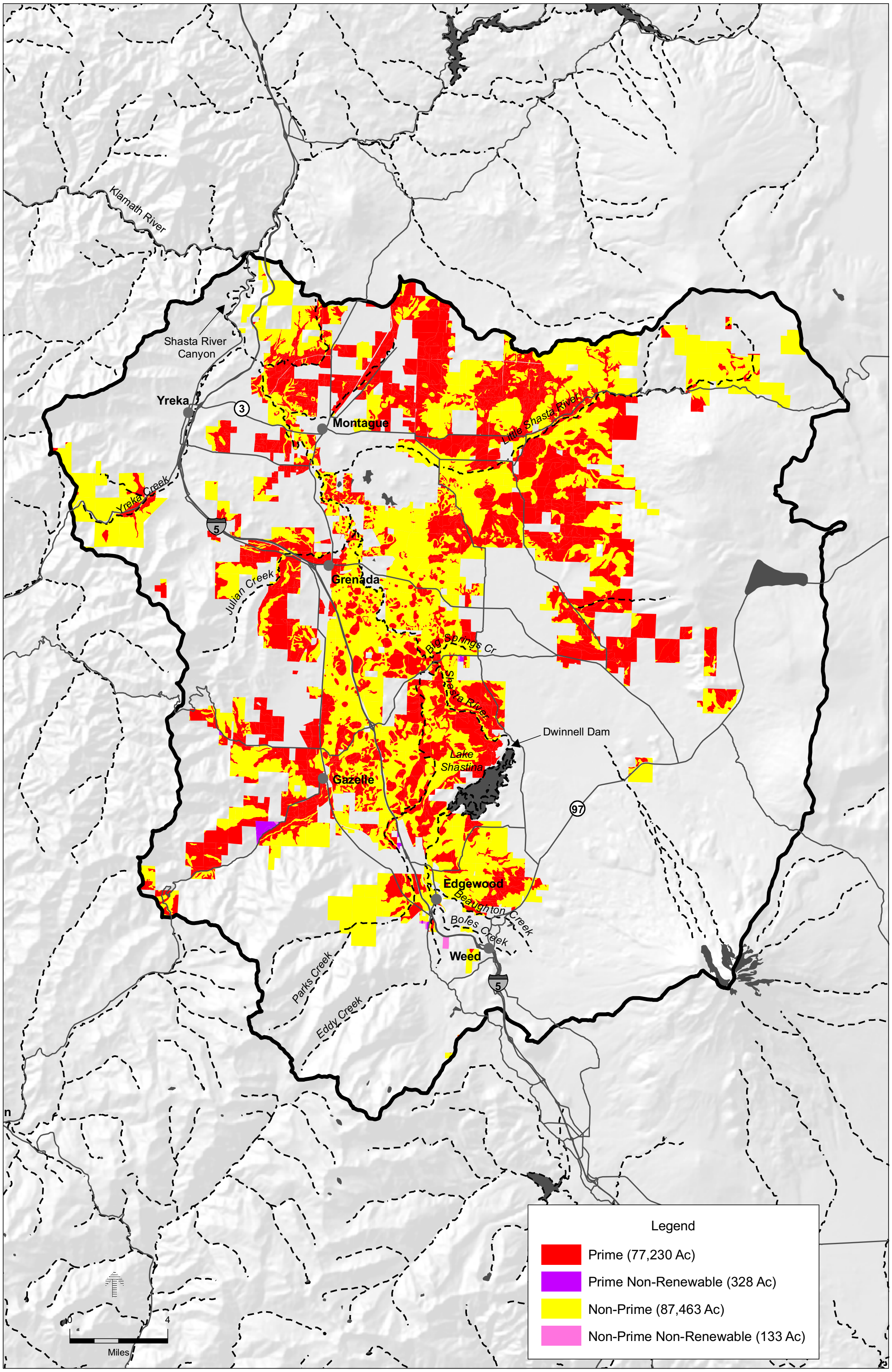
[11] Two or more parcels may be combined if they are contiguous or in common ownership.

[12] The FMMP and Williamson Act definitions of prime farmland differ. In summary, Williamson Act relates to enrollment and productivity criteria. FMMP pertains to soil characteristics. Williamson Act shows 33,360 acres as Prime, while the FMMP map shows 13,583 acres.



SOURCE: California Department of Conservation, 2003

Figure 3.1-4
Farmland Under Williamson Act Contract
in the Shasta River Watershed

Only the landowner can petition to cancel a Williamson Act contract. To approve a tentative contract cancellation, a county or city must make specific findings that are supported by substantial evidence. The existence of an opportunity for another use of the property is not sufficient reason for cancellation. In addition, the uneconomic character of an existing agricultural use shall not, by itself, be a sufficient reason to cancel a contract (DOC, 2004). If approved, the landowner must pay a cancellation fee equal to 12.5 percent of the unrestricted, current fair market valuation of the property. Legislation from 2004 (A.B. 1492) also allows a local government to levy a monetary penalty for a material breach of contract.[13] These cancellation stipulations serve as barriers to converting agricultural land to non-agricultural usage.

Agricultural Water Availability in Shasta Valley

Historically, most of the Shasta Valley was only usable in the spring when the soil moisture supported the growth of grass that could be used to feed horses, cattle and sheep. Upon summer's arrival, livestock were moved either to riparian areas or to the mountains where spring arrives later, summers are cooler, and precipitation and soil moisture could provide feed throughout the summer (Webb, 2007). Since available mountain pastures are extremely limited, there was high demand for irrigation system development.

As settlers in the Shasta Valley shifted from a mining economy to a ranching and farming economy, mining ditches were converted to irrigation ditches, and dozens of new ditches were dug (Webb, 2007). This process of irrigation development continued steadily until 1930, which allowed for crops and livestock to be successfully raised throughout the Shasta Valley.

The oldest ditches were used for flood irrigation and served those with the most senior water rights. Since then, efforts to expand irrigated agriculture have been on a smaller scale. More recent systems often utilize a pump to lift water out of the river and discharge it into a ditch at a higher elevation than the source of the water. Some sprinkler irrigation is used in the Shasta Valley, generally consisting of a buried mainline to distribute the water, and a movable sprinkler or series of sprinklers aboveground (i.e., hand line, wheel line, center pivot, or "big gun"). Drip systems are used for row crops or plants that can be watered on an individual basis. They are only used in small commercial orchards.

Irrigated Acreage in the Shasta River Watershed

Most of the irrigated permanent pasture and hay fields are located near the mainstem of the Shasta River or its tributaries with dryland grazing occurring on the more sloping farmland properties. Nearly all alfalfa grown in Siskiyou County is grown under irrigation (Thornhill, 2007) on farmland without high water tables. Dryland grain production to support livestock

[13] Government Code, § 51250(b) defines a material breach on land subject to a Williamson Act contract as a commercial, industrial or residential building(s), exceeding 2,500 square feet that is not permissible under the Williamson Act, contract, local uniform rules or ordinances. A.B. 1492 only applies to structure(s) that have been permitted and constructed after January 1, 2004. Under A.B. 1492, up to 25 percent of the unrestricted fair market value of land rendered incompatible by the breach, plus 25 percent of the value of any incompatible building and related improvements on the contracted land.

operations is generally undertaken by local farmers where the soil is tillable but irrigation is not possible. California Department of Water Resources (DWR) maintains a County-wide GIS database which tallies crop production by irrigation method and water source (see **Tables 3.1-6** through **3.1-8**). The data clarify where Agricultural Operators in the Shasta Valley are using groundwater versus surface water diversions (see **Figure 3.1-5**). This information is also relevant in understanding where future efficiency opportunities may take place (see **Figure 3.1-6**).

TABLE 3.1-6
IRRIGATED AGRICULTURAL ACREAGE – SHASTA RIVER WATERSHED (2000)

Crop	Acreage	Percentage
Grain	3,217.5	5.6 percent
Alfalfa Hay	7,795.7	13.6 percent
Pasture	40,376.3	70.5 percent
Orchard, Truck and Berry Crops	1,071.9	1.9 percent
Other	4,820.0	8.4 percent
Total	57,281.4	**100 percent**

Note: Areas classified as “Other” include urban landscapes (lawns, golf courses, and cemeteries) and idle lands.

SOURCE: DWR (2006)

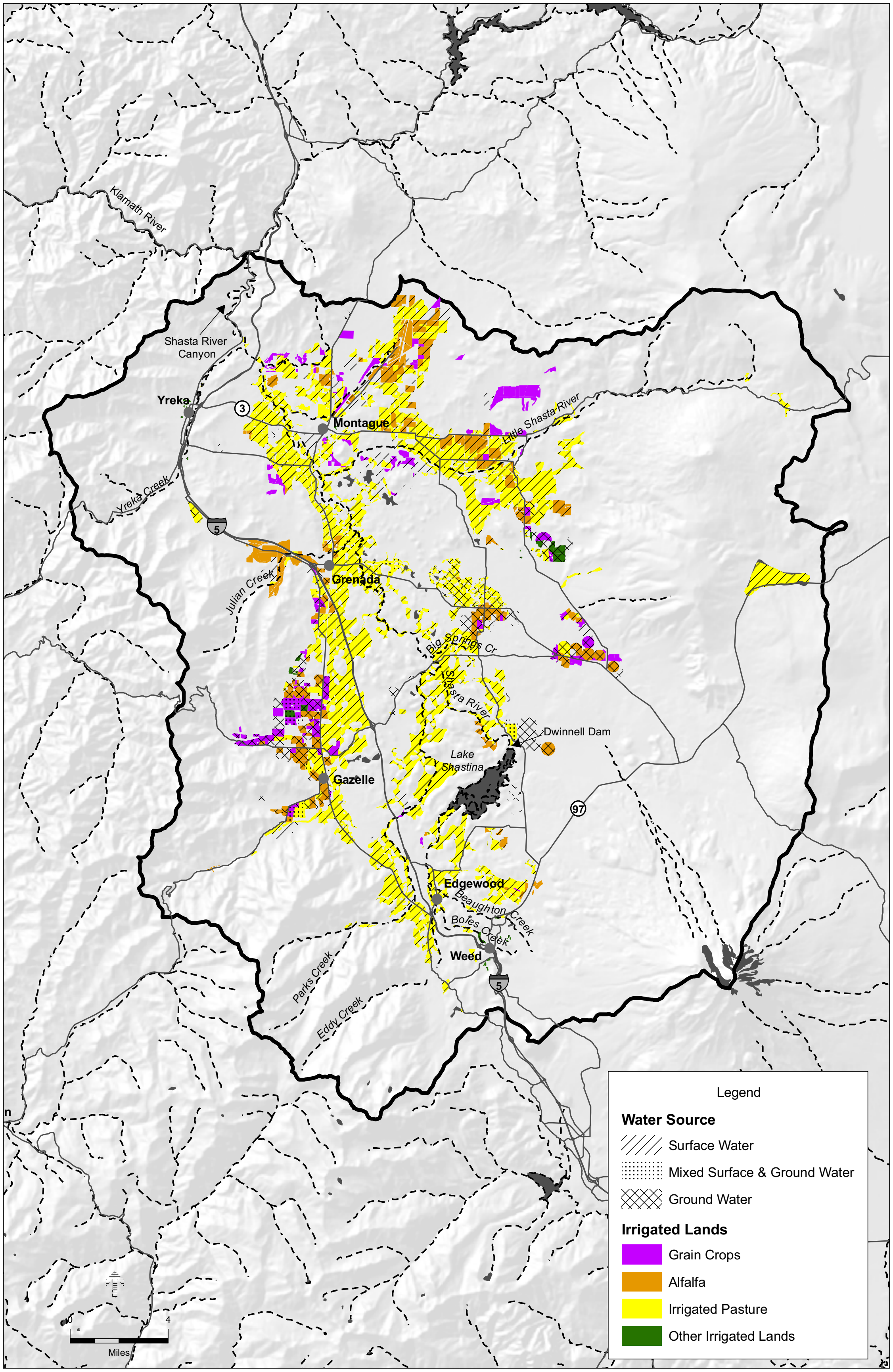
In 2000, 70.5 percent of Shasta Valley’s total irrigated agricultural acreage was comprised of pasture grasses (DWR, 2006). Alfalfa hay was a distant second, comprising only 13.6 percent of total irrigated acreage. Grains, orchards, truck and berry crops, and other miscellaneous lands comprised the remaining 15.9 percent.

DWR also reported that in 2000, 79.9 percent of irrigated lands were supplied by surface water diversion (Table **3.1-7**). Groundwater-irrigated lands comprised only 17.9 percent. In the Shasta Valley upstream of County Road A12, water use is comprised of approximately one-half surface water and one-half groundwater; downstream of County Road A12, which covers the majority of the agricultural areas in the Shasta Valley, water use is comprised of approximately one-fifth groundwater while the remaining acreage is irrigated with surface water (SVRCD, 2005).

TABLE 3.1-7
AGRICULTURAL WATER USE BY IRRIGATION TYPE – SHASTA RIVER WATERSHED (2000)

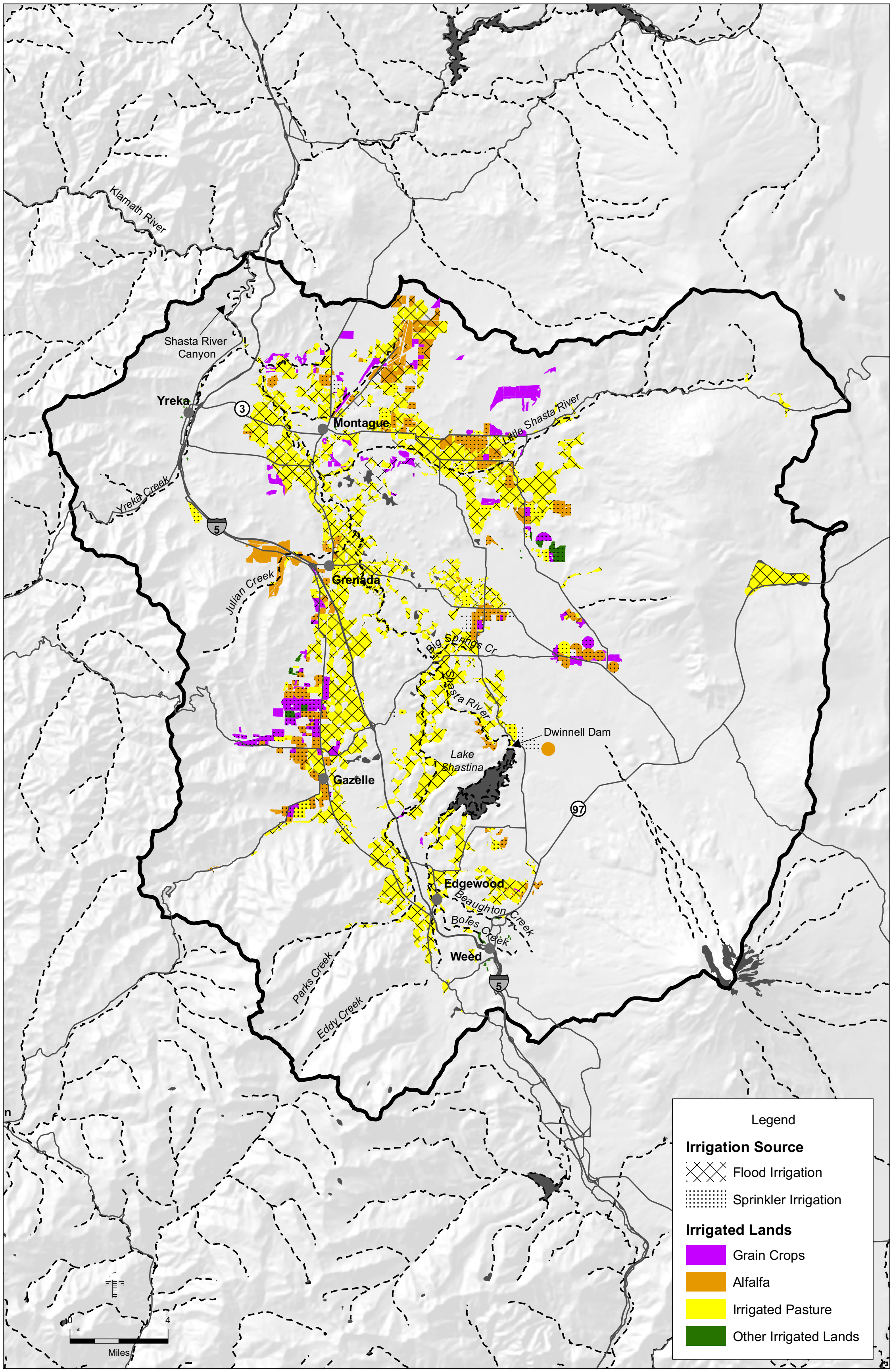
Water Type	Quantity (AF)	Percentage
Surface Water	45,781.7	79.9 percent
Groundwater	10,267.1	17.9 percent
Conjunctive Use	1,232.6	2.2 percent
Total	**57,281.4**	**100 percent**

SOURCE: DWR (2006)



SOURCE: California Department of Fish and Game, 2007

Figure 3.1-5
Water Source for Irrigated Crop Lands in Shasta River Watershed



SOURCE: California Department of Fish and Game, 2007

Figure 3.1-6
Irrigation Method for Irrigated Crop Lands in Shasta River Watershed

Looking at the two data sets together, DWR shows that in 2000, 96 percent of pasture grasses were flood irrigated by surface water diversions (**Table 3.1-8**). In contrast, grains and alfalfa were produced by a combination of flood and sprinkler irrigation from both groundwater and surface water diversions. For these two crop types, three out of every four acres were sprinkler irrigated. Orchard, truck and berry crops were also produced in the Shasta Valley using either sprinkler or drip irrigation systems (1,041 and 25 acres, respectively). Almost all of these three crops types were irrigated using groundwater, with only six percent being irrigated via a conjunctive diversion.

TABLE 3.1-8
CROP ACREAGES BY IRRIGATION METHOD AND WATER SOURCE – SHASTA RIVER WATERSHED (2000)

		Irrigation Method				Irrigation Water Source		
Crop	Total Irrigated Acreage	Acreage by Flood Irrigation	Acreage by Sprinkler Irrigation	Acreage by Drip Irrigation	Acreage by Unknown Irrigation Type	Acreage by Groundwater Irrigation	Acreage By Surface Water Diversion	Acreage By Surface and Groundwater
Grain	3,217	897	2,320	0	0	1,724	1,073	420
Alfalfa	7,797	1,896	5,836	0	65	3251	4481	65
Pasture	40,376	38,727	1,565	17	67	2,224.	37,570	582
Orchard, Truck and Berry Crops	1,072	0	1,041	25	6	999	0	73
Other	4,821	484	67	19	4251	2069	2659	93
Total	57,283	42,004	10,829	61	4,389	10,267	45,782	1,233

Note: Acreages have been rounded to the nearest whole number. Areas classified as “Other” include urban landscapes (lawns, golf courses, and cemeteries) and idle lands. These were likely irrigated with sprinkler systems.

SOURCE: DWR (2006)

Recent studies by University of California Cooperative Extension (UCCE) researchers demonstrate that there is significant potential for water conservation in irrigated pastures and to a lesser degree in alfalfa fields (Orloff, 1998, 2005). Large-scale field trials were conducted in the Intermountain Region and Sacramento Valley in 2003 through 2005 (for alfalfa only) and in the neighboring Scott Valley in 1995 and 1996 (for both alfalfa and irrigated pasture) to evaluate the effects of early curtailment of irrigation[14] (deficit irrigation) on yield, forage quality, stand persistence, and economics. The 1998 study concluded that irrigation of both alfalfa fields and irrigated pasture in the Scott Valley can cease prior to the end of September with minimal or no effect on production for the soil types studied; nor did irrigation cut-off prior to the end of September adversely affect the following year’s production. Other findings were that spring and early summer alfalfa cuttings are often higher in yield and forage quality than mid-summer cuttings, and that yield per cutting normally trails off in the fall as temperature and day length

14 Early curtailment of irrigation occurs when an irrigator ceases to irrigate land prior to the end of the “irrigation season”.

decline (Orloff, 2005). It was also found that irrigation after the final alfalfa cutting was not necessary at the alfalfa sites studied (Orloff, 1998), but this finding may depend on soil type and the final cutting date (Orloff, 2007).

UCCE researchers also found that, in some cases, substantial water conservation on irrigated pasture as well as alfalfa could be achieved through careful monitoring of soil moisture and irrigating only when necessary, thus reducing the amount applied based on agronomic need (Orloff, 1998; Orloff, 2005).

Shasta Valley Water Irrigation Districts

Although many individual farmers own and operate individual irrigation systems within Shasta Valley, several large water user associations operate in the area. These water user associations operate and manage large water irrigation systems that share the costs of maintaining and operating the system, and provide an allocation mechanism for water distribution among local farmers. The principal water user associations within the Shasta Valley are the Grenada Irrigation District, the Shasta River Water Association, and the Montague Water Conservation District. In addition, the smaller Big Springs Irrigation District operates in the Shasta Valley. For more information regarding water supply and delivery, please refer to Chapter 3.7.

Regional Land Use Setting

The Shasta River watershed covers about 792 square miles. The Shasta River flows roughly northwest, from the northern flank of Mt. Shasta, through the Shasta Valley, then through a bedrock canyon to its confluence with the Klamath River. The main tributaries to the Shasta River are Parks Creek, Big Springs Creek, Yreka Creek, and the Little Shasta River. Dwinnell Dam and Lake Shastina are major features located in the Shasta Valley. Interstate 5 runs through the Shasta Valley and is the main north-south transportation corridor. State Routes 3, 263, and 99, and U.S. 97 also run through the watershed.

Historic Land Use

Four tribes, including the Iruaitsu band of Shasta, originally occupied the Shasta Valley, Scott Valley, and Klamath River region (Renfro, 1992). The Shastas, who fished the Klamath and Shasta Rivers and their tributaries, resided in the Program Area. The Klamath Lake tribe came to the Shasta Valley to trade goods (Yreka Semi-Weekly, 1863). In 1826, trappers working for the Hudson's Bay Company entered the area. In the following decades, trails were developed through the Siskiyou County area for cattle drives and general access between the Sacramento Valley and Oregon. These same trails were upgraded into roads after the discovery of gold in 1851. Gold was first discovered in the Yreka area. Within just a few months, mining camps developed along the Shasta River and along the neighboring Scott and Klamath Rivers. Gold and quartz mining was a predominant activity in the Shasta River watershed, especially in the Greenhorn drainage and Yreka Creek, from the 1850s to 1930s. In the decades following the Gold Rush, many settlers arrived in Siskiyou County and began farming and ranching. Beginning in the 1860s, growing fruit and raising cattle were popular activities (Yreka Semi-Weekly, 1863).

In 1887, the Southern Pacific Railway was completed through Shasta Valley, allowing lumber activities to flourish. Commercial logging, as a business, began in earnest after World War II and was accompanied by the widespread construction of logging roads and skid trails. Forested lands have been and continued to be primarily owned and managed by either the U.S. Forest Service (Klamath National Forest and Shasta-Trinity National Forest) or large private timber companies. Additional regional history information pertaining to historic land uses can be found in Chapter 3.5 (Cultural Resources).

Current Land Use

The Shasta River and its major tributaries total approximately 110 miles in length. Mount Shasta lies to the south and east and the Eddy Mountains to the west. Land uses include wilderness areas on Mount Shasta above 8,000 feet, timber harvest-related activities in the public and private lands generally above 4,000 feet, urban and suburban activities in pockets below approximately 4,000 feet, and agriculture below about 4,000 feet.

Timber harvests occur in the upper subwatersheds of the Shasta River on both public and private lands. There has been limited harvest on both the Klamath and Shasta-Trinity National Forests since implementation of the Northwest Forest Plan and subsequent revisions to each National Forest's Land and Resource Management Plan. In general, timber activity has been on the decline.

Although most agricultural areas are classified as permanent agriculture under the provisions of the Williamson Act, land along the Interstate 5 corridor has been transitioning from agricultural landscapes into rural residential uses, particularly near the cities of Weed and Yreka, and around Lake Shastina (SVRCD, 2005). This transition is occurring particularly among the smaller and lower hillside farm properties. The majority of Lake Shastina development is on existing residential lots (DePree, 2007).

Agricultural activities are limited in the Shasta Canyon area to three very small ranchettes at the upper end of the reach, and homestead-style gardening is located further downstream. Livestock is currently excluded from most of this reach. This area contains an active hydroelectric powerplant for personal use, a former FERC-licensed hydroelectric plant (not in operation), and a dam (from a third hydroelectric plant removed in 1948). This area also contains a fish counting station operated by the California Department of Fish and Game (CDFG), located near the confluence with the Klamath River.

3.1.2 Regulatory Setting

Local Regulations

The Program Area falls under the sole land use jurisdiction of Siskiyou County. The cities of Weed, Yreka, and Montague are not participants in the Program because, under the Program, only the Shasta Valley Resource Conservation District (SVRCD) will be implementing coho salmon (*Oncorhynchus kisutch*) restoration projects. Furthermore, because towns do not divert water for agricultural purposes, they also will not be participating as Agricultural Operators in the Program.

Siskiyou County General Plan

The Siskiyou County General Plan is the County's long-range planning document and consists of 11 elements: land use, circulation, housing, open space, conservation, safety, noise, energy, geothermal, scenic highway, and seismic. The General Plan Land Use Element was most recently adopted in 1980 and the Conservation Element was adopted in 1973.

The primary goal of the Land Use/Circulation Element of the Siskiyou County General Plan is to allow the physical environment to determine the appropriate future land use pattern that will develop in Siskiyou County. Its focus is for future development to occur in areas that are easiest to develop without entailing great public service costs, that have the least negative environmental effect, and that do not displace or endanger the County's critical natural resources (Siskiyou County, 1980).

The technique used for the development of the Land Use Element involved preparation of a series of overlay maps identifying development constraint areas. Constraints take the form of both natural, physical barriers or problems and those culturally imposed on the basis of resource protection. The combination of overlay maps provides a visual display of tones representing physical constraints in a particular geographic area in terms of the perceived effect of urban development. In identifying an absence of physical constraints, it also indicates where urban development may proceed without encountering known physical problems (Siskiyou County, 1980).

The Land Use Element has a number of objectives and policies that pertain to prime agricultural lands, including the following, which are applicable to the Program:

> *Policy 35.* The minimum parcel size on prime agricultural land shall be forty acres. The permitted density will not create erosion or sedimentation problems.[15]
>
> *Policy 36.* In commercial agricultural areas mapped as prime agricultural land but proven not to be prime agricultural land or land clearly committed to urbanization, but not within a city or service district sphere of influence, the minimum parcel size shall be 10-20 acres, depending on distance from major agricultural areas. The permitted density will not create erosion or sedimentation problems. A minimum parcel size of 20 acres is required in areas that are adjacent or in close proximity to major commercial agricultural operations.
>
> *Policy 37.* Only agricultural uses are permitted on prime agricultural land.
>
> *Policy 38.* In commercial agricultural areas mapped as prime agricultural land but proven not to be prime agricultural land, single family residential, light commercial, light industrial, open space, non-profit and non-organization in nature, recreational uses, commercial/recreational uses and public or quasi- public uses may be permitted. The permitted density will not create erosion or sedimentation problems.
>
> *Policy 39.* Proof that the mapped prime agricultural soils are in fact not prime can only be accomplished by providing the following information:

[15] The Covered Activities of this Program that meet the General Plan designation are evaluated in Chapter 3.2 for potential erosion and sedimentation impacts.

A. Submission of a soils test prepared by a California Certified Soil Scientist or,

B. Submission of well logs that specifically demonstrate there is not enough water available for irrigation purposes or,

C. A letter from the applicable irrigation district stating that they will not and cannot provide water or,

D. Any other factual, documented information that the area is not and has not been capable of supplying enough water for irrigation.

E. If an on-site inspection by the Planning Department reveals that the land is not prime agricultural land, the data itemized in A, B, C, and D above may not be required, i.e., obvious mapping errors.

F. Submission of past financial records or statements that the agricultural operation is not economically feasible are not in any way considered to be adequate proof that the land is not prime.

> *Policy 40*. All development proposals within an irrigation district shall conform to all rules, regulations, and policies of the applicable irrigation district. The intent of this policy is not to permit district regulation of land use or density – it is intended to prohibit any interference of the district's functions, such as keeping checks and irrigation ditches free and clear of any disturbances.

The General Plan Conservation Element recognizes that prime soil is a "land resource [that is] not…readily renewable…and must be protected for its present and future value to the people of the county and state." The General Plan further states that "...safeguarding of agricultural lands is as essential as the protection afforded other types of land use." The following Conservation Element objective related to agricultural resources would be applicable to the Program:

> Preserve and protect the prime and productive agricultural lands and the agricultural economy of Siskiyou County.

Siskiyou County Land Development Manual

In July 2006, Siskiyou County released a public review draft of their Land Development Manual, Improvement Standards and Specifications (County of Siskiyou, 2006). The document states the improvement standards and specification "are for the purpose of adopting minimum standards for the development of land in Siskiyou County to protect public health and safety, and to minimize or avoid environmental consequences. They include: design of improvements; type and use of materials; methods of and the preparation of plans for construction; and repair or alteration of roadways, alleys, concrete structures, drainage, sewerage, and water supply facilities." The document also states, "[I]t is not the intent of this manual to apply to agricultural uses that are permitted by right in the agricultural zoning classifications (e.g. plowing of fields and other uses incidental to agricultural operations)."

3.1.3 Impacts and Mitigation Measures

Significance Criteria

For the purpose of this Draft Environmental Impact Report (EIR) and consistent with Appendix G of the California Environmental Quality Act (CEQA) *Guidelines* and Government Code, § 53091 *et seq*., in the context of Land Use and Agriculture the Program would have a significant impact if it would be incompatible with existing land uses in the Program vicinity or if it would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Program (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; and/or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

As proposed, the Program would not be incompatible with existing land uses and would not disrupt or divide an established community, because it does not cover or otherwise apply to existing or new structures, and all Covered Activities are within the realm of typical agricultural operations and restoration and monitoring practices within the existing agricultural landscape. For similar reasons, the Program would not conflict with any applicable land use plan, policy, or regulation because the activities will take place on lands designated for agricultural purposes. Given that there are no applicable habitat conservation plans or natural community conservation plans in the Shasta River watershed, this criterion is not applicable.

The Program would also have a significant impact if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Involve other changes that could result in conversion of farmland to nonagricultural use.

Impact Analysis

Impact 3.1-1: The Program could result in the conversion of agricultural land within the Shasta River watershed to non-agricultural uses (Less than Significant).

Under the terms of the Incidental Take Permit (ITP) (Article XIII.E.1.d), Agricultural Operators who are issued sub-permits will be responsible for costs incurred to implement avoidance or minimization measures required under their sub-permits, and SVRCD will be responsible for any costs incurred to implement mitigation and monitoring measures required under the ITP. Avoidance and minimization measures that may result in costs to sub-permittees include installation and maintenance of fish screens, riparian fencing, and bioengineered bank stabilization; improvements to water diversion structures, reductions in irrigation tailwater, and the implementation of other water efficiency and water management improvement measures required under Article XIII.E.2 of the ITP. Increased costs for Agricultural Operators could result in reduced net income for agricultural operations.

While such a reduction in income would constitute an economic impact on Agricultural Operators, it would not in itself constitute a significant effect on the environment for which mitigation would be required to reduce or avoid that effect. Under CEQA, a "significant effect" is limited to adverse changes in *physical* conditions within the area the project affects. However, the reductions in income that could result from participating in the Program could indirectly result in adverse changes to the existing physical conditions in the Program Area. Specifically, a reduction in the financial viability of existing agricultural operations in the Program Area could lead to increased pressure to convert agricultural land to non-agricultural uses. However, whether this would occur and, if so, the number of instances in which this would occur and what the resulting non-agricultural uses would be are speculative. Nonetheless, it is unlikely that the Program would reduce the financial viability of existing agricultural operations to such a level that agricultural lands would be converted to non-agricultural uses for the reasons discussed below.

The Program will Reduce the Costs of Compliance with Fish and Game Code, § 1600 *et seq.* and CESA. Because coho salmon in the Program Area are now listed as a threatened species under CESA, some routine agricultural activities may require incidental take authorization from CDFG in order to comply with CESA. The Program provides an option for Agricultural Operators who want to obtain authorization for take of coho salmon that might occur during the performance of routine agricultural activities, including, for example, the diversion of water. The Program provides Agricultural Operators a means to comply with CESA by obtaining a sub-permit and to comply with Fish and Game Code, § 1600 *et seq.* by obtaining a SAA, at much less expense and in much less time when compared to obtaining incidental take authorization or a SAA through the standard, or individual, permit processes, thereby reducing Agricultural Operators' regulatory compliance costs. However, SVRCD will require a permit fee from Agricultural Operators participating in the Program to offset Program administrative and monitoring costs, which will result in some financial burden on Agricultural Operators.

Water Trust. The ITP proposed under the Program would require SVRCD to establish the Shasta River Water Trust for acquisition of water (through purchase or lease) that would otherwise be diverted for agricultural use (ITP Article XIII.E.2(a)(i)). Water obtained through the Water Trust would be left instream to benefit fish and other aquatic species. The Water Trust will provide a market mechanism for Agricultural Operators who voluntarily reduce their surface water diversions to be compensated for at least a portion of any reduced income or increased cost that might result from participating in the Program.

Cost Reductions through Water Efficiency Measures. The ITP proposed under the Program would require SVRCD to improve existing instream flows within critical reaches of the Shasta River and its tributaries and at critical life stages of coho salmon by installing water efficiency improvement projects and water management improvement projects on sub-permittees' properties and by changing or adding points of diversion to keep flows instream to point of use (ITP Article XIII.E.2(a)(ii)). Efficiency measures would result in reduction of some costs, such as pumping costs, of some agricultural operations, while some measures, such as lining ditches, could allow a reduction in stream diversion volumes without affecting the extent and productivity of agricultural operations. As discussed in the Setting section above, research conducted by UCCE in the neighboring Scott Valley demonstrates that water conservation can be achieved without loss of production on both irrigated pasture and alfalfa fields, through soil moisture monitoring to adjust irrigation to agronomic rates, and through early curtailment of irrigation (prior to the end of September). More widespread adoption of these water conservation methods by Agricultural Operators could result in decreased water use without decreased production, and cost savings could be achieved in some cases through reduced pumping costs and reduced labor costs. The UCCE is available as a technical resource to advise on practices that include early curtailment of irrigation for alfalfa fields and use of soil moisture monitors. Water efficiency projects could, however, require a substantial investment. The potential financial impact of water efficiency projects on an individual Agricultural Operator will likely be directly related to the extent to which they must contribute financially to their construction or installation, as discussed below, and the cost savings achieved.

Program Funding. Some of the activities and projects undertaken as part of the Program would be eligible for a variety of public and private financing programs, including grants, cost-shares, and private loans, which would offset some or all of the costs associated with participation in the Program. CDFG and SVRCD anticipate that funding will be available through CDFG and other agencies, including the Natural Resources Conservation Service (NRCS), which would reduce the financial burden of Program participation on Agricultural Operators.

Restrictions on Land Use Changes. Even if Agricultural Operators were to suffer a decline in the financial viability of their agricultural operations as a result of participation in the Program, specific and general restrictions on land use changes would serve as an obstacle to the conversion of agricultural land to non-agricultural uses. As discussed in the Setting section above, non-renewal of a Williamson Act contract is costly and cancellation is difficult. The Siskiyou County General Plan has stringent policies and mechanisms that discourage conversion of agricultural land to non-agricultural uses. Zoning and land use changes would be subject to CEQA review by the County. Such laws, regulations, and policies represent substantial hurdles to land use conversion.

The conversion of agricultural land within the Shasta River Watershed to non-agricultural uses is an important concern to many parties. This Program was designed by SVRCD and CDFG with extensive consideration to alleviating costs associated with incidental take authorization and Fish and Game Code, § 1602 requirements, and includes as a SVRCD objective assisting Agricultural Operators participating in the Program in meeting the requirements of CESA and Fish and Game Code, § 1602.

Provided that adequate Program funding is available through grants and other cost-sharing programs, it is likely the Program will result in minimal net cost to participating Agricultural Operators. Furthermore, it is expected that Program participation will provide security in the form of incidental take authorization and SAAs that will reduce the major financial risk facing those agricultural operations that otherwise may face liability for future enforcement and compliance requirements. Given that Agricultural Operators will have to comply with CESA and Fish and Game Code, § 1602 with or without the Program, and the reduced cost and other benefits associated with participating in the Program, the potential for the Program to result in conversion of agricultural land is considered less than significant.

Based on the above, while it is conceivable that the Program could indirectly result in the conversion of agricultural land in the Program Area to non-agricultural uses that would not occur if the Program were not implemented, for the reasons stated above, the effect, if any, is expected to be minor, and therefore less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

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CHAPTER 3.2
Geomorphology, Hydrology, and Water Quality

This Chapter discusses the existing environment of the Shasta River watershed (Program Area); identifies potential impacts on geomorphology, hydrology, and water quality in the Shasta Valley related to the Shasta River Watershed-wide Permitting Program (Program); and proposes mitigation measures for those impacts determined to be significant. Information on the environmental setting in this Chapter was compiled from field reconnaissance of the Program Area, review of various reports and studies provided by the California Department of Fish and Game (CDFG) and the Shasta Valley Resource Conservation District (SVRCD), peer-reviewed scientific literature, and federal and state resource agency websites, databases, and reports.

3.2.1 Environmental Setting

Regional Setting – The Klamath River Basin

The Shasta River is one of the major tributaries to the Klamath River. The Klamath River originates in south-central Oregon, east of the Cascade Mountain Range. The 263-mile river flows in a general southwesterly direction through Oregon into California. In California, the Klamath River continues flowing southwesterly before turning northwesterly near its confluence with the Trinity River and continuing to the Pacific Ocean. The Klamath River drains about 15,600 square miles (of which 3,600 square miles are considered non-contributing) in California and Oregon, and is California's second largest river system (Ayres and Associates, 1999; CDFG 2002a in CDFG, 2004).

Much of the natural flow in the Klamath River basin is regulated. Four hydroelectric facilities and two other diversion and regulation dams on the mainstem system, as well as numerous public and private water diversion projects, regulate and alter the flow of the river. In the upper Klamath River basin (upstream of Keno Reservoir), a large volume of water is stored and then diverted for agricultural purposes during the spring-summer growing season by private diverters and the U.S. Bureau of Reclamation's (USBR) Klamath Project (CDFG, 2004). The Klamath Project impounds water at Upper Klamath Lake. Substantial water diversion and water use also occur in other areas of the Klamath River basin, including the Program Area. The Department of Water Resources (DWR) estimated that current annual agricultural water use in the Program Area totals 110,000 acre-feet (DWR, 1997 in CDFG, 2004). In comparison, average annual irrigation and urban water use above Keno Dam in Oregon totals 503,700 acre-feet (DWR, 1997 in CDFG, 2004).

Shasta River Watershed

The Program Area comprises the entire Shasta River watershed, which is located in Siskiyou County in central-northern California. The Program Area is approximately 795 square miles in extent; it is bounded to the north by the Siskiyou Range, to the west by the Klamath Mountains, to the east by the Cascade Range, and to the south by Mount Shasta and Mount Eddy (North Coast Regional Water Quality Control Board (NCRWQCB), 2006a). Mount Shasta (a Cascade volcano), standing at an elevation of 14,162 feet above mean sea level (amsl), is the dominant topographic feature in the watershed and contributes significantly to the hydrology of the basin.

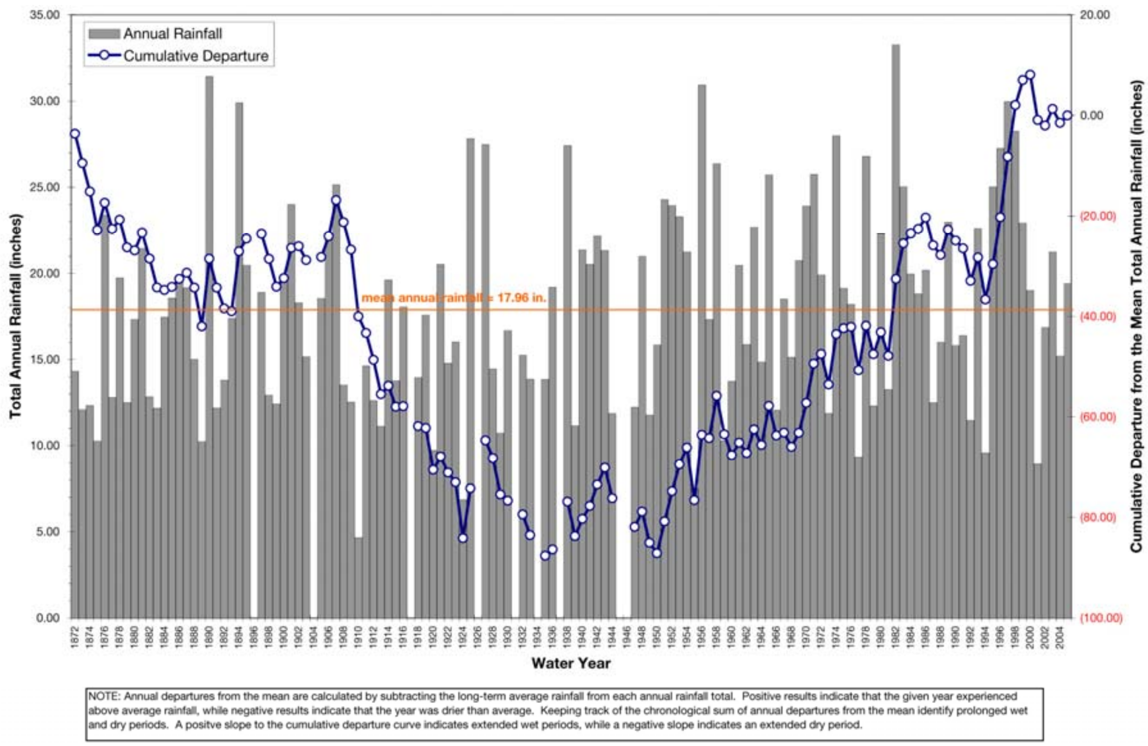
The Shasta River originates on the north slope of Mount Eddy. Flow in the Shasta River is derived from both rainfall and snowmelt. The watershed drains a portion of the Cascade Province to the east and a portion of the Klamath Province to the west. Snowmelt from Mount Shasta contributes significantly to the surface water and groundwater hydrology of the basin. Mount Shasta has permanent glaciers and a snow pack that usually persists, to varying degrees, on a year-round basis. Water from melted snow percolates down through porous volcanic rocks, follows the gradient and flows subsurface toward the Shasta River Valley (Shasta Valley), and eventually manifests as springs and seeps somewhere on the valley margin or floor. As such, Mount Shasta is a constant source of surface and spring flow to the Shasta River and its eastern tributaries.

The Shasta River is one of four major tributaries of the Klamath River within California, entering the Klamath near River Mile (RM) 177 at an elevation of approximately 2,020 feet amsl. Over a total river length of about 50 miles, the Shasta River flows in a general south-to-north direction from its origin on Mount Eddy to its mouth at the Klamath River confluence. The principal tributaries to the Shasta River include: Eddy Creek, Beaughton Creek, Carrick Creek, Julian Creek, Jackson Creek, Parks Creek, Big Springs Creek, Willow Creek, Yreka Creek, Guys Gulch, Oregon Slough, and the Little Shasta River (NCRWQCB, 2006a).

Climate and Precipitation

The Program Area has a Mediterranean climate characterized by warm, dry summers and cold, wet winters. In general, the Shasta Valley's climate is relatively dry and average precipitation on the valley floor is much less than the surrounding mountain areas. Annual precipitation ranges from less than 15 inches in parts of the Valley to over 45 inches in the Eddy and Klamath Mountains, while precipitation on Mount Shasta ranges from 85 to 125 inches (WRCC, 2007; NCRWQCB, 2006a). Moisture laden air masses moving eastward from the Pacific Ocean lose water as they rise over the Klamath Mountains, thus creating a rain shadow effect on the Shasta Valley (Klamath Resource Information System (KRIS), 2007). The wet season generally lasts from October to April and much of the winter precipitation falls as snow. In general, the amount of precipitation at any place and the proportion of precipitation that falls as snow are related directly to elevation. The annual rainfall trend recorded at Yreka from water year[1] (WY) 1872 to 2005 is shown in **Figure 3.2-1**.

[1] A water year (WY) begins on October 1 of the previous year and ends on September 30 of the designated WY. For example, WY 2004 comprises the period of October 1, 2003 through September 30, 2004.



SOURCE: Vose et al. (1992); CDEC (2007); WRCC (2007)

Shasta River Watershed-Wide Permitting Program . 206063

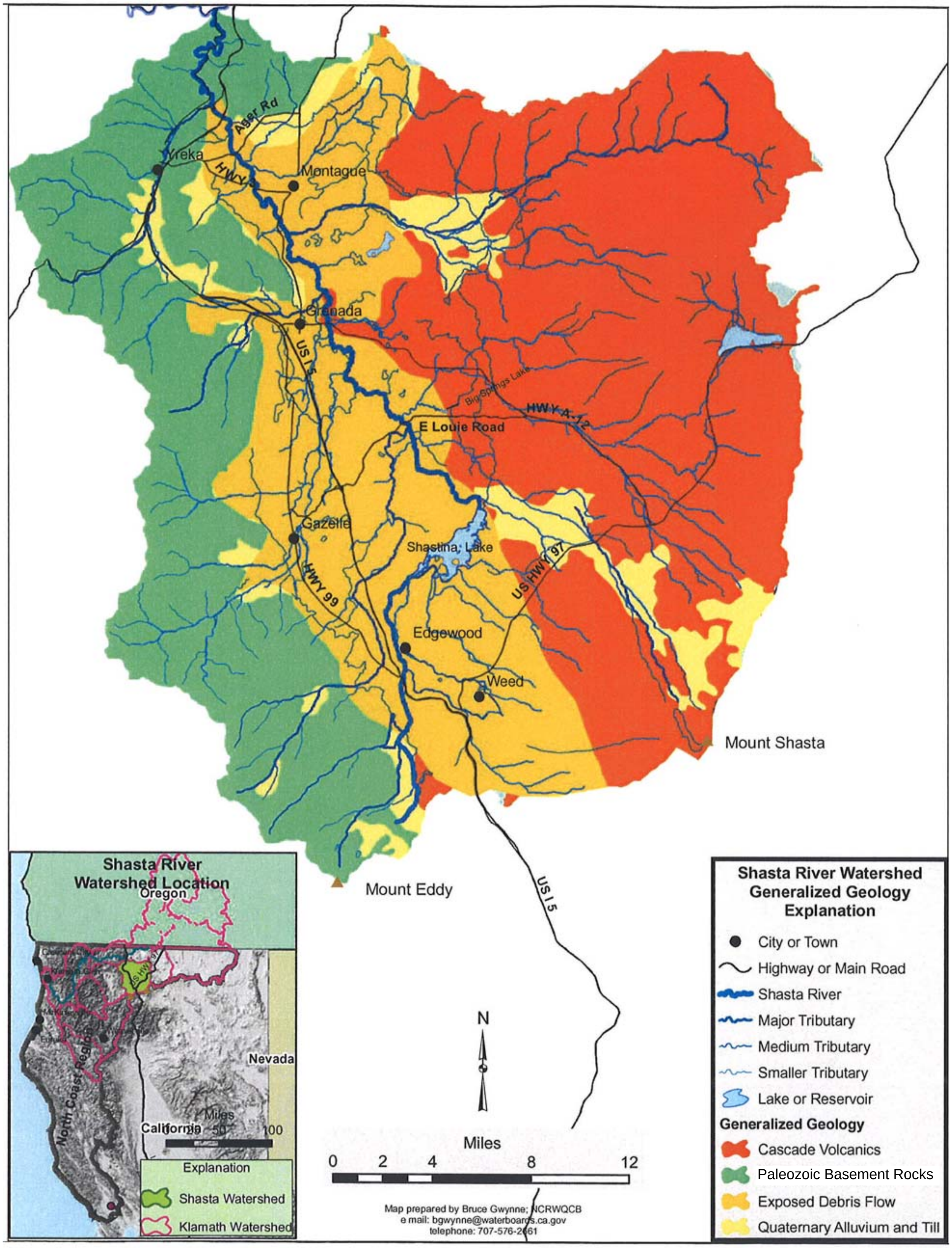
Figure 3.2-1
Annual Precipitation at Yreka, CA
(Water Years 1872-2005)

Geology

The Program Area spans the juncture of two major geomorphic provinces:[2] the Klamath Mountains province (relatively old metamorphic and sedimentary rocks on the west) and the Cascade Range province (relatively young volcanic rocks on the east). The contact between these two provinces is overlain by a low-gradient valley floor (Shasta Valley), which is built-up primarily from an ancient debris avalanche deposit and Quaternary alluvium (**Figure 3.2-2**).

On the east side of the watershed, the mountains of the Cascade Range province are primarily extrusive igneous rocks and some intrusive rocks that have been exposed by erosion. The Cascade Range province is divided into the older (Eocene-Miocene) Western Cascade Range volcanics and the younger (Pliocene-Pleistocene) High Cascade Range volcanics (Ayres Associates, 1999). The younger rocks have undergone some uplift, but the rocks are not strongly deformed. The older rocks consist of andesite, olivine basalt, and basaltic andesite (Wagner and Saucedo, 1987); these rocks are exposed along a wide swath on the east side of the Western Cascades volcanic deposits and also extend due north from the north side of Mount Shasta into Oregon. Younger High Cascades volcanic formations comprise the surface deposits on and immediately adjacent to Mount Shasta.

[2] Geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform; eleven provinces are distinguished in California (CGS, 2002) with each region displaying unique, defining features based on geology, faults, topographic relief and climate.



SOURCE: modified from NCRWQCB (2006a)

Figure 3.2-2
Shasta River Watershed Geology

The mountains along the west side of the Program Area, the Klamath Range province, are underlain by older rocks that include a variety of metamorphic rocks, slightly metamorphosed sedimentary rocks and volcanics, granite and diorite, mafic and ultramafic rocks that are largely altered to serpentine, and by eastward-dipping marine sandstone and conglomerate of the Upper Cretaceous Hornbrook Formation (NCRWQCB, 2006a; Crandell, 1989). This complex has been deformed by folding, intense shearing, and thrust faulting. Deformation in the last 1 to 2 million years has resulted in uplift of the mountains along the west flank of the Shasta Valley.

The floor of the Shasta Valley consists primarily of Quaternary alluvium and the deposit of an ancient debris avalanche from the ancestral Mount Shasta. The alluvial portions of the Shasta Valley can be divided into two areas: the gently eastward sloping alluvial plain along the western margin of the valley, and the older, dissected and rounded, coalescing fans covering the north end of the valley. The remainder of the valley floor is dominated by the debris avalanche deposit.

Valley Morphology and the Pleistocene Debris Avalanche

It is generally accepted that the present morphology of the Shasta Valley floor was largely shaped by a gigantic debris avalanche (described by Crandell (1989)) that occurred 300,000 to 380,000 years ago. The theory maintains that a massive amount of material was entrained in a huge landslide from the ancestral Mount Shasta. Large andesite blocks were scattered down the valley and a finer, more liquid matrix (similar to a lahar, or mudflow) flowed around them and filled in the Valley. The avalanche deposit covers an area of approximately 675 square kilometers and is overlain on the east by more recent basaltic lava flows and on the south by andesitic lava flows, lahars, and alluvium from Mount Shasta. Two texturally distinct parts characterize the avalanche deposit: the block facies and the matrix facies. The matrix facies consist of an unsorted and unstratified mixture of pebbles, cobbles, and boulders in compact silty sand; texturally it resembles the deposit of a mudflow (Crandell, 1989). The block facies are responsible for the many small hillocks throughout the Shasta Valley and include individual andesite blocks (many of which are pervasively shattered) ranging in size from tens to hundreds of meters in maximum dimension.

The valley morphology, in turn, controls the development and evolution of drainage networks and stream channels. The morphology of the deposit has changed little since its emplacement. The lack of a well-integrated drainage system, as well as the absence of deep and widespread dissection of the deposit, is due to its gently sloping surface and to the presence of resistant rock at the head of the lower Shasta River canyon northwest of Montague. This bedrock threshold serves as a base-level control for the Shasta River and the Shasta Valley. Consequently, the Shasta River within the Shasta Valley has since persisted as a low gradient, low energy system; this is particularly evident in the highly sinuous, meandering portion of the river between Big Springs and the Little Shasta River.

Flooding

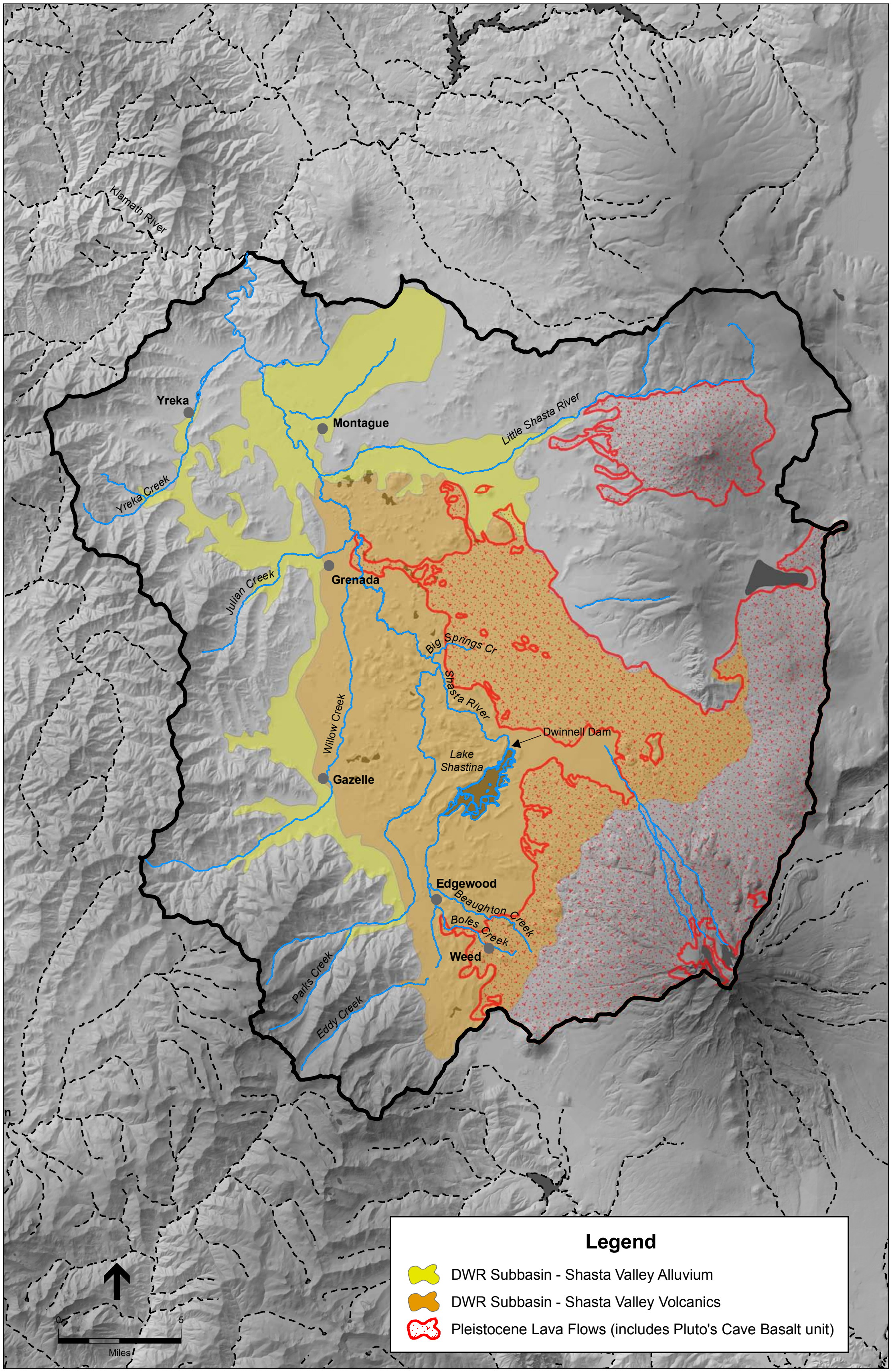
The construction of Dwinnell Dam (forming Lake Shastina, otherwise known as Dwinnell Reservoir) on the Shasta River in 1928 reduced flooding within the Shasta Valley.[3] Annual peak flows of 21,500 cubic feet per second (cfs) and 10,900 cfs were recorded at the U.S. Geological Survey (USGS) gaging station (no. 11517500, Shasta River near Yreka) on December 22, 1964 and on January 1, 1997, respectively (USGS, 2007). Otherwise, annual flood peaks have rarely exceeded 4,000 cfs since this gage began operating in 1934.

The Federal Emergency Management Agency (FEMA) is responsible for mapping areas subject to flooding during a 100-year flood event (i.e., one percent chance of occurring in a given year). FEMA (2004) has delineated the 100-year floodplain for the Program Area. Principally as a result of Dwinnell Dam, the 100-year floodplain for the Shasta River is very narrow, ranging from 200 feet to less than 2,000 wide for the most part. Wider, more notable (yet still relatively small in surface extent) 100-year floodplains are found at the confluence of Willow Creek and Julian Creek and at the mouth of Parks Creek.

Groundwater Hydrology

Owing to the unique geology of the Program Area, groundwater movement and storage is complex and does not easily lend itself to simplification into a single, homogeneous groundwater basin. The important water-bearing formations within the Shasta Valley are Quaternary alluvium (along the extreme western margin of the valley and in the area north of Montague), Pleistocene basalt formations (southeastern part of the valley), and the Pleistocene debris avalanche deposit (throughout the middle of the valley). DWR (2004) depicts two general groundwater subbasins within the valley: the Shasta Valley Alluvium and the Shasta Valley Volcanics (**Figure 3.2-3**). However, only a portion of the volcanic subbasin is actually comprised of lava flow formations (mostly basalt flows) (Figure 3.2-3), much of which are collectively referred to as the Pluto's Cave basalt. The remainder of the volcanic subbasin (i.e., that portion within the central part of the valley) is primarily comprised of the Pleistocene debris avalanche deposit. Though the degree to which these geologic units are hydraulically connected remains uncertain, all of these units serve as significant groundwater storage and recharge areas within the Shasta Valley. However, the Pluto's Cave basalt constitutes the principal water-bearing unit in the Shasta Valley and is particularly important with respect to the surface water characteristics of the Shasta River. The Pluto's Cave basalt directly supports many of the springs in the valley and groundwater discharge from this unit appears to be the primary source of cold water inflow to the Shasta River below Dwinnell Dam during the summer and fall months (DWR, 2007). Further, the Pluto's Cave basalt typically yields abundant water for irrigation, stock, and domestic wells and feeds the springs that support surface flow in the mainstem Shasta River downstream of Dwinnell Dam. Due to the complexity of the region with respect to the extensive network of volcanic recharge and storage areas, the amount of groundwater in storage has not been estimated (DWR, 2004).

[3] With respect to the overall flow regime, it should be noted that the flow from springs and seeps exerts a strong influence upon the Shasta River's flow regime, and in some ways these discharges are just as important (if not more so) as direct surface runoff.



SOURCE: ESA (2007); DWR (2004); Wagner and Saucedo (1987), as depicted by DWR (2007)

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Figure 3.2-3
Shasta River Watershed Groundwater Basins and Selected Geology Features

Groundwater dynamics exert a strong influence on the volume and quality of surface flow in the Shasta River and its tributaries. Throughout Shasta Valley the depth to the water table varies greatly, though depths tend to be greatest at the south end of the valley along the eastern and western margins. Recharge to groundwater is affected by deep infiltration of precipitation that falls on the tributary drainage area, principally the western slopes of Mount Shasta, and by seepage from streams (Mack, 1960). Further, the application of surface water through irrigation, as well as surface water conveyance losses, may be an important source of groundwater recharge in parts of the valley (DWR, 2007). Precipitation on the valley floor is generally not sufficient to contribute much to recharge of the groundwater. Groundwater discharge in Shasta Valley occurs principally by seepage into streams (Mack, 1960). Springs and seeps occur in some exposures of all the geologic formations in the Shasta Valley (particularly near the borders of the valley and along the courses of major streams). However, the young basalt formations on the eastern side are the most prolific in terms of spring and seep development and production. For example, historic flows at the mouth of Big Springs Creek were apparently on the order of 100 to 120 cfs and were largely unaffected by climatic variability (SVRCD, 2005). Percolation of surface water applied for irrigation may also be contributing to Shasta River base flow by increasing groundwater discharge to the river (DWR, 2007).

Human Influence on Hydrologic and Geomorphic Processes

Human settlement and land management activities have had a measurable and lasting effect on the natural hydrologic and geomorphic processes within the Program Area. Hence, what is seen today in the Program Area is quite different from 150 years ago. In terms of their effect on watershed processes, these activities can be divided into upland management activities that produce downslope and downstream impacts, and valley bottom/stream channel management activities that more directly affect the geomorphology of the main river system. The most important changes and land management actions include: timber harvesting and road construction, fire suppression, beaver removal, mining and dredging operations, and agricultural practices.

Upland Management

The Shasta River and the Shasta Valley have been subject to extensive human alteration since the mid-1800s. Hillslope processes have been altered over the past century by the effects of hydraulic mining, road and skid trail construction, and vegetation removal by fires, fire suppression, grazing, and timber harvest (LaPlante, 2001; National Research Council (NRC), 2004; NCRWQCB, 2006a). In the upland areas, the steep mountainous terrain is naturally susceptible to erosion, but the extent and severity of erosion varies in response to land use activities such as timber harvest and road construction, as well as to regional flood events (LaPlante, 2001). Roads were first constructed, and timber harvesting was initiated, on private lands to supply early mining, railroad and housing needs in the 1800s and early 1900s. Beginning in the 1950s, National Forest lands were intensively managed for timber harvest (Webb, 2007). The bulk of the National Forest lands in the Program Area are within the Shasta-Trinity National Forest, in the southwest (e.g., Parks Creek headwaters) and southeast (e.g., northern flank of Mount Shasta) portions of the watershed. Upslope forest management has had an effect on downstream channel systems largely through altered infiltration rates, altered peak runoff timing, increased bank erosion, and deposition of fine sediments in low gradient sections of the mainstem Shasta River.

Timber Harvesting and Road Construction

Timber was originally needed for settlement and early mining operations in the Shasta Valley near Yreka beginning in the 1850s (gold was discovered in Yreka in 1851). Commercial logging began in earnest after World War II and was accompanied by the widespread construction of logging roads and skid trails on public lands. Today, mixed conifer-hardwood forested lands exist primarily in the upper watersheds of Dale Creek, Eddy Creek, Yreka Creek, Parks Creek, the Little Shasta River, and the upper Shasta River (Webb, 2007). These forested lands are primarily owned and managed by either the U.S. Forest Service or large private timber companies.

Erosion and sedimentation are natural processes, but both have been heightened by human activities in the upland watershed areas. Construction of roads constitutes one major category of soil disturbance and sediment transport into streams. Regional and local studies have identified road and skid trail construction, including legacy features from previous forest operations, as one of the largest single sources of accelerated erosion in managed watershed areas (LaPlante, 2001; NRC, 2004). For example, Parks Creek contributes excessive fine sediments to the mainstem Shasta River (LaPlante, 2001). The channel of Parks Creek has been altered as a result of management activities within the watershed over the last 40 years (LaPlante, 2001). Road building and harvesting activities beginning in the 1960s were extensive, resulting in increases in surface runoff from skid trails, roads, and harvested areas, and subsequent increases in peak flows within the channel, bank erosion rates, and bedload transport rates. Medium- and fine-grained sediment derived from logging roads and skid trails in the watershed continues to accumulate in the Parks Creek channel and further downstream in the mainstem Shasta River (LaPlante, 2001).

Upland Fire Suppression

Wildfire is one of the triggers for generating high rates of surface erosion in areas with erodible soils, especially in a climatic regime where low precipitation contributes to excessively long recovery periods. Surface erosion from large exposures of bare soil following wild fires generates fine sediments that are easily transported to downstream areas. Dry upland forest sites may require decades for recovery due to slow tree regeneration, causing an extended window of cumulative watershed effects related to flow and fine sediment (Kier Associates, 2005). Throughout the west, decades of fire suppression has increased the susceptibility and potential magnitude of wildfire in forested landscapes. Fire suppression has been a long-standing management action on National Forest lands in the upper Shasta River watershed (Webb, 2007).

Valley Bottom and Stream Channel Management

Stream channels in the Program Area, especially in the low-gradient valley sections, have been modified almost since first European occupation of the watershed. Activities such as beaver trapping, localized alluvial gold mining (Yreka Creek and Shasta Canyon), bank protection, streamflow manipulations, dam building, and upland land management continue to dominate the geomorphic function of the Shasta River and its tributaries.

Beaver Removal

One of the earliest noted events related to impacts to the natural hydrology of the Program Area was the trapping and removal of beaver, which began in the 1820s with a group from the Hudson's Bay Company (Webb, 2007). Beaver dams add complexity to stream habitat. The stepped profiles of beaver-influenced rivers, with narrow, deep, sinuous reaches above the ponds and shallower reaches of swifter flow below the ponds, maximize the diversity of riparian and aquatic habitats (Wohl, 2005). Beaver dams reduce flow velocities, increase surface water storage, provide slack water habitat, maintain shallow groundwater levels and base streamflow throughout the summer months, increase flooding and floodplain deposition, and increase the interconnectedness of the floodplain with the adjacent stream channel system. Beaver ponds are also known to provide excellent habitat for juvenile coho salmon (*Oncorhynchus kisutch*) (Bergstrom, 1985, in Sommarstrom et al., 1990). With the removal of beavers, many beneficial attributes that their dams added to the stream system were lost.

Mining and Dredging Operations

About the time the beaver population was decimated, land use shifted to large scale mining, particularly gold mining. Gold was discovered in Yreka in the spring of 1851. The earliest phase of placer mining in the northern Shasta Valley was dominated by sluice mining. Most gold mining within the watershed took place on Yreka Flat and in the lower Shasta River canyon. The need for water in placer mining was paramount, and elaborate ditches were constructed to deliver diverted waters to mine sites (sometimes from miles away). Many of these early diversions are either still functioning as agricultural diversions or are clearly visible on the landscape. Mining activity was already beginning to diminish by the end of the 1850s, but it continued in the Program Area into the twentieth century (Webb, 2007).

Placer and dredge mining has three basic effects on river form and function (Wohl, 2005). First, the disruption of bed and bank sediment renders this material more susceptible to being moved by the river flow. This can cause down-cutting of the river at the location of the mining or change a meandering river to a braided river (Hilmes and Wohl, 1995). Smaller sediments are preferentially mobilized and winnowed from the disturbed area and accumulate downstream, which can reduce channel capacity and cause more flooding. The remaining coarse material is too large to be moved frequently or to provide spawning gravel for fish, whereas the finer sediment carried downstream preferentially fills pools and covers spawning gravel downstream. The river at the mining site remains less stable for decades after mining because the fine-grained bank sediment that once supported stabilizing riparian vegetation is gone (Hilmes and Wohl, 1995). The mining process disrupts the stratigraphy of the channel deposits and greatly increases permeability of the remaining coarse sediment. This can lead to river infiltration and increased subsurface flow and explains why surface flow dries up in summer. These persistent geomorphic and hydrologic impacts are not easily corrected or mitigated.

The second basic effect concerns the introduction of toxic heavy metals, including mercury, used during mining into the stream and retained in valley-bottom sediments. These can have an impact on the biological diversity and productivity of aquatic species in the river system (Wohl, 2005). Third, placer mining indirectly affects the channel by altering the amounts of water and sediment entering the rivers. These alterations may result from the extensive timber harvest that is required to support large scale mining operations and the settlement (such as Yreka) that accompanies mining. Mining and deforestation effects greatly exceeded the impacts associated with beaver removal, yet both actions likely had significant consequences and continue to impact the Program Area to this day.

Agricultural Practices and Water Management

Agricultural use of water in the Program Area began with the settlement of miners in the early 1850s. By the turn of the twentieth century, gold mining had diminished in the watershed and agricultural development became the economic focus, resulting in increased irrigation and water use. In the early 1900s, four water supply agencies were formed in the Program Area. The Shasta River Water Association (SRWA) is a corporation formed in 1912, and serves an area near the town of Montague along the west side of the Shasta Valley. The Grenada Irrigation District (GID) serving the area located west of Grenada, the Montague Water Conservation District (MWCD), serving the Little Shasta Valley and the northeast part of the Shasta Valley, and the Big Springs Irrigation District (BSID), serving the area north of Big Springs Lake formed under the California Irrigation District Act in 1921, 1925, and 1927, respectively (NCRWQCB, 2006a). Soon thereafter, the increasing demand for the water resources of the Shasta Valley prompted a formal adjudication of water rights within the watershed.

In 1932, the Siskiyou County Superior Court adjudicated the relative rights based upon prior appropriation of various claimants to surface water resources in the Shasta River and its tributaries, and thereafter issued the Shasta River Judgment and Decree (1932) (Shasta River Decree) (NCRWQCB, 2006a). DWR provides watermaster service that has been apportioning water within the watershed since 1934. In general, the watermaster is responsible for apportioning available water in order of priority of right as set forth in the Shasta River Decree. Riparian water rights in the Shasta River watershed are not adjudicated and are not regulated by the watermaster. Also, the court in its 1932 adjudication did not address groundwater, which as mentioned earlier is critical for support of baseflow (NRC, 2004). The Shasta River is fully appropriated from May 1 through October 31 (State Water Resources Control Board (SWRCB) 1998). A summary of the allotments in the Program Area from the 1932 adjudication is presented in **Table 3.2-1**.

The most notable water storage facility for irrigation and consumptive water use in the Program Area is Dwinnell Dam. Dwinnell Dam, which MWCD owns and operates, was completed in 1928. It captures runoff from approximately 117 square miles of the upper Shasta River watershed (about 15 percent of the entire Program Area), forming Lake Shastina (also known as Dwinnell Reservoir). MWCD has appropriative rights to store up to 49,000 acre-feet (35,000 acre-feet from the Shasta River and 14,000 acre-feet from Parks Creek) of water in Lake Shastina from October to July of each year. Although a relatively small reservoir, it only fills during above-normal runoff years due to the relatively modest yield from upstream watershed areas, seasonal water use, and appreciable seepage loss from the reservoir (Vignola and Deas, 2005). Lake Shastina inflow is primarily derived from the Shasta River. However, inflows from Carrick Creek, other smaller intermittent streams, other surface and subsurface inflow, as well as

TABLE 3.2-1
SUMMARY OF ALLOTMENTS FROM THE 1932 SHASTA RIVER ADJUDICATION

Location / Water Body	Total Allotment (cfs)
Irrigation Season	
Shasta River upstream of the confluence with Big Springs Creek	111.4
Boles Creek and Tributaries	17.6
Beaughton Creek and Tributaries	10.3
Jackson Creek and Tributaries	2.8
Carrick Creek and Tributaries	11.7
Parks Creek and Tributaries	56.3
Shasta River downstream of the confluence with Big Springs Creek, including Big Springs Creek and Tributaries	184.8
Little Shasta River and Tributaries	90.0
Willow Creek and Tributaries	55.7
Yreka Creek and Tributaries	36.0
Miscellaneous Springs, Gulches, and Sloughs	32.9
TOTAL	**609.5**
Non-Irrigation Season	
Shasta River and its Tributaries	327.4

SOURCE: 1932 Shasta River Adjudication and Decree, as summarized and presented in NCRWQCB (2006a)

precipitation contribute to the reservoir. Additionally, up to 14,000 ~~cfs~~ acre-feet per year of water from Parks Creek is diverted from October 1 to June 15 into the Shasta River upstream of Dwinnell Dam for storage in Lake Shastina under an MWCD water right.

Agricultural activities have had effects (direct and indirect) on the geomorphology and water quality of the stream system and have contributed to the decrease in the productivity of the Shasta River's anadromous fisheries (as discussed in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat). Water diversions, primarily for agricultural purposes, have led to decreased surface flows in the spring and summer months, thereby reducing the amount of instream habitat and locally increasing ambient surface water temperatures.

Grazing

In the Valley upstream of the lower Shasta River, grazing has been responsible for most of the loss of vegetation in the riparian corridor; where intense, unfenced grazing has occurred, trampling and removal of vegetation have commonly led to accelerated bank erosion, loss of shading, reduced accumulation of local woody debris, loss of pool habitat to sedimentation, loss of channel complexity and cover, and degradation of water quality (NRC, 2004). Some of the larger impoundments within the watershed, most of which are related to agricultural practices, bring about the most dramatic changes in channel morphology and function.

Livestock grazing is a Covered Activity under the Program and, similar to some other Covered Activities, it is not new; rather, it has been occurring in the Program Area for decades. Hence, authorizing livestock grazing as part of the Program will not cause the level of grazing to increase or result in any impacts in addition to those that are already part of baseline conditions in the Program Area. In fact, the Program will likely reduce the impacts of grazing by excluding livestock from some riparian areas by installing and maintaining fencing (see ITP and MLTC Covered Activity 5). Also, where riparian fencing is constructed as part of the Program, any grazing of livestock within the riparian exclusion zone ~~adjacent to the channel or within the bed, bank, or channel~~ of the Shasta River or its tributaries may only occur in accordance with a grazing management plan that will result in improved riparian function and enhanced aquatic habitat.

Dams and Impoundments

Dwinnell Dam, Greenhorn Dam, and, to a lesser degree, a number of smaller impoundments, have altered the hydrologic and geomorphic properties of rivers and streams in the watershed. Dams disrupt the longitudinal continuity of the river system, and can have profound effects on downstream channel form through alteration of the flow regime and disruption of sediment transport processes. Dams and impoundments typically reduce flow velocity, increase flow depth, and increase sedimentation. With the exception of above-average water years, when Lake Shastina is full, no flow is released from Dwinnell Dam except for small amounts to specific water users downstream (NRC, 2004). Dwinnell Dam has also reduced the magnitude and frequency of floods on the Shasta River, and this has diminished the dynamic nature of the river downstream, as well as the frequency of large flows necessary to flush fine sediments from gravel deposits.

These dams have also exacerbated the lack of coarse sediments and gravel in the Shasta River and the lower reaches of some of its main tributaries. Dams trap coarse sediments that are essential in maintaining downstream channel form, and the dam-induced change in the natural sediment budget typically results in downstream erosion and channel incision for some years following construction. Dwinnell Dam traps all of the gravel and coarse sediment from the upper Shasta River watershed; Greenhorn Dam blocks the downstream input of gravel to Yreka Creek and the lower Shasta River (within the canyon). The smaller impoundments allow fine sediments to settle and bury river gravels (where the gravels still exist).

Stream Restoration Efforts

In many areas within the Program Area, the impacts of past and present activities have been acknowledged and documented, and measures to improve water quality and restore the geomorphic structure and ecological function of the riverine habitat have been implemented. A number of groups and concerned citizens, including the SVRCD and the Shasta River Coordinated Resources Management and Planning Committee (Shasta River CRMP), have been working to manage and protect the natural resources of the Shasta River and its watershed lands. SVRCD, like other Resource Conservation Districts, is a local unit of government established to carry out natural resource management programs. SVRCD works to benefit agriculture while also protecting fish, wildlife, plants, and water quality (NCRWQCB, 2006a). The Shasta River CRMP, a subcommittee of SVRCD, has also been making significant strides in the restoration and management of the Shasta River and its tributaries (NCRWQCB, 2006a).

Since 1986, with over $11 million in funding from local, state, and federal agencies, SVRCD and the Shasta River CRMP have been involved in developing and implementing many significant and beneficial water quality and habitat restoration projects. From 1986 to the present, over 160 projects have been implemented within the Program Area (NCRWQCB, 2006a) (see also the discussion of restoration projects in Chapter 4). For the most part, these projects can be described by the following general categories of project type: riparian fencing, riparian planting, bank stabilization, habitat restoration, agricultural tailwater management, water quality and flow monitoring, fish screening and fish passage, and education and outreach.

Existing Hydrologic and Geomorphic Conditions

Based on the objectives of the Program, review of SVRCD (2005), and consideration of the Program Area climate, topography, hydrology, and geology, the Program Area is delineated into eight sub-watersheds (or sub-reaches, in regard to the mainstem Shasta River) in order to describe existing conditions: Shasta Valley (Shasta River from Dwinnell Dam to the head of the canyon), lower Shasta River (the canyon), upper Shasta River (upstream of Dwinnell Dam, including Boles Creek, Beaughton Creek, and Carrick Creek), Parks Creek, other Westside tributaries (including Julian Creek and Willow Creek), Yreka Creek, Little Shasta River, and the Eastside (volcanic) tributaries (namely the area draining to Big Springs Creek). These basins, as well as the principal tributaries within the Program Area, are shown in **Figure 3.2-4**.

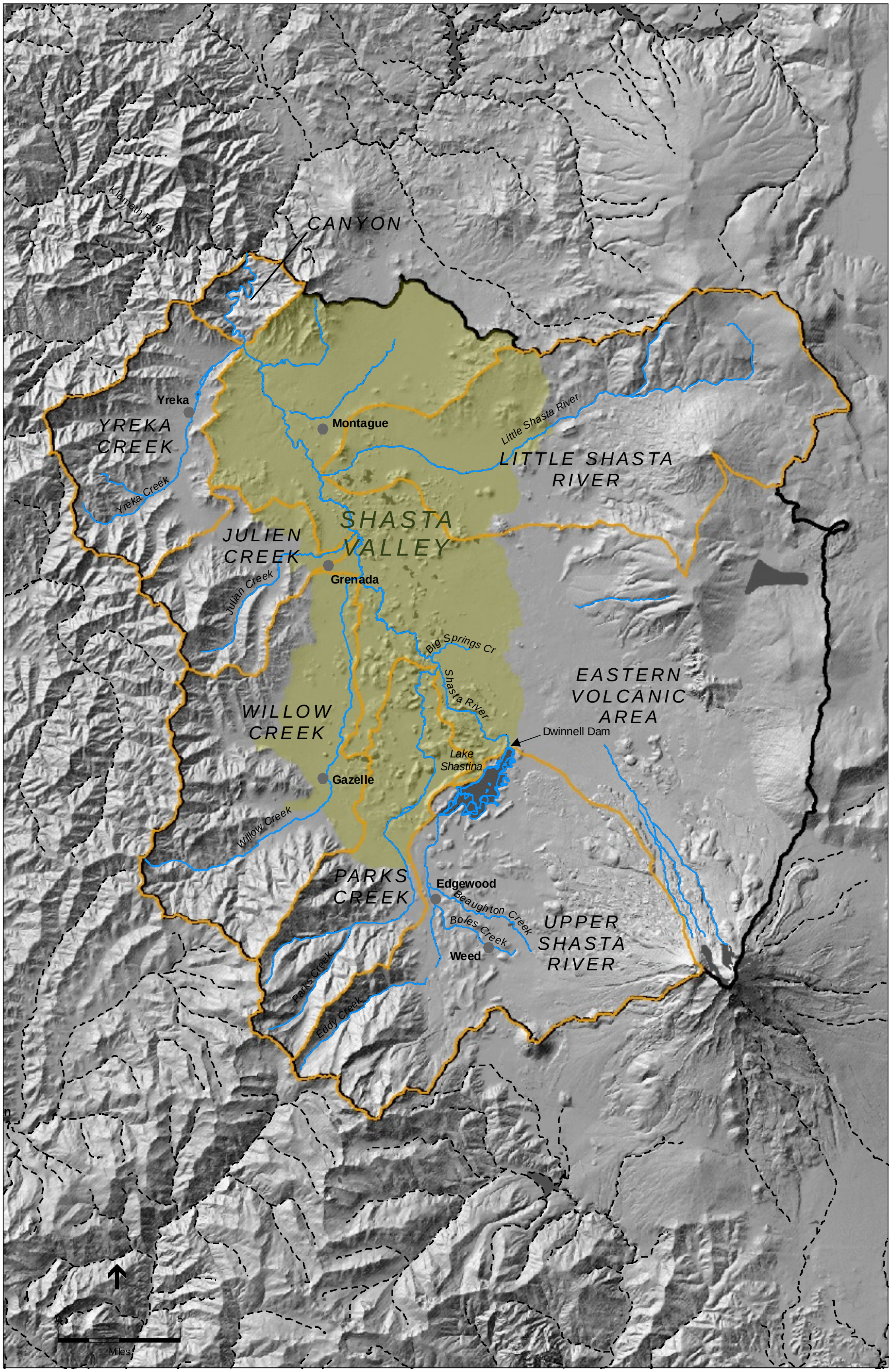
Each of the mainstem reaches and sub-watersheds contribute to geomorphic and hydrologic processes operating within the Program Area, and to the health and condition of the aquatic system. The following descriptions of the various mainstem reaches and tributary watersheds of the Shasta River are largely derived from descriptions contained in SVRCD 2005, as this represents the most comprehensive and succinct assemblage of watershed-wide information to date. The overall flow regime of the Shasta River, and changes thereto, is described from analysis of the USGS gaging record for the Shasta River near Yreka (USGS station no. 11517500).

Shasta River Watershed (General) – Shasta Valley (Shasta River from Dwinnell Dam to the Head of the Canyon)

General Morphology and Sediment Characteristics

From Dwinnell Dam to the Yreka Creek confluence, the Shasta River is approximately 32.8 miles long and is generally a meandering, low gradient and low energy system. The elevation of the channel near the base of Dwinnell Dam is 2,750 feet amsl, and the elevation of the channel at the confluence with Yreka Creek is 2,387 feet amsl (the slope of the valley is approximately 0.3 percent). This section exhibits a moderate to high sinuosity (i.e., the ratio of stream length to valley length) and contains relatively few exposed (unvegetated) bar formations.

The production and transport of sediment in the Program Area depends, in part, on natural conditions such as climate, geology, and episodic events such as flooding and landslides. However, natural stream channel processes within the watershed have been significantly altered (e.g., by Dwinnell Dam) to the point that sediment production and transport processes no longer completely support the operation of a self-sustaining geomorphic system. In addition, as discussed above, past



SOURCE: ESA (2007); modified from CalWater 2.2 dataset

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Figure 3.2-4
Shasta River Subwatersheds

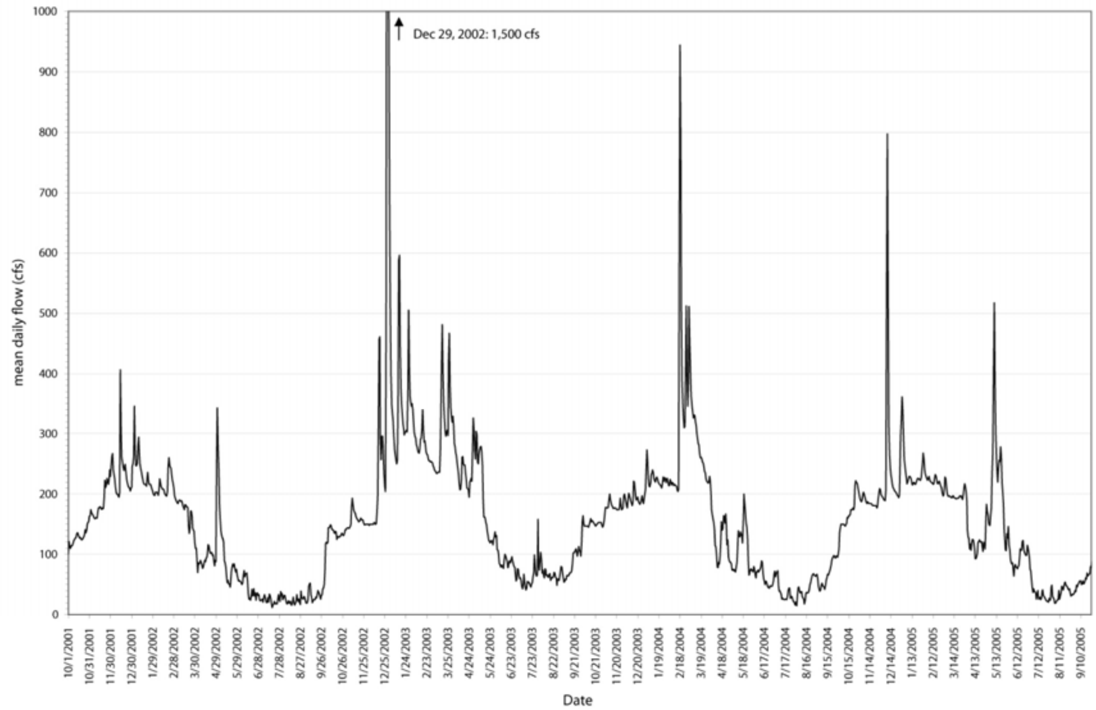
and present land-use and land management practices have increased the yield of fine sediment from certain parts of the watershed, including managed uplands, mined areas, urban developments, and degraded riparian zones. At the same time, coarse sediment is in short supply and gravels needed for channel function and aquatic habitat are not being adequately replenished. Records of various sediment-related problems can be traced back to the placer mining of the 1800s, to more recent forest management activities, and to agricultural practices. Of particular concern are excessive percentages of silt, sand, and fine gravel (particles less than 0.0625 mm and up to 6.3 mm). Excessive percentages of sediment 6.3 mm and finer can adversely affect fish species by smothering eggs and aquatic invertebrates, burying bottom cover, reducing the volume and number of pools for rearing, and, through the loss of deep, cool water pools, may result in local increases in ambient stream temperatures.

Gravels found in the reach upstream of County Road A12 provide for spawning opportunities for about half of the salmonids in the Shasta River, but these gravels are extremely vulnerable to sedimentation or complete burial from the fine sediment generated within this reach or being delivered from Parks Creek (SVRCD, 2005). Habitat surveys summarized by Ricker (1997, in NRC, 2004) and Jong (1997, in NRC, 2004) indicate that the percentage of fines in gravels is high throughout the mainstem Shasta River and Parks Creek. The fines are associated with accelerated erosion and lack of flushing flows that maintain and recruit coarse gravel (NRC, 2004). Field observations indicate that bar and streambed deposits of coarse gravel occur in upper Parks Creek and in the Shasta River upstream of Dwinnell Dam. The dam effectively traps and retains all but the finest sediment and also reduces the frequency of flows capable of periodically flushing fine sediment from any of the coarse substrate materials that remain in the channel downstream.

Surface Water Hydrology and Flow Regime

Description of the general hydrologic regime of the Shasta River is derived primarily from 72 years of record (WY 1934 through 2005) for the USGS gaging station (no. 11517500) located near the city of Yreka. The hydrograph (comprised of the mean daily flow values) from WY 2002-2005 for this station is depicted in **Figure 3.2-5**. The hydrograph shows the seasonal variability in flow of the Shasta River. Within the Valley, numerous accretions from tributaries (including Big Springs Creek, Parks Creek, Willow Creek, Julian Creek, Yreka Creek, Oregon Slough, and the Little Shasta River), springs, agricultural diversions, and return flows contribute to a complex flow regime (Deas et al., 2003).

The influence of cold-water accretions (surface water and groundwater) just downstream of Dwinnell Dam, and within the Big Springs Creek area are clearly evidenced in the temperature profile of the mainstem Shasta River depicted in **Figure 3.2-6.** This temperature profile, taken on July 26, 2003, extends from the mouth of the Shasta River upstream to Dwinnell Dam. Downstream of Willow Creek, the influence of tributaries and groundwater accretions on the mainstem Shasta River temperature profile is less apparent, as the temperature tends to rise steadily down to the mouth of the Shasta River. However, in this section, the contribution of flow (surface water and groundwater) from Willow Creek and Julian Creek, as well as from other groundwater accretions, does likely contribute to stemming the rate at which Shasta River water temperatures increase moving downstream.



SOURCE: USGS (2007)

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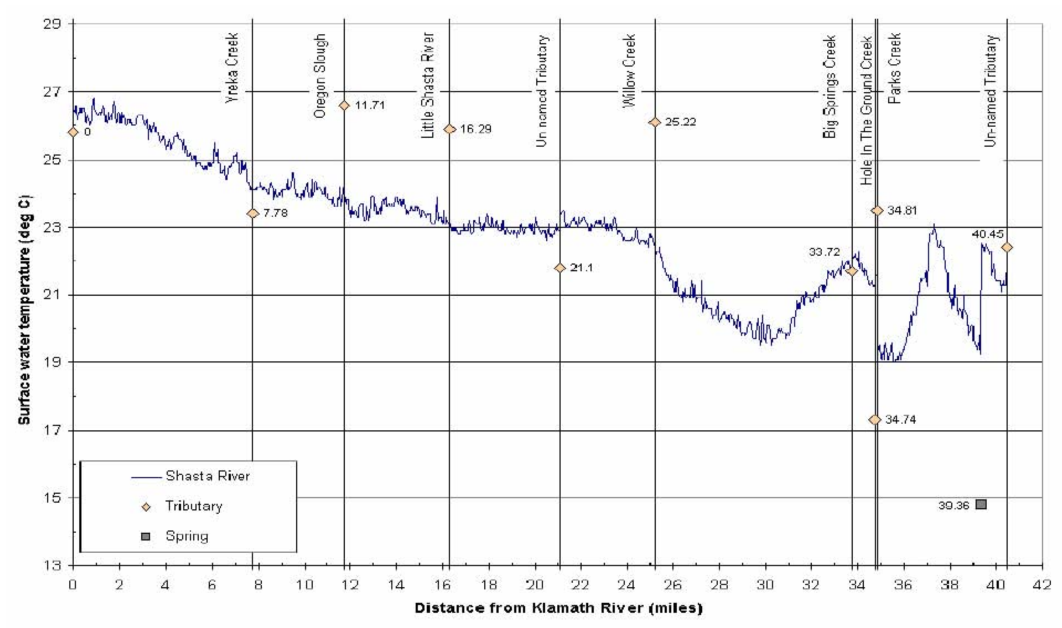
Figure 3.2-5
Shasta River Mean Daily Flows,
USGS Gage No. 11517500 (WY 2002-2005)



SOURCE: NCRWQCB (2006a)

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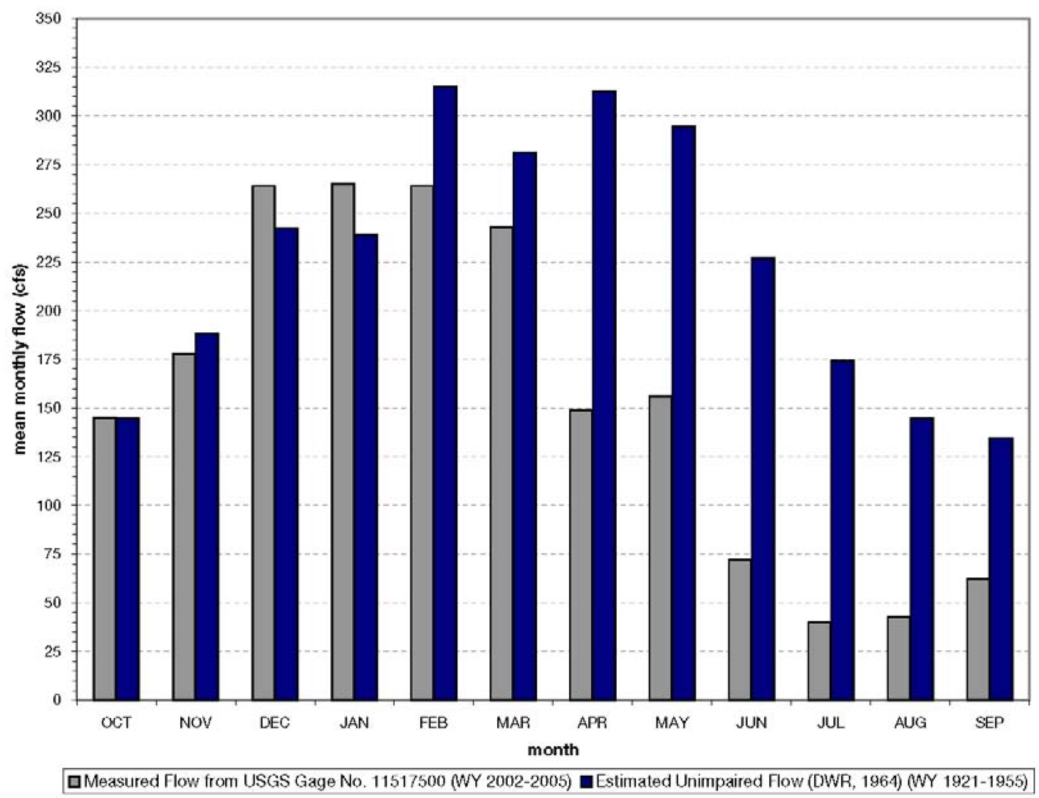
Figure 3.2-6
Shasta River Longitudinal Temperature Profile
(July 26, 2003)

The flow regime of the Shasta River is dominated by discharge from numerous cool-water springs and not by surface runoff (NRC, 2004). The major source area for the springs is Mount Shasta and the associated volcanic uplands to the east and south of the Shasta Valley, as well as localized areas in the Parks Creek watershed. Most of the surface runoff is generated in the uplands on the west side of Shasta Valley. Runoff peaks generally occur during the winter and late spring and are associated with rain and rain-on-snow events. Flow declines rapidly with the onset of irrigation in April, which reduces baseflow volumes during the spring and summer months. **Figure 3.2-7** depicts unimpaired flow estimates in comparison with measured flow volumes for the Shasta River. Flow slowly begins to increase in September and then spikes more dramatically beginning in October, which is when most of the seasonal irrigation diversions cease. Winter baseflow conditions typically are 180 to 200 cfs, regardless of precipitation (NRC, 2004).



NOTE: Average monthly runoff in acre-feet (DWR, 1964) converted to average monthly runoff in cubic feet per second.

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SOURCE: USGS (2007); DWR (1964)

Figure 3.2-7
Shasta River Measured Flow and Estimated Unimpaired Flow

The present hydrologic regime of the Shasta River is affected by surface water diversions, groundwater pumping, and Dwinnell Dam. In the Shasta Valley upstream of County Road A12, water supplied for irrigation is approximately one-half from surface water and one-half from groundwater. Downstream of County Road A12, which covers the majority of the agricultural areas in the Shasta Valley, water supplied for irrigation is approximately one-fifth from groundwater, while the remaining acreage is irrigated with surface water (SVRCD, 2005). In this latter reach, irrigation tailwater return to the river is common and contributes to temperature gains, but at the same time is a component of instream flow (SVRCD, 2005).

Allocated diversion volumes for the mainstem Shasta River are shown in Table 3.2-1.

Groundwater Use

The exceptionally high productivity of the aquifers and the large recharge area make groundwater one of the most important and resilient resources in the Shasta Valley. However, groundwater was not part of the adjudication of water rights in the Program Area, and little is known about its influence on surface flows (NRC, 2004). Most of the surface water resources in the Program Area are fully appropriated and adjudicated. As a result, those who seek additional water for irrigation or domestic use must rely on groundwater. According to information summarized by DWR (1994), annual groundwater well installation peaked dramatically in the 1970s, leveled off in the 1980s, and has continued at a relatively steady rate up to the present. Approximately 17.9 percent of the irrigated acreage in the Program Area uses groundwater exclusively, the remaining irrigated acreage uses either surface water exclusively, or some combination of groundwater and surface water (DWR, 2006).

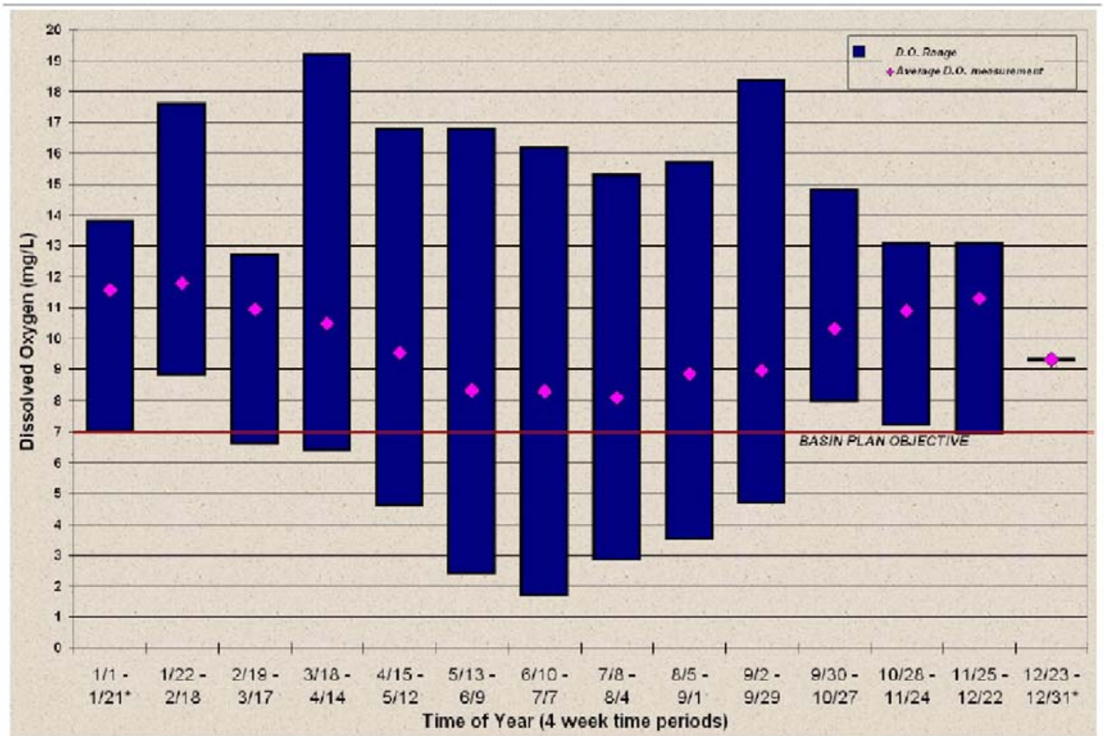
Water Quality

The NCRWQCB (NCRWQCB, 2006b) has identified water quality issues for the Shasta River related to temperature and to organic enrichment/low dissolved oxygen (e.g., high nutrient loads). In the Program Area, elevated temperatures and low dissolved oxygen contribute to the impairment of beneficial uses associated with the cold water fishery, specifically the salmonid fishery (NCRWQCB, 2006a). Potential sources for these water quality issues can be described by a few general categories: agricultural runoff, flow regulation and modification, and habitat modification (e.g., removal of riparian vegetation).

Temperature. Numerous parties have collected temperature data in the Program Area, including private landowners, the Shasta River CRMP, SVRCD, CDFG, DWR, the U.S. Fish and Wildlife Service (USFWS), the U.S. Environmental Protection Agency (USEPA), and NCRWQCB (NCRWQCB, 2006a). Shasta River temperature data records date back to the 1930s, but intensive temperature monitoring using continuous temperature probes began in the 1990s. Figure 3.2-6 shows Shasta River temperature data presented by NCRWQCB (NCRWQCB, 2006a).

Daily water temperature fluctuations vary throughout the Program Area and may fluctuate up to 8°C (14°F) (daily) during summer months at some locations, including the mouth of the Shasta River. Daily minimum water temperatures in the lower mainstem in summer are typically greater than 20°C (68°F), and daily maximums often exceed 25°C (77°F) (NRC, 2004). The Shasta River becomes progressively cooler in the upstream direction, but temperatures remain largely suboptimal for cold water fish species for most of its length from late June through early September. The causes of high temperatures include chronic low flow due to agricultural diversions, lack of riparian shading, and addition of warm irrigation tailwater (NRC, 2004).

Dissolved Oxygen. Measurement of dissolved oxygen concentrations of the Shasta River has been conducted by numerous parties, including private landowners, the Shasta River CRMP, SVRCD, the City of Yreka, CDFG, DWR, USFWS, USEPA, and NCRWQCB (NCRWQCB, 2006a). Dissolved oxygen records date back to the 1960s, but intensive dissolved oxygen monitoring using continuous recording devices began in the 1990s. **Figure 3.2-8** shows Shasta River dissolved oxygen data as presented by NCRWQCB (2006a). The data presented in Figure 3.2-8 is a composite of all dissolved oxygen measurements for mainstem Shasta River locations over the period from 1994 to 2004.



SOURCE: NCRWQCB (2006a)
* Less than 4 weeks

Shasta River Watershed-Wide Permitting Program . 206063
Figure 3.2-8
Shasta River Dissolved Oxygen Concentrations

Dissolved oxygen concentrations[4] vary both seasonally and spatially along the mainstem Shasta River. According to the data summarized and collect by NCRWQCB (2006a), with few exceptions, mainstem Shasta River dissolved oxygen concentrations are above 7.0 milligrams per liter (mg/L) (the Basin Plan minimum objective) during the fall and winter; though dissolved oxygen concentrations fall below this value for some period of time during the summer at all locations monitored on the mainstem Shasta River (NCRWQCB, 2006a), dissolved oxygen concentrations below saturation are apparently uncommon during the day in the Shasta River, but

[4] As temperature increases, less oxygen can be dissolved in water. One hundred percent saturation for freshwater at sea level and 15°C (59°F) is around 10.1 mg/L, at 20°C (68°F) it is approximately 9 mg/L, and at 25°C (77°F) it is around 8.3 mg/L (SWRCB, 2004).

where they occur, they coincide with high temperatures and low flows (Campbell, 1995, and Gwynne, 1993, in NRC, 2004).

Growth and development of the different life stages of salmon are impacted by reductions in the water's dissolved oxygen concentration. Reductions can affect fitness and survival by altering embryo incubation periods, decrease the size of fry, increase the likelihood of predation, and decrease feeding activity (SWRCB, 2004). In juveniles and adults it can impact their ability to swim, feed, and reproduce. In salmonid embryo and larval stages, no production impairment occurs at a dissolved oxygen concentration of 11 mg/L in the water column and an intragravel concentration of 8 mg/L (assumes a 3mg/L DO concentration loss between the surface water and gravels) (USEPA, 1986). As the dissolved oxygen concentration drops, a slight production impairment occurs in the water column at 9 mg/L and an intragravel concentration 6 mg/L, and severe production impairment occurs at 7 mg/L in the water column and 4 mg/L for the intragravel concentration. Juvenile and adult salmonids show no production impairment at concentrations of 8 mg/L, a slight impairment at 6 mg/L, and severe impairment when concentrations reach 4 mg/L. Most fish will not survive when the dissolved oxygen concentration is below 3 mg/L.

Water quality issues have also been examined and summarized for Lake Shastina (Vignola and Deas, 2005). In general, Lake Shastina has had and continues to experience water quality problems as a result of eutrophication.[5] The nutrient levels and algal assemblages in Lake Shastina are typical of eutrophic waters that are generally under-saturated with regards to dissolved oxygen. CDFG (1964a, 1964b, 1965a, 1965b, 1969, 1975, 1979, and 2001, *as cited in* Vignola and Deas, 2005) has reported on various water quality conditions and fish kills at Lake Shastina. Identified problems that potentially lead to fish die-off included elevated temperatures, low dissolved oxygen levels or anoxia, algal blooms, elevated ammonia, and elevated pH levels.

The Impact of Diversions on Flow Volume and Water Quality

As discussed above, water diversions have led to decreased surface flows in the spring and summer months, thereby reducing the amount of instream habitat and locally increasing ambient surface water temperatures. As part of the Program, CDFG would authorize the take of coho salmon that might occur incidental to diverting and using water pursuant to and in accordance with a valid water right (ITP Covered Activity 1). All water diversions are existing, ongoing diversions, both active and passive. NRC (2004) has concluded that the adjudication of surface waters under the Shasta River Decree, as currently administered, is insufficient to supply the quantity and quality of water necessary to sustain salmonid populations in the Program Area. Further, and more specifically, NCRWQCB (2006a) has concluded that elevated temperatures and low dissolved oxygen contribute to the non-attainment of beneficial uses associated with the cold-water fishery, namely the salmonid fishery. This is the existing condition within the Program Area. Over time, the persistence of unnaturally low baseflow volumes can exert an effect over an increasingly

[5] Eutrophication is the process whereby a water body receives an excess of nutrients (usually nitrogen and phosphorous) that subsequently stimulate excessive plant and algal growth. This enhanced plant growth, often called an algal bloom, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die.

larger area, such as adversely affecting the condition of the riparian corridor (e.g., lowering the streamside water table, loss of stabilizing vegetation, and subsequent increased rates of bank erosion and channel incision during high-flow periods). These effects can be further exacerbated by an increase in the rate of water diversion or extraction.

Implementation of the Program would not cause Agricultural Operators to increase their surface water diversions or increase the amount of water they are entitled to divert. To the contrary, the Program, by means of a number of required measures, would provide a mechanism to verify, monitor, and control the diversion and use of water within the Program Area to ensure that such diversion and use is based on a valid water right.

Lower Shasta River (Canyon Reach)

The lower portion of the Program Area (downstream of the confluence of Yreka Creek and the Shasta River) has an area of approximately 9.2 square miles and comprises about 1 percent of the entire Program Area. This reach of the Shasta River is approximately 7.7 miles in length. The elevation of the channel ranges from 2,387 feet amsl at the Yreka Creek confluence to 2,020 feet at the confluence with the Klamath River (the mouth of the Shasta River). This reach of the Shasta River is steep and surrounded by high, steeply sloping, rugged mountains. The channel winds down to the Klamath River in large meanders cut into, and confined by, bedrock. In many places in the canyon section, the highway alignment required deep cuts across and into the steep valley slopes. These steep cut slopes are especially susceptible to erosion and are responsible for contributing a large volume of fine sediment to the river (Ayres Associates, 1999). The canyon section of the lower Shasta River is a cobble-boulder bed channel that contains several cobble-boulder riffles and intermittent bedrock outcrops. Historically, gravel was supplied to this reach from Yreka Creek, but channelization, capture of flood flows, and stream incision associated with mining in the Yreka Creek watershed have substantially reduced the natural sediment supply. As a result, the lack of gravel and cobbles in the lower gorge of the Shasta River reflects a greatly reduced sediment supply (Ayres Associates, 1999).

Upper Shasta River (upstream of Dwinnell Dam)

The upper portion of the Program Area (upstream of Dwinnell Dam) has an area of approximately 127 square miles and comprises about 16 percent of the entire Program Area; this reach of the Shasta River is approximately 17.8 miles in length. The headwater elevations of this portion of the watershed range from 14,162 feet amsl (Mount Shasta) to 9,025 feet amsl (Mount Eddy), while in the lowland valley portion the elevation reduces to a minimum of 2,750 feet amsl at the base of Dwinnell Dam. This area experiences relatively high annual precipitation, both as rain and snow. Runoff from the Eddy Mountains (to the southwest) is predominately surface flow, while Mount Shasta (to the southeast) provides a large source of spring flow to the channels emerging from its flanks in the southeast portion of the watershed. Thus, flows in Dale Creek, Eddy Creek, and the Shasta River can be flashy, while flows in the predominately spring-fed creeks (Boles Creek, Beaughton Creek, and Carrick Creek) tend to be less variable and provide reliable baseflow in both wet and dry years (SVRCD, 2005). In addition to the water flowing down the Parks Creek bypass, Dwinnell Dam captures flow from the upper Shasta River watershed.

Although the Pleistocene debris avalanche deposit underlies most of this portion of the Program Area, it has been overlain by more recent materials including granitic and metamorphic sediment from the Franciscan highlands in the Mount Eddy area and more recent volcanic materials eroded from Mount Shasta and the volcanic terrain to the southeast. Because of comparatively high gradients and abundant streamflow, gravels are readily transported downstream until they reach the large flat area now occupied by Lake Shastina. This was reportedly the downstream end of gravel deposition prior to construction of Dwinnell Dam (SVRCD, 2005).

Allocated diversion volumes for the upper Shasta River and tributaries within this portion of the watershed are summarized in Table 3.2-1.

Parks Creek

The Parks Creek watershed drains an area of approximately 55 square miles to the west of the City of Weed and comprises about 7 percent of the entire Program Area; Parks Creek (including the West Fork) is approximately 23.3 miles in length. Parks Creek originates on China mountain (at a peak elevation of 8,542 feet amsl), flows east down to the Valley, and then turns and winds northeast to its confluence with the Shasta River near RM 35 (at an elevation of 2,590 feet amsl). Parks Creek has its headwaters in terrain dominated by historic glacial formation processes; from the glaciated valleys of the headwaters it transitions slowly to flat and broad alluvial fans which have formed wetlands in the lower 3 to 4 miles of the stream (SVRCD, 2005). In its lowest 10 miles, Parks Creek crosses through the debris avalanche deposits.

Parks Creek varies from a deeply incised stream with high banks in its upper reaches to a low-banked, meandering stream well connected to the surrounding landscape in its lower reaches. Flow in Parks Creek is flashy in the winter and spring due to rain-on-snow events, while substantial summer base flow is provided by numerous springs scattered along its length (SVRCD, 2005). During the summer, surface flow is intermittently lost in some reaches of Parks Creek (KRIS, 2007) while other reaches maintain year-round flow due to the influence of springs. Parks Creek is the only stream still connected to a headwater area capable of generating frequent flood events. Other similar tributaries are either disconnected from the Shasta River by Dwinnell Dam or receive too little precipitation to generate significant flows (SVRCD, 2005). Coupled with significant coarse and fine sediment supply in its headwater areas, this means that Parks Creek is capable of moving substantial amounts of sediment. However, much of this coarse sediment load is deposited in the flat, lower reaches of Parks Creek and there is little or no evidence of bedload transport to the mainstem Shasta River.

Due to the influence of snowmelt and springs, Parks Creek may have formerly contributed valuable cold water to the Shasta River during summer months. However, recent investigations suggest that cold water areas in the lower reach of the creek are found only in proximity to springs, and the water delivered to the Shasta River can be quite warm (SVRCD, 2005).

Agricultural activity is focused primarily on pasture for cattle, and most of the irrigation practices make use of surface water. Substantial winter and spring flows from Parks Creek are diverted into the Shasta River for storage at Dwinnell Dam, thereby reducing the natural source of coarse sediment supply to downstream reaches. Although Parks Creek is a gravel- and cobble-bedded stream at the point of diversion, it has now been identified as a significant source of fine sediment to the middle and lower Shasta River (LaPlante, 2001). Irrigation tailwater return is known to occur in this watershed and is believed to be contributing to elevated water temperatures in Parks Creek (SVRCD, 2005). In addition, the lower 15 miles of Parks Creek has areas of significant and long-standing livestock impacts resulting in increased sedimentation and decreased shade.

Allocated diversion volumes for Parks Creek and its tributaries are summarized in Table 3.2-1.

Yreka Creek

The Yreka Creek watershed drains an area of approximately 52 square miles surrounding the City of Yreka and comprises about 6.5 percent of the entire Program Area. The creek is approximately 12 miles in length. Elevations within this watershed range from 5,810 feet amsl along its western divide (with the Scott Valley) to 2,387 feet amsl at the confluence with the Shasta River. General characteristics of Yreka Creek vary from steep and deeply incised in its upper reaches to a near-surface stream in its alluvial lower reaches (SVRCD, 2005). Through the City of Yreka the creek has been altered and partially channelized. Downstream of Yreka, the creek’s floodplain was completely overturned by dredge mining prior to the early 1940s (SVRCD, 2005). Subsequently, in the 1950s, the dredge tailings were leveled and Yreka Creek was relocated to a newly constructed channel at the base of the hills bordering the eastern edge of the historic floodplain (SVRCD, 2005).

Irrigation diversions capture the available water in the headwater reaches of Yreka Creek (SVRCD, 2005). The Greenhorn Reservoir, owned by the City of Yreka and used for recreational purposes, captures runoff from Greenhorn Creek, a principal tributary to Yreka Creek. Underflow of both Yreka Creek and Greenhorn Creek is also used for domestic and irrigation purposes (SVRCD, 2005). Surface flows are maintained in Yreka Creek through the summer as a result of releases from Greenhorn Reservoir, and sub-surface inflows below the Yreka Wastewater Treatment Plant (KRIS, 2007).

Allocated diversion volumes for Yreka Creek and its tributaries are summarized in Table 3.2-1.

Julian Creek and Willow Creek

Julian Creek and Willow Creek drain much of the remainder of the westside of the Program Area between the Parks Creek watershed to the south and the Yreka Creek watershed to the north. The Julian Creek watershed is 33.8 square miles in extent (4.2 percent of the Program Area); the Willow Creek watershed is 89.4 square miles in extent (11.2 percent of the Program Area). Both of these creeks have their headwater areas among very old igneous and sedimentary rock formations, and both emerge onto the gently sloping debris avalanche deposit of the Shasta Valley. Compared to the eastside of the Program Area, where percolation of rain and snow through porous volcanic rock formations dominates the runoff process, runoff from these uplands on the westside is predominantly surface flow. Julian Creek is unique in being the only tributary that flows across the debris avalanche deposit yet is capable of delivering coarse sediment to the Shasta River. Most years, however, this watershed generates little overland flow and significant amounts of coarse materials are only delivered during very large flood events (SVRCD, 2005). Much of the length of these tributaries is dry by mid-summer (SVRCD, 2005).

Allocated diversion volumes for Willow Creek and its tributaries are summarized in Table 3.2-1.

Little Shasta River

The Little Shasta River drains an area of approximately 131 square miles, comprising about 16 percent of the entire Program Area. The Little Shasta River is approximately 26 miles long, and flows through the northeast portion of the Program Area. Elevations within this watershed range from 8,241 feet amsl at Goose Nest to 2,471 feet amsl at the confluence with the Shasta River (SVRCD, 2005). The Little Shasta River watershed consists of Cascade volcanic terrain in its headwater area, a steep constrained canyon along its middle reaches, and dry flatlands along its lower reaches, where the influence of the ancient debris avalanche predominates. Similar to Parks Creek, the Little Shasta River deposits most of its coarse sediment load within the Valley prior to reaching the Shasta River. Flow can be flashy in the winter and spring, though the highly porous soils, the relatively low elevation, and the modest amount of precipitation within this watershed all tend to minimize runoff (SVRCD, 2005). Substantial summer baseflow is provided by numerous springs in the headwater areas and other springs concentrated near RM 13 (SVRCD, 2005). The numerous diversions on the Little Shasta River routinely dewater the channel in late summer (NRC, 2004).

Agricultural activities in the Little Shasta River watershed are primarily cow-calf operations, with land used for dryland and irrigated pasture, production of grass and alfalfa, and production of small grains for livestock feed. Allocated diversion volumes for the Little Shasta River and its tributaries are summarized in Table 3.2-1.

Eastern Volcanic Area and Big Springs Creek

The eastern volcanic area sub-watershed refers to the vast area to the east of the Shasta River between the upper Shasta River watershed and the Little Shasta River watershed. The geology of this area is dominated by recent lava (mainly basalt) flows emanating from Mount Shasta, and to a lesser degree by older (i.e., late Pleistocene and Tertiary) lava flows in its northern portion. Most of the eastern streams that cross the lava flows of the high Cascades normally do not maintain surface flow as far west as Shasta Valley, owing to the porous nature of the lava (Mack, 1960). Concerning the Program, the dominant hydrologic feature of this sub-watershed is Big Springs Creek. During summer months Big Springs Creek inflow accounts for up to 50 percent of the flow in the Shasta River downstream of Big Springs Creek (NCRWQCB, 2006a).

As summarized by SVRCD (2005):

> Big Springs Creek (along with its only tributary, Little Springs Creek) presents the most visibly important component of the entire Shasta River as its major source of cold water in summer. While less visible, the entire area around Big Springs, the lower end of Parks Creek, and for several miles upstream/downstream of the Big Springs Creek confluence the area is dotted with springs, named and unnamed, that collectively create nearly all the

instream flow of the Shasta in the summer. In this area ground water apparently originating from the porous volcanic slopes of Mt. Shasta, Whaleback and Herd Peak encounter the relatively impermeable volcanic debris flow deposits, and are forced to the surface, discharging at approximately 56-58°F (13-14°C) year round. In addition to high quality water, gravels are also located in large patches in this portion of the reach, and present substantial spawning areas.

Historically flows at the mouth of Big Springs Creek were apparently on the order of 100 to 120 cfs, and were largely unaffected by climatic variability. Unfortunately, lack of access to this entire area for scientific investigation severely limits the ability to report directly on current conditions.[6]

Conclusions Regarding Hydrologic and Geomorphic Setting for the Shasta River Watershed

Past and present human activity and development have substantially altered the hydrologic and geomorphic conditions within the Program Area. The most important detrimental land uses have been timber harvesting and related road construction, fire suppression, beaver removal, mining and dredging, channel modification and flood control, agricultural practices, and the construction of Dwinnell Dam. The principal impacts of these human actions have been an altered channel structure, an altered flow regime, and disruption of sediment transport processes. Some of these impacts may be essentially irreversible or infeasible to change (e.g., Dwinnell Dam); others can be partially alleviated or even completely repaired in some cases (e.g., enhancement of the riparian corridor). Most of the lasting impacts observed today are the collective result of multiple actions and land management decisions, and it is often difficult to “tease out” the relative influence of any one particular action. Nevertheless, it is important to understand that historical or continuing practices such as flow regulation, channel modification, and grazing can affect contemporary river characteristics for decades, or longer.

3.2.2 Regulatory Setting

Federal and State Water Quality Policies

The statutes that govern the activities under the Program that affect water quality aspects are the federal Clean Water Act (CWA) (33 U.S.C. § 1251) and the Porter-Cologne Water Quality Control Act (Porter-Cologne) (Water Code, § 13000 *et seq.*). These acts provide the basis for water quality regulation in the Program Area.

The California Legislature has assigned the primary responsibility to administer and enforce statutes for the protection and enhancement of water quality to the SWRCB and its nine Regional Water Quality Control Boards (RWQCB). The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for the implementation of state and federal regulations. The nine RWQCBs throughout California adopt and implement

6 Recently, access to perform hydrologic studies has been granted in parts of the Big Springs Creek area. Flow monitoring began on Big Springs creek in the spring of 2008; the data collected to date is preliminary and subject to approval and quality assurance by those parties collecting and analyzing the data.

water quality control plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems. The RWQCB adopts and implements a Water Quality Control Plan (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan (California Water Code, §13240-13247).

Corps Permit and Water Quality Certification

CWA section 404 requires a permit from the United States Army Corps of Engineers (Corps) prior to discharging dredged or fill material into waters of the United States, unless such a discharge is exempt from CWA section 404. The term “waters of the United States” as defined in the Code of Federal Regulations (40 CFR 230.3[s]) includes all navigable waters and their tributaries. In addition, section 401 of the CWA requires that an applicant for any federal permit (e.g., a Corps 404 permit) obtain certification from the state that the discharge will comply with other provisions of the CWA and with state water quality standards. For the Program Area, NCRWQCB or the SWRCB (in the case of activities associated with water diversions) must provide the water quality certification required under section 401 of CWA. It is up to the individual project proponent, in this case the sub-permittees and SVRCD, to contact the federal agency(s) in order to determine whether the federal agency(s) would take jurisdiction on a specific project and require a permit; if a federal permit is required then the project proponent would also be required to obtain water quality certification from NCRWQCB.

Beneficial Use and Clean Water Act Section 303(d)

NCRWQCB is responsible for the protection of the beneficial uses of waters within Siskiyou County. NCRWQCB uses its planning, permitting, and enforcement authority to meet this responsibility and has adopted the Water Quality Control Plan for the North Coast Region (Basin Plan) to implement plans, policies, and provisions for water quality management. NCRWQCB published the most recent version of the Basin Plan in September 2006 (NCRWQCB, 2006c).

In accordance with state policy for water quality control, NCRWQCB employs a range of beneficial use definitions for surface waters, groundwater basins, marshes, and mudflats that serve as the basis for establishing water quality objectives and discharge conditions and prohibitions. The Basin Plan (NCRWQCB, 2006c) has identified existing and potential beneficial uses supported by the key surface water drainages throughout its jurisdiction. The beneficial uses designated in the Basin Plan for the water bodies relevant to the Program are identified in **Table 3.2-2**. The applicable beneficial use categories are defined in **Table 3.2-3**. The Basin Plan (NCRWQCB, 2006c) also includes water quality objectives for each of the identified beneficial uses.

The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Under CWA section 303(d), the State of California is required to develop a list of impaired water bodies that do not meet water quality standards and objectives. A statewide list of impaired water bodies was first established in 1998, and subsequently has been updated to include more recent information and new pollutants.

TABLE 3.2-2
BENEFICIAL USES IN THE SHASTA VALLEY HYDROLOGIC AREA

Waterbody	MUN[a]	AGR	IND	PRO	GWR	FRSH	NAV	POW	REC 1	REC 2	COMM	WARM	COLD	WILD	RARE	MIGR	SPWN	AQUA
Shasta River & Tributaries	E	E	E	P	E	E	E	P	E	E	E	E	E	E	E	E	E	E
Lake Shastina	P	E	P	P	E	E	E		E	E		E	E	E		P		P
Lake Shastina Tributaries	E	E	E	P	E	E	P	P	E	E	E	E	E	E		E	E	P

E = existing beneficial use
P = potential beneficial use

[a] Refer to Table 3.2-3, below, for definition of abbreviations

SOURCE: NCRWQCB (2006c)

Table 3.2-4 provides details of the listing of the Shasta River as an impaired water body, as designated by NCRWQCB (2006b), including pollutants and issues of concern. For those water bodies failing to meet standards, states are required to establish total maximum daily loads (TMDL). A TMDL defines how much of a specific pollutant a given water body can tolerate and still meet relevant water quality standards. The Shasta River has been listed as impaired because of temperature and dissolved oxygen levels in excess of (or in the case of dissolved oxygen, below) water quality standards described in the CWA or in the Basin Plan. In the Program Area, elevated temperatures and low dissolved oxygen contribute to the non-attainment of beneficial uses associated with the cold water fishery, specifically the salmonid fishery (NCRWQCB, 2006a). Water quality standards concerning Shasta River temperature and dissolved oxygen levels have also been identified in the Basin Plan (NCRWQCB, 2006c). The standards stipulate that the natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the RWQCB that such alteration in temperature does not adversely affect beneficial uses, and at no time or place shall the temperature of any “cold” water be increased by more than 2.8°C (5°F) above the natural receiving water temperature. Further, the standards state that the minimum dissolved oxygen level for the Shasta River (and other streams within the Program Area) is 7.0 mg/L and the 50 percent lower limit[7] is 9.0 mg/L.

The Staff Report for the Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads was published in June of 2006 (Shasta River TMDL; NCRWQCB, 2006a). In general, this document identifies and describes the causes of impairment and recommends specific actions and implementation measures in order to achieve the water quality standards set forth in the Basin Plan. To help reduce ambient stream temperatures in the

7 Fifty percent upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. Fifty percent or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

TABLE 3.2-3
DEFINITIONS OF BENEFICIAL USES OF SURFACE WATERS

Beneficial Use	Description
Municipal and Domestic Supply (MUN)	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
Agricultural Supply (AGR)	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
Industrial Service Supply (IND)	Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.
Industrial Process Supply (PRO)	Uses of water for industrial activities that depend primarily on water quality.
Groundwater Recharge (GWR)	Uses of water for natural or artificial recharge or groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
Freshwater Replenishment (FRSH)	Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
Navigation (NAV)	Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
Hydropower Generation (POW)	Uses of water for hydropower generation.
Water Contact Recreation (REC 1)	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white-water activities, fishing, or use of natural hot springs.
Non-Contact Water Recreation (REC 2)	Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
Commercial and Sport Fishing (COMM)	Uses of water for commercial, recreational (sport) collection of fish, shellfish, or other aquatic organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
Warm Freshwater Habitat (WARM)	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Cold Freshwater Habitat (COLD)	Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Wildlife Habitat (WILD)	Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
Rare, Threatened, or Endangered Species (RARE)	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal laws as rare, threatened, or endangered.
Migration of Aquatic Organisms (MIGR)	Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.
Spawning, Reproduction, and/or Early Development (SPWN)	Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
Aquaculture (AQUA)	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

SOURCE: NCRWQCB (2006c)

TABLE 3.2-4
PROPOSED 2006 CWA SECTION 303(D) LIST OF WATER QUALITY LIMITED SEGMENTS IN THE PROGRAM AREA

Name	Pollutant/Stressor	Source	TMDL Completion Date
Shasta River	Organic Enrichment / Low Dissolved Oxygen	• Minor Municipal Point Source • Agriculture – storm runoff • Agriculture – irrigation tailwater • Dairies • Hydromodification • Dam Construction • Flow Regulation/Modification • Habitat Modification	Staff Report for the Action Plan published on June 28, 2006
	Temperature	• Agriculture – irrigation tailwater • Flow Regulation/Modification • Habitat Modification • Removal of Riparian Vegetation • Drainage/Filling of Wetlands	Staff Report for the Action Plan published on June 28, 2006

SOURCE: NCRWQCB (2006b)

Shasta River, NCRWQCB (2006a) has identified temperature loading allocations for tailwater return flow and instream surface flows. In terms of tailwater return, NCRWQCB (2006a) calls for no net increase in receiving water temperature; for surface water flows, NCRWQCB (2006a) calls for reductions in the maximum daily stream temperature, by means of an increase and dedication of cold-water instream flow, of 1.5°C (2.7°F), 1.2°C (2.2°F), and 2.1°C (3.8°F) at RM 24.1, RM 15.5, and RM 5.6, respectively. Through modeling exercises that also incorporate and simulate additional improvement measures (including increased shading through riparian vegetation restoration), NCRWQCB (2006a) has concluded that satisfying the above criteria would result in a decrease in the ambient water temperature of the Shasta River and attainment of the temperature component of the cold-water beneficial use. In addition, to help increase dissolved oxygen levels in the Shasta River the NCRWQCB (2006a) has also identified a nitrogenous oxygen demand (NBOD) loading allocation of 0.85 mg/L for tailwater return flows.

NPDES Program

The CWA was amended in 1972 to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. In November 1990, USEPA published final regulations that establish storm water permit application requirements for discharges of storm water to waters of the United States from construction projects that encompass five or more acres of soil disturbance. Regulations (Phase II Rule) that became final on December 8, 1999, expanded the existing NPDES Program to address storm water discharges from construction sites that disturb land equal to or greater than one acre and less than five acres (small construction activity) (SWRCB, 1999).

While federal regulations allow two permitting options for storm water discharges (individual permits and General Permits), SWRCB has chosen to adopt only one statewide General Permit at this time that would apply to all storm water discharges associated with construction activity.[8] This General Permit requires all dischargers where construction activity disturbs one acre or more, to:

- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices (BMPs) that would prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off site into receiving waters.
- Eliminate or reduce non-storm water discharges to storm sewer systems and other waters of the nation.
- Perform inspections of all BMPs.

This General Permit is implemented and enforced by the nine RWQCBs. NCRWQCB administers the stormwater permitting program in the section of Siskiyou County that includes the Program Area. Dischargers are required to submit a Notice of Intent (NOI) to obtain coverage under this General Permit and annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected. Dischargers are responsible for notifying the relevant RWQCB of violations or incidents of non-compliance.

On August 19, 1999, SWRCB reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ, referred to as “General Permit”). In September 2000, a court decision directed SWRCB to modify the provisions of the General Permit to require permittees to implement specific sampling and analytical procedures to determine whether BMPs implemented on a construction site are: (1) preventing further impairment by sediment in storm waters discharged directly into waters listed as impaired for sediment or silt, and (2) preventing other pollutants that are known or should be known by permittees to occur on construction sites and that are not visually detectable in storm water discharges from causing or contributing to exceedances of water quality objectives. The monitoring provisions in the General Permit have been modified pursuant to the court order.

As part of the Program, if a Covered Activity performed at a single project location will disturb a total of one acre or more of land, then SVRCD or the Agricultural Operator performing the activity will be required to submit a NOI to SWRCB and obtain coverage under the General Permit. The preparation of a SWPPP would be required in accordance with the General Permit. The SWPPP would include, but not be limited to, relevant measures, conditions, and obligations already described as part of the Program which would reduce the impacts of construction activities on stormwater and receiving water quality and quantity.

[8] SWRCB Order No. 99-08-DWQ National Pollutant Discharge Elimination System General Permit No. CAS000002.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act (codified in the California Water Code, §13000 *et seq*.) is the basic water quality control law for California. As mentioned above, it is implemented by SWRCB and the nine RWQCBs. SWRCB establishes statewide policy for water quality control and provides oversight of RWQCBs' operations. RWQCBs have jurisdiction over specific geographic areas that are defined by watersheds. Siskiyou County is under the jurisdiction of NCRWQCB. In addition to other regulatory responsibilities, RWQCBs have the authority to conduct, order, and oversee investigation and cleanup where discharges or threatened discharges of waste to waters of the state[9] could cause pollution or nuisance, including impacts to public health and the environment.

Dredge/Fill Activities and Waste Discharge Requirements

Covered Program Activities that involve or are expected to involve dredge or fill, and discharge of waste, are subject to water quality certification under section 401 of the CWA and/or waste discharge requirements under the Porter-Cologne Act. SWRCB's Division of Water Rights processes section 401 water quality certifications on projects that involve water diversions (California Code of Regulations, title 23, § 3855). Chapter 4, Article 4 of the Porter-Cologne Act (California Water Code, § 13260-13274), states that persons discharging or proposing to discharge waste that could affect the quality of waters of the state (other than into a community sewer system) shall file a Report of Waste Discharge with the applicable RWQCB. For discharges directly to surface water (waters of the United States) an NPDES permit is required, which is issued under both state and federal law; for other types of discharges, such as waste discharges to land (e.g., spoils disposal and storage), erosion from soil disturbance, or discharges to waters of the state (such as isolated wetlands), Waste Discharge Requirements (WDRs) are required and are issued exclusively under state law. The WDR application process is generally the same as for CWA section 401 water quality certification, though in this case it does not matter whether the particular project is subject to federal regulation. The project proponent would contact the NCRWQCB, who would determine whether WDRs or a waiver of WDRs is required.

State Regulation and Oversight of Water Rights

SWRCB regulates the diversion and use of water in California, in part by the issuance of permits and licenses. In general, under state law, a person may divert and use water under a riparian or appropriative right. A riparian right entitles the landowner to use a correlative share of the water flowing past his or her property. Riparian rights do not require permits, licenses, or government approval, but they apply only to the water which would naturally flow in the river (or stream or creek), and they may only be exercised on the property adjacent to the stream. Further, riparian rights do not entitle a water user to divert water to storage in a reservoir for use in the dry season or to use water on land outside of the watershed that comprises the diversion location. Riparian

9 "Waters of the state" are defined in the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, § 13050 (e)).

rights remain with the property when it changes hands, although parcels severed from the adjacent water source generally lose their right to the water.

An appropriative water right allocates a given rate and/or volume of water to a specific entity or user. In California, appropriative water rights are generally described as pre-1914 and post-1914 rights. For pre-1914 rights, water rights could be acquired simply by taking and beneficially using water, and also (e.g., after 1872) through establishing a priority of right by posting a notice of appropriation at the proposed point of diversion and recording the notice with the respective County Recorder (SWRCB, 1990). Regardless of the amount of water claimed in the original notice of appropriation or at the time diversion and use first began, the amount of water which can now be rightfully claimed under an appropriative right initiated prior to December of 1914 is essentially fixed by that amount which is being put to beneficial use. Persons diverting water under riparian or pre-1914 claims of right, with certain exceptions, are required to file a Statement of Water Diversion and Use with SWRCB (SWRCB, 1990).

For post-1914 appropriative rights, an application for appropriation of water is submitted to SWRCB, and SWRCB issues permits and/or licenses that govern the beneficial use and diversion and/or storage of water from surface streams, other surface bodies of water, or from subterranean streams flowing in known and definite channels. An appropriation of such water requires compliance with the provisions of Division 2, Part 2, of the California Water Code. Under post-1914 appropriation law, anyone intending to divert water from surface waters or subterranean streams, in order to 1) use on land which is not riparian to the source, 2) store in a reservoir for later use on either riparian or non-riparian lands, or 3) make use of water which would not naturally be in the source, must apply with SWRCB for a permit or small domestic use registration. Aside from the requested amount of water, an application, and the subsequent permit or license (if issued), typically specifies the purpose of use (e.g., irrigation, recreation, fish and wildlife enhancement, etc.), the place of use, and the point(s) of diversion. In order for SWRCB to approve an application, unappropriated water must be available to supply the applicant (e.g., water in many streams, including the Shasta River and its tributaries, has already been fully appropriated during the dry season of the year). Although pre- and post-1914 appropriative rights are similar, post-1914 rights are subject to a much greater degree of scrutiny and regulation by SWRCB. Riparian rights, which usually are inherent in ownership of parcels that border or span streams and rivers, still have a higher priority than appropriative rights. In order for an appropriative or riparian claim to ripen into a prescriptive right, the use must be continuous and uninterrupted for a period of five years (SWRCB, 1990).

In certain cases, use of water does not require an appropriative water right permit or a small domestic use registration. SWRCB does not have permitting authority over the use of groundwater unless it is the underflow of a surface stream or otherwise is flowing in a subterranean stream with a known and definite channel. Further, a permit is not required for the proper exercise of a riparian right or the diversion of surface water under pre-1914 claims of right. However, as mentioned above, diverters are required to file a Statement of Water Diversion and Use with SWRCB.[10]

[10] See California Water Code, § 5101.

In particular circumstances (e.g., when stream systems have a proportionately large amount of diversions, or the system is seemingly over-allocated and the priority of right amongst diverters is in question or disputed), SWRCB may determine all rights to water in a given stream system whether based upon appropriation, riparian right, or other basis of right. Such a determination ultimately takes the form of a legal report often referred to as an adjudication and/or decree, as with the 1932 Shasta River Decree. The process is initiated by one or more claimants (e.g., diverters) formally requesting that a determination of rights be made by SWRCB for a given stream system; SWRCB then determines whether or not such a determination of rights is warranted and, if so, proceeds with the process of quantifying water allocations and priorities of right. Ultimately, such a decree sets forth the priority, amount, season of use, purpose of use, point of diversion, and place of use of the water. Further, with respect to water used for irrigation, the decree also typically declares the parcels of land to which a particular right applies.

Water Rights Changes (California Water Code, § 1707). California Water Code, § 1707 authorizes any person entitled to the use of water to petition SWRCB for a change to the person's existing water right for purposes of preserving or enhancing wetlands habitat, fish and wildlife resources, or recreation in or on the water.

Applicable Local/County Regulations

Siskiyou County General Plan

The Conservation Element of the Siskiyou County General Plan (Siskiyou County, 1973) includes some general objectives relating to hydrology, water resources, and water quality. These objectives include:

- To preserve and maintain streams, lakes and forest open space as a means of providing natural habitat for species of wildlife;
- To preserve the quality of existing water supply in Siskiyou County and adequately plan for the expansion and retention of valuable water supplies for future generations and to provide for a comprehensive program for sustained multiple use of watershed lands through reduction of fire hazards, erosion control and type-conversion of vegetation where desirable and feasible.

3.2.3 Impacts and Mitigation Measures

Significance Criteria

Significance criteria, or thresholds, listed in Appendix G in the California Environmental Quality Act (CEQA) *Guidelines* may be used to determine the significance of a project's potential impacts. Additional (or more specific) criteria and objectives derived from other agencies or documents (e.g., NCRWQCB water quality standards), and determined to be appropriate based on Program-specific considerations, have also been incorporated within the context of Appendix G.

Some of the criteria listed in Appendix G of the CEQA *Guidelines* are not applicable to the Program or otherwise do not merit further discussion. Specifically, the Program is not anticipated to have a potentially significant impact in regard to some of the flood-related criteria in Appendix G. These criteria include exceeding the capacity of stormwater drainage systems, placing housing within a flood hazard area, or exposing people or structures to significant risk of loss, injury, or death involving flooding. Furthermore, the Program Area is not subject to inundation by seiche or tsunami. Parts of the Program area may experience mudflows or be relatively more susceptible to mudflow hazards. Mount Shasta, in the southeast portion of the Shasta River watershed, is an active volcano whose latest flows are probably not more than a few centuries old. An eruption or another kind of extremely rare, catastrophic seismic event on Mount Shasta could trigger a lahar, debris avalanche, or mudflow-like event capable of filling the entire Shasta Valley (such as occurred some 300,000 years ago) and destroying every structure therein, including those constructed as part of the Program. However, such events are extremely rare and the potential risk of loss involving a mudflow (or debris avalanche) is not considered significant in this document. The significance criteria addressed above are not discussed further in this Draft EIR. The significance criteria in Appendix G that are pertinent to the Program, as well as applicable water quality objectives identified by NCRWQCB (2006c), are listed below. Using these criteria, a project or program would normally result in a significant hydrology- and water quality-related impact if it would:

Water Quality

- Cause or contribute to violations of ambient water quality objectives by substantially 1) reducing dissolved oxygen concentrations and 2) altering the ambient temperature of receiving waters such that one or more beneficial uses are adversely affected.
- Otherwise substantially degrade water quality or provide substantial additional sources of polluted runoff, including degradation of stream or river characteristics related to cold freshwater habitat.

Groundwater

- Substantially deplete groundwater supplies or interfere with groundwater recharge.

Surface Water Drainages

- Substantially alter channel stability (erosion or sedimentation rates) through increases or decreases in flow or sediment supply.
- Substantially alter channel stability by changing the course or hydraulic characteristics of a stream or river.

Flooding

- Substantially impede or redirect flood flows

In addition to these considerations, the reader is referred to the discussion of existing conditions, significance criteria, and potential impacts contained in Chapter 3.3, Impact 3.3-1.

Impact Analysis

Impact 3.2-1: Certain construction activities performed under the Program could result in increased erosion and sedimentation and/or pollutant (e.g., fuels and lubricants) loading to surface waterways, which could increase turbidity, suspended solids, settleable solids, or otherwise decrease water quality in surface waterways (Significant).

Construction activities associated with the Program could increase the turbidity or otherwise degrade the water quality of receiving channels and waterways. This is a potentially significant impact. Activities that disturb ground within the floodplain, banks, or bed of a channel could make soils and sediments more susceptible to erosion. Increased erosion rates would likely lead to increased sediment concentrations and turbidity levels in the receiving channel(s) and to the subsequent degradation of aquatic habitats. Also, moderate increases in runoff from construction areas could initiate or exacerbate an erosion and sediment delivery problem. An increase in the runoff rate from the construction area may result from temporarily decreasing the resistance to overland flow (e.g., clearing of native vegetation or on-slope grading), decreasing the infiltration capacity of the soil through compaction, and/or by increasing the velocity of runoff (e.g., concentrating flow into manmade features or into existing rills or gullies). Further, if construction equipment or workers inadvertently release pollutants (e.g., hydraulic fluid or petroleum) on site, these compounds could be entrained by runoff and discharged into receiving channel(s) causing water quality degradation. The extent of erosion or pollution that could occur at any given project site varies depending on soil type, vegetation/cover, and weather conditions.

Most of the Covered Activities and proposed mitigation measures that would require construction involve short-term (i.e., within a single season) construction activities, and thus the associated potential impacts would be temporary in nature. Covered Activities and measures that include notable construction components include maintenance, installation, and removal of water diversion structures; installation and maintenance of fish screens; construction and maintenance of stream crossings; riparian restoration and revegetation; installation, maintenance, and repair of instream structures; and barrier removal projects including fish ladder and boulder weir installations and channel restoration projects. Specific construction activities referenced under this potential impact include, but are not limited to, use of heavy machinery including loaders and backhoes within and near the channels, shallow excavation within and near the channels, moving bed material within the channels, and establishing and grading staging areas for equipment, machinery, and vehicles.

Program measures, as well as adherence to federal and state water quality standards, would help protect water quality during construction activities. As discussed above, if as part of the Program a Covered Activity performed at a single project location will disturb a total of one acre or more of land, SVRCD or the Agricultural Operator performing the project will submit a NOI to SWRCB to obtain coverage for the activity under the General Permit. The preparation of a SWPPP would be required in accordance with the General Permit. The SWPPP would include, but not be limited to, relevant measures, conditions, and obligations already described as part of the Program which would reduce the impacts of construction activities on stormwater and receiving water quality and quantity. However, even for cases where a General Permit would not be required, such as a project which would disturb less than one acre of land, the Program measures, conditions, and obligations that would protect water quality during construction activities would still be implemented.

Covered Activities that involve or are expected to involve dredge or fill, and discharge of waste, are subject to water quality certification under section 401 of the CWA and/or waste discharge requirements under the Porter-Cologne Act. SWRCB's Division of Water Rights processes section 401 water quality certifications on projects that involve water diversions (California Code of Regulations, title 23, § 3855). Chapter 4, Article 4 of the Porter-Cologne Act (California Water Code, § 13260-13274), states that persons discharging or proposing to discharge waste that could affect the quality of waters of the state (other than into a community sewer system) shall file a Report of Waste Discharge with the applicable RWQCB. For discharges directly to surface water (waters of the United States) an NPDES permit is required, which is issued under both state and federal law; for other types of discharges, such as waste discharges to land (e.g., spoils disposal and storage), erosion from soil disturbance, or discharges to waters of the state (such as isolated wetlands), Waste Discharge Requirements (WDRs) are required and are issued exclusively under state law. The WDR application process is generally the same as for CWA section 401 water quality certification, though in this case it does not matter whether the particular project is subject to federal regulation. The project proponent would contact the NCRWQCB, who would determine whether WDRs or a waiver of WDRs is required.

Also, as discussed above, it is up to the individual project proponent (e.g., the Agricultural Operators and SVRCD) to contact the relevant federal agency(s) in order to determine whether that federal agency(s) would take jurisdiction on a specific project and require a permit; if a federal permit is required then the project proponent would be required to also obtain water quality certification from NCRWQCB. In addition, the project proponent would contact NCRWQCB and determine whether an issuance or a waiver of WDRs is required.

However, with respect to controlling erosion and pollutant issues during project construction (and even project operation, in most cases), the conditions and obligations within the Incidental Take Permit (ITP) and Master List of Terms and Conditions (MLTC) are comprehensive and either meet or exceed the provisions normally stipulated in water quality certifications and WDRs. Aside from the seasonal issue discussed below, the Program measures that would protect water quality during construction activities are intended to be appropriate and sufficient with respect to federal and state water quality protection standards.

Of particular concern regarding potential erosion and pollutant impacts is the time of year when construction activities would be allowed. The risk of erosion, sediment delivery, and pollutant loading would be of most concern during the winter and spring, when significant rainfall and runoff occurs. To minimize this risk, the season for instream equipment operations and work related to structural restoration projects is limited to the period from July 1 to October 15 ~~31~~, according to ITP General Conditions (g) and (h) (Article XIII.E.1). Much of this season typically experiences little rainfall and runoff. However, summer thunderstorm events and early winter storms could still occur during the period from July 1 to October 15 ~~31~~, and the potential for early storms increases substantially in the second half of October. Therefore, though the Program measures and regulatory requirements would be adequate to control potential construction-related water quality impacts through the early fall, allowing the construction period to continue ~~through the end of~~ after October 15 poses a potentially significant impact to water quality. If work needs to be completed before July 1 or after October 15, SVRCD is required to request, in writing, a variance from CDFG. If CDFG grants the variance, the work will be completed in accordance with the avoidance, minimization, mitigation, and monitoring measures CDFG specifies in granting the variance.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.2-1a: ITP General Condition (b) (Article XIII.E.1) requires the immediate containment and clean-up of any fuel, lubricants, or other hazardous materials that leak or spill that occurs during a Covered Activity.

Mitigation Measure 3.2-1b: ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation F. – Push-Up Dams and Obligation G. - Other Temporary Diversion Structures (Article XV) requires preparation and adoption of a set of Best Management Practices (BMP) governing the construction, operation, and removal of push-up dams and other temporary diversion structures other than push-up dams.

Mitigation Measure 3.2-1c: The MLTC includes the following conditions which will reduce the potential for construction-related impacts to water quality:

A. Water Diversions: Conditions 33, 36, and 41 ~~31, 34, and 39~~;

C ~~B~~. Instream Structures: Conditions 62, 64-66 ~~58-60~~;

E ~~C~~. Use of Vehicles in Wetted Portions of Streams: Conditions 73-75 ~~65-67~~;

F ~~D~~. Pollution Control: Conditions 76-84 ~~68-75~~;

G ~~E~~. Erosion and Sediment Control: Conditions 85-93 ~~76-84~~;

I ~~F~~. Dewatering: Conditions 98-101, 103, 105-107 8~~9-92, 94, 96-98~~; and

J ~~G~~. Ground-Disturbing Activities: Condition 122 ~~108~~.

Mitigation Measures Identified in this Draft EIR

Mitigation Measure 3.2-1d: The season for instream construction activities and equipment operations shall be limited to the period from July 1 to October 15. If weather conditions permit and the stream is dry or at its lowest flow, instream construction activities and equipment operations may continue after October 15, provided a written request is made to CDFG at least five days before the proposed work period variance. Written approval from CDFG for the proposed work period variance must be received by the SVRCD or Agricultural Operator prior to the start or continuation of work after October 15.

If work is performed after October 15 as provided above, the SVRCD or Agricultural Operator will do all of the following:

A. Monitor the 72 hour forecast from the National Weather Service. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, the work shall cease.

B. Stage erosion and sediment control materials at the work site. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, implement erosion and sediment control measures.

Level of Significance after Mitigation

Implementation of Mitigation Measures 3.2-1a through 3.2-1d would substantially reduce the potential for erosion and pollution from project construction sites and, as a result, construction activity-related impacts on water quality (e.g., turbidity) would be reduced to a less-than-significant level.

Impact 3.2-2: Certain instream structures proposed to improve fish habitat as part of the Program would be installed within a flood hazard area and could impede or redirect flood flows (Less than Significant).

Some of the instream structures proposed as part of the Program would be installed within a 100-year flood hazard area as defined by FEMA (2004); these structures include water diversion structures (including weirs), fish screens, fish ladders, stream crossings, and structures related to channel restoration projects. Such structures, placed within the stream channel, could impede or redirect flood flows. However, water diversion structures and fish ladders installed as part of the Program would improve fish passage conditions at currently impassable (or difficult to pass) locations or alleviate existing impediments to flow (e.g., replacing dams with weirs that are lower in elevation). In doing so, they would provide for more natural passage of low to moderate flows. These structures would be submerged during floods and exert little resistance upon flood flows. Likewise, fish screens, stream crossings, and restoration-related structures would not be expected to impede or redirect flood flows. This impact would therefore be less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

Impact 3.2-3: Installation and operation of instream structures permitted under the Program could alter channel stability and degrade water quality by increasing turbidity downstream (Significant).

As part of the Program, CDFG would require and permit the installation and operation of instream structures under ITP Covered Activity 4 (Stream Access and Crossings), ITP Covered Activity 7 (Instream Structures), ITP Covered Activity 9 (Barrier Removal and Fish Passage Projects), and ITP Covered Activity 12 (Permit Implementation). These activities and measures are intended to either improve fish passage and habitat within the Program Area or control activities (such as cattle and vehicle crossings) that could damage streambanks or channels. Structures included in this potential impact are: boulder weirs, angular rock, bioengineered habitat structures, large woody debris (LWD), fish ladders, and other channel restoration or protection measures, some of which may span the width of a channel. Although the purpose of such structures is to improve habitat, as discussed below, on a reach-scale such structures have the potential to alter channel stability and influence water quality by altering sedimentation and turbidity downstream. This would be a potentially significant impact.

Instream structures may increase sediment deposition on their upstream side and induce erosion and scour immediately downstream. Lower flows (on the order of one half the bankfull discharge and lower) typically do not transport much sediment or induce channel bed and bank scour in gravel-bed streams, and therefore these flows are not a concern regarding this potential impact. The bankfull flow[11] (or range of intermediate high flows) occurs, on average, once every one to two and a half years and, over the long-term, tends to move the most sediment in a gravel-bed stream (Dunne and Leopold, 1978; Simon and Castro, 2003; Schmidt and Potyondy, 2004). Higher flow events (10-year flood, 25-year flood, etc.) move more sediment in a single event but with much less frequency.

If instream structures are too large or too high, they could impede the sediment transport processes that occur during larger flow events. Depending on the amount of sediment being carried into the reach of interest, these structures could alter the transport capacity of bankfull flows and cause deposition on the upstream side; if this continues to occur and the channel begins to aggrade (e.g., to cause an increase in the overall bed elevation), then this location could serve as an elevation control for the entire reach and ultimately promote further deposition upstream and exacerbate erosion immediately downstream of the structure. If the change in water surface elevation between the upstream and downstream side is great enough, these structures could induce erosion near the base and immediately downstream, as well as dissipate the flow energy to the point that the capacity for bankfull flows to move sediment from the downstream reach is notably decreased.

For structures intended specifically to improve fish habitat and passage, studies have illustrated various problems and various success rates (Frissel and Nawa, 1992; Roper et al., 1998; Niezgoda and Johnson, 2006). Roper et al. (1998) concluded that instream structures are most appropriate when used as short-term tools to improve degraded stream conditions while activities that caused the habitat degradation are simultaneously modified. The stability of instream structures would be of particular concern in the higher-order stream segments within the lowland and valley areas.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.2-3a: ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation D.4. - Livestock and Vehicle Crossings (Article XV) requires annual monitoring of all livestock and vehicle crossings installed under the Program. If the crossing is exacerbating erosion and contributing fine sediment to the stream, SVRCD shall note that in its Annual Report and the sub-permittee shall be responsible for remediation of the problem.

[11] Bankfull flow is hereinafter used in the plural, “bankfull flows” or “bankfull flow conditions,” to emphasize that this term does not invoke a single or static flow rate, but rather a limited range of intermediate high flows at or near the bankfull extent.

Mitigation Measure 3.2-3b: MLTC Conditions 37, 43, 47, and 55 ~~35 41, 45, and 53~~ would ensure that boulder weirs are sized to resist wash-out and do not create lifts in the stream channel that exceed twelve (12) inches, and that instream structures shall be designed and implemented in accordance with CDFG's Salmonid Stream Habitat Restoration Manual.

Mitigation Measures Identified in this Draft EIR

Mitigation Measure 3.2-3c: CDFG and SVRCD shall establish performance criteria for new and replacement instream structures including boulder weirs, angular rock for bank protection, bioengineered habitat structures, large woody debris, fish ladders, and other channel restoration or protection measures. The performance criteria shall include, but not be limited to, the following:

- Sediment deposition upstream and erosion/scour and subsequent deposition downstream of these instream structures, during bankfull flow conditions, would be avoided to the extent feasible, unless the intent of the particular structure is to facilitate such processes (e.g., gravel trapping);
- Instream structures shall not alter channel hydraulics such that the project reach can no longer move the imposed sediment load (e.g., upstream supply) with the available range of sediment-transporting flows; this criterion shall focus on the transport of bed-material load;
- Instream structures shall not lead to a permanent increase in the downstream transport of sediments that is outside the historical range of sediment flux; and
- Instream structures shall be designed to withstand a given range of flows (e.g., some structures are permanent, such as fish ladders, while other structures are "semi-permanent," such as placement of LWD). The range of flows that a particular structure will be designed to handle shall be quantified and rationalized.

Engineered structures such as fish ladders and boulder weirs designed for grade control, or for fish passage in proximity of a water diversion, require design and assessment by a qualified hydrologist, geologist, engineer, or other similarly qualified individual using methods and levels of rigor that have been established in the engineering and scientific community. Based on the assessment, if the proposed structure would fail to meet the performance criteria, then the structure shall not be installed within that particular reach.

The performance criteria shall be included in the SVRCD ITP Monitoring and Adaptive Management Plan (ITP Attachment 3) and their verification and effectiveness shall be included in the Monitoring (ITP Covered Activity 13) or Research (ITP Covered Activity 14) activities of the Program.

Level of Significance after Mitigation

Implementation of Mitigation Measures 3.2-3a through 3.2-3c would reduce the potential channel stability and water quality impacts to a less-than-significant level.

Impact 3.2-4: The Program could result in an increase in the extraction of groundwater, which could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries (Less than Significant).

Most of the surface water resources in the Program Area are fully appropriated and have been adjudicated under the Shasta River Decree. Hence, an Agricultural Operator who needs additional water for irrigation may find it easier to meet that demand by using groundwater. As discussed above, the Program will not cause an increase in the use of groundwater by Agricultural Operators to *add* to the amount of water they already obtain through their surface water diversions. However, the Program could indirectly result in an increase in the use of groundwater if the measures that apply to surface water diversions included in Streambed Alteration Agreements (SAAs), the ITP, and sub-permits issued under the Program pose regulatory, economic, or other burdens that an Agricultural Operator could avoid by *substituting* all or part of its surface water diversion(s) for groundwater. The extraction of groundwater for irrigation is not a Covered Activity under the Program. However, any need for water by Agricultural Operators in addition to the amount of surface water they are entitled to divert and use would be driven by factors independent of the Program, namely increased development within the watershed and the fluctuation of commodity prices (e.g., lower commodity prices would increase the pressure to produce more or to switch to crops with higher market values but which are potentially more water intensive, such as alfalfa). The Program could also directly result in an increase in the use of groundwater because, under the Program, groundwater supplies may be used as one alternative means to satisfy stock water demands from October through December as a means of enhancing surface flows during dry conditions and during critical times of the year to improve salmonid habitat (see ITP Mitigation Obligations of SVRCD (a)(iv) (Article XIII.E.2)).

Increased use of groundwater during dry conditions in order to curb the consumptive use of surface water, as proposed by the Program, could decrease groundwater discharge into the Shasta River and its tributaries. A reduction in groundwater discharge could decrease baseflow volumes and could contribute to increased water temperatures. Groundwater and subsurface flow contribute cool water, directly and indirectly (e.g., by means of spring and seep maintenance), to surface stream channels in the Program Area. As shown by NCRWQCB (2006a), spring flow input can dramatically reduce the ambient water temperature within the mainstem Shasta River. However, due to the complex geology that makes up the Shasta Valley groundwater basin, the inter-relationship between groundwater and surface water in the Program Area is still not well understood. During low flow conditions, if groundwater is pumped in the proximity of a flowing stream or a subsurface channel such that subterranean flow is impacted than that groundwater extraction could result in a decrease in instream flow and, concomitantly, an increase in water temperatures in the nearby stream.

Any increase in groundwater use under the Program is expected to be low for the following reasons: 1) the proposed scale of the alternative stock watering system is small; the Program specifies the installation of two systems per year within the entire Program Area; 2) not all such systems would necessarily use groundwater, as alternative methods are also proposed; 3) groundwater irrigation tends to cost more (for well installation, piping, and power costs); and 4) the availability of groundwater resources in the Shasta Valley varies greatly from location to location. As to the latter, in the northern portion of the Valley where the majority of irrigated lands exist, groundwater resources are generally less productive compared to areas within the eastern portion of the Valley that overlie the basalt formations.

Because it is not likely that the Program would cause a substantial increase in the use of groundwater, the level of any impacts associated with such use would be low. Further, for the season in which the alternative stock watering system is proposed for use, October through December, the *volume* of streamflow is as much of a concern for salmonid habitat as the temperature of the water. High water temperatures are of principal concern and exert more influence on limiting salmonid habitat in the summer and early fall months. In addition, some Agricultural Operators must divert much more surface water than is needed to satisfy their stock-watering needs, because a higher volume of water is necessary to enable water to flow from the point of diversion to the point of use to accommodate for carriage loss due to varying delivery efficiencies. Hence, in some cases, substitution of groundwater for surface water would result in a reduction in the amount of water diverted.

As such, with respect to the impact that alternative stock watering systems may have on surface water temperatures, this potential impact is less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

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CHAPTER 3.3

Biological Resources: Fisheries and Aquatic Habitat

This Chapter discusses the existing environment of the Shasta River watershed (Program Area) with regards to fisheries resources and aquatic habitat; identifies potential impacts on fisheries resources and aquatic habitat in the Shasta Valley related to the Shasta River Watershed-wide Permitting Program (Program); and proposes mitigation measures for those impacts determined to be significant. The Program Area supports one special-status[1] fish species, coho salmon (*Oncorhynchus kisutch*), and four CDFG fish species of special concern[2]: Chinook salmon (*O. tschawytscha*); steelhead (*O. mykiss*); Klamath River lamprey (*Lampetra similis*); and river lamprey (*L. ayresi*). Pacific lamprey (*L. tridentata*), although not officially a CDFG fish species of special concern, is treated as such for the purpose of this document. Other native fish species known to occur in the Shasta River watershed include western brook lamprey (*L. richardsoni*); Klamath smallscale sucker (*Catostomus rimiculus*); speckled dace (*Rhinichthys osculus*); and sculpins (*Cottus* spp.). However, particular attention in this Draft Environmental Impact Report (EIR) is given to coho salmon because: 1) coho salmon in the Program Area are listed as threatened under the California Endangered Species Act (CESA) and federal Endangered Species Act (ESA); 2) the Program is intended to provide incidental take authorization for coho salmon, pursuant to CESA, and to implement key coho salmon recovery projects; and 3) the other fish species identified above are dependent on a similar range of aquatic habitats as coho salmon. Hence, any impacts the Program could have on those aquatic habitats that could affect coho salmon, could also affect those other fish species, although the significance thresholds for those species are much higher.

1 For the purpose of this document a “special-status species” is any species that meets the definition of “endangered, rare or threatened” in CEQA *Guidelines*, § 15380 (fully defined in the Glossary). Some CDFG species of special concern are special-status species. Such species are referred to as “special-status species” in this document.

2 “CDFG species of special concern” are those species that CDFG has determined are either declining at a rate that could result in listing or historically occurred in low numbers and known threats to their persistence currently exists (See the Glossary for a complete definition). Some CDFG species of special concern are “special status species” because they meet the definition of “endangered, rare, or threatened” in CEQA *Guidelines* § 15380. For the purpose of this document, CDFG species of special concern that are also special-status species are referred to as “special-status species”, while CDFG species of special concern that are *not* also special-status species are referred to as “CDFG species of special concern.”

3.3.1 Setting

Regional Setting

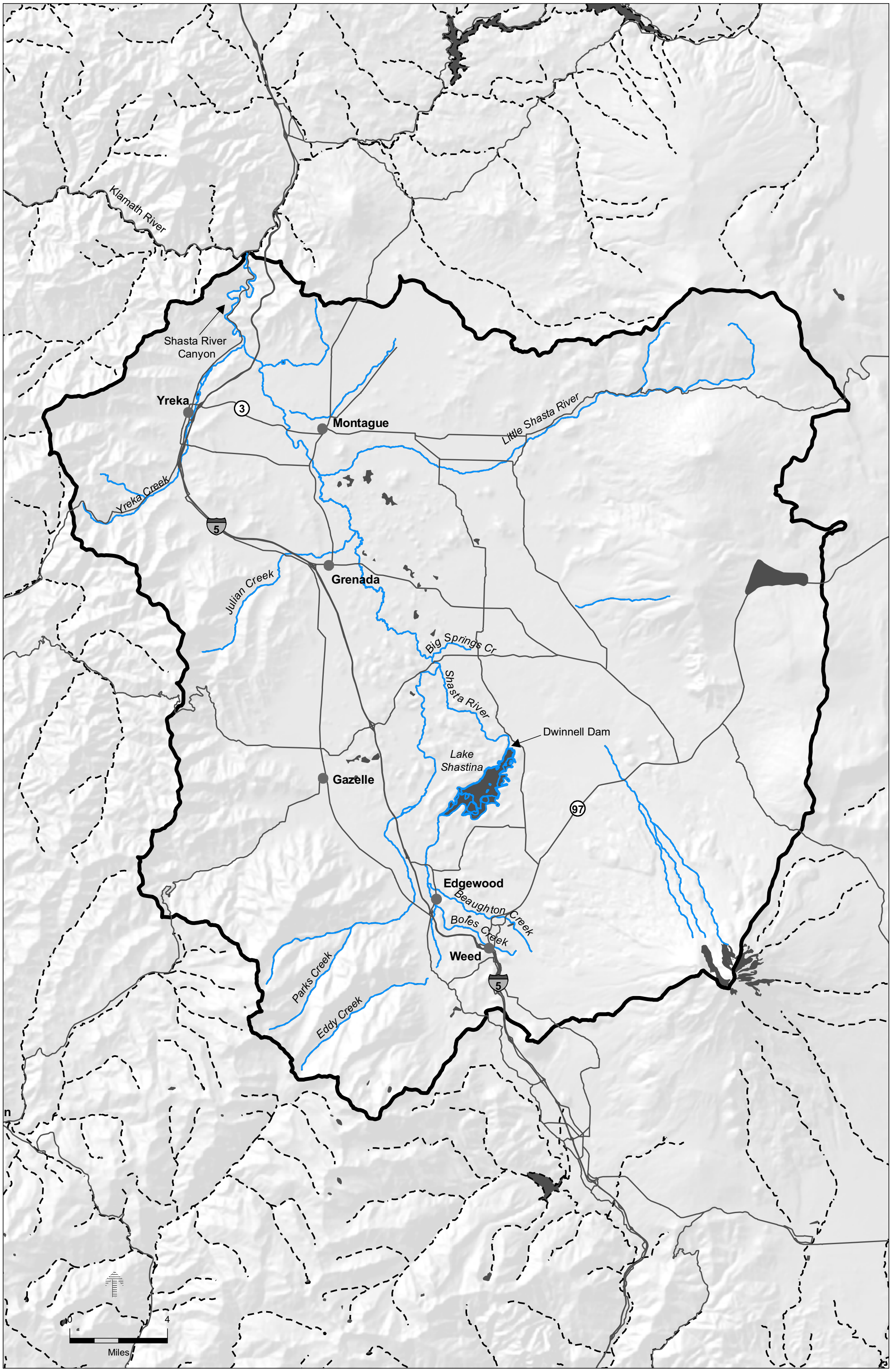
The Shasta River, located in Siskiyou County in Northern California, is one of four major tributaries to the Klamath River. The Klamath River is California's second largest river, draining approximately 15,600 square miles (of which 3,600 square miles are considered non-contributing) in California and Oregon with approximately 1,832 miles of waterways (Ayres and Associates, 1999; CDFG, 2004a). Major tributaries include the Trinity, Salmon, Scott, and Shasta Rivers. Numerous other tributaries enter the Klamath River along its length.

Past and ongoing agricultural and hydroelectric development and use of the water resources in the Klamath Basin have degraded the water quality of the Klamath River and its tributaries, reduced total annual discharge, and altered the magnitude, timing and duration of flow so that more water runs downstream in the Klamath River during winter months, and less during the spring and summer than occurred prior to such development. Problems facing anadromous salmonids, including coho salmon, include an altered hydrograph, high summer water temperatures, reduced and degraded habitat, lack of access to available habitat, erosion and sedimentation, degraded condition of riparian vegetation, depleted large woody debris (LWD), unscreened water diversions, legacy impacts from historical timber operations and mining, and agricultural conversion (CDFG, 2004a). Other water quality conditions, such as low dissolved oxygen concentrations, high nutrient loads, and toxic algae associated with reservoirs have also resulted in aquatic habitat degradations that include the prevalence of fish diseases and parasites.

One outcome of the impaired conditions in the Klamath River was a major adult salmonid mortality event that occurred in the fall of 2002. At least 33,000 adult salmonids died during mid- to late-September 2002 in the lower 36 miles of the river (CDFG, 2004b). Fall-run Chinook salmon were the primary species affected, but coho salmon, steelhead, and other fish species were also lost. The primary cause of the fish-kill was a disease epizootic (CDFG, 2004b). Several factors contributed to stressful conditions for fish, which ultimately led to the epizootic, including low river flow, an above-average number of Chinook salmon entering the Klamath River between the last week in August and the first week of September 2002, and a low volume of water in the fish-kill area. Fish passage may have been impeded by low-flow depths over certain riffles or a lack of cues for fish to migrate upstream. The high density of hosts and warm temperatures created ideal conditions for pathogens ichthyopthirius or "ich" (*Ichthyophthirius multifiliis*) and columnaris (*Flexibacter columnaris*) to infect salmon.

Shasta River Watershed

The Shasta River enters the Klamath at River Mile (RM) 177 at an elevation of approximately 2,000 feet and drains a watershed area of approximately 507,500 acres (793 square miles). Major tributaries to the 50-mile long Shasta River include Parks Creek, Big Springs Creek, Little Shasta River, and Yreka Creek (**Figure 3.3-1**). The river drains a portion of the Cascade Province to the east and a portion of the Klamath Province to the west.



SOURCE: ESA, 2007

Shasta River Watershed-Wide Permitting Program . 206063

Figure 3.3-1
Shasta River Watershed

The Shasta River originates in the Eddy Mountains and the watershed is bounded on the north by the Siskiyou Mountains, to the east by the Shasta-Cascades, to the west by the Klamath Mountains, and to the south by Mount Shasta and Black Butte. Located in the rain shadow of Mount Shasta and the Klamath range, the watershed experiences most of its precipitation in the southwest. Annual precipitation ranges from less than 15 inches in parts of the Valley to over 45 inches in the Eddy and Klamath Mountains, while precipitation on Mount Shasta ranges from 85 to 125 inches (WRCC, 2007; NCRWQCB, 2006). As relatively little precipitation falls on the floor of the Shasta Valley, the Shasta River receives the majority of its flow from glacial melting and mountain precipitation on Mount Shasta and the Eddy Mountains.

The Shasta River is an inland drainage with hot dry summers and cold, snowy winters. Summer temperatures may at times exceed 38ºC (100ºF) and average temperatures at Yreka range from approximately 20.5ºC (69ºF) in the summer to 2ºC (36ºF) during the winter. Vegetation in the watershed is diverse due to the variability in elevations, precipitation, and soil depths, and includes subalpine conifer, montane hardwood-conifer, rabbit brush, juniper, and montane riparian.

Further information on the Shasta River watershed hydrology, geomorphology, and water quality is provided in Chapter 3.2 of this Draft EIR and reach-specific aquatic habitat conditions are described below under *Aquatic Habitat Conditions and Utilization* in this Chapter.

Special-Status Fish Species and CDFG Fish Species of Special Concern

Aquatic habitats within the Program Area are known to support one special-status species, coho salmon, and five CDFG fish species of special concern; Chinook salmon; steelhead; river lamprey; Klamath River lamprey; and Pacific lamprey.[3] The status, life cycle, habitat requirements, and known population trends of these species are described below with particular emphasis on coho salmon as they are listed as threatened under CESA and ESA and a primary objective of the Program is to conserve and protect coho salmon.

Coho Salmon

Status

Coho salmon in the Klamath River watershed are part of the federally-designated Southern Oregon/Northern California Coast (SONCC) Evolutionarily Significant Unit (ESU), which includes all coho salmon stocks between Cape Blanco in southern Oregon and Punta Gorda in northern California.

Based on its review of the status of coho salmon north of San Francisco, the California Department of Fish and Game (CDFG) (2002) concluded that California coho salmon have experienced a significant decline in the past 40 or 50 years. CDFG also concluded that coho

3 Although not officially a CDFG fish species of special concern, the Pacific lamprey is treated as such for the purposes of this Draft EIR.

salmon populations have been individually and cumulatively depleted or extirpated and that the natural linkages between individual populations have been fragmented or severed. For the California portion of the SONCC coho salmon ESU, an analysis of presence-by-brood-year data indicated that coho salmon now occupy about 61 percent of the streams that were previously identified by others (e.g., Brown and Moyle, 1991) as historical coho salmon streams (i.e., any stream for which published records of coho salmon presence could be found) (CDFG, 2002). However, these declines appeared to have occurred prior to the late 1980s and data available at the time of the CDFG (2002) analysis did not support a significant decline in distribution between the late 1980s and 2002. The analysis did indicate, however, that some streams in the ESU may have lost one or more brood year[4] lineages. Based on this information, CDFG concluded that coho salmon populations in the California portion of the SONCC ESU are threatened and will likely become endangered in the foreseeable future in the absence of special protection and management efforts required by CESA. In response to these findings, the Fish and Game Commission (Commission) adopted amendments to § 670.5 in title 14 of the California Code of Regulations on August 5, 2004, adding California coho salmon populations between Punta Gorda and the northern border of California to the list of threatened species under CESA, effective as of March 30, 2005 (Commission, 2004). The Commission had adopted the *Recovery Strategy for California Coho Salmon* (CDFG, 2004a) the previous year.

The National Marine Fisheries Service (NMFS) conducted a similar status review of the SONCC coho salmon populations in 1995 (Weitkamp et al., 1995). NMFS arrived at similar conclusions as CDFG regarding the likelihood that coho salmon in this ESU may become endangered in the foreseeable future if observed declines continue. NMFS listed the ESU as threatened under ESA on May 6, 1997, and designated critical habitat[5] for the ESU on May 5, 1999. The critical habitat designation encompasses accessible reaches of all streams and rivers within the range of SONCC coho salmon, including the Shasta River. Two subsequent NMFS status reviews in 2001 and 2005 essentially reaffirmed the prior conclusions (NMFS, 2001a; NMFS, 2005a) and the ESU continues to be listed as threatened (NMFS, 2005b). NMFS recently completed a recovery plan for coho salmon in the Klamath River basin (NMFS, 2007) and is currently preparing a recovery plan for the entire SONCC ESU.

Life Cycle

Adult coho salmon enter freshwater from the ocean in the fall in order to spawn. In the Klamath River watershed, coho salmon begin entering in early to mid-September and the migration reaches a peak in late September to early October. Arrival in the upper tributaries such as the Shasta River generally peaks in November and December. The majority of the coho salmon spawning activity in this area occurs mainly during these two months. Females usually choose

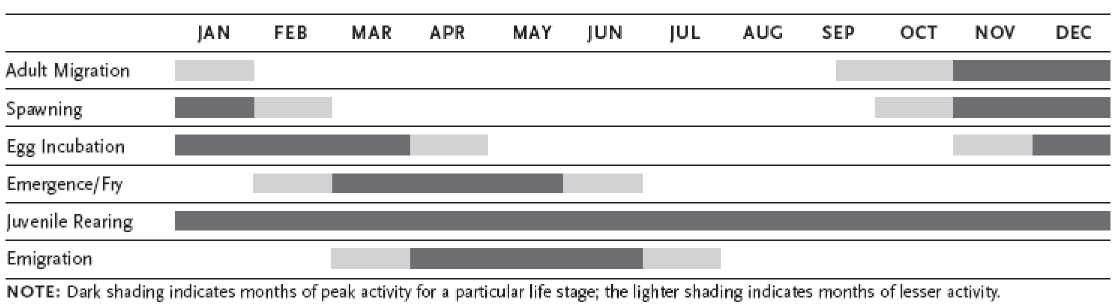
[4] A brood year is identified by the year in which spawning begins. For example, offspring of coho that migrated up the Klamath River to spawn in the Shasta River in the later part of 2001 or early part of 2002 are identified as "Brood Year 2001."

[5] The Endangered Species Act requires the federal government to designate "critical habitat" for any species it lists under the Act. "Critical habitat" is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation.

spawning sites near the head of a riffle, just below a pool, where the water changes from a smooth to a turbulent flow. Spawning sites are often located in areas with overhanging vegetation. Medium to small-sized gravel is essential for successful coho salmon spawning. Females dig nests, called “redds,” in the gravel and deposit approximately one hundred to several thousand eggs in each (CDFG, 2004a). After fertilization, the eggs are buried by the female digging another redd just upstream, which carries streambed materials a short distance downstream to the previous redd. The flow characteristics of the redd location usually ensure good aeration of eggs and embryos, and the flushing of waste products.

In California, coho salmon eggs generally incubate in the gravels from November through April. After hatching, the hatchlings, called “alevins,” remain within the gravel bed for two to 10 weeks before they emerge as fry into the actively flowing channel between February and June. The fry seek out shallow, low velocity water, usually moving to the stream margins, where they form schools. As the fish feed heavily and grow, the schools generally break up and individual fish set up territories. At this stage, the juvenile fish are called “parr.” As the parr continue to grow and expand their territories, they move progressively into deeper water until July and August, when they inhabit the deepest pools. Rearing areas used by juvenile coho salmon include low-gradient coastal streams, lakes, sloughs, side channels, estuaries, low-gradient tributaries to large rivers, beaver ponds, and large slackwaters. The most productive juvenile habitats are found in smaller streams with low-gradient alluvial channels containing abundant pools formed by LWD such as fallen trees.

Juvenile coho salmon typically rear in freshwater for an entire year before ocean entry (see **Figure 3.3-2**). This necessitates survival of juvenile coho salmon in streams through the winter months. Inland winter streamflows are characterized by periods of cold low flows interspersed with freshets and possibly floods. Juvenile coho salmon require areas of velocity refuge during periods of high flows. Potential habitats offering velocity refuge during winter include off-channel habitats and beaver ponds.



SOURCE: CDFG, 2004a

Figure 3.3-2
Seasonal Presence of Coho Salmon Life Cycle Stages
in California Coastal Watersheds

After spending one year in fresh water, the majority of the juvenile coho salmon hatched during the previous spring begin migrating downstream to the ocean in late March/early April through June. Juvenile salmonids migrating toward the ocean are called “smolts.” Upon entry into the ocean, the immature salmon remain in inshore waters, congregating in schools as they move north along the continental shelf. After two years of growing and sexually maturing in the ocean, coho salmon return to their natal streams as three-year-olds to begin the life cycle again.

This three-year cycle is fairly rigid among coho salmon as they rarely spend less than two years in the ocean.[6] Since wild female coho salmon are typically three years old when spawning, there are three distinct and separate maternal brood year lineages for each stream. For example, almost all coho salmon produced in 1994 were progeny of females produced three years earlier in 1991, which in turn were progeny of females produced three years earlier in 1988, and so on. The three maternal brood year lineages are:

Brood Year Lineage I:	….1994….1997.…2000….2003….2006
Brood Year Lineage II:	….1995….1998.…2001….2004….2007
Brood Year Lineage III:	….1996….1999.…2002….2005….2008

This life cycle has been cited as a major reason for coho salmon’s greater vulnerability to catastrophic events compared to other salmonids (CDFG, 1998). Should a major event, such as El Niño floods or anthropogenic disturbance severely deplete coho salmon stocks during one year, the effects will be noticed three years later when few or no surviving female coho salmon return to continue the brood year lineage.

Habitat Requirements

Suitable aquatic habitat conditions are essential for migrating, spawning, and rearing coho salmon. Important components of productive freshwater habitat for coho salmon include a healthy riparian corridor, presence of LWD in the channel, appropriate substrate type and size, a relatively unimpaired hydrologic regime, low summer water temperatures, and relatively high dissolved oxygen concentrations. The importance of these habitat parameters is further described below, based on a summary provided in CDFG (2004a).

Riparian vegetation provides many essential benefits to stream conditions and habitat. It serves as a buffer from sediment and pollution, influences the geomorphology and streamflow, and provides streambank stability. The riparian buffer is vital to moderating water temperatures that influence spawning and rearing by providing the canopy, which protects the water from direct solar heating, and the buffer, which provides a cooler microclimate and lower ambient temperatures near the stream. The riparian canopy also serves as cover from predators, supplies both insect prey and organic nutrients to streams, and is a source for LWD.

LWD within the stream channel is an essential component of coho salmon habitat with several ecological functions. It stabilizes substrate, provides cover from predators and shelter from high

6 Some coho return to spawn after spending only one year in the ocean. These fish are referred to as grilse or jacks.

water velocities, aids in pool and spawning bed establishment and maintenance, and provides habitat for aquatic invertebrate prey.

The channel substrate type and size, and the quantity and distribution of sediment, have essential direct and indirect functions at several life stages of coho salmon. Adults require gravel of appropriate size and shape for spawning (building redds and laying/fertilizing the eggs). Eggs develop and hatch within the substrate, and alevins remain there for some time for protection and shelter. An excess of fine sediment such as sandy and/or silty materials is a significant threat to eggs and fry because it can reduce the interstitial flow necessary to regulate water temperature and dissolved oxygen, remove excreted waste, and provide food for fry. Fine sediments may also envelop and suffocate eggs and fry, and reduce available fry habitat. The substrate also functions as habitat for rearing juveniles by providing shelter from faster flowing water and protection from predators. Furthermore, some invertebrate prey inhabit the benthic environment of the stream substrate.

The characteristics of the water and geomorphology of the stream channel are fundamentally essential to all coho salmon life stages. Important characteristics include water velocity, flow volume, water depths, and the seasonal changes and dynamics of each of these (e.g., summer flow, peak flow, and winter freshets). Appropriate water temperature regimes, in particular, are essential throughout the freshwater phases of the coho salmon life cycle. Water temperature affects the rate and success of egg development; fry maturation; juvenile growth, distribution, and survival; smoltification; initiation of adult migration; and survival and success of spawning adults. Water temperature is influenced by many factors including streamflow, riparian vegetation, channel morphology, hydrology, soil-geomorphology interaction, climate, and impacts of human activities. The heat energy contained within the water and the ecological paths through which heat enters and leaves the water are dynamic and complex.

As a general guideline, the appropriate water temperature range for coho salmon is approximately 3-20°C (37-68°F) (Hardy and Addley, 2001), although preferred rearing temperatures are 12-14°C (54-57°F) (Bjornn and Reiser, 1991). Temperatures above 16.5°C (61.7°F) have been documented to result in a 10 percent weight decrease in juvenile coho salmon (Sullivan et al., 2000) and upper lethal temperatures have been reported as 26°C (79°F) (Bjornn and Reiser, 1991; Sullivan et al., 2000). However, water temperature requirements must be considered in relation to the unique physiological phenomena associated with each life stage. Additionally, environmental conditions in specific watersheds may affect the normal range and extreme end-points for any of these temperature conditions for coho salmon within these watersheds. The water temperature requirements for coho salmon are dependent on their metabolism and health, and on available food. These factors need to be considered together when trying to understand the habitat needs of coho salmon in a particular watershed or river system.

An adequate level of dissolved oxygen is necessary for each life stage of coho salmon and is affected by water temperature, instream primary productivity, and streamflow. Fine sediment concentrations in gravel beds can also affect dissolved oxygen levels, impacting eggs and fry. Dissolved oxygen levels in streams and rivers are typically lowest during the summer and early fall, when water temperatures are higher and streamflows lower than during the rest of the year. Dissolved oxygen concentrations of 8 mg/L or higher are typically considered ideal for rearing salmonids including coho salmon. Rearing juveniles may be able to survive when concentrations are relatively low (e.g., less than 5 mg/L), but growth, metabolism, and swimming performance are adversely affected (Bjornn and Reiser, 1991).

Population Trends

Historically, the Shasta River was one of the most productive salmon streams in California (NRC, 2004). However, even as early as 1931, Snyder (1931) referred to the Shasta River as a "stream *once* famous for its trout and salmon" (emphasis added). By the 1960s, CDFG estimated the annual coho salmon run of the Shasta River at 1,000 fish (NRC, 2004).

CDFG has operated the Shasta River Fish Counting Facility (SRFCF) at the mouth of the Shasta River since 1930.[7] The primary purpose of the weir has been to facilitate development of fall Chinook escapement estimates, and with a few exceptions, the weir was historically removed each year prior to the height of the coho salmon migration and spawning period. However, since 2001, the SRFCF has been operated beyond the Chinook salmon migration period in an effort to better document coho salmon returns in the Shasta River. High flows, common during the coho salmon migration period, have nevertheless compromised CDFG's ability to gather consistent data on annual coho salmon run sizes (Hampton, 2006). Because of the inconsistencies in sampling duration over the years, direct comparisons of the annual coho salmon counts are not possible, and the numbers presented in **Table 3.3-1** should not be construed as total run sizes.

The currently known and suspected spatial distribution of coho salmon in the Shasta River watershed is depicted in **Figure 3.3-3**. Formal coho salmon spawning ground surveys of redds and carcasses have not been conducted in the Shasta River, but in 2004, 2006, and 2007, CDFG trapped adult coho salmon at the SRFCF and implanted them with radio tags to investigate migration behavior and distribution (Littleton and Pisano, 2006; 2007; Littleton et al., 2008). The results of these studies indicate that adult coho salmon currently migrate primarily to two distinct areas of the Shasta River watershed to spawn: the canyon reach (lower seven miles) of the mainstem river and the upper region of the Shasta River (beyond RM 34) known as the Big Springs complex, including the mainstem Shasta River, Big Springs Creek, and Parks Creek. **Figure 3.3-4** and **Figure 3.3-5** depict the upstream extent of migration of individual tagged adults in 2007 for the canyon reach and the Big Springs complex, respectively.

CDFG has also been conducting annual rotary screw trap surveys on the Shasta River since 2001 to monitor outmigrant salmonid juveniles, including coho salmon. Coho salmon smolt population estimates were derived from the trapping results since 2003. The results of the surveys are summarized in **Table 3.3-2**. In addition to coho salmon smolts (age 1+ fish) migrating out of the watershed, CDFG has also observed distinct emigrations of age 0+ juveniles from the watershed (Chesney and Yokel, 2003; Chesney et al., 2007). The reasons for the observed emigration of

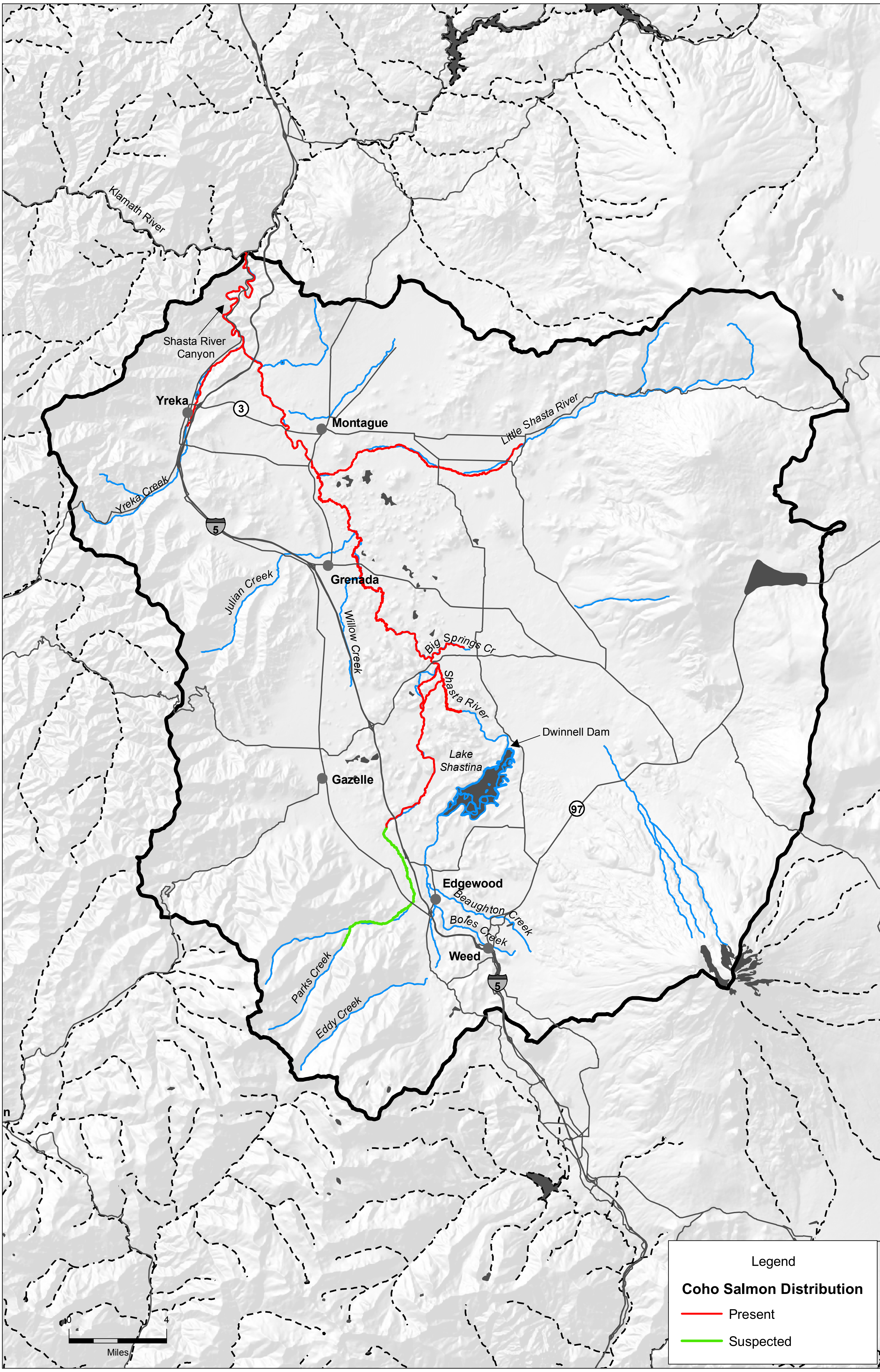
[7] Between 1938 and 1957, the SRFCF was operated approximately 6.5 miles upstream of the mouth of the Shasta River.

TABLE 3.3-1
YEAR, DATES OF OPERATION, AND COUNTS OF EARLY RETURNING COHO SALMON AT THE SHASTA RIVER FISH COUNTING FACILITY

Year	Last Day of Operation	Coho Salmon Counts
1979	Unknown	355
1981	1/6/82	418
1982	2/28/83	263
1983	1/19/84	36
1984	11/19/84	69
1985	Early December	3
1986	11/3/86	0
1987	10/12/87	0
1988	11/2/88	3
1989	10/21/89	6
1990	10/28/90	2
1991	11/11/91	9
1992	11/11/92	3
1993	11/12/93	6
1994	11/6/94	17
1995	11/11/95	12
1996	11/14/96	1
1997	10/28/97	0
1998	11/4/98	0
1999	11/10/99	27
2000	11/7/00	1
2001	12/14/01	291
2002	12/17/02	86
2003	12/28/03	187
2004	12/8/004	373
2005	12/12/05	69
2006	12/13/06	47
2007	12/31/07	255 (preliminary)

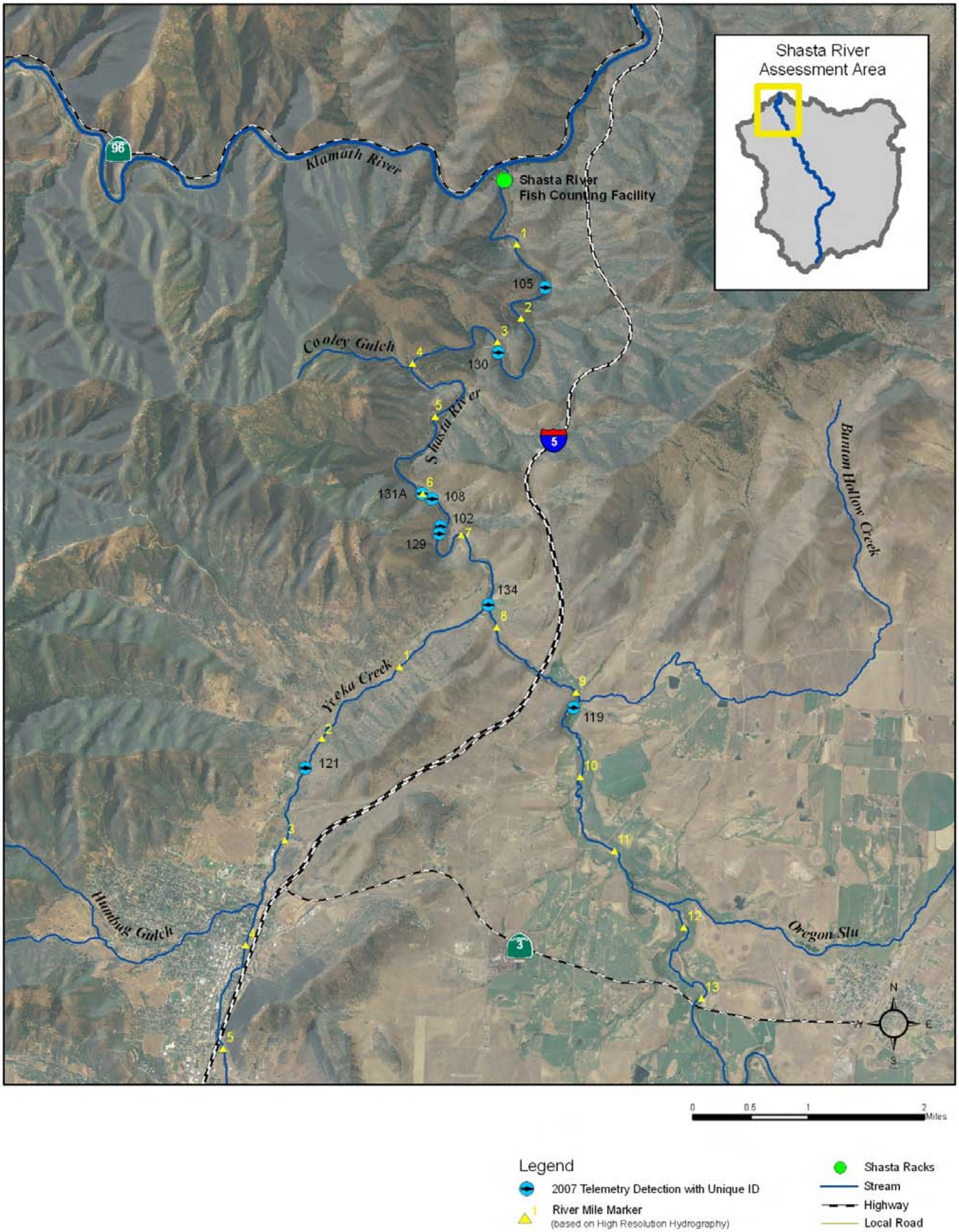
SOURCE: Hampton, 2006; Hampton, 2007; Walsh and Hampton, 2007.

age 0+ coho salmon from the Shasta River are not yet fully understood, but one possible explanation is that while most juvenile coho salmon typically rear in freshwater for an entire year before ocean entry, recent data from the Shasta River indicate that due to the high productivity in a portion of the watershed, a percentage of the age 0+ juvenile coho salmon are able to reach a size that allows them to emigrate as smolts in the spring and early summer of their first year (**Table 3.3-3**). CDFG has observed age 0+ coho salmon smolts in the catch at the rotary trap located near the mouth of the Shasta River since 2003. Analysis of scale and otolith samples collected in 2003 through 2006 determined that coho salmon smolts or “silvery parr” emigrating from the Shasta River between May 21st through July 15th, with a fork length greater than 90 mm and less than 120mm, were almost exclusively age 0+ smolts (Chesney, 2008a). On April 8, 2008, Carson Jeffres observed coho salmon rearing in Big Springs Creek which were significantly larger than coho salmon in the rest of the watershed (Jeffres, 2008) and generally fell



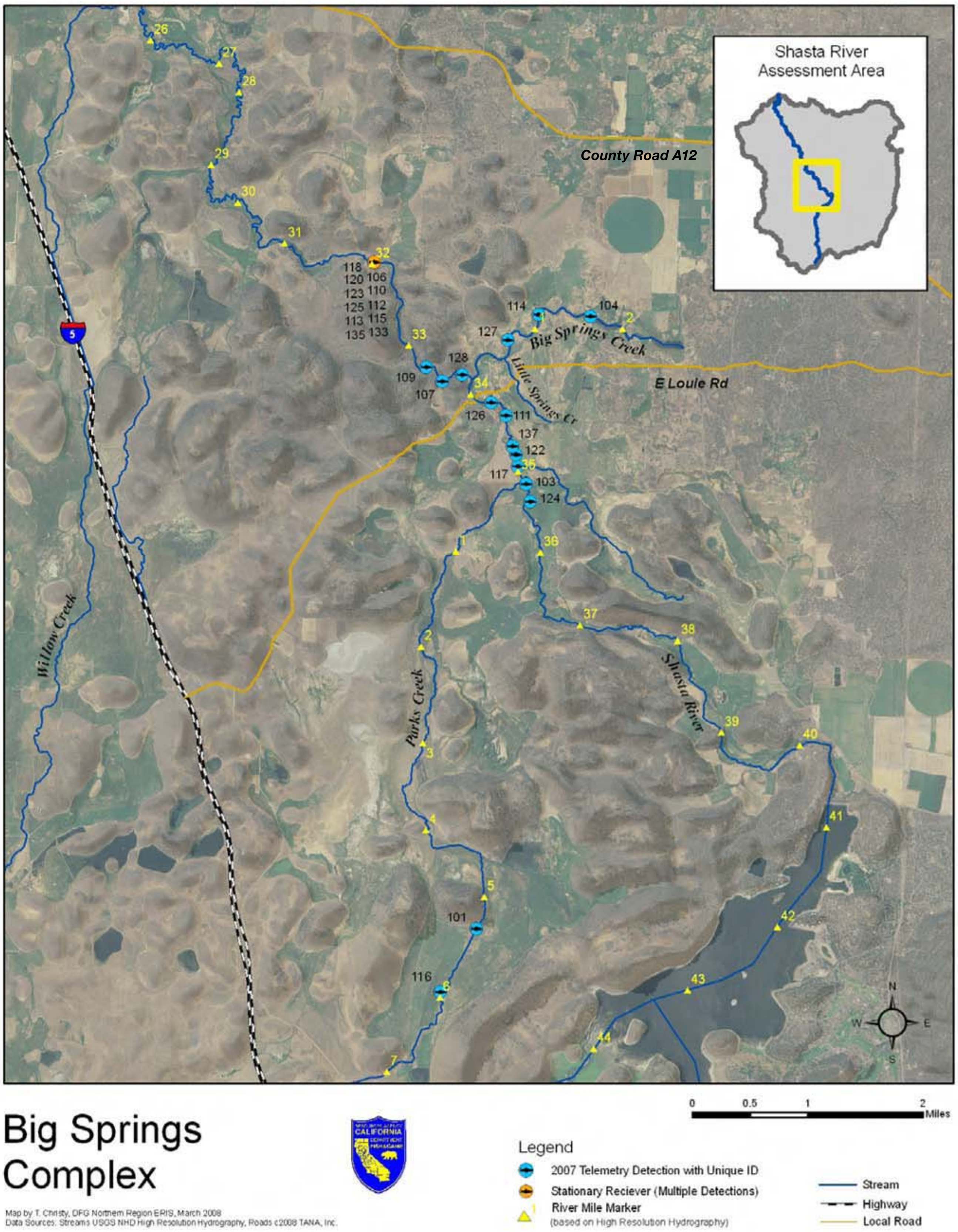
SOURCE: ESA, 2007

Figure 3.3-3
Coho Salmon Distribution within the Shasta River Watershed



SOURCE: Map by T. Christy. DFG Northern Region ERIS, March 2008
Data Sources: Streams USGS N-ID High Resolution Hydrography, Roads c2008 TANA, Inc.

Figure 3.3-4
Shasta River Canyon



SOURCE: Map by T. Christy. DFG Northern Region ERIS, March 2008
Data Sources: Streams USGS N-ID High Resolution Hydrography, Roads c2008 TANA, Inc.

Figure 3.3-5
Big Springs Complex

TABLE 3.3-2
YEARLY SHASTA RIVER WATERSHED JUVENILE COHO PRODUCTION ESTIMATES BASED ON OUTMIGRANT TRAPPING SURVEYS

	2003	2004	2005	2006	2007
Age 0+ coho	292[a]	1,135	15,581	870	NA
Age 1+ coho	11,052	1,799	2,054	10,833	1,178 [b]

a NOTE: Due to low number of age 0+ recaptures during the 2003 season, a production estimate was not possible and the number presented is a total count of fish captured.

b NOTE: Due to anticipated low numbers of age 1+ coho salmon in 2007, mark/recapture methods to estimate trap efficiency were not used in 2007; instead, efficiency was estimated based on a correlation between trap efficiency data for age 2+ steelhead in 2007 and age 1+ coho salmon in 2004 and 2005.

SOURCE: Chesney et al., 2007; Chesney, 2007; Chesney, 2008a.

TABLE 3.3-3
RELATIVE CONTRIBUTION OF AGE 0+ COHO SALMON SMOLTS TO THE OVERALL COHO SALMON SMOLT COUNTS IN THE SHASTA RIVER WATERSHED BASED ON OUTMIGRANT TRAPPING SURVEYS

	2003	2004	2005	2006
Age 0+ coho salmon smolts	2	622	1,791	112
Age 1+ coho salmon smolts	11,052	1,799	2,054	10,833
Total coho salmon smolts	11,054	2,427	3,845	10,946
Percentage of 0+ coho salmon smolts	0.02%	25.71%	46.58%	1.02%

SOURCE: Chesney, 2008a.

within the size range of the age 0+ smolts observed at CDFG's rotary trap. During instream surveys on May 6, 2008, CDFG staff observed coho salmon of a similar size rearing at a location upstream of Big Springs Creek on the Shasta River mainstream between approximately RM 36.1 and RM 37.1. During subsequent surveys performed in this section of the stream the first two weeks of June, 2008, CDFG staff counted approximately 450+ juvenile coho salmon which appeared to be within this size range.

Although the data on adult coho salmon returns at the SRFCF (Table 3.3-1) are inconsistent due to varying sampling periods, a comparison of the data collected since 2001 with the smolt outmigration data presented in Table 3.3-2 suggests that only one strong brood year lineage (2001…2004…2007)[8] remains within the Shasta River watershed.

8 Note that age 0+ fish are of the previous year's brood lineage and age 1+ fish are offspring of the brood lineage from two years ago. Thus, adults observed at SRFCF in 2004, age 0+ fish observed at the rotary trap in 2005, and age 1+ fish observed at the rotary trap in 2006, are all progeny of the 2001…2004 brood lineage.

Using the counts of returning adult coho salmon from the SRFCF since 2001 (Table 3.3-1) and the annual estimates for age 1+ coho salmon since 2003 (Table 3.3-2), CDFG developed a relationship between the number of returning adults and the subsequent number of smolts produced from the same brood year. Based on the estimated numbers of smolts produced per adult returning in 2001 through 2004, CDFG projected that an average of 24.7 smolts will have been produced for each adult that returned in 2005 and 2006 (Chesney et al., 2007). The past and projected coho salmon smolt productions in the Shasta River watershed are summarized in **Table 3.3-4**.

TABLE 3.3-4
RELATIONSHIP BETWEEN THE NUMBER OF RETURNING COHO SALMON ADULTS AND THE NUMBER OF SMOLTS PRODUCED

Brood Year	# of adults	# of smolts produced	Year	# of smolts per adult
2001	291	11,052	2003	38.0
2002	86	1,799	2004	20.9
2003	187	2,054	2005	11.0
2004	373	10,833	2006	29.0
2005	69	1,178	2007	17.0
2006	47	1,090	2008	23.2
2007	255	5,516	2009	23.2

NOTE: Shaded cells represent projections. Projected numbers of smolts per adult for brood years 2006 and 2007 are based on average of numbers (23.2) estimated for 2001 through 2005.

SOURCE: Chesney et al., 2007; Chesney, 2008a.

Based on the data presented above, CDFG has also projected the number of adult coho salmon expected to return to the Shasta River in 2008, 2009, and 2010. Based on the observed number of outmigrating smolts in 2003 through 2007, and the subsequent return of adults observed in 2004 through 2007, CDFG estimated that an average of 2.96 percent of smolts return as adults (Chesney, 2008a). Applying this ratio to the known and projected numbers of smolts for 2007, 2008, and 2009, CDFG estimated the numbers of returning adults over the following years at 35 (2008), 32 (2009), and 175 (2010), respectively (Chesney, 2008a). The results of these projections are presented in **Table 3.3-5**.

It should be noted that the above projections are based on three data points for the 2001…2004…2007 brood year lineage and only two data points for the other two lineages. Greater confidence in predicting future returns will require additional monitoring and consideration of confidence intervals for such projections. Nevertheless, the data reinforce the indication that only one strong brood year lineage remains in the Shasta Valley and suggests that coho salmon of all three brood years appear to be on a downward trend. Across the range of coho salmon along the California coast, an average decline of 73 percent in returning adults occurred in 2007 compared to the same cohort in 2004 (McFarlane et al., 2008). The observed decline for the Shasta River was 32 percent (McFarlane et al., 2008).

TABLE 3.3-5
OBSERVED AND PROJECTED SHASTA RIVER WATERSHED COHO SALMON PRODUCTION

Brood Year	# of Adults	Emigration Year	# of smolts produced	% Return	# of Adults Returning	Return (Brood) Year
2001	291	2003	11,052	3.37%	373	2004
2002	86	2004	1,799	3.84%	69	2005
2003	187	2005	2,054	2.29%	47	2006
2004	373	2006	10,833	2.35%	255	2007
2005	69	2007	1,178	2.96%	35	2008
2006	47	2008	1,090	2.96%	37	2009
2007	255	2009	5,916	2.96%	175	2010

NOTE: Shaded cells represent projections. Projected numbers of returning adults for 2008 through 2010 are based on average rate of return (2.96 percent) for 2004 through 2007.

SOURCE: Chesney et al., 2007; Chesney, 2008a.

Chinook Salmon

Status

Chinook salmon in the Shasta River watershed are part of the federally-designated Upper Klamath and Trinity Rivers Chinook ESU, which includes all populations upstream of the confluence of these two rivers. NMFS determined on March 9, 1998 that this ESU did not warrant listing under ESA. Spring-run Chinook salmon within this ESU are a CDFG species of special concern.

Life Cycle

The life history patterns of Chinook salmon vary among runs. The Klamath River Basin, including the Shasta River, currently supports fall-run and historically supported spring-run Chinook salmon. A third run, the late fall-run, may also have historically existed in the basin, but it is either poorly documented or extinct (Moyle, 2002). The spring-run differs from the fall-run in that the adults enter the river before they are ready to spawn and reside in deep pools for two to four months before they spawn, whereas fall-run adults spawn soon after reaching their spawning destination (Moyle, 2002). In addition, spring-run juveniles may remain in the streams for a year or longer before their seaward migration, whereas fall-run juveniles are generally less than one year old before they migrate to sea.

Adult fall-run Chinook salmon entry into the Klamath River Basin typically peaks in September and continues through late October, with adults arriving at their spawning grounds approximately two to four weeks after freshwater entry (NRC, 2004). As such, adult Chinook salmon typically arrive in the Shasta River watershed prior to the peak of coho salmon spawning migration. Chinook salmon tend to spawn in lower gradient reaches than coho salmon, primarily in rivers and larger streams. Within the Shasta River watershed, Chinook are known to spawn in the mainstem Shasta River (Canyon reach and vicinity of Big Springs Creek), Parks Creek, and Big Springs Creek (CDFG, 1997; Chesney et al., 2007). Spawning also occurs in two other tributaries, Yreka Creek and Little Shasta River, during years when a hydrologic connection between the tributaries and the mainstem exist at the time of the Chinook spawning migration. The majority of juvenile fall-run Chinook salmon spend only a few months rearing in freshwater before outmigrating in the spring and early summer. Peak smolt outmigration from the Shasta River typically occurs in March and April (Chesney et al., 2007)

Spring-run Chinook salmon enter rivers as immature fish in spring and early summer. They migrate to their upstream spawning sites where they hold for several months in deep, cool pools prior to spawning in early fall. Juvenile spring-run Chinook salmon rear in freshwater for three to fifteen months with outmigration peaking in winter (January – February) and again in spring (April) (Moyle, 2002).

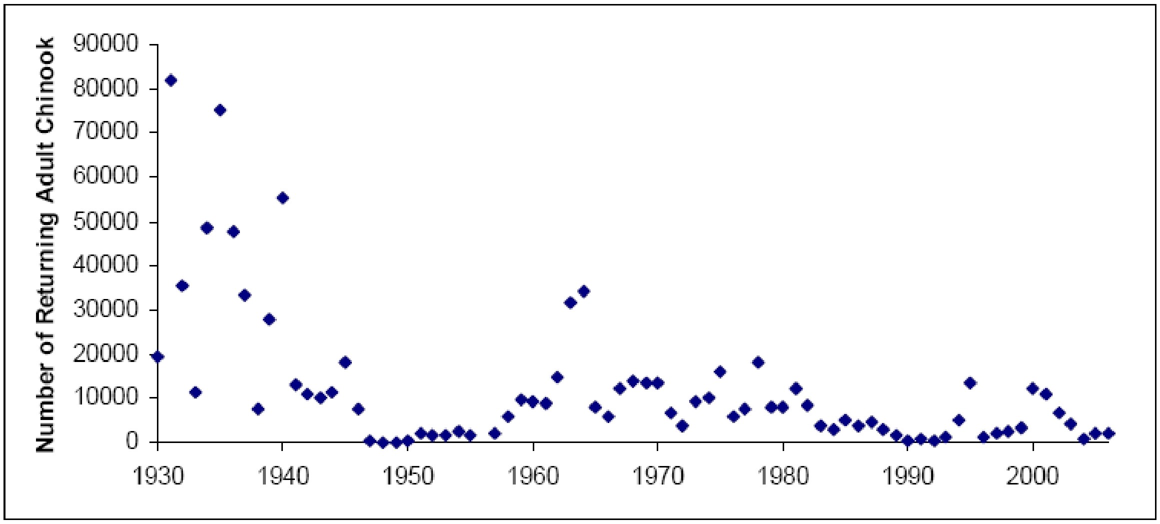
Habitat Requirements

Although the life history patterns of Chinook salmon differ from that of coho salmon, the overall habitat requirements of the two species are fairly similar. Like coho salmon, Chinook salmon require adequate flows, temperatures, water depths and velocities, appropriate spawning and rearing substrates, and availability of instream cover and food. The importance of these habitat parameters are described above for coho salmon.

Adult holding areas, consisting of deep pools with cool water temperatures, are of particular importance to spring-run Chinook which must reside in the freshwater streams and rivers throughout the summer. Adult fall-run Chinook salmon, on the other hand, are particularly dependent on adequate streamflows in the fall, prior to the onset of significant precipitation, to enable successful migration to their spawning sites. Most juvenile Chinook salmon leave their freshwater habitat in the spring and are therefore not as susceptible to the high water temperatures and low streamflows that are common during summer and early fall. The optimal rearing temperature range for juvenile Chinook salmon is approximately 14 to 19ºC (57-66ºF) (Hardey and Addley, 2001), which is somewhat higher than that of coho salmon. The upper lethal temperature for Chinook salmon, however, is similar to that of coho salmon which has been reported as 26°C (79°F) (Bjornn and Reiser, 1991).

Population Trends

Historically, the Shasta River was one of the most productive salmon streams in California, with runs of Chinook salmon over 80,000 returning adults in the 1930s (NRC, 2004). Since the 1940s, Chinook salmon numbers have decreased dramatically (**Figure 3.3-6**). Between 2001 and 2006, Chinook returns averaged 4,566 adults per year with a high of 11,093 and a low of 978 (Jeffres et al., 2008). Construction of Dwinnell Dam in 1928 precluded salmon from accessing the upper watershed, effectively eliminating an estimated 22 percent of the total spawning habitat formerly available to salmon and steelhead (Wales, 1951), and altered habitat conditions downstream. Over time the combination of lower summer flows and less frequent and smaller magnitude peak winter flows resulted in sedimentation of fine material within the gravels and encroachment of riparian vegetation. This reduction in stream size resulted in a considerable loss of spawning habitat in the reach from Dwinnell Dam to Big Springs Creek. It is possible that the gradual loss of spawning habitat below Dwinnell Dam allowed Chinook salmon populations to be maintained



SOURCE: Jeffres et al., 2008

Figure 3.3-6
Fall-run Chinook Salmon Returns in the Shasta River, 1930 – 2006

at relatively high numbers for several years after dam construction, but ultimately the combined loss of both upstream and downstream habitat may have led to numbers more consistent with current conditions (Jeffres et al., 2008). Recent spawning habitat surveys have shown that from Dwinnell Dam to the mouth, the quality of spawning gravels is poor (Ricker, 1997).

Spring-run Chinook salmon, once the most abundant Chinook run in the Klamath River basin (Hardy and Addley, 2001), were reportedly present in the Shasta River until at least 1850 (West, 1991), and a remnant population of this run is generally believed to be confined to the Salmon River watershed (Chesney, 2007). However, in October 2006, CDFG personnel operating a screw trap on the mainstem Shasta River noted that some juvenile male Chinook salmon caught in the trap were sexually mature (Jeffres et al., 2008). Mature male juveniles are very rare in nature and are most often found in spring-run Chinook salmon that hatch earlier than fall-run fish, and thus are able to grow more rapidly and mature at an earlier age (Jeffres et al., 2008). While the potential exists for these early maturing juveniles to be offspring of a vestigial run of spring Chinook salmon in the Shasta River, they may also be the product of early spawning fall-run Chinook salmon utilizing spawning gravels in the vicinity of Big Springs Creek. As this area is influenced by warmer spring flows naturally rich in nutrients, the incubation period is likely reduced and the resultant fry emerge earlier to experience a longer growing period in a highly productive environment. This could also lead to early sexual maturation and precocious behavior. Additional evaluation is needed.

Steelhead

Status

Steelhead within the Shasta River basin are part of the federally-designated Klamath Mountains Province Distinct Population Segment (DPS). Listing of this DPS under ESA was determined not to be warranted by NMFS on April 4, 2001. Summer-run steelhead within this DPS are a CDFG species of special concern.

Life Cycle

Steelhead exhibit one of the most complex life histories of any salmonid species. The resident rainbow trout form spends its entire life in freshwater environments, while the anadromous steelhead form migrates between its natal streams and the ocean. Furthermore, two reproductive forms of steelhead are recognized, the summer-run (stream-maturing) and winter-run (ocean-maturing), which describes the level of sexual development following return to the freshwater environment. Some researchers further divide the winter steelhead into early (fall-run) and late (winter-run) (e.g., Hardy and Addley, 2001), but the two forms have similar life histories (NRC, 2004) and are treated together here as winter-run steelhead. In addition, the Klamath River Basin is distinctive in that it is one of the few basins producing ‘‘half-pounder’’ steelhead. This life history type refers to immature steelhead that return to fresh water after only two to four months in the ocean, generally over-winter in fresh water, then outmigrate again the following spring (NMFS, 2001b).

Unlike salmon, steelhead are iteroparous, meaning they can spawn more than once before they die. In California, females commonly spawn twice before they die. Adult winter-run steelhead typically enter the Klamath River from late August to February before spawning, which extends from January through April, peaking in February and March (NRC, 2004). Summer-run steelhead enter freshwater as immature fish from May to July, migrate upstream to the cool waters of larger tributaries, and hold in deep pools roughly until December, when they spawn (NRC, 2004). Juvenile steelhead rear in freshwater for one to three years (mostly two) before migrating downstream toward the ocean in spring, primarily during the months of March through May. They then typically reside in marine waters one to three years prior to returning to their natal stream to spawn as three- or four-year olds.

Habitat Requirements

As discussed above, the overall habitat requirements of the various salmonid species are fairly similar. Like coho salmon, steelhead require adequate flows, temperatures, water depths and velocities, appropriate spawning and rearing substrates, and availability of instream cover and food. The importance of these habitat parameters are described above for coho salmon.

Notable differences in habitat preferences include the fact that while juvenile coho salmon prefer pools with low average velocities and are not as common in riffles with high current velocities, juvenile steelhead tend to occupy riffles as well as deep pools with relatively high velocities along the center of the channel (Bisson et al., 1988). Similar to spring-run Chinook salmon, adult holding areas are of particular importance to summer-run steelhead who must reside in the freshwater streams and rivers throughout the summer. The thermal tolerance of steelhead is generally higher than that of most other salmonids. Preferred temperatures in the field are usually 15 to 18°C (59-64°F), but juveniles regularly persist in water where daytime temperatures reach 26 to 27°C (79-81°F) (Moyle, 2002). Long-term exposure to temperatures continuously above 24°C, however, is usually lethal (NRC, 2004; Moyle, 2002).

Population Trends

Population trends of steelhead within the Program Area have not been monitored as closely as those of coho and Chinook salmon. Within the Klamath Basin, historical numbers of winter steelhead are not known, but total run sizes in the 1960s were estimated at about 170,000 for the Klamath River and 50,000 for the Trinity River (NRC, 2004). In the 1970s, Klamath River runs were estimated to average around 129,000 and by the 1980s, they had dropped to around 100,000 (NRC, 2004). In 2001, NMFS estimated the natural escapement for the entire Klamath Mountains Province DPS at 100,000 to 130,000 adults per year, with the California portion of the DPS contributing approximately 30,000 to 50,000 adults (NMFS, 2001b).

Summer-run steelhead once were widely distributed in the Klamath Basin and were present in most headwaters of the larger tributaries (NRC, 2004). In the 1990s, estimated numbers were 1,000 to 1,500 adults across eight populations – less than 10 percent of their former abundance (Moyle, 2002). Numbers presumably are still declining because of loss of habitat, poaching in summer, and reduced access to upstream areas during migration periods as a result of diversions (NRC, 2004). Summer-run steelhead were observed in the mainstem Shasta River as recently as June 2007 (Jeffres et al., 2008).

Lampreys

Status

Three lamprey species have been observed in the Shasta River watershed: river lamprey; Klamath River lamprey; and Pacific lamprey (Chesney et al., 2007). The river and Klamath River lampreys are CDFG fish species of special concern. The U.S. Fish and Wildlife Service (USFWS) determined in 2004 that a formal listing of the Pacific lamprey under ESA was not warranted (USFWS, 2004). However, there is reasonable likelihood that the Pacific lamprey may become listed in the foreseeable future and they are also considered a tribal trust species with a high priority for recovery to fishable populations (NRC, 2004). Therefore, Pacific lamprey is treated as a CDFG fish species of special concern for the purposes of this Draft EIR.

Life History

Lampreys are anadromous. Like salmon and steelhead, they hatch in freshwater streams, migrate out to the ocean, and return to fresh water as mature adults to spawn. Landlocked forms that do not migrate to the ocean are also known, including from the Upper Klamath Basin (Moyle, 2002). The life history of the Klamath River lamprey has not been documented and the biology of river lampreys has only been studied in British Columbia where the timing of life history events may or may not be the same as in California (Moyle, 2002). Thus, the following description focuses largely on Pacific lampreys.

Most adult Pacific lampreys enter freshwater from January through March to spawn from March to June, although movement has also been observed in most other months (Moyle, 2002). Most spawning appears to take place in the mainstem or larger tributaries. Like salmon, lampreys construct redds for spawning in gravel riffles. Once they emerge, larvae (ammocoetes) are carried downstream by streamflows and burrow into sand or mud substrates at the edge of the river. The larvae live in burrows for probably five to seven years, during which time they move about frequently and are commonly captured in salmon outmigrant traps (NRC, 2004). Once the ammocoetes transform into adults, they migrate to the sea. Downstream migration usually is coincidental with high flows in the spring, but movement has also been observed during summer and fall (NRC, 2004). In the ocean and estuary, they prey on salmonids and other fish for one to two years before returning to spawn.

Habitat Requirements

While in freshwater, lampreys are often found to coexist with steelhead and salmon, indicating that these species share similar habitat requirements. Juveniles require muddy bottoms, backwater areas, and low gradient areas, and it is therefore likely that rapid or frequent drops in flow deprive them of habitat and force them to move into open water, where they are vulnerable to predation (NRC, 2004). Due to the migratory behavior of the species, lamprey distribution within watersheds is also affected by barriers. They do not, however, appear to be limited by water temperatures (NRC, 2004).

Population Trends

Lampreys once were so abundant in the coastal rivers of California that they inspired the name Eel River for the third largest river in the state (NRC, 2004). Today, their numbers are low and declining (NRC, 2004; Moyle, 2002).

Other Fisheries Resources

In addition to coho salmon and the CDFG species of special concern described above, the Program Area supports other native, non-listed fish species such as western brook lamprey (*L. richardsoni*), Klamath smallscale sucker (*Catostomus rimiculus*), speckled dace (*Rhinichthys osculus*), and sculpins (*Cottus* spp.) (Chesney et al., 2007). Although the life cycles and habitat requirements of these species may differ somewhat from those of coho salmon and CDFG fish species of special concern, all native fisheries within the Shasta River have co-evolved and are similarly affected by aquatic habitat disturbances. Furthermore, populations of these species have received little attention and population trends are not available. Thus, due to their non-special status, similar preference for undisturbed aquatic habitat conditions, and lack of adequate population data, these species are not further discussed in this Draft EIR.

A number of non-native fish species are also known to be present in Lake Shastina and the Shasta River below Dwinnell Dam. The most abundant of these appear to be yellow bullhead (*Ameiurus natalis*), green sunfish (*Lepomis cyanellus*), and golden shiner (*Notemigonus crysoleucas*) (Chesney et al., 2007). To the extent the Program will adversely affect non-native fish species (e.g., direct mortality resulting from instream construction activities, potential decreases in habitat suitability resulting from decreases in water temperatures), the impacts will be less than significant because when present in streams or rivers, non-native fish species typically compete with, or prey on, native species, and therefore any reduction in non-native fish species will benefit native fish. In that regard, any reduction in the abundance or distribution of non-native fish species will only serve to further one of the primary the objectives of the Program to protect and preserve coho salmon. Thus, non-native fish species are not further discussed in this Draft EIR.

Aquatic Habitat Conditions and Utilization

This section describes the existing aquatic habitat conditions and utilization by coho salmon and CDFG fish species of special concern within the Shasta River watershed, with primary attention given to coho salmon and other salmonids. For clarity, the watershed has been divided into various sub-watershed areas based on similarities in geomorphologic and biologic conditions. Due to the large geographic scope of the Program Area, aquatic habitat conditions are described on the sub-watershed scale (e.g., adequate spawning habitat and poor rearing habitat) rather than detailed reach-by-reach accounts of existing habitat features (e.g., pool complexity and percent cover). The descriptions of the sub-watersheds are largely based on summaries provided by SVRCD (2005) and personal communications (e.g., Webb, 2007). Figure 3.3-1 depicts the Shasta River watershed, including significant tributary streams.

Shasta River Above Dwinnell Dam

The watershed of the Shasta River upstream of Dwinnell Dam is comprised of about 81,500 acres, which accounts for approximately sixteen percent of the total watershed area. Elevations in this area range from 14,162 feet at Mount Shasta to approximately 2,750 feet at the base of Dwinnell Dam. The high elevation terrain captures significant amounts of rain and snow, with precipitation ranging from 70 inches at the highest elevations to less than ten inches at the lower end of the reach. The large amount of rain and snow at high elevation creates surface flows forming Dale Creek and Eddy Creek, and also large amounts of flow from springs, especially from the flanks of Mount Shasta. Those springs form numerous tributary creeks, including Boles Creek, Beaughton Creek, and Carrick Creek, that comprise the headwaters of the Shasta River.

Dwinnell Dam, completed in 1928 and located at approximately River Mile (RM) 40.6, forms the downstream end of this reach. Although the dam was built to impound 74,000 acre feet, the Department of Water Resources (DWR) currently limits storage to 50,000 acre feet. The dam is owned and operated by the Montague Water Conservation District (MWCD), which supplies water to the City of Montague and to farmers and ranchers through a 60-mile long canal and ditch system. Lake Shastina captures the majority of runoff from the upper watershed in most years, as well as a portion of the flow of Parks Creek through the Parks Creek diversion ditch, and provides no flow release other than to meet specified irrigation demands immediately downstream. Dwinnell Dam prevents anadromous fish access to the upper watershed. It has been estimated that construction of the dam eliminated access to about 20 percent of the total spawning habitat formerly available to salmon and steelhead (CDFG, 1997) and drastic declines in Chinook salmon populations occurred subsequent to the construction of the dam (Jeffres et al., 2008).

Agricultural activity in this reach consists primarily of cow-calf operations with associated irrigated pasture and hay production. Urbanization is rapidly overtaking this portion of the Shasta Valley at the lower elevations along the Interstate 5 corridor, and around Lake Shastina. Former agricultural areas are being converted into rural residential land uses.

Water quality studies of the Shasta River watershed were conducted by the North Coast Regional Water Quality Control Board (NCRWQCB) in 2002 and 2003 (NCRWQCB, 2004). Continuous water temperature data collected in the Shasta River at Edgewood Road (RM 43)[9] from June 2002 through September 2003 indicate that weekly average temperatures are typically in excess of 20°C (68°F) during the month of July and remain above approximately 18°C (64°F) during August before dropping to more suitable temperatures for salmonids in September. Average weekly water temperatures on Boles Creek downstream of the City of Weed wastewater treatment ponds (RM 45), however, remained below 15°C (59°F) during the entire continuous monitoring period of late June 2003 through late October 2003 (NCRWQCB, 2004).

Current Habitat Function and Primary Limiting Factors

Morphologically, the Shasta River above Dwinnell Dam is characterized by wandering to meandering channels with in-channel and lateral gravel bars, moderate to steep topographic gradients, riffle-pool sequences, coarse bed materials, and confined and narrow floodplains (Jeffres et al., 2008). Most of the low elevation stream reaches throughout this sub-watershed have a large and reliable source of cold water as well as abundant supplies of spawning gravel supplied from upland areas (SVRCD, 2005). Although no detailed aquatic habitat assessments of this area have been conducted, coho salmon and the CDFG fish species of special concern would likely benefit from access to this sub-watershed.

Shasta River from Dwinnell Dam to County Road A12

The reach of the Shasta River between Dwinnell Dam and County Road A12 (officially the 99-97 Cut-Off) runs from RM 40.6 to RM 26.5. Elevations within this sub-watershed range from 7,071 feet at Herd Peak to approximately 2,500 feet at the downstream end of the reach. Tributaries to the mainstem include Parks Creek (RM 34.8), Hole in the Ground Creek (RM 34.7), and Big Springs Creek (RM 33.7). Both Parks and Big Springs Creeks are important sub-watersheds and are discussed separately below. Precipitation ranges from 30 inches annually in the highest elevations to as little as five inches near the middle of the reach. Land use consists primarily of timber harvest in the upper watershed to the east, grading into dry land grazing and then irrigated pastures and hayfields nearer the river.

The primary agricultural activities in this portion of the watershed are focused on cow-calf production involving irrigated pasture for summer grazing and irrigated hayfields for livestock feed. Additional agricultural activities include the growing of strawberry bedding plants for export. Currently, livestock exclusion fencing had been placed along approximately 11 miles of the

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[9] River mile measurements for locations upstream of Lake Shastina are determined using an assumed stream length along the floor of the lake (NCRWQCB, 2004).

mainstem (Webb, 2008). Irrigation tailwater return to the river is known to occur in this reach, and is believed to be contributing to water temperature gains (SVRCD, 2005).

Demands for water in this section of the river are substantial. Even in mid-summer, flows in this area ramp up rapidly from near zero at the base of the dam, to over 100 cfs in the middle of the reach, and then decline as water is diverted for agricultural uses. The permitted season for most irrigation diversions from the mainstem Shasta River extends from April 1 through October 1 and the diversion quantity is approximately 42 cfs (Webb, 2008). Maintenance of substantial instream flows are dependent on the active efforts of the watermaster directing water downstream in periods of short supply to meet the demands of higher priority water users further downstream. An unintended consequence of the watermastering activities is that instream flows for fisheries use are maintained throughout and beyond this reach. The five active diversions in this reach of the mainstem have been screened according to CDFG/NMFS screening guidelines (Webb, 2008).

Riparian conditions within this reach vary from among the best in the entire watershed to areas significantly affected by livestock usage. Areas in the upper portion of the reach appear to be in a declining trend due to increased livestock pressure.

The entire area around Big Springs, the lower end of Parks Creek, and for several miles of the mainstem Shasta River upstream and downstream of the Big Springs Creek confluence contains numerous springs that discharge water at approximately 13 to 14.5°C (56 to 58°F) throughout the year and collectively create nearly all the instream flow of the Shasta River during the summer. Water temperatures measured during the summer of 2001 confirm that daily average temperatures in the mainstem upstream of the Parks Creek confluence frequently approach 20°C (68°F), while temperatures at the Grenada Irrigation District (GID) pumps typically remained well below 20°C (NRC, 2004). Similarly, water temperatures measured at GID during the months of June through September in 1995 through 1997 revealed mean monthly temperatures below 19.5°C (67°F), although maximum monthly water temperatures at times exceeded 24°C (75°F) (Deas, 1998). In general, temperatures in this reach increase as the downstream distance from the Big Springs area increases (Watershed Sciences, 2004). A review of aerial and infrared images collected during a July 2003 thermal infrared remote (TIR) sensing survey of the Shasta River (Watershed Sciences, 2004) reveal the opposing influences of cold spring inflows and irrigation tailwater returns on this reach of the Shasta River. While some sections of the mainstem receive cold water spring and/or groundwater accretion, and thus contain water temperatures suitable for juvenile coho salmon rearing, other sections receive tailwater return flows, primarily from flood irrigation, at temperatures that are in some cases in excess of 26°C (79°F). In addition to relatively cool summer water temperatures, the springs in this reach provide relatively warm water conditions in the winter and spring that likely promote rapid salmonid egg maturation.

Some springs are fed by seepage from Dwinnell Dam and can at times be distinguished by degraded water quality in terms of low levels of dissolved oxygen. Periodically during the irrigation season, water is released from the dam into the Shasta River to supply irrigation water for any one of three downstream users whose water rights were affected when the dam was built. The water is released from near the bottom of the reservoir, and is therefore highly variable in quality and particularly poor in mid- to late summer, and also contains non-native fish species from Lake Shastina.

Coho salmon, Chinook salmon, and steelhead use this portion of the watershed for both spawning and rearing. The area of the mainstem extending from approximately two miles below the Big Springs Creek confluence to approximately one mile upstream of the Parks Creek confluence contains suitable, albeit patchy, spawning habitat. However, stream substrates in this reach contain high levels of fine sediments which are typically associated with excessive salmon egg mortality and decreased fry emergence (Ricker, 1997). Nevertheless, approximately half of the adult coho salmon tagged during a 2004 radio telemetry tracking investigation spawned in this area of the watershed, including in the mainstem, Big Spring Creek, and Parks Creek (Littleton and Pisano, 2006) and approximately 74 percent of tagged adults spawned in this reach in 2007 (Littleton et al., 2008). Historically (post-construction of Dwinnell Dam), between one- and two-thirds of the fall Chinook run are believed to have utilized this upper area of the Shasta River watershed for spawning, and presumably it was equally suitable for coho salmon (Webb, 2007) and steelhead.

With the obvious exception of Dwinnell Dam, adult coho salmon and steelhead passage throughout this reach appears to be adequate. However, adult Chinook salmon passage and all juvenile salmonid passage may be impeded by the GID diversion dam and the Novy/Rice diversion during the irrigation season. As discussed above, inflows of spring water provide cooler summer water temperatures than the rest of the river, although temperatures do at times reach near maximum tolerance levels for salmonids in reaches influenced by water management practices. Thus, this reach, including the lower portions of Big Springs and Parks creeks, provide the best remaining, albeit suboptimal, coho salmon rearing habitat in the watershed.

Current Habitat Function and Primary Limiting Factors

Based on the presence of some cold water refugia and the observations of fisheries biologists conducting research in the watershed, this reach contains potentially high quality juvenile salmonid rearing habitat (Jeffres et al., 2008), as well as one of the primary adult coho salmon spawning grounds, in the mainstem Shasta River (e.g., Chesney, 2007). However, stream water temperatures are raised significantly by tailwater return flows from flood irrigation and possibly as a result of groundwater extractions (i.e., a decrease in cold groundwater accretion to the channel). Furthermore, spawning gravel quality is affected by fine sediment input, primarily from Parks Creek.

Shasta River from County Road A12 to Yreka Creek

This reach of the mainstem Shasta River is approximately 19.25 miles long and traverses the majority of the agricultural portions of the Shasta Valley. The river in this reach varies between an elevation of 2,500 feet at the upper end (RM 26.5) and 2,387 feet at the confluence with Yreka Creek (RM 7.75). The highest elevation in this reach is 8,158 feet at the divide between Parks Creek to the south and Willow Creek to the north. This portion of the Shasta River forms a meandering channel as it travels through the low gradient central portion of the Shasta Valley.

The drainage area of this portion of the river is located primarily to the west of the river. Significant tributaries include Willow Creek (RM 25), the Little Shasta River (RM 16), and Oregon Slough (RM 11.7). The Little Shasta River watershed is further described below. Precipitation in this reach ranges from approximately 50 inches in the higher elevations, to as little as ten inches on the valley floor.

Primary agricultural activities in this portion of the watershed are focused on cow-calf production, including the maintenance of irrigated pasture for summer grazing, irrigated hayfields for growing livestock feed for the winter, and dry upland areas usable for spring grazing and as sites for winter supplemental feeding. Additional agricultural activities include the growing of conventional and organic fruits and vegetables on a small scale, and production of alfalfa for sale to buyers outside the area.

One irrigation district, located at approximately RM 18, diverts approximately 42 cfs of surface water from this reach and approximately sixteen smaller diversions divert a combined maximum of approximately 27 cfs. Twelve diversions located in areas potentially accessible to coho salmon are currently not screened, but five were scheduled to be screened during 2007 (Webb, 2007). The above numbers do not include any diversions or screens on Willow Creek, for which reliable data is not available. However, three unscreened diversions are believed to be located on Willow Creek in reaches accessible to coho salmon (Webb, 2007).

Riparian conditions in this reach are variable, ranging from relatively good and improving conditions to areas heavily impacted by livestock. Approximately nine miles of the mainstem Shasta River are fenced on both banks, but as of March 2005, an approximately equal amount remained to be protected. Approximately one mile of riparian fencing is present on the tributary streams in this reach. Planting of trees and emergent plants has been undertaken on much of the fenced area along the mainstem, but these plantings have had very low survival rates. Stream banks in this area tend to be fine textured, highly erodible, and vertical, which makes them very susceptible to livestock hoof and grazing impacts.[10] Stream bank failures and concomitant increases in fine sediment loads are common along this reach. Furthermore, soil alkalinity over parts of the reach tends to restrict tree growth, although other areas within the reach still sustain good canopy and shade. Monitoring and hypothesis testing data that could be used to determine the causes of failure have not been collected.

This reach contains only minor cold water inputs from springs, but numerous irrigation tailwater return areas. Water temperatures rise above tolerances for cold water fish through most of the

[10] As discussed in Chapter 3.2, livestock grazing is a Covered Activity under the Program, but similar to some other Covered Activities it is not new; rather, it has been occurring in the Program Area for decades. Hence, authorizing livestock grazing as part of the Program will not cause the level of grazing to increase or result in any impacts in addition to those that are already part of baseline conditions in the Program Area. In fact, the Program will reduce the impacts of grazing by excluding livestock from some riparian areas by installing and maintaining fencing (see ITP and MLTC Covered Activity 5). Also, where riparian fencing is constructed as part of the Program, any grazing of livestock within the riparian exclusion zone ~~adjacent to the channel or within the bed, bank, or channel~~ of the Shasta River or its tributaries may only occur in accordance with a grazing management plan that will result in improved riparian function and enhanced aquatic habitat.

reach every year and over the entire reach during many years due to tailwater input, lack of shade, and increased transit time due to reduced river volumes. Continuous water temperature monitoring conducted by the NCRWQCB at five locations along this reach during the summer (June through October) of 2003 revealed a clear increase in temperatures in a downstream direction (NCRWQCB, 2004). All five locations had weekly average water temperatures in excess of 20°C (68°F) throughout the month of July, with peak weekly average temperatures at the furthest downstream site (Yreka-Ager Road, RM 10.4) approaching 25°C (77°F) (NCRWQCB, 2004). Water temperatures throughout much of this reach also remained above suitable levels for coho salmon throughout the month of August (NCRWQCB, 2004). Similar water temperature monitoring results were obtained during the summer (June through September) of 1995 through 1997 (Deas, 1998). During a July 2003 TIR sensing survey of the Shasta River, water temperatures in the County Road A12 to Yreka Creek reach were found to be between 21°C (70°F) and 24°C (75°F) (Watershed Sciences, 2004).

There are limited areas of suitable spawning gravels present in this reach of the Shasta River. The primary salmonid use of this reach is for migration to and from more important spawning areas upstream, but adult Chinook salmon upmigration may be impeded by irrigation dams. One of 19 adult coho salmon tagged with radio telemetry transmitters in 2004 was tracked to the vicinity of County Road A12, but the fish presumably died en route to upstream spawning areas (Littleton and Pisano, 2006). Nine more tagged coho salmon migrated through the reach to spawning sites in the Dwinnell Dam to County Road A12 reach discussed above (Littleton and Pisano, 2006). In 2007, 74 percent of all tagged coho salmon adults migrated through this reach (Littleton et al., 2008). Although the reach has the potential to serve as extensive rearing habitat for juvenile salmonids (e.g., it has high productivity, some channel complexity, and relatively warm winter water temperatures), summer water temperatures typically exceed the tolerance of juvenile coho salmon. Juvenile steelhead may be able to tolerate water temperatures in some areas of this reach. Thus, this reach generally does not provide year-round coho salmon rearing habitat. Juvenile passage out of this warm reach may also be impeded during summer months by flashboard dams blocking movement upstream, and increasingly high temperatures downstream.

Current Habitat Function and Primary Limiting Factors

As discussed above, the primary function of this reach for coho salmon is that of a migratory route to and from more suitable upstream spawning and rearing grounds. Over-summer survival of juvenile coho salmon, if present, is assumed to be low due to limited cold water refugia areas, difficulty of passage upstream to reliably cold areas, and high temperatures during at least some periods of the summer. However, some steelhead may be able to utilize this reach for rearing and lampreys are likely present. Salmonid spawning in this reach is believed to be limited by poor gravel conditions.

Shasta River Canyon

The Shasta River Canyon reach extends from the Yreka Creek confluence (RM 7.75) to the Klamath River (Figure 3.3-4). A relatively steep gradient and bedrock channel substrate dominates the reach. Elevations range from 2,036 feet at the confluence with the Klamath River to 4,974 feet at Badger Peak. The watershed draining into this short reach covers 5,867 acres (approximately one percent of the total watershed area). Other than Yreka Creek, no significant tributaries join the mainstem in this reach. The Yreka Creek watershed is further described below. Rainfall varies between 18 and 30 inches. The river runs through about three miles of public lands in this reach.

Although essentially no commercial agricultural activities or significant water diversions occur here, the effects of upstream activities, including reductions in flow, increases in water temperature, and fine sediment load, are evident throughout the reach. Water diversions in this reach are limited and all known diversions are screened.

Mining activities beginning in the late 1800s stripped most of the soil and vegetation from the bedrock adjacent to the channel and subsequent livestock usage until 1991 largely prevented riparian recovery. Since 1991 significant herbaceous and woody vegetation growth has occurred in the canyon, sediment is being trapped, and the channel is gaining shade and bank complexity. Nevertheless, proximity of bedrock near the surface, as well as sudden drops in instream flows at the beginning of the diversion season, limit water availability to plants.

Water temperatures in the canyon reach are largely unsuitable for rearing juvenile coho salmon during most of the summer. From June through August 2003, the weekly average temperatures at Old Shasta Road (RM 4) were continuously higher than 20°C (68°F) with peak weekly average temperatures exceeding 25°C (77°F) (NCRWQCB, 2004). During a July 2003 TIR sensing survey of the Shasta River, water temperatures in the canyon reach were found to be between 24°C (75°F) and 26.5 °C (79.7°F) (Watershed Sciences, 2004).

Coho salmon, Chinook salmon, and steelhead use this reach for migration, spawning, and rearing. Nine of the 19 radio tagged adult coho salmon in 2004 and nine of 35 tagged adults in 2007 were recovered in the canyon reach (Littleton and Pisano, 2006; Littleton et al., 2008). CDFG personnel documented production and rearing of young-of-the-year coho salmon (CDFG, 2005). Nearly 3,300 emerging coho salmon were counted from a single capped coho salmon redd in a side channel of the canyon in 2005. However, as rearing conditions diminished due to low flows resulting from upstream irrigation withdrawals and high water temperatures, young-of-the-year coho salmon were no longer encountered in the side channel, but increasing numbers of them were captured in the rotary screw traps monitoring juvenile outmigration (Littleton and Pisano, 2006). The fate of these young-of-the-year coho salmon emigrating from the watershed is poorly understood. Unfavorable rearing conditions in the Klamath River likely result in the loss of many of these fish, but at least some are believed to migrate into tributaries to the mainstem Klamath where water temperatures are sufficiently low to allow for successful rearing.

Current Habitat Function and Primary Limiting Factors

Based on the distribution of adult spawning and the successful emergence of a large number of fry from a single capped redd, CDFG estimates that the number of juvenile coho salmon produced in the canyon reach may be equal to half the annual production of the entire Shasta River. However, while the canyon reach provides suitable habitat features for spawning and rearing in the spring, flow and temperature conditions in this reach after the onset of the irrigation season become inhospitable and force juvenile coho salmon out of the watershed (Pisano, 2007; CDFG 2005).

Parks Creek

The Parks Creek sub-watershed is approximately 35,152 acres (or seven percent of the entire watershed) and includes approximately 23.3 miles of both the West Fork and mainstem of Parks Creek. Parks Creek enters the Shasta River from the west at approximately RM 35. Elevations range from a high of 8,542 feet at China Mountain to 2,590 feet at the confluence with the Shasta River. The West Fork of Parks Creek is the only significant tributary in the sub-watershed. As one travels downstream in the watershed from the headwaters to the mouth, the glaciated valleys of the headwaters transition slowly to flat and broad alluvial fans which have formed wetlands in the lower three to four miles of the stream. Parks Creek varies from deeply incised channels in its upper reaches to a meandering stream in its lower reaches. Water flow in the creek is flashy in the winter and spring due to rain on snow events upslope. Substantial summer base flow is provided by numerous springs throughout the sub-watershed. Precipitation ranges from 55 inches annually in the headwaters, to as little as five inches near its confluence with the Shasta River.

Land use in the upper quarter of the watershed is primarily timber harvest-related in the public and private lands there. Agricultural land uses (irrigated and dryland pasture) predominate along the lower 15 miles of Parks Creek. Agricultural activity is focused primarily on pasture for cattle.

The only significant water usage in Parks Creek is for irrigation. Diversion occurs during the summer for immediate use, in winter for stock watering purposes, and in winter/spring for storage for subsequent summer use, most notably including a substantial diversion by MWCD from Parks Creek to the upper Shasta River to supplement inflows to Lake Shastina. Current records indicate that 27 diversions are located in the Parks Creek sub-watershed. Coho salmon are known or presumed to have access to 24 of those. Three diversions remain to be screened: the top two diversions and MWCD's diversion to Lake Shastina (Beck, 2008). The irrigation season extends from March 1 to November 1 and the maximum diversion quantity identified in the decree is 46.2 cfs, although the full diversion quantity is unlikely to be available all summer. Winter diversion quantity for stock water is 16.3 cfs, and 14,000 acre-feet per year are diverted to Lake Shastina between October 1 and June 15 for storage with a maximum diversion rate of 150 cfs. China Ditch also diverts approximately 8 cfs from Parks Creek during this period (Scott, 2008).

The lower 15 miles of Parks Creek contain areas of extensive livestock impacts resulting in increased sedimentation and decreased shade. As of March 2005, no riparian fencing or other streambank protection associated with agricultural operations existed in the watershed.

The headwaters of the sub-watershed originate in the Eddy Mountains and streamflows are largely fed by snowmelt, resulting in naturally cool water conditions. From June through October 2003, the weekly average temperature in Parks Creek near its headwaters ranged from approximately 10°C (50°F) to 17.5°C (63.5°F) (NCRWQCB, 2004; 2006). However, as Parks Creek traverses the Shasta Valley toward the Shasta River, the lack of riparian vegetation, multiple water diversions, unconfined channel, and tailwater return flows raise the water temperature of the stream. Based on a one-day July 2003 thermal infrared remote sensing surveys of the Shasta River, Parks Creek added a heat load to the Shasta River that causes an increase in the surface temperatures of the Shasta River by 1.7°C just downstream of the confluence of Parks Creek (Watershed Sciences, 2004). On the day of the TIR survey, the surface water temperature at the mouth of Parks Creek was 26.6°C (79.9°F) and the surface water temperature of the Shasta River just upstream of Parks Creek was 21.4°C (70.5°F) (Watershed Sciences, 2004).

Unusually warm weather in early May 2006 caused rapid melting of an above-average snow pack in the Parks Creek watershed. High flows observed on May 19, 2006 caused the creek to spill over its banks. Flows spread across the floodplain and warmed rapidly. Although access restrictions prevented the collection of water temperature measurements in lower Parks Creek, CDFG staff measured temperatures at the Interstate 5 crossing at 11°C (52°F), on the Shasta River above Parks Creek at 12°C (53.5°F), and on the Shasta River below Parks Creek at 24°C (75°F) (Chesney et al., 2007). The event likely resulted in poor conditions for rearing coho salmon and other salmonids.

Currently both coho and Chinook salmon are known to spawn in the lower four miles of Parks Creek where limited spawning gravels exist in association with tributary springs. Two of the nineteen adult coho salmon implanted with radio tags in 2004 were tracked to Parks Creek (Littleton and Pisano, 2006). In 2007, two of 35 tagged coho salmon were tracked to Parks Creek (Littleton et al., 2008). Presumably steelhead and lampreys also use this sub-watershed for spawning. While summer utilization studies have not been conducted, water temperatures in the numerous springs feeding Parks Creek are well within the tolerance range of coho salmon and other salmonids, as are water temperatures in the higher elevation reaches where slope and velocity may or may not allow coho salmon usage. The middle and lower portions of Parks Creek exceed water temperature requirements for rearing coho salmon during most summers, although thermal refugia associated with spring inputs are known to support some juveniles through the summer (Chesney, 2008b).

Current Habitat Function and Primary Limiting Factors

Juvenile coho salmon rearing in Parks Creek is likely confined to cold water refugia associated with spring inflows.

Big Springs Creek

Big Springs Creek is approximately 2.3 miles long from the outlet of Big Springs Lake to its confluence with the Shasta River at RM 33.7 (Figure 3.3-5). Big Springs Creek (along with its only tributary, Little Springs Creek) presents one of the most visibly important components of the entire Shasta River for salmonids, as it is a major source of cold water for the Shasta River during the summer. Currently, most of the water from the spring is diverted for irrigation. Before spring of 2008, access to this reach was restricted and a definitive description of this sub-watershed is currently not available.

A single cow-calf operation, which includes a few llamas and sheep, borders Big Springs Creek and portions of the Shasta River. Land uses include wet meadow pastures, flood-irrigated pastures and dry rocky uplands. Some grass hay is cut from the natural meadows.

Documented surface water rights in Big Springs and Little Springs creeks amount to approximately 28 cfs (Webb, 2008). While Big Springs Creek typically maintains substantial flow at its confluence with the Shasta River, the entire flow of Little Springs Creek is often diverted for flood irrigation during much of the summer. Prior to the mid 1980s, in addition to the above two diversions, the Big Springs Irrigation District (BSID) also utilized a surface water diversion from Big Springs Lake, but found itself increasingly restricted in order to assure that higher priority water users further downstream received their water. Eventually the BSID drilled several relatively shallow wells and effectively abandoned their surface water right for unregulated groundwater, presumably originating from the same aquifer that feeds Big Springs Creek and the other springs in the area.

Aerial images of Big Springs Creek show there is no shade-producing vegetation along the banks and that the area tends to be heavily grazed, both in and adjacent to the channel. Remnant fences and water diversion structures suggest substantial widening of the channel. Riparian conditions are believed to be poor and degrading and no riparian exclusion fencing is in place in this area. While the wet meadow characteristics of the Big Springs Creek area was probably never conducive to substantial tree growth, those same conditions would likely have supported abundant emergent plant growth such as bulrushes and sedges, both of which would have maintained well stabilized banks and provided some shade and channel roughness.

Due to prior access restrictions in this portion of the Shasta Valley, virtually no water temperature data is currently available.[11] However, the aerial TIR investigation of the Shasta River watershed conducted in July 2003 revealed that spring influences reduced water temperatures in Big Springs Creek to approximately 15.6°C (60°F) at RM 1.9, but that downstream of the springs, temperatures increased rapidly, reaching 21.0°C (70°F) at RM 0.7 (Watershed Sciences, 2004). Based on these surveys, the NCRWQCB estimates that the overall rate of heating in Big Springs Creek is approximately 2.7°C (4.9°F)/mile with a maximum rate of heating of 4.5°C (8.1°F)/mile (NCRWQCB, 2006). By contrast, the rate of heating in the Shasta River in reaches not affected by surface water diversions was approximately 0.35°C (0.63°F)/mile at the time of the TIR survey (NCRWQCB, 2006). Aerial and TIR images of Big Springs Creek indicate that the area contains no shade-producing vegetation, tailwater returns to the creek are considerable, and the channel is substantially widened, increasing solar gain. Based on the above information, the NCRWQCB estimates that the baseline temperatures in Big Springs Creek could be reduced by approximately 4°C (7.2°F) if riparian shading were at or near site-potential conditions and the heating influence of tailwater returns was eliminated (NCRWQCB, 2006).

[11] Recently, access to perform hydrologic studies has been granted in parts of the Big Springs Creek area. Flow monitoring began on Big Springs Creek in the spring of 2008; the data collected to date is preliminary and subject to approval and quality assurance by those parties collecting and analyzing the data.

Historically (post-construction of Dwinnell Dam), between one- and two-thirds of the fall Chinook run are believed to have utilized this upper area of the Shasta River watershed, including Big Springs creek, for spawning, and presumably it was equally suitable for coho salmon (Webb, 2007). The current understanding of coho salmon use of this sub-watershed is limited, but three of 19 adult coho salmon implanted with radio tags in 2004, and three of 35 adults tagged in 2007, were tracked to Big Springs Creek (Littleton and Pisano, 2006; Littleton et al., 2008).

Current Habitat Function and Primary Limiting Factors

Although spawning adult coho salmon have been tracked to Big Springs Creek, ongoing livestock grazing in the channel poses a threat to coho salmon eggs, alevins, and fry.[12] Rearing conditions are likely variable through the reach. While some thermal refugia associated with springs are present and support some juvenile coho and steelhead rearing during the summer, current management practices in the sub-watershed have been documented to result in substantial water temperature gains in the system (see above) and present one of the best opportunities for making substantial improvement to coho salmon survival in the near term.

Little Shasta River

The Little Shasta River is approximately 26 miles long with a watershed area of approximately 51,950 acres (or approximately ten percent of the overall watershed). Elevations range from 8,241 feet at Goose Nest to 2,471 feet at the confluence with the Shasta River. Numerous intermittent tributaries enter the Little Shasta River from the north. The Little Shasta sub-watershed comprises cascade volcanics in the headwaters transitioning through a steep constrained canyon reach, and then flowing across dry flatlands in the lower 11 miles. Land along the creek varies from high mountain wet meadows in its upper reaches, through long stretches of steep ground covered with sandy volcanic ash and lava flows where timber harvest was actively engaged in, to its low gradient reaches in the Shasta Valley where agricultural activities predominate. Streamflows can be flashy in winter and spring although the very porous soils tend to minimize runoff from much of the drainage. The relatively low elevations limit snowfall and total precipitation ranges from only ten to 40 inches annually. Substantial summer base flow is provided by numerous springs in the headwaters and in the mid-reaches. Land use is primarily timber harvest related in the upper watershed and predominantly agricultural in the lower half of the watershed. In addition to public lands managed by the U.S. Forest Service (USFS) in the higher elevations, CDFG operates a wildlife area, centered near RM 4, where several manmade winter storage reservoirs, fed by a surface water diversion from the Little Shasta, provide hunting, fishing and bird watching opportunities to the public.

Agricultural activities in the Little Shasta focus on cow-calf operations, with land used for dryland and irrigated pasture, production of grass and alfalfa hay, and production of small grains for local livestock. Substantial farmable acreages exist that are largely left fallow due to a lack of sufficient water in this sub-watershed.

[12] See footnote 10.

Significant water usage in the Little Shasta is for irrigation, stock watering, municipal, and recreational uses. Diversion occurs during the summer for immediate use, in winter for stock watering and municipal purposes, and also in winter for storage for recreation and/or subsequent summer use. There are currently six screened and three unscreened agricultural diversions on the Little Shasta. Of the unscreened diversion, one is scheduled to be screened in the fall/winter of 2008. Screening of the remaining two will be accomplished by combined the two into one diversion and is currently scheduled for summer of 2009 (Davis, 2008). The summer maximum diversion quantity for irrigation is 85.6 cfs, although full diversion quantity is unlikely to be available most of any summer. The winter diversion quantity is 6.8 cfs for stock water and 8,528 acre-feet for storage.

Riparian conditions above about RM 11 are relatively good with dense overstory, tall trees, and stable banks. Between RM 11 and RM 8.75, recently installed fencing is resulting in improvements. Below RM 8.75, riparian conditions tend to be unprotected and poor. Approximately19 percent of the stream frontage on private land used by livestock is currently fenced to protect stream banks. Of the portions of the stream on USFS lands, most of the streambanks accessible to livestock have been fenced.

Continuous water temperature monitoring conducted at two locations on the Little Shasta River in late June through late October 2003 revealed weekly average water temperatures ranging between 15°C (59°F) and 20°C (68°F) at Ball Mountain Road (RM 10) during much of July and August, and temperatures between 20°C (68°F) and 25°C (77°F) at the mouth of the Little Shasta River during the same period (NCRWQCB, 2004). The aerial TIR investigation of the Shasta River watershed conducted in late July 2003 indicated an average median water temperature in the Little Shasta River of 28°C (82°F) between RM 11.3 and the confluence with the Shasta River (Watershed Sciences, 2004). During the survey, very little visible surface flow was present in the Little Shasta River throughout much of the survey extent.

Current Habitat Function and Primary Limiting Factors

Until recently, the Little Shasta River was only known to be used intermittently by fall-run Chinook salmon and steelhead when early rains or irrigation cessation resulted in water conditions that allowed them to migrate upstream. However, CDFG staff encountered juvenile coho salmon in the creek in 2006 (Whelan, 2007). Reaches containing suitable spawning gravels occur primarily upstream of RM 10. However, little is known regarding the use of the watershed by coho salmon, and the largely dry condition during the summer months likely preclude year-round juvenile rearing below RM 10.

Yreka Creek

The Yreka Creek sub-watershed comprises about 12 miles of Yreka Creek and six miles of Greenhorn Creek, its only significant tributary. The total watershed acreage is approximately 33,450 acres (or 6.6 percent of the overall watershed area) and elevations range from a high of 5,810 feet on the ridge shared by Yreka and Greenhorn creeks with the Scott Valley, down to 2,387 feet at the confluence with the Shasta River at RM 7.75. The creek varies from steep and deeply incised in its upper reaches to a near-surface stream in its alluvial lower reaches. The portion of the creek flowing through the City of Yreka has been channelized to a significant degree. Downstream of Yreka, the floodplain was severely degraded by dredge mining prior the 1950s, at which time the dredge tailings were leveled, and a channel was created for the stream at the base of the hills bordering the east side of the historic floodplain. Precipitation ranges from 40 inches annually in the headwaters of Greenhorn Creek, to 18 inches near the confluence with the Shasta River. Summer thunderstorms can result in very flashy flows in mid-summer, and on rare occasions rain-on-snow events can produce high water in winter. Land use is primarily timber harvest in the upper watershed, grading into rural residential near the base of the hills, and agricultural land use (irrigated and dryland pasture) and urban areas in the valley bottom. The City of Yreka is in the center of the watershed. The City owns and operates Greenhorn Reservoir built near the mouth of Greenhorn Creek. Historically Greenhorn Creek appears to have been the primary gravel source for Yreka Creek and the lower Shasta River, a function now precluded by the reservoir.

Agricultural use in the watershed is limited and consists of irrigated and partially irrigated fields in the bottomlands bordering Yreka Creek (but not Greenhorn Creek) both upstream and downstream of the City of Yreka. Those fields are grazed while forage and water is available, but livestock are moved elsewhere later in the season.

No active surface water diversions are believed to be located within the current range of coho salmon within this sub-watershed. Approximately nine active diversions capture the available water in the headwaters of Yreka Creek, although runoff there appears to be largely seasonal. Runoff in Greenhorn Creek is captured by Greenhorn Reservoir, which does not provide fish passage. Residents living outside of town capture underflow of both Yreka Creek and Greenhorn Creek for domestic and/or irrigation uses. The City of Yreka imports up to 6 cfs from Fall Creek on the Klamath River for domestic use, but supplements that water with water from the underflow of Yreka Creek during times of peak demand in mid-summer. At the same time, the city’s waste water treatment plant supplements flows of Yreka Creek, along with supplementing its surface and underflow with secondarily treated waste water. Peak potential diversion quantities equal 9.88 cfs, not including any water captured by Greenhorn Reservoir or in Greenhorn Creek upstream of the reservoir. Some water usage is believed to be occurring from Humbug Creek, a small and usually disconnected tributary which might otherwise reach Yreka Creek and provide for surface or subsurface flows (SVRCD, 2005). Diversions in Yreka Creek are not watermastered.

Riparian conditions in the upper five miles of Yreka Creek are generally poor as a result of ongoing grazing impacts[13] and loss of most of what little water would be in the stream in mid- to late summer to support riparian growth. The lower seven miles of Yreka Creek are in generally good condition in terms of riparian vegetation, but the stream is overly constrained to a fixed channel with limited opportunities for habitat variability, particularly in the absence of its historic supply of gravel. Riparian fencing in this sub-basin is largely non-existent (Webb, 2008).

[13] See footnote 10.

Only limited water temperature data is available for Yreka Creek. The maximum temperature recorded in 2001 (sampling period and location unknown) is reported by the NCRWQCB (2006) as 28.4°C (83°F) while the maximum weekly average temperature was 24.4°C (76°F). Temperatures measured in late July 2003 during the aerial TIR investigation were 23.4°C (74°F) at the mouth of Yreka Creek (Watershed Sciences, 2004).

Chinook salmon can be found spawning in the lower four miles of Yreka Creek in years when creek flows are high enough in the fall to allow for adult access. Steelhead are also known to spawn in Yreka Creek. One tagged adult coho salmon was tracked to RM 2.5 in Yreka Creek in 2007 (Littleton et al., 2008) and juvenile coho salmon were reported from CDFG electrofishing surveys conducted on Yreka Creek in 2002 (Whelan, 2007). Juvenile coho salmon and steelhead are found over-summering in Yreka Creek where pockets of cold water persist through the summer. Cold water sources include some small springs within the city limits of Yreka, and seepage from the City of Yreka sewage treatment plant.

Current Habitat Function and Primary Limiting Factors

Coho salmon use and habitat conditions in the Yreka Creek watershed have not been thoroughly investigated. Adult coho salmon access to the creek is likely limited by low flows. Juvenile rearing habitat appears to be restricted to a few cold water refugia.

Limiting Factors

A detailed limiting factors analysis for coho salmon and the CDFG fish species of special concern in the Shasta River watershed has not been prepared. However, a number of surveys and studies have been conducted over the past decade, focusing on fisheries population data, habitat extent, and water quality conditions. Combining the results and observations summarized in these studies with the known habitat preferences and physiological requirements of coho salmon and the CDFG fish species of special concern allows us to identify suboptimal habitat conditions that are prevalent in the watershed and that, if addressed appropriately in future management efforts, may help, at a minimum, to stabilize salmonid populations and possibly aid in the recovery of coho salmon. While the majority of these factors have been mentioned in the previous descriptions of the various sub-watersheds, the discussion presented below summarizes the current understanding of the primary features of existing aquatic habitat impairment in the Shasta River watershed.

Streamflows

As discussed in Chapter 3.2, Geomorphology, Hydrology, and Water Quality, in this Draft EIR, the present hydrologic regime of the Shasta River is affected by surface water diversions, groundwater pumping, and Dwinnell Dam. Runoff peaks generally occur during the winter and late spring and are associated with rain and/or rain-on-snow events. Flows decline rapidly with the onset of the irrigation season in March and April, which reduces baseflow volumes during the spring and summer months. Flow slowly begins to increase in September and October when most of the seasonal irrigation diversions cease. Winter baseflow conditions typically are 180 to 200 cfs, regardless of precipitation, and similar flows probably existed historically throughout the year (NRC, 2004). Surface diversions and loss of flow from springs due to groundwater withdrawals have reduced summer flows to approximately ten percent of their historic rates (NRC, 2004). Figure 3.2-7, presented in Chapter 3.2, depicts unimpaired flow estimates in comparison to measured flow volumes for the Shasta River from 2002-2005.

As discussed previously, suitable streamflows throughout the year are important for the various life stages of coho salmon, Chinook salmon, and steelhead. Streamflows need to be sufficiently deep and continuous for adults to complete their migration from the ocean to freshwater spawning grounds unimpeded. Excessive water velocities during the winter and spring incubation and emergence period may scour out redds or flush fry out of the drainage. Spring flows must be sufficient to allow for incubation of eggs and alevins, to provide edge habitat for newly emerged fry, and to enable smolt emigration. Low summer base flows reduce effective juvenile rearing habitat availability, may result in water temperature increases, and can cause stress or mortality to riparian vegetation.

Intuitively, the reduction of streamflow associated with water diversions reduces the overall volume of water available to fish and results in adverse effects to fish through habitat loss and/or degradation. However, the effects of variations in streamflow on fish survival and growth can be difficult to estimate because of the possible confounding effects of associated increases in water temperature and population densities (Harvey et al., 2006). Nevertheless, some research has been conducted on these effects. For example, researchers studying the effect of streamflow on survival and growth of resident rainbow trout by manipulating streamflows entering experimental and control reaches in a small stream in northwestern California found that the mean body mass of fish in control units increased about 8.5 times as much as that of fish in units with reduced streamflow (Harvey et al., 2006).

A reduction in habitat availability is the most obvious effect of water diversions and the relationship between streamflow and habitat availability has been investigated in numerous studies. For example, an Instream Flow Incremental Methodology (IFIM) study of lower Scott Creek in Santa Cruz County, found that optimum habitat conditions for juvenile steelhead and coho salmon in Scott Creek are provided at 20 cfs, and that only half of the maximum habitat remains at 5-6 cfs (Snider et al., 1995). Nevertheless, while habitat availability is a measurable parameter, the response of fish to reduced habitat availability is more difficult to quantify.

CDFG studies in the lower Shasta River in 2005 documented a substantial loss of suitable rearing habitat and the displacement of rearing age 0+ coho salmon as a result of streamflow reductions associated with the April 1 onset of the diversion season (CDFG 2005, Chesney et al., 2007). Nearly 3,300 emerging coho salmon were counted from a single capped coho salmon redd in a side channel of the canyon in 2005. However, after April 1, flows diminished rapidly as a result of upstream irrigation withdrawals and young-of-the-year coho salmon were no longer encountered in the side channel, but increasing numbers of them were captured in the rotary screw traps monitoring juvenile outmigration (Littleton and Pisano, 2006). Measurements of habitat extent conducted at the time of the redd capping investigation showed that up to fifty percent of available rearing habitat was lost in a side channel of the Shasta River canyon reach when streamflow in the side channel was reduced from 41.4 cfs on February 23, 2005 to 20.5 cfs on April 5, 2005 (CDFG, 2005). These results provide a strong indication that coho salmon fry produced in the Shasta River canyon, and potentially elsewhere in the watershed, are being forced out of the system by decreased streamflows resulting from surface water diversions. Similarly, a year-long study conducted by the Center for Watershed Sciences at the University of California at Davis during water year 2007 (October 1, 2006 through September 30, 2007) showed that while juvenile coho salmon, Chinook salmon, and steelhead were all present within the mainstem Shasta River between RM 27.5 and RM 32.0 during the spring season, primarily juvenile steelhead remained in the reach over the summer (Jeffres et al., 2008). Some level of coho salmon and Chinook salmon absence from this reach after the spring can presumably be attributed to natural smolt outmigration, but only one age 0+ coho salmon was observed in this reach after the irrigation season had started, suggesting that even young-of-the-year juveniles emigrated from the reach. Increased water temperatures and reduced habitat availability attributable to the diversions are believed to have played an important role in the summer absence of rearing juvenile coho salmon (Jeffres et al., 2008).

Another effect of habitat reduction associated with water diversions, if all other factors remain constant, is an increase in population density. Studies of varying densities of rearing juvenile coho salmon in hatcheries have found that an increase in fish density was associated with significant decreases in weight, length, condition factor, and food conversion efficiency; elevated body water content; reduced fat and protein contents; and increased mortality (Fagerlund et al., 1981). While this study was not conducted in a natural setting and may therefore not be directly applicable to density variations in streams and rivers, the fact that a hatchery experiment allows for control of all parameters (e.g., food supply, temperature) eliminates some of the confounding effects inherent in natural settings.

The reduction of water may also result in increased inter-specific fish densities in natural settings. For example, steelhead and coho salmon are known to be significant competitors for resources when not segregated by natural habitat diversity and preference. Steelhead densities have been shown to have a negative effect on coho salmon growth as measured in weight change. Harvey and Nakamoto (1996) showed that weight change in coho salmon was positive among fish held in the absence of steelhead, neutral among coho salmon held with natural steelhead densities, and negative among those held in twice the natural steelhead densities. The more aggressive coho salmon typically dominate interactions among similar-sized juvenile salmonids (Moyle, 2002). However, Moyle (2002) points out that “when habitat conditions in California streams favor juvenile steelhead so that their densities are higher than those of coho, growth of coho may be suppressed through competition for food in crowded pools, especially when flows are low, and through aggressive interactions with large 1- to 2-year-old steelhead.”

In addition to habitat loss, reduced streamflows can result in the direct mortality of certain life stages of coho salmon. Particularly during below-average water years, streamflows in the Shasta River decrease rapidly after the onset of the diversion season (CDFG, 2005) and CDFG speculates that if 2005 had been a below-average water year, the capped redd that produced almost 3,300 coho salmon fry discussed above would have likely been dewatered and most, if not all, of its fry would have perished (Pisano, 2007).

Along with excessive water temperatures discussed below, impaired streamflows are likely the most significant factor limiting coho salmon and the CDFG fish species of special concern in the Shasta River watershed. It is important to recognize that the effects of water diversions on coho salmon and the other CDFG fish species of special concern and their habitats are in many instances the cumulative result of the water diversions in total throughout the watershed. While some individual diversions might not significantly affect fisheries resources and their habitat because, for example, they are already screened or the amount of water diverted is small, the total volume of water diverted in the watershed results in degraded conditions that contribute to mortality and other adverse impacts to fisheries resources and aquatic habitat quality within the Program Area. This is another reason the Program is watershed-wide.

Water Quality

Coho salmon and other salmonid species are dependent on suitably low water temperatures and adequately high dissolved oxygen concentrations. Increased water temperatures and low dissolved oxygen levels decrease the area and volume of suitable habitat for salmonids, decrease survival during incubation, rearing, and migration, and can be lethal. In the Shasta River basin, elevated temperatures and low dissolved oxygen contribute to the non-attainment of beneficial uses associated with the cold water fishery, specifically the salmonid fishery (NCRWQCB, 2006).

As discussed above, much of the Shasta River downstream of the GID diversion, as well as the tributaries known to be used by coho salmon for spawning, exhibit summer water temperatures that are at the upper end or in excess of coho salmon temperature preferences, although species with a higher temperature tolerance (Chinook salmon and steelhead) have been noted to experience high growth rates within a 4.5-mile reach of the mainstem Shasta River (RM 27.5 to RM 32.0) immediately downstream of the GID diversion (Jeffres et al., 2008). Water temperatures influence rearing juveniles’ growth rate, population density, swimming ability, ability to capture and metabolize food, and ability to withstand disease.

During the spring and summer of 2008, CDFG staff conducted surveys of the upper Shasta River (above RM 32) and its tributaries, Big Springs Creek and Parks Creek, to determine the location and thermal characteristics of summer rearing habitat utilized by juvenile coho salmon. From the beginning of the surveys in March through late August, CDFG staff observed a decrease in the distribution and number of rearing coho salmon and noted that the only locations where juveniles continued to rear in late summer were near, or downstream of, cold water springs (Chesney, 2008a). Preliminary results of the investigation suggest that water diversions reduce instream habitat and the warm tailwater returns displace juvenile coho salmon from areas that had been suitable earlier in the season (Chesney, 2008b).

Although historic water temperature data for the Shasta Valley is not available,[14] several factors that are widely understood to cause increases in stream temperatures exist in the watershed. The NCRWQCB identified limited riparian shading, tailwater return flows, surface water diversions,

[14] Jeffres et al. (2008) cite currently unpublished modeling results estimating pre-development hydrologic and thermal conditions of the Shasta River at the Nelson Ranch property (RM 27.5 to RM 32.0). Published reports of the modeling results for the entire watershed were not available at the time of Draft EIR preparation.

groundwater accretion, and the effects of Lake Shastina and minor impoundments as factors affecting water temperatures in the Shasta River watershed (NCRWQCB, 2006). A lack or scarcity of riparian cover, as is the current condition in much of the Shasta Valley, allows increased solar radiation to reach the water surface, resulting in gradual temperature gains. Tailwater returns add heated water to the river and tributaries. In one instance, water temperatures of a tailwater return on Big Springs Creek were shown through aerial infrared imaging to be 9.2°C warmer than temperatures in the creek (NCRWQCB, 2006). Furthermore, reduced water volumes and velocities resulting from diversions typically allow water temperatures to rise. Aerial infrared imaging revealed that the locations of several diversions on the Shasta River coincide with increases in the rate of heating in the river (NCRWQCB, 2006). Conversely, temperature models completed for the Shasta River suggest that the addition of 20 cfs of cold water flow to the current August baseline flows would reduce maximum water temperatures in the middle and lower reaches of the Shasta River by 2 to 3°C (Watercourse Engineering, 2003) and that the addition of 45 cfs of cold water flow below the confluence of Big Springs Creek would result in reductions of maximum water temperatures by as much as 6°C at the Yreka-Ager Road crossing (NCRWQCB, 2006).[15] Water diversion structures, particularly dams, also contribute to rises in summer water temperatures due to slowing water velocities upstream of the dams. Thus, it is evident that agricultural water diversions in the Shasta River watershed are at least partly responsible for observed warm water conditions in the late summer and early fall. Along with impaired streamflows, excessive water temperatures are likely the most significant factor limiting coho salmon survival in the Shasta River watershed.

In addition to excessive water temperatures during critical juvenile rearing periods, the Shasta River has been designated as impaired for dissolved oxygen concentrations by the NCRWQCB (2006). Dissolved oxygen concentrations of 8 mg/L or higher are typically considered ideal for rearing salmonids including coho salmon. Rearing juveniles may be able to survive when concentrations are relatively low (e.g., less than 5 mg/L), but growth, metabolism, and swimming performance are adversely affected (Bjornn and Reiser, 1991). The Water Quality Control Plan for the North Coast Region (Basin Plan) (NCRWQCB, 2005) objective for the Shasta River and its tributaries is 7 mg/L. Factors contributing to changes in dissolved oxygen concentrations include photosynthesis and respiration of aquatic plants, respiration of aerobic organisms including bacteria that decompose organic material, concentrations of oxygen-consuming constituents, flow, velocity, and water temperature. The NCRWQCB (2006) found that during the fall and winter seasons (October 1 through March 30), dissolved oxygen concentrations in the Shasta River generally range from 7 to 19 mg/L, and during the spring and summer seasons (April 1 through September 30), concentrations range from 2 to 18 mg/L. Thus, some areas of the Shasta River watershed do not provide suitable dissolved oxygen levels for coho salmon during the spring and summer period.

[15] NCRWQCB (2006) estimate assumes that water temperatures in Big Springs Creek and Parks Creek are reduced by 4°C and 2°C, respectively, through increased riparian shading, elimination of tailwater return, and, in the case of Parks Creek, a reduction in water diversions.

Habitat Features

Salmonid species' need for habitat features such as LWD, pool availability and depth, and channel complexity are discussed above. No recent focused habitat inventories of the entire Shasta River watershed have been conducted, although a habitat typing study was conducted on the lower ten miles of the Shasta River in the late 1980s (West et al., 1990). Within the lowland valley portion of the watershed, riparian and instream cover are scarce, fine sediment levels are high (Ricker, 1997), and water temperatures are high. Nevertheless, suitable habitat conditions for coho salmon and CDFG fish species of special concern remain in some reaches. For example, researchers studying a 4.5-mile reach of the mainstem Shasta River (RM 27.5 to RM 32.0) downstream of the GID diversion concluded that this reach provides unique and potentially very high quality habitat for rearing juvenile salmonids (Jeffres et al., 2008). However, while species with a higher temperature tolerance (Chinook salmon and steelhead) experience high growth rates in this reach, water temperatures are believed to be a limiting factor for juvenile coho salmon despite the abundance of available habitat (Jeffres et al., 2008).

Migration Barriers

Barriers to adult up-migration, smolt out-migration, and juvenile intra-watershed migration may be complete and relatively permanent, such as in the case of Dwinnell Dam, but are more often partial and temporary, such as low flow migration impediments (e.g., Little Shasta River, Yreka Creek). Structural impediments such as flashboard dams are in many instances partial barriers as they may block intra-watershed movement of juveniles during the summer months but are typically removed at the end of the irrigation season in time for the majority of the adult spawning migration except when the diverter has stock water rights. Within the Shasta River watershed, Dwinnell Dam represents the most significant migration barrier for coho salmon, effectively eliminating an estimated 22 percent of the total spawning habitat formerly available to salmon and steelhead (Wales, 1951). Along with impaired streamflows and excessive water temperatures, Dwinnell Dam is likely one of the most significant factors limiting coho salmon and CDFG fish species of special concern in the Shasta River watershed.

Coho Salmon Brood Year Lineages

While evaluating the known and potential effects that the factors discussed above have on limiting coho salmon productivity within the watershed, it is important to keep the rigid three-year life cycle of coho salmon in mind. Although aquatic habitat conditions in the Shasta River and its tributaries have been impaired by land use practices over the past 100 years, outmigration studies conducted by CDFG resulted in population estimates of approximately 10,800 smolts emigrating from the watershed during the spring 2006 migration period compared to approximately 1,800 smolts during the spring of 2004 (Chesney et al., 2007). Smolts captured in 2006 were hatched in the spring of 2005 and are thus members of the one remaining strong brood lineage (2001…2004…2007). The 2006 smolt data, as well as data collected on returning adults (2004), suggest that even though coho salmon populations have experienced declines over historic numbers, the watershed is capable of producing relatively large numbers of juvenile coho salmon when sufficient numbers of adults return to the system to spawn and flows are adequate. One of the most important factors in the low numbers of coho salmon observed during two out of every three years may therefore be the low population numbers in and of themselves. Severely depressed brood lineages require a long period of time to recover and regain historic population sizes, even if habitat conditions are ideal and, conversely, a relatively strong brood lineage perpetuates itself even in less than ideal conditions.

It should also be noted that prior to 2007, many other coastal watersheds in California showed similar coho salmon population trends consisting of a strong 2001…2004…2007 brood lineage and weak 1999…2002…2005 and 2000…2003…2006 lineages (e.g., Smith, 2002).[16] Thus, the decline in coho salmon populations is at least partially a result of conditions or events that are not specific to any given watershed. Some of these factors are discussed below.

External Factors

While the limiting factors discussed above pertain primarily to conditions affecting coho salmon within the Shasta River watershed, the anadromous life history of salmonids and lampreys also exposes the species to factors outside the Program Area, including ocean conditions, migratory conditions in the Klamath River, climate conditions, and a number of highly variable factors. For example, recent studies have documented significant mortality in juvenile salmon and steelhead populations in the Klamath River due to infectious disease, primarily caused by the endemic parasites *Ceratomyxa shasta* and *Parvicapsula minibicornis*. In 2004, infection rates in juvenile Chinook salmon ranged from about 20 to 70 percent for *C. shasta* and from 40 to 96 percent for *P. minibicornis*. In 2005, dual infection rates at or near 100 percent were observed for consecutive weeks in April, a critical period for outmigration of juvenile anadromous fishes (USFWS, 2007).

Although freshwater habitat loss and degradation have been identified as leading factors in the decline of anadromous salmonids in California, climatic variations such as droughts, floods, and ocean conditions also affect these species. For example, a strong correlation between salmon abundance, as measured in annual catch, and Pacific Decadal Oscillation (PDO) cycles has been shown by researchers (Mantua et al., 1997). A warm phase PDO is typically associated with reduced abundance of coho and Chinook salmon in the Pacific Northwest, while cool phase PDO is linked to an above average abundance of these fish (Mantua et al., 1997). A marked decline in the 2007 coho and Chinook salmon returns was observed throughout the species' range in California and elsewhere along the Pacific coast (McFarlane et al., 2008). A recently developed ocean conditions index, the Wells Ocean Productivity Index (WOPI), reveals poor conditions during the spring and summer of 2006, when juvenile coho salmon from the 2004...2007 brood lineage entered the ocean (McFarlane et al., 2008).

[16] The cited document states that only the "1993, 1996, 1999, 2002 year class" remains strong. However, this assessment is based on data collected during surveys of rearing juveniles. Thus the "2002 year class" is equivalent to the 2001 brood lineage.

3.3.2 Regulatory Framework

Federal and State Regulation of Special-Status Fish Species and CDFG Fish Species of Special Concern

Endangered Species Act

Under ESA, the Secretaries of the Interior and Commerce have joint authority to list a species as threatened or endangered (16 U.S.C. § 1533[c]). ESA prohibits take of endangered or threatened fish and wildlife species on private property, and from take of endangered or threatened plants in areas under federal jurisdiction. Under ESA, "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." USFWS and NMFS define "harm" in their regulations to include significant habitat modification that could result in take of a species. If a project would result in take of a federally-listed species, either an incidental take permit under ESA section 10(a), or an incidental take statement issued pursuant to federal interagency consultation under ESA section 7 is required prior to the occurrence of any take. Such authorization typically requires various measures to avoid and minimize take and, if necessary, to compensate for take.

Pursuant to the requirements of ESA section 7, a federal agency reviewing a proposed project that it might authorize, fund, or carry out, must determine whether any federally-listed threatened or endangered species, or species proposed for federal listing may be present in the project area and determine whether implementation of the proposed project is likely to affect the species. In addition, the federal agency is required to determine whether a proposed project is likely to jeopardize the continued existence of a listed species or any species proposed to be listed under ESA or result in the destruction or adverse modification of critical habitat proposed or designated for such species (16 U.S.C. § 1536[3], [4]).

NMFS administers ESA for marine fish species, including anadromous salmonids such as coho salmon, and USFWS administers ESA for non-marine species. Projects where a federally-listed species and/or its habitat are present and are likely to be affected by the project must receive authorization from either NMFS or USFWS. Authorization may involve a letter of concurrence that the project will not result in the potential take of a listed species and/or its habitat or it may result in the issuance of a Biological Opinion that describes measures that must be undertaken in order to minimize the likelihood of an incidental take of a listed species. Where a federal agency is not authorizing, funding, or carrying out a project, take that is incidental to the lawful operation of a project may be permitted pursuant to ESA section 10(a).

California Endangered Species Act

CESA (Fish and Game Code, § 2050 *et seq.*) prohibits take[17] of an endangered, threatened, or candidate species unless the take is authorized by CDFG. CDFG may authorize take by permit provided: 1) it is incidental to a lawful activity; 2) the impacts of the authorized take are

[17] "Take" means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. (Fish and Game Code, § 86).

minimized and fully mitigated; 3) the permit is consistent with any regulations adopted pursuant to Fish and Game Code, §§ 2112 and 2114; 4) there is adequate funding to implement the minimization and mitigation measures, and to monitor compliance with and the effectiveness of those measures; and 5) issuance of the permit will not jeopardize the continued existence of the species (Fish and Game Code, § 2081, subds. (b), (c)). Under CESA, the Commission maintains the lists of threatened species and endangered species (Fish and Game Code, § 2070). The Commission also maintains a list of candidate species for which CDFG has issued a formal notice as being under review for addition to either the list of endangered species or threatened species.

Fish and Game Code, § 1600 et seq.

Under Fish and Game Code, § 1600 *et seq.*, CDFG regulates activities that will "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, streams and lakes, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake." Before an entity may begin such an activity, it must notify CDFG and describe the activity. If CDFG determines that the activity described in the notification could substantially adversely affect an existing fish or wildlife resource, the entity must obtain a Streambed Alteration Agreement (SAA) before conducting the activity, which will include measures CDFG determines are necessary to protect the fish and wildlife resources the activity could affect.

Fish and Game Code, § 5901

Fish and Game Code, § 5901 makes it "unlawful to construct or maintain in any stream … any device or contrivance that prevents, impedes, or tends to prevent or impede, the passing of fish up and down stream."

Fish and Game Code, § 5937

Fish and Game Code, § 5937 requires "the owner of any dam [to] allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam."

Goals and Policies

The Klamath Fishery Management Council

The Klamath Fishery Management Council (KFMC) was an 11-member federal advisory committee which included representatives from commercial and recreational ocean fisheries, the in-river sport fishing community, tribal fisheries, and state and federal agencies (CDFG, Oregon Department of Fish and Wildlife, NMFS, and U.S. Department of the Interior) that worked by consensus to manage harvests and ensure continued viable populations of anadromous fish in the Klamath Basin. KFMC developed a long-term plan for the management of in-river and ocean harvest of Klamath Basin anadromous fish.

Before the Klamath Act expired in 2006, the KFMC met three times each spring to review the past year's harvest of Chinook salmon, and to review predictions of Chinook salmon ocean abundance and harvests in the upcoming year developed by their Technical Advisory Team. KFMC then made specific recommendations to the agencies that regulate the harvest of Klamath Basin fish. These agencies include the Pacific Fishery Management Council (PFMC), Commission, Oregon Department of Fish and Wildlife, Yurok Tribal Fisheries, and Hoopa Tribal Fisheries. KFMC recommendations to PFMC were used to develop ocean salmon fishing seasons. PFMC then passed its recommended fishing seasons to the Department of Commerce, which has final authority in setting regulations for the ocean fishery.

In 2006 and 2007, PFMC severely limited the allowable catch of salmon off the California and Oregon coasts, in order to protect the depleted Klamath stocks. For 2008, PFMC took the unprecedented action of completely closing the salmon fishing season off the California coast due to severely depressed Sacramento River stocks. While the intent of the restrictions is to rebuild salmon stocks, they have also had the consequence of impairing the commercial, recreational, and tribal salmon fisheries.

Siskiyou County General Plan

The Conservation Element of the Siskiyou County General Plan includes general objectives relating to biological resources. These objectives include "to preserve and maintain streams, lakes and forest open space as a means of providing natural habitat for species of wildlife." There are no Habitat Conservation Plans or other approved habitat plans that apply to lands within the Program Area.

3.3.3 Impacts and Mitigation Measures

Significance Criteria

To determine the level of significance of an identified impact, the criteria outlined in the CEQA *Guidelines* and Appendix G in the CEQA *Guidelines* were used. The following is a discussion of the approach used to determine whether the Program could have a significant effect on fisheries and aquatic habitats.

Under CEQA *Guidelines,* § 15065(a), if a project "has the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish and wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species,"[18] the lead agency must prepare an EIR for the project (CEQA *Guidelines,* § 15065, subds. (a), (a)(1)). CEQA *Guidelines,* § 15206(b)(5) specifies that a project shall be deemed to be of statewide, regional, or area-wide significance if it "would substantially affect sensitive wildlife habitats including but not limited to riparian lands, wetlands, bays, estuaries, marshes, and habitats for rare and endangered species as defined by CEQA *Guidelines,* § 15380"

[18] "Endangered, rare, or threatened species" is defined in the Glossary.

(California Code Regulations, title 14, § 15065, subd. (b), (b)(5)). "Endangered, rare, or threatened species" and species that meet the definition of an endangered, rare, or threatened species under CEQA *Guidelines*, § 15380 are collectively referred to as special-status species in this Draft EIR.

In addition to the significance criteria in Appendix G for biological resources (discussed below), for the purpose of this analysis, the criteria in CEQA *Guidelines*, §§ 15065(a)(1) and 15206(b)(5) were used to determine whether any effect of the Program on fisheries and aquatic habitats could be significant. Hence, any effect of the Program that would "substantially degrade the quality of the environment," "substantially reduce the habitat of a fish or wildlife species," and/or "substantially affect sensitive wildlife habitats," constitute a significant effect for the purpose of this impact analysis. The Program would "substantially degrade the quality of the environment" if it could render currently suitable fisheries habitat unsuitable (e.g., fine sediment deposition at levels that would impair salmonid spawning). The Program would "substantially reduce the habitat of a fish or wildlife species" if it could cause an overall reduction in current habitat availability (e.g., through migration barriers) or suitability (e.g., through increases in water temperature). The Program would "substantially affect sensitive wildlife habitats" if it could adversely alter the current use of a fisheries habitat area (e.g., fine sediment deposition at levels that would impair salmonid spawning). Also for the purpose of this impact analysis, an overall reduction of the current extent or ecological function of fishery habitat caused by the Program would constitute a "substantial, or potentially substantial, adverse change in . . . the physical conditions [in the Program Area]," and therefore would be considered a significant effect (CEQA *Guidelines*, § 15382).

In accordance with Appendix G in the CEQA *Guidelines*, the Program would have a significant effect on the environment if it could:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS (or NMFS in the case of marine and anadromous species). For purposes of this analysis, substantial adverse effects on species are defined as effects that result in mortality of a substantial number of individuals or habitat modifications that would reduce the overall suitability of the habitat.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS (or NMFS in the case of marine and anadromous species). For purposes of this analysis, substantial adverse effects on sensitive natural communities are defined as effects that result in the overall reduction of the current extent or ecological function of the community.

- Have a substantial adverse effect on federally protected wetlands as defined by Clean Water Act section 404 (including, but not limited to, marshes and vernal pools) through direct removal, filling, hydrological interruption, or other means. For purposes of this analysis, substantial adverse effects on federally protected wetlands are defined as effects that result in the overall reduction of the current extent or ecological function of wetlands.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. For purposes of this analysis, substantial interference with the movement of fish species are defined as effects that permanently block (e.g., dams) or seasonally impede (e.g., insufficient water depths) fish movement.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. For purposes of this analysis, a fundamental conflict with a local plan or ordinance is defined as any action that substantially conflicts with the terms of such policies or ordinances.

- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. For purposes of this analysis, a fundamental conflict with an adopted habitat conservation plan is defined as any action that would substantially conflict with the terms of such a plan.

Impact Analysis

As discussed earlier in this Draft EIR, some of the activities the Program proposes to authorize through the issuance of SAAs and sub-permits are historic, ongoing activities that, along with the impacts they have had on the physical conditions in the Program Area, are part of the existing environmental setting. These include water diversions that the Program proposes to authorize to bring them into compliance with Fish and Game Code, § 1600 *et seq.* and CESA. As a result, authorizing existing water diversions and the activities related to them will not further degrade the physical conditions in the Program Area or elsewhere, or cause the number of water diversions or the amount of water diverted to increase. In fact, it is expected that the overall amount of water diverted in the Program Area will decrease at certain times of the year after the Program is implemented due to the terms and conditions in the SAAs, ITP, and sub-permits that CDFG issues under the Program. Further, the existing water diversions and related activities will continue whether or not the Program is implemented. However, by implementing the Program, the fisheries and aquatic habitat conditions are expected to improve as a result of the implementation of many of the terms and conditions in the SAAs, ITP, and sub-permits that CDFG would issue under the Program. Those terms and conditions are described in Chapter 2 and Appendices A and B of this Draft EIR. Again, it is important to emphasize that these terms and conditions are not mitigation measures CDFG has identified to reduce the level of impacts to less than significant as required by CEQA; rather they are measures which avoid and minimize impacts in accordance with the Program participants' statutory obligations under Fish and Game Code, § 1600 *et seq.* and CESA.

Impact 3.3-1: Construction, maintenance, and other instream activities associated with various Covered Activities may result in impacts to fisheries resources and their habitat (Significant).

In addition to the discussion below, please refer to the similar description of impacts and mitigation measures from a hydrological perspective under Impact 3.2-1 in Chapter 3.2.

Implementation of several of the Covered Activities would involve new construction activities within stream channels and/or upland areas in close proximity to channels. Instream construction activities would be required for projects that involve the construction of new headgates, fish screens, stream access and crossings, instream habitat structures, and barrier removal/fish passage, as well as the maintenance and repair of existing structures (e.g., due to flood damage). Projects requiring construction and maintenance activities in upland or floodplain areas include the installation of fencing and riparian restoration/revegetation.

Most of these construction and maintenance activities would require some degree of ground clearing, channel and bank excavation, backfilling, earthmoving, stockpiling and/or compaction, grading, and concrete work. These activities may result in the following significant impacts to coho salmon, CDFG fish species of special concern, and other fisheries resources:

Short-term increases in sedimentation and turbidity. Increased sedimentation rates could result if fine sediment is discharged to streams or mobilized within channels during project activities. Increased sedimentation may adversely affect water quality and channel substrate composition. Specific rates of sedimentation are dependant upon the duration, volume, and frequency at which sediments are contributed to the surface water flow. Substantial sedimentation rates may smother fish eggs and fish food (i.e., benthic invertebrates), degrade spawning habitat, and fill pools. Furthermore, suspended sediments increase the turbidity of the water. High rates of turbidity can result in direct mortality or deleterious sublethal effects (e.g., gill abrasion, decreased visibility during foraging) to fish.

Accidental spills and use of hazardous materials. Equipment refueling, fluid leakage, and maintenance activities within or near-stream channels pose a risk of accidental water contamination that may result in injury or death to coho salmon and other fish species. Many commonly used hydraulic fluids contain organophosphate ester additives that are toxic to salmonids and other fish species. Acute lethal and sublethal effects have been documented in salmonids in particular (as opposed to warm water species). Leaks or spills of petroleum hydrocarbon products found in construction equipment have similar adverse effects on fish.

Furthermore, when surface water comes into contact with uncured concrete, either through accidental spills of concrete or through contact with recently-poured structures (e.g., headgates, fish screens), alkaline substances in the concrete may leach into the water, resulting in decreases in the natural hydrogen ion concentration (pH). Rapid changes in the pH of the stream water can have adverse effects on fish, particularly if the hydrogen ion concentration is reduced such that the pH reading increases above nine.

Direct injury or mortality resulting from equipment use and dewatering activities. During instream construction activities, fish species may be crushed by earth moving equipment, construction debris, and worker foot traffic. It is therefore necessary to isolate the work area from actively flowing water through the use of coffer dams and dewatering pumps. However, dewatering activities can lead to fish becoming concentrated or stranded in residual wetted areas. Thus, if coho salmon and CDFG fish species of special concern are known to or assumed to occur in the project area, capture and relocation procedures need to be implemented prior to construction. Capture and relocation efforts, in turn, may also result in injury or mortality to fish if not conducted by a qualified biologist according to established guidelines.

Temporary loss, alteration, or reduction of habitat. In-channel construction activities, the use of construction equipment in stream channels, workspace dewatering, and clearing of riparian vegetation for work site access may result in temporary impacts to the habitat of coho salmon and CDFG fish species of special concern. Potential adverse impacts that may occur include alterations of the stream substrate composition and channel integrity. Riparian vegetation is an important component of coho salmon habitat, providing channel shading, bank stability and complexity, instream cover in the form of LWD, and an important source of organic matter and food. The temporary loss of riparian vegetation may result in increased soil erosion, elevated water temperatures, and loss of fisheries habitat complexity.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.3-1a: Implementation of ITP General Conditions (g) Instream work period, (h) Instream equipment work period, and (i) Compliance with Fish and Game Code, § 1600 *et seq.* (Article XIII.E.1) would avoid or minimize potential direct and indirect impacts to coho salmon and CDFG fish species of special concern resulting from instream construction and maintenance activities.

Mitigation Measure 3.3-1b: Implementation of numerous applicable conditions in the MLTC would further avoid or minimize potential direct and indirect impacts to coho salmon and CDFG fish species of special concern resulting from instream and upland construction and maintenance activities.

Mitigation Measures Identified in this Draft EIR

Mitigation Measure 3.3-1c: ITP General Conditions (g) and (h) (Article XIII.E.1) limit the season for instream equipment operations and work related to structural restoration projects to the period from July 1 to October 15 ~~31~~. Similarly, ITP Additional Avoidance and Minimization Measure D (Livestock and Vehicle Crossings) (Article XV.D) and conditions in the MLTC limit the use of stream crossings to the same period. ~~However, based on documented adult coho salmon migration timing in the Shasta River (Hampton, 2006), coho salmon may enter the Shasta River prior to October 31. Furthermore, the Chinook salmon spawning season occurs even earlier in the season, depending on streamflows. Therefore, as specified under Mitigation Measure 3.2-1d (Chapter 3.2 Geomorphology, Hydrology, and Water Quality) the season for instream construction activities, equipment operations, and stream crossing utilization shall be limited to the period of July 1 through October 15.~~ If weather conditions permit and the stream is dry or at its lowest flow, instream construction activities and equipment operations may continue after October 15, provided a written request is made to CDFG at least five days before the proposed work period variance. Written approval from CDFG for the proposed work period variance must be received by SVRCD or Agricultural Operator prior to the start or continuation of work after October 15.

If work is performed after October 15 as provided above, SVRCD or Agricultural Operator will do all of the following:

- Monitor the 72 hour forecast from the National Weather Service. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, the work shall cease.
- Stage erosion and sediment control materials at the work site. When there is a forecast of more than 30 percent chance of rain, or at the onset of any precipitation, implement erosion and sediment control measures.

Level of Significance after Mitigation

Implementation of the Program, including the mitigation measure discussed above, would reduce potential impacts of construction, maintenance, and other instream activities to coho salmon and CDFG fish species of special concern and their habitat to a less-than-significant level.

Impact 3.3-2: Increased extraction of groundwater could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries, thereby impacting coldwater fish habitat (Less than Significant).

As part of the Program, groundwater may be utilized in place of surface water supplies. In particular, under ITP Mitigation Obligations of SVRCD (a)(iv) (Article XIII.E.2) groundwater supplies may be used as one alternative means of satisfying stock water demands from October through December (the other alternatives being off-stream storage or other appropriate methods). This measure is intended to enhance surface flows during dry conditions and during critical times of the year (October through December) in order to improve salmonid habitat.

However, as discussed in Impact 3.2-5 in Chapter 3.2, increased use of groundwater during dry conditions in order to curb the consumptive use of surface water, as proposed by the Program, could decrease groundwater discharge into the Shasta River and its tributaries. A reduction in groundwater discharge could decrease base flow volumes and could contribute to increased water temperatures. Groundwater and subsurface flow contribute cool water, directly and indirectly (i.e., by means of spring and seep maintenance), to surface stream channels in the Program Area. As shown by NCRWQCB (2006), spring flow input can dramatically reduce the ambient water temperature within the mainstem Shasta River. However, due to the complex geology that makes up the Shasta Valley groundwater basin, the inter-relationship between groundwater and surface water in the Program Area is still not well understood. During low flow conditions, if groundwater is pumped in proximity of a flowing stream or a subsurface channel such that subterranean flow is impacted, then that groundwater extraction could result in a decrease in instream flow and, concomitantly, an increase in water temperatures in the nearby stream.

Notwithstanding the above, any increase in groundwater use under the Program is expected to be low for the following reasons: 1) the proposed scale of the alternative stock watering system is small; the Program specifies the installation of two systems per year within the entire Program Area; 2) not all such systems would necessarily use groundwater, as alternative methods are also proposed; 3) groundwater irrigation tends to cost more (for well installation, piping, and power costs); and 4) the availability of groundwater resources in the Shasta Valley varies greatly from location to location. As to the latter, in the northern portion of the Valley where the majority of irrigated lands exist, groundwater resources are more scarce compared to areas within the eastern portion of the Valley that overlie the more productive basalt formations.

Because it is not likely that the Program would cause a substantial increase in the use of groundwater, the level of any impacts associated with such use would be low. Further, for the season in which this system is proposed for use, October through December, the *volume* of streamflow is more of a concern for salmonid habitat than the temperature of the water. High water temperatures are of principal concern and exert more influence on limiting salmonid habitat in the late spring and summer months. In addition, some Agricultural Operators must divert much more surface water than is needed to satisfy their stock-watering needs, because a higher volume of water is necessary to enable water to flow from the point of diversion to the point of use to accommodate for carriage loss due to varying delivery efficiencies. Hence, in some cases, substitution of groundwater for surface water would result in a substantial reduction in the amount of water diverted.

As such, with respect to the impact that alternative stock watering systems may have on surface water temperatures, and thus fisheries and aquatic habitat, this potential impact is less than significant.

Mitigation Measures Identified in this Report

This potential impact was determined to be less than significant. No mitigation measures required.

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CHAPTER 3.4

Biological Resources: Botany, Wildlife, and Wetlands

This Chapter discusses the existing environment for terrestrial wildlife, botanical, and wetland resources[1] in the Shasta River watershed; identifies potential impacts the Shasta River Watershed-wide Permitting Program (Program) could have on those resources; and identifies mitigation for those impacts deemed to be potentially significant. Information presented in the Setting section below is based on reconnaissance surveys of the watershed conducted October 2, 2006 through October 6, 2006, as well as numerous published reports and technical studies, including the California Natural Diversity Data Base (CDFG, 2008) and California Native Plant Society's (CNPS) Electronic Inventory (CNPS, 2006) records for the following United States Geological Survey (USGS) quadrangles: Weed, Lake Shastina, Gazelle, Montague, and Little Shasta. Regional published and unpublished biological literature, e.g., *Shasta River Woody Riparian Vegetation Inventory* (Deas et al., 1997), *Northwest California, a Natural History* (Sawyer, 2006) and other biological literature, e.g., Sawyer and Keeler-Woolf (1995); Zeiner et al. (1990); and Holland (1986) were other sources. Additional information on special-status species[2] and communities of concern were obtained through the U.S. Fish and Wildlife Service (USFWS) Arcata Field Office (USFWS, 2006).

3.4.1 Setting

The Program Area is within the California Floristic Province,[3] Cismontane Region and is located within the Klamath Bioregion,[4] which extends from the Pacific Coast eastward more than halfway across California to the Modoc Plateau and the Sacramento Valley floor. Forest types change from old-growth redwoods, white fir, and Douglas fir along the coast to drier types in the mountain ranges of Siskiyou County: mixed conifer–pine and mixed conifer–fir, then to Ponderosa pine and a variety of shrub communities (e.g., bitterbrush-rabbitbrush and juniper-sagebrush). The region is drained by rivers including the Eel, Trinity, Klamath, and Russian. The

[1] Wetland resources are treated in this Chapter when they are under state or federal jurisdiction and have an ecological function supporting plants and terrestrial animals. Chapter 3.2 discusses hydrology and water quality.

[2] For the purpose of this document a "special-status species" is any species that meets the definition of "endangered, rare or threatened" in CEQA *Guidelines,* § 15380. Some CDFG species of special concern are special-status species. Such species are referred to as "special-status species" in this document.

[3] Geographic subdivisions are used to describe and predict features of the natural landscape. The system of geographic units is four-tiered: provinces, regions, subregions, and districts. The State of California is covered by three floristic provinces: California Floristic Province, Great Basin, and Desert. The California Floristic Province is the largest, includes most of the state and small portions of Oregon, Nevada and Baja California, Mexico and is made up of six regions.

[4] California bioregions were developed by the Inter-agency Natural Areas Coordinating Committee (California Department of Forestry and Fire Protection, 1992). These regions are more reflective of fauna as well as flora.

Klamath is a major river of the Pacific coast (250 miles long). Two of its tributaries that enter the Middle Klamath, the Scott and Shasta Rivers, drain arid interior valleys characterized by extensively utilized annual grasslands.

Shasta River Valley

The Program Area is generally located in central Siskiyou County and regionally within the Shasta Valley of the Cascade Ranges ecological region (U.S. Forest Service, 2005). The southern portion of the Program Area is a diverse mixed conifer/pine woodland, or "Eastside Pine," although this area is just west of the extent of Eastside Pine as mapped by Mayer and Laudenslayer (1988). Ponderosa pine (*Pinus ponderosa*) is the dominant tree species in this habitat type. The northern three-quarters of the Program Area is dominated by annual grassland habitats, much less complex but interspersed with wet meadows, seeps, and crossed by several riparian corridors.

Climate, Topography, Soils and Drainage

The Shasta River watershed is located in the rain shadow of the Klamath range. Summers are very hot, winters cold (average winter temperature in Yreka is 2°C (36°F), and in summer can exceed 38°C (100°F)). The Klamath mountains to the west block moist ocean air currents as they move eastward, and the Shasta Valley itself receives only 11 to 17 inches of rain annually (and even less in some areas) between the months of October and March.

Elevations within the Program Area generally range between 2,500 feet above mean sea level (amsl) at the northern end of the Program Area to 3,500 feet amsl at the southern end of the Program Area. The dominant soil types vary significantly along the River's length. Settlemeyer loam is the dominant near river soil in the Valley from Interstate 5 to the vicinity of County Road A12. Gazelle silt loam and Settlemeyer loam both dominate from County Road A12 to near Louie Road. Settlemeyer loam again dominates from the area of Louie Road to Dwinnell Dam. Other soils are interspersed with these dominant types, but are generally limited in their areal extent. These dominant soils, Settlemeyer loam and Gazelle silt loam, are both subject to winter flooding and have persistent high water tables for at least a few months each year (Deas, 1997).

The Shasta River originates on the north slope of Mount Eddy. Flow in the Shasta River is derived from both rainfall and snowmelt. Snowmelt from Mount Shasta contributes significantly to the surface water and groundwater hydrology of the basin. Mount Shasta has permanent glaciers and a snow pack that usually persists, to varying degrees, on a year-round basis. Chapter 3.2 provides a more detailed discussion of these topics.

Existing Land Use

Irrigated permanent pasture and hay fields are located near the mainstem of the Shasta River with dryland grazing occurring on the more sloping, foothill farmland properties. Alfalfa farming occurs on most of the farmland without high water tables. Nearly all of the alfalfa grown in Siskiyou County is grown under irrigation (see Chapter 3.1). Dry-land grain production to support livestock operations is generally undertaken by local farmers where the soil is tillable but irrigation is not possible.

Plant Communities/Wildlife Habitats – Higher Portions of the Valley

The vegetation classification system used in this document is based, in part, on the classification systems of Holland (1986) and Mayer and Laudenslayer (1988). The first has been the standard classification system used for describing California's vegetation for a number of years. The second system uses broader groupings known as **Wildlife Habitat Relationships** types (in bold), which are more useful when evaluating plant and animal resources simultaneously. Each of these communities as they are found in the Valley and surrounding slopes is described below and displayed in **Figure 3.4-1**.

Klamath Mixed Conifer

Klamath Mixed Conifer (KMC) is present in the higher, southernmost portion of the Program Area. KMC habitat is typically composed of tall, dense to moderately open, needle-leaved evergreen forests with patches of broad-leaved evergreen and deciduous low trees and shrubs (Küchler, 1977). The overstory layer is characterized by a mixture of conifers. Dominant conifers in this portion of this habitat are white fir (*Abies concolor*), Douglas-fir (*Peudotsuga menziesii*), and ponderosa pine (*Pinus ponderosa*). The KMC type comprises highly diverse vegetation and soils, with multiple nesting and feeding niches for wildlife. On the western portion of the Valley slopes, this type includes Jeffrey pine (*Pinus jeffreyi*).

Montane Hardwood

The **Montane Hardwood** habitat type occurs at lower elevations below 4,000 feet on the west side of the Shasta Valley. In the Coast Range and Klamath Mountains, canyon live oak often forms pure stands on steep canyon slopes and rocky ridge tops. At higher elevations, it is scattered in the overstory among ponderosa pine, white fir, Jeffrey pine; middle elevation associates are Douglas-fir and California black oak (*Quercus kellogii*). Understory vegetation is mostly scattered woody shrubs.

Juniper

Surrounding much of the Valley at middle elevations (from 2,450 to 4,000 feet) are extensive stands of **Juniper** habitat (*Juniperus occidentalis*). Shrub species typically associated with juniper habitats include antelope bitterbrush (*Purshia tridentata*), California buckwheat (*Eriogonum fasciculatum*), and curlleaf mountain-mahogany (*Cercocarpus ledifolius*).

Eastside Pine

The **Eastside Pine** habitat is characterized by short to moderate height (65-115 feet tall at maturity) pine trees. Ponderosa pine is the dominant species in the Program Area, but it also includes Jeffrey pine, incense cedar (*Calocedrus decurrens*), and western juniper. Tree densities within this community vary depending upon local soil and topographic conditions. Undergrowth includes big sagebrush (*Artemisia tridentata*), antelope bitterbrush and ceanothus (*Ceanothus spp*.). Mayer and Laudenslayer (1988) remark on the value of this habitat as winter range for deer, especially when the stands are varied in tree species, sub-canopy species, and understory vegetation.

Plant Communities/Wildlife Habitats – Valley Floor

Sagebrush and Bitterbrush

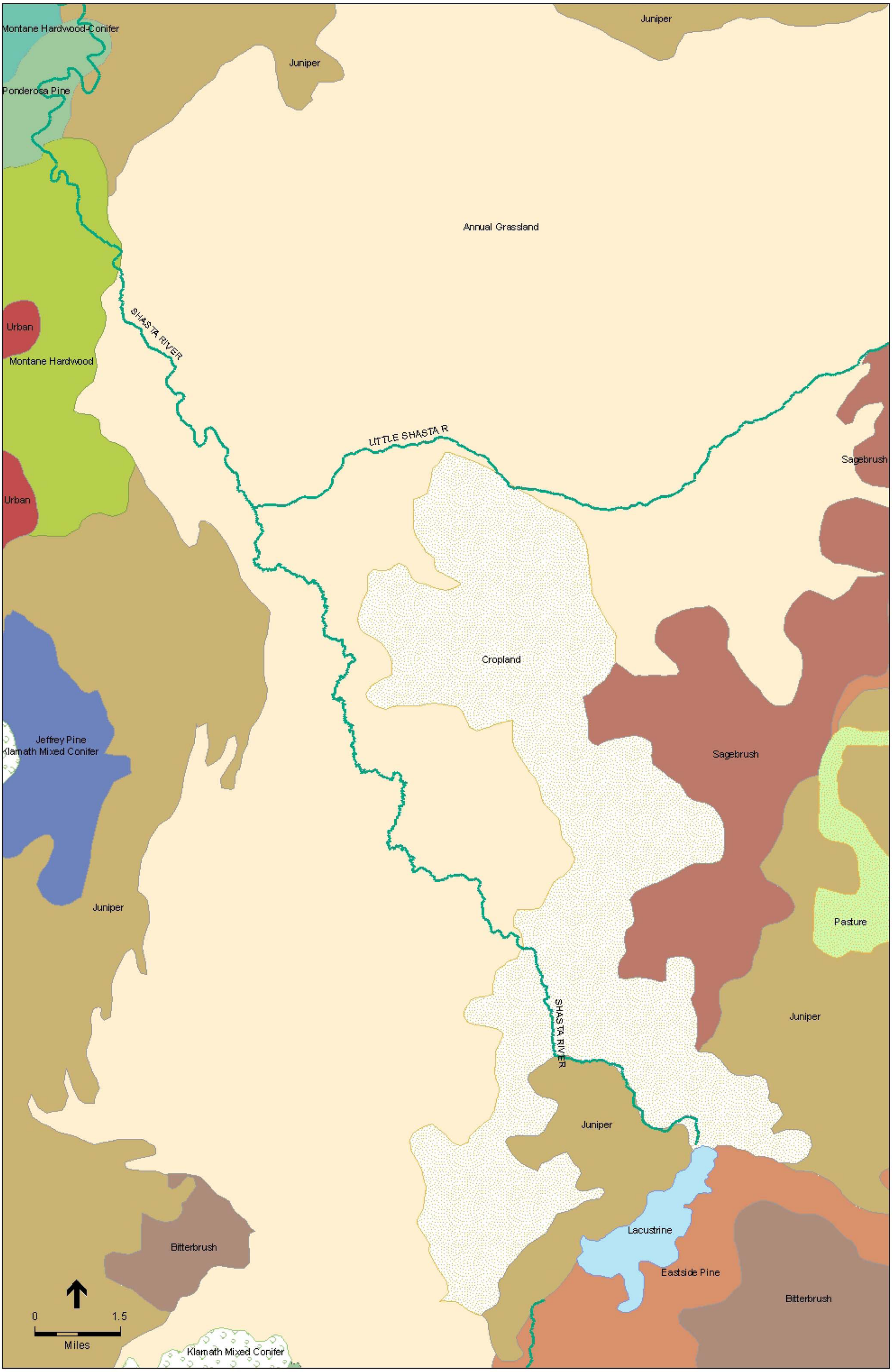
The **Sagebrush** habitat type occurs on the Shasta Valley's non-pasture lands, especially on the east side. Sagebrush stands are typically large, open and discontinuous and dominated usually by big sagebrush (*Artemisia tridentata*). However, in the Shasta Valley the habitat is predominately rabbitbrush (*Chrysothamnus nauseosus*) with western chokecherry (*Prunus virginiana demissa*) and bitterbrush (*Purshia tridentate*) also present. Where the latter species dominates, the habitat is termed "Bitterbrush," a species highly digestible, with desired levels of moisture, calcium, phosphorus, and fat (Hickman, 1975). It tolerates considerable browsing. Its seeds are used by many species of birds, rodents, and insects and it provides high value winter forage for native ungulates.

Annual Grassland

Where the land is not in active cultivation, the habitat is classified as **Annual Grassland** (AG) which comprises mainly herbaceous annual plant species and is the largest single habitat type in the Shasta Valley. Introduced annual grasses are the dominant plant species in this habitat: slender wild oats (*Avena bargata*), brome (*Bromus*), meadow barley (*Horeduem* spp.), and fescue (*Festuca*). Common forbs include broadleaf filaree (*Erodium botrys*), turkey mullein (*Eremocarpus setigerus*), bur clover (*Medicago polymorpha*), and popcorn flower (*Plagiobothrys nothofulvus*). There are remnant stands of the original perennial grasses that dominated before European settlement, including purple needlegrass (*Nassella pulchra*) and Idaho fescue (*Festuca idahoensis*). Many wildlife species, especially raptors, use AG for foraging, but may require special habitat features in addition, such as cliffs, caves, ponds, or adjacent woodlands for breeding, resting, and escape cover.

Fresh Emergent Wetland

Fresh Emergent Wetlands (FEW) are characterized by erect, rooted herbaceous hydrophytes (i.e., water-dependent plants). Dominant vegetation is generally perennial monocots. All emergent wetlands are flooded frequently enough so that the roots of the vegetation prosper in an anaerobic environment. Fresh emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds and numerous mammals, reptiles, and amphibians (Mayer and Laudenslayer, 1988). The dominant plants in these Shasta Valley FEW areas include pale spikerush (*Eleocharis macrostachya*) and sword-leaved rush (*Juncus ensifolius*).



SOURCE: California Gap Analysis Landcover, 1998

Figure 3.4-1
Vegetation/Habitat Types in the Shasta Valley and Vicinity

Composition and Condition of the Riparian Vegetation – Relationship to Streamflow

Riparian vegetation and habitat along the Shasta River is adjacent to a variety of upland habitats and has diverged considerably from pristine conditions. The discussion is this Chapter focuses on the riparian areas and the wildlife they support, as terrestrial impacts of the Program are almost exclusively limited to this habitat type and immediately adjacent uplands.

The long-term health of dynamic riparian ecosystems is dependant upon more than access to water during the growing season. Reproduction and growth of riparian plant species are closely associated with peak flows (also referred to as flood flows or channel-forming flows), and related channel processes such as meandering (Busch and Scott, 1995). Where stream regulation limits flooding and channel movement, opportunities for seed germination are limited. In such systems, riparian community structure may become less dynamic (Busch and Scott, 1995). The reverse is also true: if a stream is denuded of riparian vegetation, the system becomes so active and unconfined that successful establishment of riparian plants is inhibited by never being simultaneously moist, bare, and protected from removal by subsequent disturbance for a period of time long enough to germinate, root and set seed. The current condition of Shasta River riparian vegetation reflects a history of logging, mining, grazing,[5] beaver trapping, water diversion, and control (Dwinnell Dam) that has reduced its extent and structural and species diversity.

Riparian vegetation in the Shasta River has eight dominant tree species: white alder (*Alnus rhombifolia*); Oregon ash (*Fraxinus latifolia*); black cottonwood (*Populus trichocarpa*); red birch (*Betula fontanalis*); Oregon white oak (*Quercus garryana*); red willow (*Salix laevigata*); arroyo willow (*Salix lasiolepsis var. bracelinea*); and Pacific willow (*Salix lasiandra*) (Watercourse Engineering, 2002).

In 1997, Deas et al. conducted an inventory of location and extent of woody riparian vegetation for the Shasta River from Dwinnell Reservoir to the confluence with the Klamath River. Four general classifications were defined to represent densities throughout the study reach: 1) forest features; 2) continuous, linear vegetation features (>2 trees per 100 feet); 3) discontinuous vegetation; and 4) absence of vegetation. The Deas (1997) report is the principle source for the discussion that follows, updated where available from more current information and observations made during the preparation of this Draft EIR.

5 As discussed in Chapter 3.2 and below under Section 3.4.3, livestock grazing is a Covered Activity under the Program, but similar to some other Covered Activities it is not new; rather, it has been occurring in the Program Area for decades. Hence, authorizing livestock grazing as part of the Program will not cause the level of grazing to increase or result in any impacts in addition to those that are already part of baseline conditions in the Program Area. In fact, the Program will reduce the impacts of grazing by excluding livestock from some riparian areas by installing and maintaining fencing (see ITP and MLTC Covered Activity 5). Also, where riparian fencing is constructed as part of the Program, any grazing of livestock within the riparian exclusion zone ~~adjacent to the channel or within the bed, bank, or channel~~ of the Shasta River or its tributaries may only occur in accordance with a grazing management plan that will result in improved riparian function and enhanced aquatic habitat.

Riparian Conditions, Upper Watershed. Deas et al. found few tracts of riparian “forest” along the mainstem of the Shasta River. Many of these areas could be described as thickets, consisting mainly of willow and other smaller trees. There were a few locations that formed continuous areas of large woody vegetation, i.e., a roughly continuous row of trees lining the river banks along the four or five miles immediately downstream from the Dwinnell Reservoir. Riparian conditions are variable today, but long stretches here are in relatively good shape and provide shade, woody debris, and overhung banks. There is little depth (measured as the distance perpendicular to the axis of the river) to these riparian vegetation components, and while there are other reaches where continuous, linear woody vegetation is present, it generally occurs intermittently and on one bank or the other. Several areas are devoid of woody riparian vegetation altogether, for example, in the vicinity of the County Road A12 where woody vegetation is mostly absent (Deas et al., 1997).

Riparian Conditions, Middle Watershed. A recent analysis (SVRCD File Information) took a more structural approach to describing the riparian conditions from River Mile (RM) 27 to RM 7.75. Here the mainstem Shasta flows through the majority of the agricultural portions of the Shasta Valley. This reach includes significant tributaries at Willow Creek, Julian Creek, and the Little Shasta River. This reach ends at the confluence with Yreka Creek. Streambanks in this area tend to be fine textured, highly erodible and vertical (height ranging from three to six feet), and hence very susceptible to livestock hoof and grazing impacts.[6] The condition of the streambank encourages streambank failures and significantly increases fine sediment load. Soil alkalinity over parts of the reach tend to be very restrictive of tree growth, although other areas within the reach still sustain good canopy and shade. Tules are the most common emergent plant in this reach, and they provide for channel roughness, channel narrowing, shade, bank stabilization, and fine sediment capture.

Riparian conditions approaching RM 11 are generally quite good with dense overstory, tall trees and appropriately stable banks. Between RM 11 and RM 8.75, recently installed fencing is yielding rapid improvement in an area that previously had been in only fair condition.

Riparian Conditions, Lower Watershed. SVRCD’s Incidental Take Permit Application (2005) describes the stretch of the River from RM 7.75 to the mouth as steep, bedrock constrained, hot and dry, and without significant tributaries. Past mining beginning in the late 1800s stripped most of the soil and vegetation from the bedrock adjacent to the stream in this reach. Subsequent livestock usage until 1991 largely prevented recovery from those activities. Since 1991, significant herbaceous and woody vegetation growth has occurred in the canyon, sediment is being trapped, and the channel is gaining shade and bank complexity. Riparian condition is on an improving trend: herbaceous vegetation is vigorous and effective in capturing fine sediment and providing some channel and bank complexity, but will be slow to recruit trees until streambanks acquire sufficient soil to hold adequate moisture.

[6] See footnote 5.

Riparian Overview. Examples of robust riparian vegetative complexes along the Shasta River are seen on property near the Grenada Irrigation District diversion, adjacent to the bridge over the river on the Grenada/Montague Road, and at the Shasta Valley Wildlife Area, where intact tule/willow/cattail (*Typha*) complexes grade into mature alder/ash/cottonwood and boxelder (*Acer negundo*) stands as overstory trees. These conditions are difficult to find elsewhere. However, given the amount of water diverted from the river, the riparian complex appears remarkably intact in many places, albeit very narrow. Poor conditions appear to be more a result of historic livestock grazing,[7] timber harvesting and mining, than any chronic de-watering of the river for human use. There are two reasons for this. First, numerous springs in the upper and middle reaches of the river basin provide substantial base flow in the river and its tributaries; second, the river has been allowed to retain much of its original meander pattern within its relatively low stream gradient and avoid the effects of stream channelization. Riparian restoration is generally highly effective in this context, however in the Shasta River, due to the regulation of the instream flows and issues related to soil alkalinity and anaerobic soils (due to saturation from flood irrigation), restoration efforts have been met with limited success.

Special-Status Species

Some species known to occur or considered likely to occur in the vicinity of the Program Area are accorded “special-status” because of their recognized rarity or vulnerability to various causes of habitat loss or population decline. Some of these receive specific protection under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA). Others have been designated as “sensitive” based on the expertise of state resource agencies or non-governmental organizations with acknowledged expertise, or policies adopted by the state and by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. For the purpose of this Draft Environmental Impact Report (EIR), “special-status species” means any species that meets the definition of “endangered, rare or threatened species” in California Environmental Quality Act (CEQA) *Guidelines*, § 15380, as fully defined in the Glossary.

Figure 3.4-2 displays species records from the California Natural Diversity Data Base (CNDDB) for the portion of the Program Area where Program impacts are most likely. In addition to those species listed under CESA, CNDDB includes additional CDFG species of special concern. CDFG species of special concern include those species which CDFG has determined are either declining at a rate that could result in listing or historically occurred in low numbers and known threats to their persistence currently exist. Some CDFG species of special concern are also “special status species” because they meet the definition of “endangered, rare, or threatened” in CEQA *Guidelines,* § 15380. For the purpose of this document, CDFG species of special concern that are also special-status species are referred to as “special-status species”, while CDFG species of special concern that are not also special-status species are referred to as “CDFG species of special concern.” Figure 3.4-2 does not include those species discussed in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitats.

[7] See footnote 5

Plant and wildlife species occurring anywhere within the USGS quadrangles that define the Program Area and adjacent quadrangles, and have records in CNDDB are displayed in **Table 3.4-1**. However, CNDDB may not include all CESA listed or CDFG species of special concern which occur in an area because it only lists those species for which an observational record has been submitted. The CNDDB-based table must be modified in two ways to produce a focused list that can be used as part of an environmental analysis under CEQA (Table 3.4-2). First, the list is augmented from CNPS's *Inventory of Rare and Endangered Plants*, published literature, and unpublished sources such as bird lists compiled by Audubon Society chapters, by professional knowledge, and by direct observations from nearby areas with similar habitats (such as the Scott Valley). Second, the list is *reduced* by eliminating those species that will not be affected by the actions of the project being reviewed under CEQA (in this case, the Program and the activities it covers). Also, in this case, the area of potential effect is limited to riparian or wet meadow species and does not, for example, include impacts on furbearing mammals or raptors nesting at higher elevations or away from streams where Program Covered Activities will occur. The analysis is then carried forward in detail for the final list. The list used for this analysis is displayed in **Table 3.4-2** and discussed below. Again, the list does not include those species discussed in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitats.

Plants

Alkali hymenoxys (*Hymenoxys lemmonii* – CNPS List 2.2; State Rank S2.2)

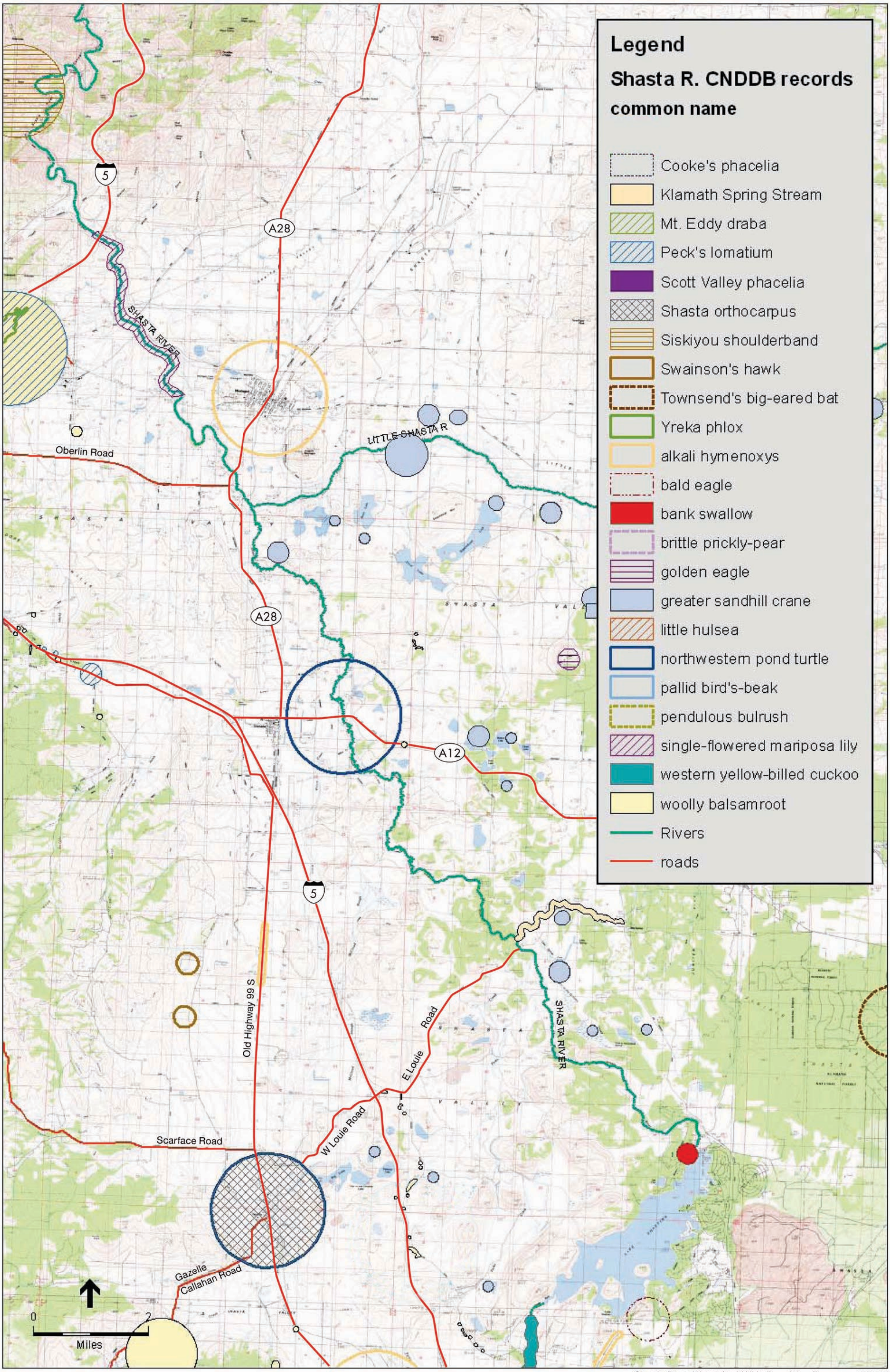
Alkali hymenoxys occurs in Oregon, Utah, Nevada, Arizona, and in Siskiyou County, California. Plants grow in moist or wet alkaline meadows in sagebrush scrub and yellow pine forest communities and at elevations of 787 to 3,280 feet (CNPS, 2006). Five populations of alkali hymenoxys occur in the vicinity of the Program Area, including near the town of Montague. Moreover, these populations are historical collections from 1897 to 1934 and have not been relocated. Suitable habitat exists, but the reported locations are not specific.

Oregon fireweed (*Epilobium oreganum* - CNPS List 1 B.2; State Rank S2.2)

Oregon fireweed is known from northern California, including Siskiyou County, and Oregon. This plant is a perennial herb that occurs in bogs and fens, as well as mesic areas in lower and upper montane coniferous forest at elevations of 1,640 to 7,350 feet. The period of identification for Oregon fireweed is June through September.

Pallid bird's-beak (*Cordylanthus tenuis* spp. *pallescens* - CNPS List 1B.2; State Rank S1.1)

Pallid bird's beak is an annual herb that is sometime parasitic on other plants. The species' known distribution is restricted to Shasta, Sierra, and Siskiyou Counties. Pallid bird's beak occurs on gravelly, volcanic alluvium in lower montane coniferous forest at elevations ranging from 2,200 to 5,400 feet. The species' bloom period is July through September.



SOURCE: CDFG, 2006

Figure 3.4-2
CNDDB-Recorded Species in the Shasta Valley and Vicinity

TABLE 3.4-1
SPECIES REPORTED IN THE CALIFORNIA NATURAL DIVERSITY DATABASE FOR ALL PROGRAM AND ADJACENT USGS QUADRANGLES

Common Name ***Scientific Name***	**Listing Status ESA**	**Listing Status CESA**	**CNPS / CDFG Status/ # Occurrences Statewide (for plants)**
PLANTS			
Aleppo avens (*Geum aleppicumi*)	None	None	2.2 / S2.2? / 5
Alkali hymenoxys (*Hymenoxys lemmonii*)	None	None	2.2 / S2.2 / 8
Alpine dusty maidens (*Chaenactis douglasii* var. *alpinai*)	None	None	2.3 / S2.3? / 8
Applegate stonecrop (*Sedum oblanceolatum*)	None	None	1B.3 / S1.2 / 9
Ashland thistle (*Cirsium ciliolatum*)	None	Endangered	2.1 / S1.2 / 5
Blue alpine phacelia (*Phacelia sericea* var. *ciliosa*)	None	None	2.3 / S1.3 / 8
Blushing wild buckwheat (*Eriogonum ursinum* var. *erubescens*)	None	None	1B.3 / S2.3 / 9
Brittle prickly-pear (*Opuntia fragilis*)	None	None	2.1 / SH / 1
Broad-nerved hump-moss (*Meesia uliginosa*)	None	None	2.2 / S2.2 / 22
Brown fox sedge (Carex vulpinoidea)	None	None	2.2 / S2.2 / 16
Canadian buffalo-berry (*Shepherdia Canadensis*)	None	None	2.2 / S1.2 / 1
Cascade alpine campion (*Silene suksdorfii*)	None	None	2.3 / S2.3 / 8
Cascade grass-of-Parnassus (*Parnassia cirrata* var. *intermedia*)	None	None	2.2 / S2.2 / 13
Cascade stonecrop (*Sedum divergens*)	None	None	2.3 / S1.3 / 4
Castle Crags harebell (*Campanula shetleri*)	None	None	1B.3 / S2.3 / 7
Coast fawn lily (*Erythronium revolutum*)	None	None	2.2 / S2.2 / 50
Columbia yellow cress (*Rorippa columbiae*)	None	None	1B.2 / S1.1 / 11
Cooke's phacelia (*Phacelia cookei*)	None	None	1B.1 / S1.1 / 3
Crested potentilla (*Potentilla cristae*)	None	None	1B.3 / S2.3 / 7

TABLE 3.4-1 (Continued)
SPECIES REPORTED IN THE CALIFORNIA NATURAL DIVERSITY DATABASE FOR ALL PROGRAM AND ADJACENT USGS QUADRANGLES

Common Name *Scientific Name*	**Listing Status ESA**	**Listing Status CESA**	**CNPS / CDFG Status/ # Occurrences Statewide (for plants)**
PLANTS (cont.)			
Detling's silverpuffs (*Microseris laciniata* ssp. *detlingii*)	None	None	2.2 / S1.2 / 1
English Peak greenbriar (*Smilax jamesii*)	None	None	1B.3 / S3.2 / 54
Ephemeral monkeyflower (*Mimulus evanescens*)	None	None	1B.2 / S1.2 / 15
Gentner's fritillary (*Fritillaria gentneri*)	Endangered	None	1B.1 / S1.1 / 2
Golden draba (*Draba aureola*)	None	None	1B.3 / S1.3 / 6
Grass alisma (*Alisma gramineum*)	None	None	2.2 / S1S2 / 12
Great Basin claytonia (*Claytonia umbellate*)	None	None	2.3 / S1.3 / 5
Greene's mariposa lily (*Calochortus greenei*)	None	None	1B.2 / S3.2 / 50
Henderson's fawn lily (*Erythronium hendersonii*)	None	None	2.3 / S1.3 / 4
Henderson's horkelia (*Horkelia hendersonii*)	None	None	1B.1 / S1.2 / 1
Horned butterwort (*Pinguicula vulgaris* ssp. *macroceras*)	None	None	2.2 / S3.2 / 15
Howell's sandwort (*Minuartia howellii*)	None	None	1B.3 / S3.2 / 20
Howell's triteleia (*Triteleia grandiflora* var. *howellii*)	None	None	2.1 / S1.1 / 4
Klamath fawn lily (*Erythronium klamathense*)	None	None	2.2 / S2.2 / 6
Little hulsea (*Hulsea nana*)	None	None	2.3 / S2.3 / 20
Little-leaved huckleberry (*Vaccinium scoparium*)	None	None	2.2 / S2.2? / 19
Marbled wild-ginger (*Asarum marmoratum*)	None	None	2.3 / S1.3 / 6
Marsh skullcap (*Scutellaria galericulata*)	None	None	2.2 / S2.2? / 24
Mason's sky pilot (*Polemonium chartaceum)*	None	None	1B.3 / S1.3 / 15

TABLE 3.4-1 (Continued)
SPECIES REPORTED IN THE CALIFORNIA NATURAL DIVERSITY DATABASE FOR ALL PROGRAM AND ADJACENT USGS QUADRANGLES

Common Name *Scientific Name*	**Listing Status ESA**	**Listing Status CESA**	**CNPS / CDFG Status/ # Occurrences Statewide (for plants)**
PLANTS (cont.)			
Mt. Eddy draba (*Draba carnosula)*	None	None	1B.3 / S2.2 / 13
Mud sedge *(Carex limosa*)	None	None	2.2 / S3? / 31
Newberry's cinquefoil (*Potentilla newberryi*)	None	None	2.3 / S2.3? / 14
Nodding vanilla-grass (*Hierochloe odorata*)	None	None	2.3 / S1.3? / 5
Northern adder's-tongue (*Ophioglossum pusillum)*	None	None	2.2 / S1.2 / 4
Northwestern moonwort (*Botrychium pinnatum*)	None	None	2.3 / S1.3? / 5
Oregon fireweed (*Epilobium oreganum*)	None	None	1B.2 / S2.2 / 43
Pallid bird's-beak (*Cordylanthus tenuis* ssp. *pallescens*)	None	None	1B.2 / S1.1 / 36
Parish's alumroot (*Heuchera parishii*)	None	None	1B.3 / S2.3 / 12
Peck's lomatium (*Lomatium peckianum*)	None	None	2.2 / S1.2 / 13
Pendulous bulrush (*Scirpus pendulus*)	None	None	2.2 / S1.2 / 2
Pickering's ivesia (*Ivesia pickeringii*)	None	None	1B.2 / S2.2 / 12
Pyrola-leaved buckwheat (*Eriogonum pyrolifolium* var. *pyrolifolium*)	None	None	2.3 / S2.3 / 12
Rattlesnake fern (*Botrychium virginianum*)	None	None	2.2 / S1.2 / 10
Scott Mountain bedstraw (*Galium serpenticum* ssp. *scotticum*)	None	None	1B.2 / S2.2 / 33
Scott Mountain sandwort (*Minuartia stolonifera*)	None	None	1B.3 / S1.3 / 2
Scott Mountains fawn lily (*Erythronium citrinum* var. *roderickii*)	None	None	1B.3 / S1.3 / 46
Scott Valley buckwheat (*Eriogonum umbellatum* var. *lautum*)	None	None	1B.1 / S1.1 / 2
Scott Valley phacelia (*Phacelia greenei*)	None	None	1B.2 / S2.2 / 28

TABLE 3.4-1 (Continued)
SPECIES REPORTED IN THE CALIFORNIA NATURAL DIVERSITY DATABASE FOR ALL PROGRAM AND ADJACENT USGS QUADRANGLES

Common Name ***Scientific Name***	**Listing Status ESA**	**Listing Status CESA**	**CNPS / CDFG Status/ # Occurrences Statewide (for plants)**
PLANTS (cont.)			
Shasta chaenactis (*Chaenactis suffrutescens*)	None	None	1B.3 / S3.2? / 25
Shasta orthocarpus (*Orthocarpus pachystachyus*)	None	None	1B.3 / S1.1 / 4
Showy raillardella (*Raillardella pringlei*)	None	None	1B.3 / S2.2 / 21
Silky balsamroot (*Balsamorhiza sericea*)	None	None	1B.3 / S2.3 / 7
Single-flowered mariposa lily (*Calochortus monanthus*)	None	None	1A / SH / 1
Siskiyou fireweed (*Epilobium siskiyouense*)	None	None	1B.3 / S2.2 / 45
Siskiyou mariposa lily (*Calochortus persistens*)	Candidate	Rare	1B.2 / S2.2 / 3
Siskiyou paintbrush *(Castilleja miniata ssp. elata*)	None	None	2.2 / S2.2 / 30
Siskiyou phacelia (*Phacelia leonis*)	None	None	1B.3 / S2.2 / 18
Slender-stemmed androsace (*Androsace filiformis*)	None	None	2.3. / S1? / 2
Subalpine aster (*Eurybia merita*)	None	None	2.3 / S1.3 / 1
Trinity buckwheat (*Eriogonum alpinum*)	None	Endangered	1B.2 / S2.2 / 17
Waldo daisy (*Erigeron bloomeri* var. *nudatus*)	None	None	2.3 / S2? / 10
Wilkin's harebell (*Campanula wilkinsiana*)	None	None	1B.2 / S2.2 / 19
Woolly balsamroot (*Balsamorhiza lanata*)	None	None	1B.2 / S2.2 / 38
Yreka phlox (*Phlox hirsute*)	Endangered	Endangered	1B.2 / S1.1 / 4
ANIMALS			
American badger (*Taxidea taxus*)	None	None	SSC
American (=pine) marten (*Martes americana*	None	None	

TABLE 3.4-1 (Continued)
SPECIES REPORTED IN THE CALIFORNIA NATURAL DIVERSITY DATABASE FOR ALL PROGRAM AND ADJACENT USGS QUADRANGLES

Common Name *Scientific Name*	**Listing Status ESA**	**Listing Status CESA**	**CNPS / CDFG Status/ # Occurrences Statewide (for plants)**
ANIMALS (cont.)			
American peregrine falcon * (*Falco peregrinus anatum*)	Delisted	Endangered	
Bald eagle (*Haliaeetus leucocephalus*)	Delisted	Endangered	
Bank swallow (*Riparia riparia*)	None	Threatened	
California wolverine (*Gulo gulo*)	None	Threatened	
Cascades frog (*Rana cascadae*)	None	None	SSC
Foothill yellow-legged frog (*Rana boylii*)	None	None	SSC
Golden eagle (*Aquila chrysaetos*)	None	None	
Gray-headed pika (*Ochotona princes schisticeps*)	None	None	
Greater sandhill crane (*Grus canadensis tabida*)	None	Threatened	
Northern goshawk (*Accipiter gentilis*)	None	None	SSC
Northwestern pond turtle (*Acinemys marmorata marmorata*)	None	None	SSC
Osprey (*Pandion haliaetus*)	None	None	SSC
Pacific fisher (*Martes pennanti*)	Candidate	None	SSC
Pallid bat (*Antrozous pallidus*)	None	None	SSC
Prairie falcon (*Falco mexicanus*)	None	None	SSC
Scott Bar salamander ** (*Plethodon asupak*)	None	Threatened	
Sierra Nevada red fox (*Vulpes vulpes necator*)	None	Threatened	
Silver-haired bat (*Lasionycteris noctivagans*)	None	None	
Siskiyou Mountains salamander (*Plethodon stormi*)	None	Threatened	

TABLE 3.4-1 (Continued)
SPECIES REPORTED IN THE CALIFORNIA NATURAL DIVERSITY DATABASE FOR ALL PROGRAM AND ADJACENT USGS QUADRANGLES

Common Name *Scientific Name*	**Listing Status ESA**	**Listing Status CESA**	**CNPS / CDFG Status/ # Occurrences Statewide (for plants)**
ANIMALS (cont.)			
Siskiyou shoulderband (*Monadenia chaceana*)	None	None	
Spotted bat (*Euderma maculatum*)	None	None	SSC
Swainson's hawk (*Buteo swainsoni*)	None	Threatened	
Topaz juga (*Juga acutifilosa*)	None	None	
Townsend's big-eared bat (*Corynorhinus townsendii*)	None	None	SSC
Western mastiff bat (*Eumops perotis californicus*)	None	None	SSC
Western tailed frog (*Ascaphus truei*)	None	None	SSC
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	Candidate	Endangered	
Willow flycatcher (*Empidonax traillii*)	None	Endangered	

* The Fish and Game Commission has received and is proceeding with a review of a delisting request for the American peregrine falcon.

** As recognized by the Fish and Game Commission, the Scott Bar salamander is currently protected under CESA as a sub-population of the Siskiyou Mountains salamander (*Plethodon stormi*). (See California Code Regulations, title 14, §670.5, subd. (b)(3)(A); Cal. Reg. Notice Register 2007, No. 21-Z, p. 916 (May 25, 2007)).

ESA = federal Endangered Species Act
CESA = California Endangered Species Act
SSC = CDFG Species of Special Concern

California Native Plant Society codes:
List 1A=Plants presumed extinct in California
List 1B=Plants rare, threatened, or endangered in California and elsewhere
List 2= Plants rare, threatened, or endangered in California but more common elsewhere
List 3= Plants about which more information is needed
List 4= Plants of limited distribution

Threat Code extensions

.1 – Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

Note that all List 1A (presumed extinct in California) and some List 3 (need more information- a review list) plants lacking any threat information receive no threat code extension. Also, these Threat Code guidelines represent a starting point in the assessment of threat level. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are also considered in setting the Threat Code.

CDFG State Ranking Codes

S1 = Less than 6 element occurrences (Eos) OR less than 1,000 individuals OR less than 2,000 acres
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres
S2.1 = very threatened
S2.2 = threatened; S2.3 = no current threats known

S3 = 21-80 Eos or 3,000-10,000 individuals OR 10,000-50,000 acres
S3.1 = very threatened
S3.2 = threatened
S3.3 = no current threats known
SH = possibly extirpated (historical)

TABLE 3.4-2
SPECIAL-STATUS SPECIES ANALYZED FOR IMPACTS WITHIN THE PROGRAM AREA

Common Name ***Scientific Name***	**Listing Status ESA**	**Listing Status CESA**	**CNPS / CDFG Status**	**Occurrence Reported in the Program Area/Potential for Occurrence**
Plants				
Alkali hymenoxys *(Hymenoxys lemmonii)*	None	None	2.2/ S2.2	Known to occur
Oregon fireweed (*Epilobium oreganum*)	None	None	1B.2/ S2.2	Low
Pallid bird's-beak (*Cordylanthus tenuis* spp. *Pallescens*)	None	None	1B.2/ S1.1	Low
Peck's lomatium *(Lomatium peckianum)*	None	None	2.2/ S1.2	Moderate
Pendulous bulrush *(Scirpus pendulus)*	None	None	2.2/ S1.2	Known to occur
Pickering's ivesia *(Ivesia pickeringii)*	None	None	1B.2/ S2.2	Moderate
Rattlesnake fern (*Botrychium virginianum*)	None	None	2.2/ S1.2	Low
Shasta chaenactis *(Chaenactis suffrutescens)*	None	None	1B.3/S3.2	Low
Shasta orthocarpus *(Orthocarpus pachystachyus)*	None	None	1B.1/ S1.1	Known to occur
Single-flowered mariposa lily *(Calochortus monanthus)*	None	None	1A / SH / 1	Known to have occurred; presumed extinct
Siskiyou mariposa lily (*Calochortus persistens*)	None	None	1B.2/ 2.2	Low
Tufted saxifrage (*Saxifraga cespitosa*)	None	None	2.3/ 1.3	Low
Woolly balsamroot (*Balsamorhiza hookeri* var. *lanata*)	None	None	1B.2/ S2.2	Known to occur
Birds				
Bank swallow *(Riparia riparia)*	None	Threatened	None	Known to occur
Greater sandhill crane *(Grus canadensis tabida)*	None	Threatened	Fully Protected Species	Known to occur
Swainson's hawk (Buteo swainsoni)	None	Threatened	None	Known to occur
Western yellow-billed cuckoo *(Coccyzus americanus occidentalis)*	Candidate	Endangered	None	Very Low
Willow flycatcher *(Empidonax traillii)*	None	Endangered	None	Known to occur
Yellow warbler (*Dendroica petechia brewsteri*)	None	None	SSC	Known to occur

For explanation of codes, see Table 3.4-1.

Plants (continued)

Peck's lomatium (*Lomatium peckianum* – CNPS List 2.2)

Peck's lomatium occurs in Oregon and Siskiyou County, California. Plants occur on rocky clay or clay-loam flats and slopes in the sagebrush-juniper, foothill woodland, and yellow pine forest communities. Plants are found at elevations ranging from 2,296 to 5,904 feet. Records for the species are near Yreka and Julian Creek (CDFG, 2008).

Pendulous bulrush (*Scirpus pendulus* – CNPS List 2.2)

Pendulous bulrush occurs throughout the United States, but is found only in Siskiyou County, California. Plants occur at 2,624 to 3,280 feet in marshes, swamps, moist meadows, ditches and are often associated with calcareous substrates. Under natural conditions, pendulous bulrush occurs almost always in wetlands. Plants have been recorded in Shasta Valley (CNPS, 2006).

Pickering's ivesia (*Ivesia pickeringii* – CNPS List 1B.2; State Rank 2.2)

Pickering's ivesia occurs only in two counties in California: Siskiyou and Trinity. Plants occur in ephemeral drainages and seasonally wet grassy slopes in mixed conifer and yellow pine forests on ultramafic soils. Under natural conditions, Pickering's ivesia occurs almost always in wetlands at elevations of 2,624 to 4,593 feet. Flowering occurs from June to August (CNPS, 2006).

Rattlesnake fern (*Botrychium virginianum* – CNPS List 2.2; State Rank S1.2)

Rattlesnake fern is a perennial herbaceous species known from locations throughout the western United States. However, in California it is only documented from Mendocino, Shasta, and Siskiyou Counties. This species grows in bogs and fens, meadows and seeps, riparian forest, and in mesic micro-habitats in lower montane coniferous forest. The period of identification for rattlesnake fern is June through September and the species can be found at elevations ranging from 2,400 to 4,300 feet.

Shasta chaenactis (*Chaenactis suffrutescens* – CNPS List 1B.3; State Rank 3.2)

Shasta chaenactis is present in Siskiyou and Trinity Counties. Plants occur on rocky open slopes, cobbled river terraces and on ultramafic soil or glacial till with ultramafics included. Plants also occur on upper montane coniferous forest habitat. Elevations range from 2,492 to 9,184 feet (CNPS, 2006).

Shasta orthocarpus (*Orthocarpus pachystachyus* – CNPS List 1B.1)

Shasta orthocarpus is endemic to California and is found only in Siskiyou County. Plants occur on ultramafic alluvium with sagebrush and native bunchgrasses, and may be found in meadows and seeps. Elevations range from 2,755 to 2,788 feet (CNPS, 2006). Records for the species are near Yreka (CDFG, 2008).

Single-flowered mariposa lily (*Calochortus monanthus* – CNPS List 1A, State Rank SH)

Single-flowered mariposa lily was documented historically from Siskiyou County but is currently believed to be extinct. The species is known only from the type collection, made in 1876. This perennial bulbiferous herb was blooming when it was collected in June, and was found at an elevation of approximately 2,600 feet. The location documented for the species is "meadows on Shasta River" in the Montague USGS 7.5 minute quadrangle (CDFG, 2008).

Siskiyou mariposa lily (*Calochortus persistens* – CNPS List 1B.2, State Rank S2.2)

Siskiyou mariposa lily is documented only from Siskiyou County, California, but occurs in Oregon as well. This perennial bulbiferous herb grows in rocky soils in lower montane and North Coast coniferous forest types. The period of identification for this mariposa lily is June to July and it can be found at elevations ranging from 3,280 to 6,100 feet.

Tufted saxifrage (*Saxifraga cespitosa* – CNPS List 2.3, State Rank S1.3)

Tufted saxifrage is known only from Siskiyou and Modoc counties in California, although it also occurs in Oregon, Washington, Nevada, and Arizona. This is a perennial herb that grows in rocky areas in meadows and seeps. Tufted saxifrage blooms from June through September and can be found at elevations ranging from 3,000 to 6,500 feet.

Woolly balsamroot (*Balsamorhiza hookeri var. lanata* – CNPS List 1B.2; State Rank 2.2)

Woolly balsamroot is endemic to California and is found in four counties: Siskiyou, Sierra, Nevada, and Alpine. Plants occur in cismontane woodlands, grassy flats, and open pine or oak woodlands on volcanic or serpentine substrates. Wooly balsamroot is recorded at multiple sites in the Program Area (see Figure 3.4-2) at elevations ranging from 2,625 to 6,217 feet.

Wildlife

Birds

Bank swallow (*Riparia riparia* – California State Threatened[8]). The bank swallow occurs as a breeding species in California in a hundred or so widely distributed nesting colonies in alluvial soils along rivers, streams, lakes, and ocean coasts. It is largely found in riparian ecosystems, particularly rivers in the larger lowland valleys of northern California, nesting colonies are located in vertical banks or bluffs in friable soils. This species is recorded along the Shasta River just below Lake Shastina.

Greater sandhill crane (*Grus canadensis tabida* – California State Threatened and Fully Protected[9]). Historically, greater sandhill cranes nested in eastern Siskiyou County and northeastern Shasta County southward to Honey Lake in Lassen County. Presently, greater sandhill cranes nest in Lassen, Modoc, Plumas, Shasta, Sierra, and Siskiyou Counties. In California, greater sandhill cranes establish territories in wet meadows that are often interspersed with emergent marsh. California birds tend to nest in rather open habitat; favorable roost sites and an abundance of cereal grain crops characterize the cranes' Central Valley wintering ground. This species continues to experience threats on both wintering and breeding grounds by agricultural

[8] "California State Threatened" means the species is listed as threatened under CESA.
[9] A "fully protected" species is a species listed under Fish and Game Code section 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), or 5515 (fish). Take of a fully protected species is prohibited except for scientific research and, as to fully protected birds, the protection of livestock.

and residential conversion of habitat, predation, human disturbance, and collisions with power lines. The Shasta Valley population is relatively new, since the 1980s, and was considered a westward expansion of their breeding range at that time (Smith, 1999). There have been several recorded observations of greater sandhill cranes within the Shasta Valley and in the vicinity of the Program Area (CDFG, 2008). Nests mapped in the year 2000 are displayed in Figure 3.4-2. There are no more recent published data, but the species was observed by CDFG biologists in the spring of 2008.

Swainson's hawk (*Buteo swainsoni* – California State Threatened). Swainson's hawks often nest peripherally to riparian systems of the as well as utilizing lone trees or groves of trees in agricultural fields. Suitable foraging areas include native grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. They are known to occur in the Program Area.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis* – California State Endangered[10]). A slender brown bird, ranging from 11 to 13 inches in length, the cuckoo typically nests in horizontal branches of willows in well-hidden locations two to 12 feet above ground. It requires a dense riparian forest and woodlands dominated by cottonwoods and/or willows with an associated understory composed of blackberry, nettles, or wild grape (Riparian Habitat Joint Venture, 2004). The species is probably extirpated from Shasta Valley, but CDFG routinely requires surveys for the species when working in riparian habitat along the Shasta Valley.

Willow flycatcher *(Empidonax traillii* – California State Endangered). The willow flycatcher, a small insect-eating bird of the tyrant flycatcher family, was formerly a common summer resident throughout California. Its breeding range extended wherever extensive willow thickets occurred. The species has now been eliminated as a breeding bird from most of its former range in California. Only small, scattered populations remain in isolated meadows of the Sierra Nevada and in Southern California (Remsen, 1978), but two nests were reported by CDFG from the Shasta Valley Wildlife Area in 2007.

Yellow warbler (*Dendroica petechia brewsteri* – CDFG Species of Special Concern). This species utilizes riparian deciduous habitats with willows or other dense foliage and a low, open canopy. Nest parasitism by brown-headed cowbirds (*Molothrus ater*) has apparently been a major cause of the drastic decline in numbers in lowland localities in recent decades (Zeiner et al., 1990). Parasitism increases when the riparian vegetation is in poor condition. This species is known to occur in the Program Area.

Species Eliminated From Further Consideration

Potential impacts to common plant and wildlife species were determined by CDFG to be less than significant based on the abundance of the species, the small area disturbed by the Covered Activities, and/or the ability of wildlife to move away from any disturbance. CDFG species of

[10] "California State Endangered" means the species is listed as endangered under CESA.

special concern which could occur in the vicinity of Covered Activity sites include northwestern pond turtle (*Actinemys marmorata marmorata*), long-eared owl (*Asio otus*), northern harrier (*Circus cyaneus*), yellow-breasted chat (*Icteria virens*), and American badger (*Taxidea taxus*). CDFG has determined the Program's impacts on these species to be less than significant because the potential for any one of them to be present at a project site is low, the Program's timing restrictions for instream work (July1 to October 15 ~~31~~) would avoid potential impacts to nests and den sites, and their ability to move away from and avoid areas of active construction.

The California red-legged frog (*Rana aurora draytonii*) is included in the group of species listed under ESA and identified by USFWS as potentially within Siskiyou County. This is apparently an expression of a hypothetical historical range, which included the Sierra Nevada from Shasta County south, but these populations have been fragmented and have nearly disappeared (USFWS, 2002). The Program Area is located outside of the current range of the species. There are no records of this species in Siskiyou County in the CNDDB database. During the preparation of this Draft EIR, USFWS added the vernal pool fairy shrimp (*Branchinecta lynchi*) to the Siskiyou County list of federally threatened or endangered species. It had been considered previously extant only from Mount Shasta south. Vernal pools will not be impacted by the Program's Covered Activities.

Jurisdictional Wetlands in the Program Area

Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance and sensitivity of wetlands has increased as a result of their value as recharge areas and filters for water supplies and widespread filling and destruction to enable urban and agricultural development.

Federal Definition of Wetland

The U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corps of Engineers (Corps) define "wetland" differently. As defined by USFWS, "[Wetlands are] lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is non-soil and is saturated with water of covered by shallow water at some time during the growing season each year (Cowardin et al., 1979).[11] By contrast, the Corps defines "wetland" to include only those areas containing hydrophytic vegetation, hydric soils, *and* wetland hydrology. The Corps' definition states: "those areas that are inundated or saturated by surface water 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. Wetlands generally include swamps, marshes, bogs, and similar areas." (33 Code of Federal Regulations, § 328.3(b); 40 Code of Federal Regulations § 320.3(t).)

[11] The definition is also used by the California Coastal Commission and, at the federal level outside the jurisdiction of the CWA, by USFWS and the National Park Service.

State Definition of Wetland

At least for purposes of the California Wildlife Protection Act of 1990 in the Fish and Game Code, wetlands are defined as: "lands which may be covered periodically or permanently with shallow water and which include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, fens and vernal pools" (Fish and Game Code, § 2785, subd. (g)). The purpose of the act is to provide funds to acquire, enhance, or restore habitat, including wetlands.

On March 9, 1987, the California Fish and Game Commission adopted a wetlands policy. As part of its policy, the Commission adopted USFWS' definition of "wetland," described above. However, as the Commission stated, its wetlands policy is not a regulatory program.

Wetlands as Analyzed in this Chapter

This Chapter addresses only those wetland resources in the Program Area that are subject to state and/or federal jurisdiction and have an ecological function supporting plants and terrestrial animals. Chapter 3.2 discusses hydrology and water quality. For this Draft EIR, National Wetlands Inventory (NWI) maps were used to identify wetlands (including manmade wetlands) in the Program Area. NWI maps are based on the Corps' definition of wetlands (**Figure 3.4-3**) but they have not been assessed *in situ*. As a result, they provide an overview useful in displaying the general extent of jurisdictional wetlands rather than a formal determination.

The mainstem of the Shasta River and all of its named tributaries are "riverine" habitat as mapped by the NWI under the Corps' jurisdiction. Naturally flooded wet meadows (*Freshwater Emergent Wetlands* in Figure 3.4-3) that occur throughout the valley, especially in the southern portion, could constitute wetlands subject to the Corps' jurisdiction, as well, because they are clearly connected with the Shasta River. However, NWI maps do not have the accuracy of ground-based delineations. Other more isolated ponds and forested wetlands that might be under state jurisdiction would need to be delineated and reviewed by the Corps before a determination can be made as to their federal status.

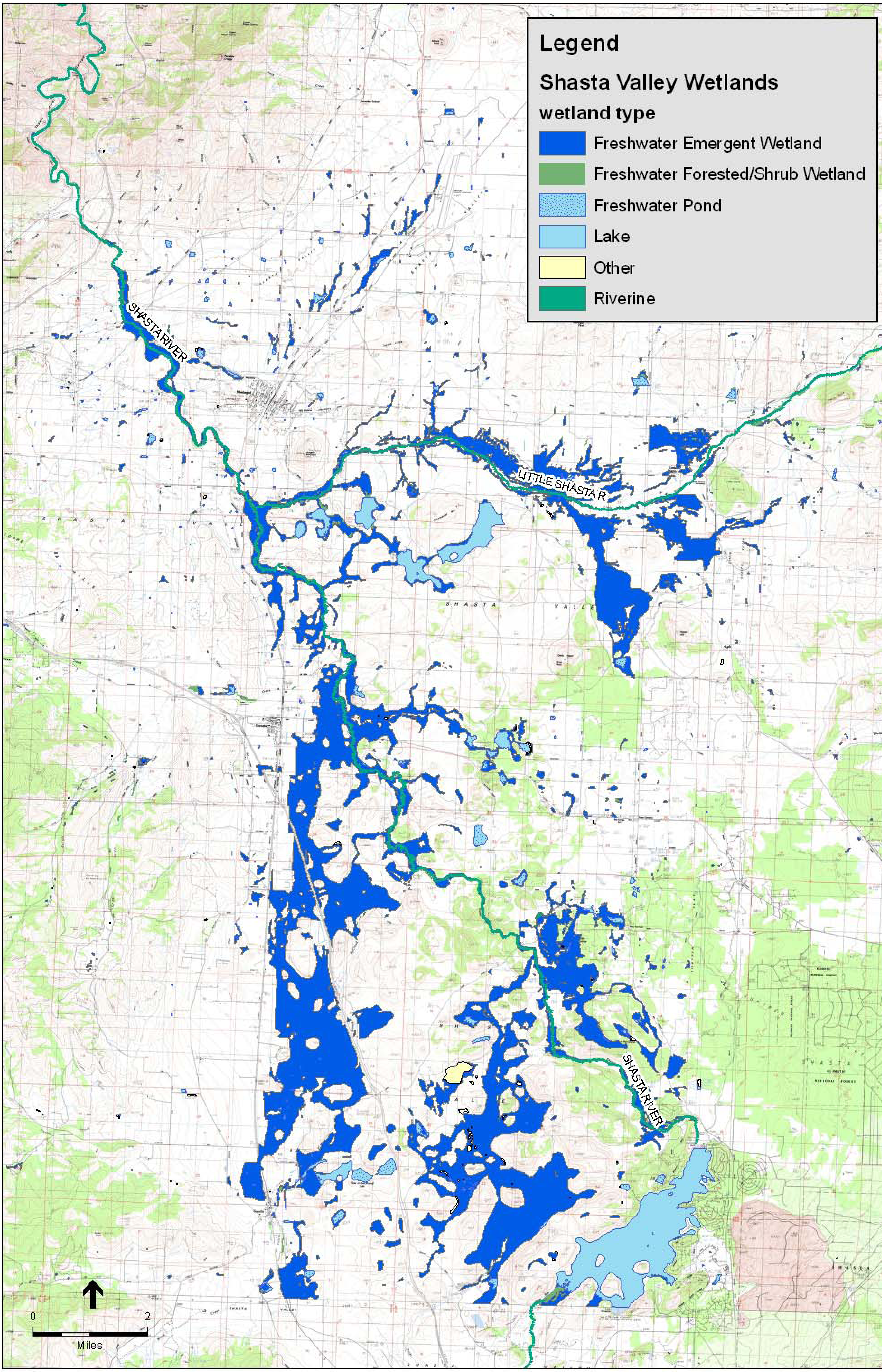
3.4.2 Regulatory Framework

Federal and State Regulation of Botany and Wildlife

In addition to ESA and CESA, described in Section 3.3.2 in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat, the statutes identified below apply to the species evaluated in this Chapter.

The Migratory Bird Treaty Act (16 U.S.C. § 703) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act applies to whole birds, parts of birds, and bird nests and eggs.

The California Native Plant Protection Act of 1977 (NPPA) (Fish and Game Code, § 1900-1913) directs CDFG to "preserve, protect and enhance endangered and rare native plants of this state."



SOURCE: USFWS National Wetlands Inventory, 2006

Figure 3.4-3
Potential Wetlands in the Shasta Valley and Vicinity

(Fish and Game Code, § 1900.) NPPA, authorizes the Commission to designate native plants as “endangered” or “rare” and to protect endangered and rare plants from take.

Fish and Game Code, § 3503 makes it “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.”

Fish and Game Code, § 3503.5 makes it “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” This applies to red-tailed hawks, white-tailed kites, burrowing owls, and other birds of prey.

Fish and Game Code, § 3511 prohibits the take or possession of fully protected birds, except for scientific research or to protect livestock. As mentioned above, the greater sandhill crane is a fully protected bird.

Fish and Game Code, § 3513 prohibits the take or possession of any nongame migratory bird.

Fish and Game Code, § 3800 generally prohibits the take of any nongame bird with some exceptions. Nongame birds are birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds.

Federal and State Regulation of Wetlands

Federal Regulation of Activities in Wetlands

The regulations and policies of various federal agencies, including the Corps, U.S. Environmental Protection Agency (USEPA), and USFWS, mandate that the filling of wetlands be avoided unless it can be demonstrated that no practicable alternatives exist. The Corps is mainly responsible for regulating activities that could affect the wetlands identified in the Program Area through the issuance of permits under Clean Water Act (CWA) section 404 (33 U.S.C. § 1251 *et seq.*), USEPA, USFWS, and several other federal agencies provide comments on section 404 permit applications. USEPA provides the primary criteria for evaluating the biological impacts of Corps (section 404) permit actions in wetlands.

State Regulation of Activities in Wetlands

The State’s authority in regulating activities that could affect wetlands identified in the Program Area resides primarily with the State Water Resources Control Board (SWRCB). SWRCB normally regulates impacts to wetlands through the water quality certification process under CWA section 401. Under that process, SWRCB, acting through its Regional Water Quality Control Boards (RWQCB), must certify that a federal permitting action (including the issuance of a CWA section 404 permit) meets state water quality objectives in accordance with CWA section 401. In addition, under the Porter-Cologne Water Quality Control Act (Water Code, § 13000 *et seq.*) RWQCB has the authority to regulate activities that could impact the beneficial use of surface waters including the ability of wetlands to provide wildlife habitat and support plant or animal species identified under state or federal laws as rare, threatened, or endangered. Also, in 2004, SWRCB approved Order No. 2004-0004-DWQ, Statewide General Waste Discharge Requirements for Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside of Federal Jurisdiction (General Dredge and Fill WDRs). The issuance of General Dredge and Fill WDRs applies to the discharge of small amounts of dredge and fill to wetlands (and other water bodies) that are not subject to CWA sections 401 and 404 (see Chapter 3.2.3 for a general discussion of CWA and the Porter-Cologne Water Quality Control Act.)

CDFG does not have direct permitting authority over activities that could impact wetlands, but CDFG would have indirect authority over such activities if they were also subject to Fish and Game Code, § 1600 *et seq.* or CESA. Also, CDFG may comment on Corps permit actions under the Fish and Wildlife Coordination Act and as a trustee agency under CEQA.

Local Regulations, Goals and Policies Relating to Botany, Wildlife, and Wetlands

Siskiyou County General Plan

The Conservation Element of the Siskiyou County General Plan includes general objectives relating to biological resources. These objectives include: 1) "to preserve, protect and manage the Forest Lands as both wild habitat and a productive economic resource"; and 2) "to preserve and maintain streams, lakes and forest open space as a means of providing natural habitat for species of wildlife." There are no Habitat Conservation Plans or other approved governmental habitat plans that involve lands in the Program Area.

3.4.3 Impacts and Mitigation Measures

Significance Criteria

To determine the level of significance of an identified impact, the criteria outlined in the CEQA *Guidelines* and Appendix G in the CEQA *Guidelines* were used. The following is a discussion of the approach used to determine whether the Program could have a significant effect on plants and wildlife and their habitats.

Under CEQA *Guidelines,* § 15065(a), if a project "has the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish and wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species"[12] the lead agency must prepare an EIR for the project (CEQA *Guidelines,* § 15065, subds. (a), (a)(1)). CEQA *Guidelines,* § 15206(b)(5) specifies that a project shall be deemed to be of statewide, regional, or area-wide significance if it "would substantially affect sensitive wildlife habitats including but not limited to riparian lands, wetlands, bays, estuaries, marshes, and habitats for rare and endangered species as defined by CEQA *Guidelines,* § 15380"

[12] "Endangered, rare, or threatened species" is defined in the Glossary.

(California Code Regulations, title 14, § 15065, subd. (b), (b)(5)). "Endangered, rare, or threatened species" and species that meet the definition of an endangered, rare, or threatened species under CEQA *Guidelines*, § 15380 are collectively referred to as special-status species in this Draft EIR.

In addition to the significance criteria in Appendix G for biological resources (discussed below), for the purpose of this analysis, the criteria in CEQA *Guidelines*, §§ 15065(a)(1) and 15206(b)(5) were used to determine whether any effect of the Program on terrestrial wildlife, botanical, and wetland resources could be significant. Hence, any effect of the Program that would "substantially degrade the quality of the environment," "substantially reduce the habitat of a fish or wildlife species," and/or "substantially affect sensitive wildlife habitats," constitute a significant effect for the purpose of this impact analysis. The Program would "substantially degrade the quality of the environment" if it could render currently suitable plant and/or wildlife habitat unsuitable. The Program would "substantially reduce the habitat of a fish or wildlife species" if it could cause an overall reduction in current habitat availability (e.g., through removal of riparian vegetation) or suitability. The Program would "substantially affect sensitive wildlife habitats" if it could adversely alter the current use of a habitat area (e.g., removal of a nesting trees). Also for the purpose of this impact analysis, an overall reduction of the current extent or ecological function of plant and/or wildlife habitat caused by the Program would constitute a "substantial, or potentially substantial, adverse change in . . . the physical conditions [in the Program Area]," and therefore would be considered a significant effect (CEQA *Guidelines,* § 15382).

In accordance with Appendix G in the CEQA *Guidelines*, the Program would have a significant effect on the environment if it could:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS (or National Marine Fisheries Service (NMFS) in the case of marine and anadromous species). For purposes of this analysis, substantial adverse effects on species are defined as effects that result in mortality of a substantial number of individuals or habitat modifications that would reduce the overall suitability of the habitat.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS. For purposes of this analysis, substantial adverse effects on sensitive natural communities are defined as effects that result in the overall reduction of the current extent or ecological function of the community.

- Have a substantial adverse effect on federally protected wetlands as defined by Clean Water Act section 404 (including, but not limited to, marshes and vernal pools) through direct removal, filling, hydrological interruption, or other means. For purposes of this analysis, substantial adverse effects on federally protected wetlands are defined as effects that result in the overall reduction of the current extent or ecological function of wetlands.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. For purposes of this analysis, a fundamental conflict with a local plan or ordinance is defined as any action that substantially conflicts with the terms of such policies or ordinances.

- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. For purposes of this analysis, a fundamental conflict with an adopted habitat conservation plan is defined as any action that would substantially conflict with the terms of such a plan.

Impact Analysis

Impact 3.4-1: The Program could result in impacts to special-status plant or animal species (Significant).

The Program could result in impacts to special-status plant or animal species for the following Covered Activities:

- Installation, operation, and maintenance of fish screens;
- Installation of instream and erosion control structures;
- Relocation of existing water diversion structures;
- Installation of fencing;[13]
- Riparian restoration and revegetation; and
- Maintenance of installed structures.

Direct mortality to special-status plant species can result from removal of individuals or their seed banks. Special-status animals can be killed by vehicles and equipment, their burrows or other retreats could be crushed, or they could be killed if buried by new or maintained instream structures. Flow modification can dry-out downstream seasonal ponds in which aquatic animals live, or pools in which the larval stages of amphibians are developing. Larvae and other organisms can be entrained in pumps. Noise and human activity, during installation and maintenance of structures or at equipment staging areas, also has the potential to cause breeding animals to abandon their nests or their young.

Pendulous bulrush, Shasta orthocarpus, sandhill crane, Swainson's hawk, willow flycatcher, and bank swallow are the special-status species most likely to occur in the areas where the above-described Covered Activities could take place. Impacts on these species represent potentially significant impacts because they are restricted in number and/or range or are dependent on habitats which are limited in extent.

Large-scale habitat reduction could theoretically be significant for other species, especially other riparian nesting birds, but substantial effects at this scale are not likely as part of the Program.

[13] A scoping comment requested clarification of the width of riparian buffer. As noted in the ITP (Additional SVRCD and sub-permittee Avoidance and Minimization Obligation E), the sub-permittees must build any exclusion fencing approximately 35 feet from the edge of the streambank. This was not intended to imply that 35 feet was a sufficient width for all riparian functions.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.4-1a: ITP General Conditions (g) and (h) (Article XIII.E.1) stipulate that instream work on structural restoration projects and instream equipment operations shall occur from July 1 to October 15 ~~31~~. This restricts noise and other sources of disturbance during most of the nesting season for special-status riparian birds.

Mitigation Measure 3.4-1b: ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation B.1 (Article XV) requires that water removed directly from the stream by means of a pump shall have inlets properly screened per CDFG/NMFS fish screen standards (NMFS, 1997). These standards specify a mesh size that would avoid entrainment of special-status species in pumps.

Mitigation Measure 3.4-1c: Master List of Terms and Conditions (MLTC) Condition 109 ~~100~~ stipulates that, prior to ground-disturbing activities, work sites shall be surveyed for special-status plant species by a qualified botanist. Special-status plant surveys shall be conducted following the *Guidelines for Assessing Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities* (CDFG, 2000). The survey report, including the methodology and survey findings, shall be provided to CDFG for review and approval prior to any ground-disturbing activities. MLTC ~~c~~Condition 110 ~~101~~ further states that if any special-status plant species are identified at a work site, CDFG shall identify one or more of the following protective measures, but not limited to these measures, to be implemented at the project site before work may proceed:

- Fencing to prevent accidental disturbance of special-status plants during construction;
- On-site monitoring by a qualified botanist during construction to assure that special-status plants are not disturbed; and/or
- Redesign of proposed work to avoid disturbance of special-status plant species.

Mitigation Measures Identified in this Draft EIR

Mitigation Measure 3.4-1d: The permissible work window for individual work sites shall be further constrained as necessary to avoid the nesting or breeding seasons of special-status birds and terrestrial animals for which CDFG determines impacts could be significant. At most sites with the potential for significant impacts to nesting special-status birds work shall be conditioned to start after July 31 when the young have typically fledged, potential impacts will be avoided, and no surveys will be required. Where work after July 31 would still have the potential to significantly impact nesting special-status birds, work shall not begin until the potential for impacts no longer exists. CDFG may advance the window at individual work sites if:

- There is no suitable habitat present. “Suitable habitat” in this sense varies between species and would be determined by CDFG, for example, for the willow flycatcher in accordance with Figura (2007); or,
- Surveys determine nesting birds will not be affected, either because the animals are not present or the nests are safely distant or otherwise screened from the activity.

In addition, to prevent impacts to bank swallow nesting areas, no fencing or planting action will be allowed to change the cross-sectional profile of the stream (e.g., lay a cutbank back to an angle of repose for riparian planting) until after a survey is conducted that establishes that bank swallows are not using the area to be affected. No area supporting bank swallows shall be manipulated in any way.

To avoid potential impacts to sandhill crane nesting and rearing activities, surveys for active nests shall be performed by a qualified biologist prior to the start of a Covered Activity when a known sandhill crane nesting territory is located within 0.5 mile of the project site and the activity will occur during the typical nesting and rearing season (March 1 to August 15). If active nests are found, a no-disturbance buffer radius of up to 0.5 mile will be required around the nest. The actual size of the buffer may be modified based on an evaluation by a qualified biologist of the sensitivity of the birds to the level of project disturbance. The no-disturbance buffer may be lifted prior to August 15, if it is determined safe to do so by a qualified biologist and approved by CDFG. Any reduction in the 0.5 mile buffer radius will be approved in writing by CDFG.

To avoid potential impacts to Swainson's hawk nesting and rearing activities, surveys for active nests within 0.5 miles of a project site shall be performed by a qualified biologist when a Covered Activity will occur in known Swainson's hawk nesting territory during the typical nesting and rearing season (March 15 to August 15). If one or more active Swainson's hawk nests are present within the 0.5 mile survey area, the active nest(s) shall be monitored by a qualified biologist prior to and during project activities. If, in the professional opinion of the qualified biologist, the nesting pair's behavior suggests agitation or disturbance by project activities, all activities in the area shall immediately stop pending consultation with CDFG. Following a review of the breeding pair's behavior, both as reported by the biologist and independently verified by CDFG, CDFG will determine whether the Covered Activity may continue during the nesting season and, if so, the conditions under which they may continue. The no-disturbance buffer may be lifted prior to August 15, if it is determined safe to do so by a qualified biologist and approved by CDFG. Any reduction in the 0.5 mile buffer radius will be approved in writing by CDFG. If, during the non-breeding season, a Swainson's hawk nest is present in the project area and has been used within the past breeding season, the nest site shall not be disturbed pending consultation with CDFG.

To avoid potential impacts to willow flycatchers during the typical nesting and rearing season (May 15 to August 30), no project related activities shall occur within 300 feet of potential nesting habitat. A Covered Activity may be performed within the 300-foot buffer zone if surveys for active nests are performed prior to the start of the Covered Activity and no active nests are present.

Level of Significance after Mitigation

Seasonal restrictions on equipment operations reduce direct effects on special-status breeding birds. Pre-construction plant and nesting bird surveys, and resulting activity restrictions will avoid impacts to these species. Implementation of Mitigation Measures 3.4-1a through 3.4-1d will reduce the impact to less than significant.

Impact 3.4-2: Construction of new and maintenance and repair of existing stream access and crossings could result in impacts to special-status plant or animal species (Less than Significant).

Crossing construction and use as a Covered Activity may include the placement of a boulder weir on the downstream side of the crossing at or near grade and placement of angular quarry rock within the crossing location. Constructing and using the crossing for livestock or vehicles can adversely affect stream and riparian special-status species. Although disturbances are temporary and intermittent, movement of livestock and vehicles can mobilize sediment, decreasing habitat quality for aquatic species, destabilize streambeds and banks, and inhibit the growth or reduce the vigor of riparian or instream vegetation. ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation D.1 and 3 (Article XV), however, prohibit livestock and vehicles crossing flowing streams between October 15 ~~31~~ through July 1, except in designated, CDFG-approved crossing lanes. Further, the ITP and sub-permits include the following restrictions:

- Crossing sites shall not be located in the tails of pools, known spawning habitat, or identified, suitable spawning habitat;
- Approaches must be no steeper than 3:1, and should be sloped with angular base rock;
- For intermittent streams, application of rock shall occur when the stream channel is dry; and
- Annual monitoring shall be required to detect shifting of base rock.

Implementation of these measures is sufficient to render this impact less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

Impact 3.4-3: ITP Covered Activity 10, the grazing of livestock within the riparian exclusion zone ~~bed, bank, or channel of a stream~~ different from current operations (i.e., not part of baseline conditions), could impact sensitive habitat and special-status species (Significant).

Grazing of livestock within the riparian exclusion zone ~~adjacent to the channel or within the bed, bank, or channel,~~ of the Shasta River or its tributaries in accordance with a grazing management plan approved by CDFG is a Covered Activity under the ITP. Grazing of livestock in the riparian or aquatic habitat of the Shasta River or its tributaries can have deleterious effects on both riparian species through habitat destruction. This would be a significant impact.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.4-3~~a~~: ITP Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation E.5 (Article XV) stipulates that livestock grazing be done in accordance with a grazing management plan prepared by the sub-permittee and approved by CDFG. The grazing management plan shall address the timing, duration, and intensity (number of livestock grazing per unit area [i.e., stocking rate]) of livestock grazing within the riparian zone and shall explain how the proposed management plan will result in improved riparian function and enhanced aquatic habitat. Grazing plans completed in accordance with the ITP shall include, in addition to other specified requirements, a means to prohibit livestock from entering live streams.

~~*Mitigation Measures Identified in this Draft EIR*~~

~~**Mitigation Measure 3.4-3b:** The ITP stipulation noted in Mitigation Measure 3.4-3a does not constitute complete mitigation because the actual restriction is not sufficiently specific. Mitigation Measure 3.4-3b clarifies "intensity" to stipulate the number of livestock allowable per unit area (i.e., stocking rate) per unit of time. Grazing plans completed in accordance with the ITP shall include, in addition to other specified requirements, a means to prohibit livestock from entering live streams.~~

Level of Significance after Mitigation

Implementation of Mitigation Measures 3.4-3a and 3.4-3b will reduce the impact to less than significant.

Impact 3.4-4: ITP Covered Activities may result in incidental discharge of fill into wetlands under federal jurisdiction causing temporary direct and indirect impacts to wetland function (Less than Significant).

Activities in streams can destabilize streambanks, mobilize silt and small gravels, and impact the root systems of wetland vegetation. This could cause a significant impact to wetlands and wetland function, and could trigger the requirement for federal permitting; however, as described below, the Program and its associated permits would constrain the impact to below the level of significance.

Restoration projects performed by SVRCD which are funded through CDFG's Fisheries Restoration Grant Program and Klamath River Restoration Grant program would be covered under the Corps' Regional General Permit 12 (RGP-12; Corps File No.: 27922N). However, RGP-12 includes only restoration actions. Other Covered Activities performed by Agricultural Operators and SVRCD may require a CWA section 404 permit and/or take authorization under ESA. However, it would be the responsibility of Agricultural Operators and SVRCD to obtain any necessary federal permits that might apply to a Covered Activity. Authorization might also be needed from the Regional Water Quality Control Board.[14]

Because MLTC Specific Terms and Conditions 21 ~~20~~ through 130 ~~114~~ are comprehensive and either meet or exceed the provisions which are normally included within CWA section 404 permits, this impact is considered less than significant and requires no further mitigation.

[14] The RWQCB must certify that a Corps section 404 Nationwide permit action meets state water quality objectives by issuing a Water Quality Certification pursuant to CWA section 401.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

Impact 3.4-5: Water efficiency measures required by the Program could in some instances significantly impact nesting special-status birds (Significant).

ITP Covered Activities and associated mitigation measures involve water efficiency measures, including “improve baseline instream flows and/or water quality.” Water management improvement projects may include the lining or piping of diversion ditches which will result in water savings through the elimination of ditch loss. The removal of woody vegetation which may have developed in the diversion ditch would be required prior to the piping or lining of the ditch. Since this vegetation may provide habitat for nesting special-status birds described earlier in this Chapter, nests could be destroyed as a result of such actions.

Strictly speaking, the above-described impact derives from a mitigation measure in the Program (ITP Mitigation obligations of SVRCD (a) Flow Enhancement [Article XIII.E.2]). Flow improvement translates to reduced water usage and possibly more water in the Shasta River to implement the objectives of the Permit Program. However, many diversion ditches support complex and robust assemblages of riparian plant species frequently absent from the mainstem of the river.

On balance, ongoing and future riparian enhancement activities will largely offset the loss of vegetation in the ditches, and potential impacts are limited to the loss of special-status riparian bird nests such as willow-flycatcher nests. Nevertheless, this could cause a significant impact.

Mitigation Measures Proposed as Part of the Program

None specified.

Mitigation Measures Identified in this Draft EIR

Mitigation Measure 3.4-5: Where piping or lining of a diversion ditch is performed as a water efficiency measure under the Program, any required woody vegetation removal shall be considered an activity subject to the same mitigation measure as prescribed for other riparian impacts (Mitigation Measure 3.4-1d).

Level of Significance after Mitigation

Implementation of Mitigation Measure 3.4-5 will reduce the impact on birds nesting in vegetation along diversion ditches to less than significant.

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CHAPTER 3.5
Cultural Resources

This Chapter discusses the existing cultural resources in the Program Area, including historical resources, archeological resources, paleontological resources, and human remains; identifies potential impacts the Shasta River Watershed-wide Permitting Program (Program) could have on those resources; and identifies mitigation measures for those impacts determined to be potentially significant.

3.5.1 Setting

Ethnography

Shasta Valley and the Shasta River watershed are within the ethnographic territory of the Shasta Indians, who are one of four northern California Hokan-speaking groups collectively termed Shastan peoples. Several references discuss the culture of these people (Dixon, 1907; Holt, 1946; Kroeber, 1925; Silver, 1978). The information below is derived from these sources unless otherwise cited. Historically, the Shasta occupied territories in present-day California and Oregon including almost all of Siskiyou County in California and Jackson and Klamath counties in Oregon. The four main divisions of the Shasta peoples roughly correspond to topographic features: Shasta Valley, Scott Valley, approximately 60 miles of the Klamath River Basin, and the Rogue River Valley.

Permanent winter villages were located along the major rivers and tributaries; and during the other seasons, the Shasta lived in temporary brush huts or bark houses, as they moved to various resource locations. The fundamental social unit of the Shasta was the family. Many villages were small, composed of only one extended family, and larger villages had a headman. Some ownership of land and resource exploitation areas was practiced with regard to village territories, hunting and fishing areas, tobacco plots, and oak trees. Three ethnographic villages are reported by Silver (1978:211) in the Shasta Valley: *kusta* was along Yreka Creek near Yreka; *cataywa* was on the Shasta River near Montague; and another un-named village was along the river near Big Springs.

The Shasta were hunters and gatherers who practiced an annual subsistence pattern based on a series of seasonal moves designed to ensure their arrival at specific areas during the peak period of productivity for certain resources. Their life-style centered on careful attention to the cycles of nature and the habits and needs of wildlife and plants. Strict laws, including hunting, fishing, and gathering, were observed to guard and manage the plants, wildlife, water, and other natural resources.

Salmon was historically one of the most abundant natural resources in the Shasta Valley and was central to the religion, diet, and way of life of the Shasta, who fished with hook and line, spear, and harpoon. Other foods were also plentiful, with major protein sources including deer, bear, small mammals, birds, other anadromous fish species, resident fish, turtles, and invertebrates such as mussels, grasshoppers, and crickets. Men hunted by tracking, driving, and smoking out. Women gathered seeds, bulbs, roots, insects, and grubs. They also trapped fish in baskets. Both men and women collected acorns and pine nuts. In addition, the Shasta practiced limited plant husbandry by burning areas to stimulate plant growth and encourage better seed harvests.

Shasta technology used a wide variety of materials including stone, bone, wood, shell, and plants obtained both locally and in trade with other groups. The Shasta relied heavily on obsidian for tools, but a variety of cherts and basalts were also used. The Shasta traded with their southern and western neighbors, the Wintu and the Hoopa; but trade with the Klamath and Modoc to the east was not common.

The Shasta had a rich culture of songs, artistic works, and ceremonies. Elaborate ceremonies were held at certain points in the natural calendars, and these ceremonies were the main social gatherings for various villages and tribes. These ceremonies are still practiced today by the Shasta.

With the influx of miners into Siskiyou County in the 1850s, the traditional Shasta way of life was completely disrupted. In 1851, a treaty made with the three California divisions of the Shasta provided for a reservation in Scott Valley, but it was never ratified (Heizer, 1972:97-99), and "most of the Indians were murdered in the fort at Fort Jones" (Scott Valley History, 2007). Survivors went to the aid of the Oregon Shasta in the Rogue River Wars of 1851-1856. Those survivors were then taken to reservations in Oregon.

Some families returned to the area, and in 1937 and 1939, the federal government bought land in Scott Valley under the Reorganization Act for native peoples, and the Quartz Valley Reservation was established. In 1960, however, this reservation was terminated, and, although the property was deeded to the Indians, most of the land was sold out of Indian ownership. In 1983, the termination was declared unlawful and the Reservation was legally reinstated. Today the Reservation is home to some 150 community members, and it provides services to the Indian people of both Scott Valley and Shasta Valley. The Reservation is a member of the Inter-Tribal Council of California.

As noted above, salmon was historically one of the most abundant natural resources in the Klamath River region. As described in some detail in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat, historic and contemporary land use practices have caused a decline in salmonid stocks in the Shasta River and Scott River watersheds and throughout the Klamath River Basin. This has had and continues to have a profound effect on the subsistence economies of Native American people, including disruption of traditional fishing practices and related ceremonies (Harling, 2007).

As stated in his cover letters for the Quartz Valley Indian Reservation's comments on the Draft Action Plans for both the Scott and Shasta River Total Maximum Daily Loads, Tribal Vice Chairman Harold Bennett stated that the watersheds are in peril and need immediate attention and action. He noted, "To us, water is life… The health of the fishery in these two watersheds is critical to the health and survival of the way of life of our native people, within the Shasta and Scott and the entire lower Klamath basin."

Prehistory

The following summary of archaeological investigations in Shasta Valley is taken from Hamusek et al. (1997:22-24) and summarizes the work of Wallace and Taylor (1952), Clewett (1968), Ritter (1989), Nilsson (1985, 1987, 1988), Johnston and Nilsson (1983), and Nilsson et al. (1989).

The earliest systematic archaeological investigations performed within ethnographic Shasta territory were conducted in 1950 by Wallace and Taylor who excavated a small rockshelter along the eastern edge of the valley. Based on the presence of small triangular barbed projectile points, Wallace and Taylor suggest a period of occupation as late as A.D. 1700 to 1800. Obsidian was the dominant lithic material used for stone tool manufacturing at the site, although cryptocrystalline silicates (ccs) and basalt were also present. Site function was attributed to seasonal hunting by Achumawi, Modoc or eastern Shasta peoples (Wallace and Taylor, 1952:33).

Excavations at CA-SIS-327, the Chaney Site, were undertaken by S. E. Clewett and California State University, Chico in 1965. This site was a small pithouse village located in southern Shasta Valley along the banks of the Shasta River. The village's cultural assemblage included projectile points and groundstone implements indicative of a late prehistoric occupation (Clewett, 1968). Hamusek et al. (1997) looked at this artifact assemblage again, and they suggest that while projectile points typically assigned to the late prehistoric period dominate the assemblage, there are hints of earlier occupational sequences (e.g., Clikapudi Series projectile points) occurring at the site.

In 1984, excavations were conducted at CA-SIS-266, Sheep Rock Shelter (Ritter, 1989). Unlike the cultural deposit encountered by Wallace and Taylor at CA-SIS-13, Sheep Rock Shelter yielded few archaeological remains, despite the presence of a midden deposit. One corner-notched projectile point, two metate fragments, a mountain sheep bone awl and lithic debitage dominated by obsidian were recovered. Ritter's analysis of the cultural and ecofactual material suggests that the site was utilized as a lithic reduction workshop in which the maintenance and final shaping of tools was occurring along with local foraging for seeds and other plant foods and hunting. Radiocarbon dates and obsidian hydration rim readings obtained on cultural material indicate that the site was occupied between 600 B.C. to A.D. 700 (Ritter, 1989:42).

In the mid to late 1980s, eight prehistoric sites were excavated in the northern portion of Shasta Valley near Ager for the proposed realignment of the Montague-Ager Road (Johnston and Nilsson, 1983; Nilsson, 1985, 1987, 1988; and Nilsson et al., 1989). Nilsson (1991) states that four of these sites (three sparse surface lithic scatters and a housepit village) where minimal testing was conducted, yielded little in the way of archaeological data; but the archaeological investigations conducted at the remaining sites (CA-SIS-154, CA-SIS-331, CA-SIS-332, CA-SIS-900) and a re-examination of the data from the previously excavated rockshelters (CA-SIS-13 and CA-SIS-266) provided a significant body of data that allowed Nilsson to develop the following provisional chronological sequence for Shasta Valley (Nilsson, 1991).

The earliest distinct cultural manifestations in Shasta Valley that can be solidly documented are defined by Nilsson (1991) as the Ager Phase which dates from 500 B.C. to A.D. 500. The artifact assemblage associated with this phase is characterized by Elko Corner-Notched, medium-sized side-notched and stemmed leaf-shaped projectile points manufactured nearly exclusively of Grasshopper Flat obsidians, as well as unifacial and bifacial manos, unifacial metates, end scrapers, and side-scrapers. Lithic technology during this period of time appears to focus on the reduction of imported, pre-formed obsidian bifaces; however, core reduction of local ccs and basalt materials was also commonly encountered. Faunal remains indicate that dietary patterns focused primarily on large and small terrestrial mammal species. Settlement pattern information appears to suggest that the river banks at the transition zone between the valley bottom and the upland region were occupied. The adjacent upland areas were utilized on a more sporadic basis.

The Meek Phase follows the Ager Phase, which Nilsson (1991) dates to the period from A.D. 500 to historic contact. Projectile point types in this phase are dominated by Gunther Barbed series specimens, as well as a limited number of Desert Side-Notched series and other small corner-notched specimens; and the groundstone assemblage is similar to that of the preceding complex, except for the appearance of flat-ended and cylindrical pestles and, more rarely, hopper mortars. Also commonly found in site assemblages from this period are various bone tools and ornaments, shell beads, twined basketry, ceramic figurines, and pottery fragments identified as Siskiyou Utility Ware.

Lithic technology patterns typical of Meek Phase assemblages include core, biface, and bipolar techniques revolving around a reduction strategy which was multi-faceted and material specific. Also of note is the apparent increase in the number of obsidian sources utilized during this phase. Whereas assemblages associated with the Ager Phase are dominated by a near exclusive use of obsidian from Grasshopper Flat, site assemblages associated with the Meek Phase reveal the presence of four additional Medicine Lake Highland glasses, as well as material from the Cougar Butte, Callahan, Glass Mountain, and Railroad Grade sources.

Subsistence data from Meek Phase site assemblages suggest a continued focus on terrestrial mammal species, but evidence for the exploitation of riverine resources begins to appear during this time period. Based on these data, coupled with the lack of fish bone and freshwater mollusk from Ager Phase site assemblages, Nilsson (1991) hypothesizes that shifts in subsistence patterns may have occurred during the Meek Phase as riverine resources began to be exploited and the reliance on land animals was lessened in favor of a broader-based economy.

Regional History

Siskiyou County was created in 1852 from the northern part of Shasta County and a part of what was formerly Klamath County. “Siskiyou is an Indian name of undetermined origin,” according to Rensch et al. (1933:405), but Luecke (1982:75) provides two derivations. The French trappers called it *Six Cailloux* for the six stones or boulders in the Klamath River over which Hudson’s Bay Company trappers crossed, and the Indian council grounds on the north side of the Siskiyou Mountains was pronounced “Seeskalyou.”

The following discussion of the earliest travel and settlement in the area is excerpted from Hamusek et al. (1997) and Silva and Arnold (1999). Richard Silva and Keith Arnold are both Yreka residents and members of the California-Oregon Trails Association. They have conducted both extensive archival research and field verification of the early trails and roads through Siskiyou County.

The first Euroamericans to enter the area that became Siskiyou County appear to have been a company of Hudson’s Bay trappers and traders led by Peter Skene Ogden during the winter of 1826-1827.Over the next 20 years, trappers associated with the Hudson’s Bay Company were active in the area. Alexander McLeod and his party of trappers are reported to have traveled through Shasta Valley in 1828-1830 where they established camps on the McCloud and Klamath rivers. Later, another group of trappers under John Work used the same route and camps to stage expeditions in Shasta, Scott, and Butte Valleys.

The California-Oregon Trail was first traveled by a settler headed for Oregon in 1834. This trail skirted the western base of Mt. Shasta. In 1849, a party of wagons heading south from Oregon came over the Siskiyou Mountains to Shasta Valley, but “fearing the Native Americans and being concerned about the remoteness of the area,” the party returned to Oregon (Marschner, 2001:201). By the 1850s, the California-Oregon Trail had become a well-established wagon road. The first wagon team to reach Siskiyou County from the Sacramento Valley came in 1854. Traveling from Red Bluff, the route headed north to Old Shasta, up over Scott Mountain, then through Scott Valley to Yreka.

In 1846, the Applegate Trail provided the first regular crossing of the Klamath River near the mouth of Spencer Creek (outside the Program Area). The Yreka Trail was established in 1851 from a branch of the Applegate Trail, and it continued south to Grass Lake and Sheep Rock before heading west to Yreka. Near Sheep Rock, the Yreka Trail intersected with the Military Pass Road. The latter road began as an Indian trail and was used by Hudson’s Bay Company trappers. Later, emigrants using this route constructed the wagon road in 1856; and by 1857, the military began accompanying wagon trains in order to protect them from the Modocs; hence the name Military Pass Road (Luecke, 1982). The Yreka Trail measured approximately 73 miles in length, but was in use for no more than 10 or 12 years. By the 1860s, new, shorter routes were being developed to Yreka, ones that bypassed the dangers of Modoc raiding parties around Tule Lake which had plagued the trail since its inception.

In the spring of 1851, gold was discovered at Yreka Flat, in the extreme northwest corner of the valley. Immediately, there was a rush to the new diggings, and a considerable town sprang up around the find. Mining activities were generally confined to the northwestern portion of the Shasta Valley watershed, however, and were not nearly as extensive as in the Scott Valley watershed to the east. In Shasta Valley, a number of these early settlers took up their claims in Shasta and Little Shasta valleys in order to work as farmers and ranchers so that they could provide food and other supplies to the miners (Wells, 1881:192).

In 1854, the Yreka Ditch Company was founded, and construction of the Yreka Ditch began to supply water from the Shasta River and Parks Creek to the Yreka area for the miners. As reported by Foulke et al. (1960), the diversion point from the Shasta River was only some 30 air miles southeast of Yreka, but the ditch was 95 miles long winding in and out of the various canyons and gulches enroute to maintain a consistent grade. Water was turned into the ditch on March 1, 1856, and originally there were some 5,000 feet of wooden flumes. Over the years, these have all been replaced by cuts. Circa 1880, the ditch began to be used by ranchers and farmers as well, with various turnouts. Numerous water disputes have occurred, there have been many changes in ownership and operation of the ditch, and the ditch has been repaired and widened in places, but in 1960, Foulke et al. (1960:5), stated, "the ditch is in its 104th year of continuous usage and continues to contribute its share to the prosperity of Siskiyou County."

Although the majority of land situated within the valley bottom was used for agricultural purposes, along the foothills and crossing over the mountains to the east there were several historic trails used to lead cattle and sheep to their summer range. Raising sheep was the major activity in the valley during the early 1900s. The summer range of the sheep was the summit of the Cascade Mountains from Mount Shasta to the Klamath River in the vicinity of the Klamath Hot Springs, while the winter range was in Shasta Valley. It was perhaps as a direct result of these early livestock herding activities that many of the stone fences found throughout the foothills overlooking Shasta Valley were originally constructed.

When the Southern Pacific Railroad was constructed from Redding into Oregon in 1886 to 1887, its route was nearly identical with that of the earlier California-Oregon Trail and portions of the stage road. Many of the railroad stations were built either on the exact line of the original trail or very close to it. The railroad followed the western edge of the valley past the town of Edgewood to Gazelle, then went north across Shasta Valley, fording the Shasta River near the site of Montague before proceeding north to Willow Creek.

Additional history of Euroamerican settlement in Shasta Valley is provided below in a brief history of the towns and other locations in the area. These are listed in alphabetical order. Most of the information is from Luecke (1982), much of which she obtained from Wells (1881).

Ager

Started as a stage stop in 1876 built by J. B. Ager, Ager became a thriving town on the railroad from 1887 to 1903. Supplies, passengers, and mail were sent from here to eastern Oregon, Klamath Basin, and the Klamath River. The post office was moved from Willow Creek to Ager in 1888, then from Ager to Beswick in 1940 (Luecke, 1982:2).

Edgewood

This town began as a store in 1856 and became a major stage stop called Butteville in 1857. It became known as Cavanaugh's in 1860 when the property and store were purchased by Joseph Cavanaugh. The post office was established in 1870 with the name Edgwood, because it was on the edge of the forest. The spelling was then changed to Edgewood in 1902. In 1880, the population of the town was 50 (Luecke, 1982:25).

Dwinnell Dam/Lake Shastina

The following history of the development of Dwinnell Reservoir, now known as Lake Shastina, is provided by the Lake Shastina Community Services District (2003). Dr. Dwinnell arrived in Shasta Valley in 1891 from Chicago, and by the early 1900s he was working to improve access to water for the valley's farmers. Between 1913 and 1915, he helped establish the Shasta River Water District, Big Springs Water District, and Mt. Shasta Land Company Water District. Farmers had been investigating diverting the Klamath River to non-irrigated areas of the Shasta Valley, when interest turned to a natural reservoir site about 15 miles southeast of Montague. Dr. Dwinnell envisioned turning this reservoir into a large lake which would then gravity-feed water through a long canal with lateral ditches to a large portion of the Shasta Valley; and, with the cooperation of local farmers and entrepreneurs, he established the Montague Irrigation District, now known as the Montague Water Conservation District, in 1925.

The project was designed by Civil Engineer John A. Beemer, and bonds were issued to pay for construction which began in 1926. The Nevada Contracting Company constructed the dam, the 1,800-foot flume, trestles, the 21-mile long canal and the 55 miles of laterals. Problems were encountered upon completion, not with the structural integrity of the project, but the filling of the reservoir. Geological faults and crevices prevented the water from filling the newly constructed ditch system. The farmers' greatest fear became a reality when their fields were either flooded or completely devoid of water, and to make matters even worse, the next three years were the driest on record for Siskiyou County.

Many methods were tried to stop the leaks, with negative results; but finally, "as if by divine intervention, the lake began to seal itself with silt and small debris that had worked its way into the cracks and crevices." By 1947, the reservoir was 50 percent efficient; and as improvements continued, the district increased the allowance from 35,000 to 50,000 acre feet by 1955.

Gazelle

The town began as a stage station named Edson's sometime prior to 1853, and it was operated by E. B. and J. R. Edson. The post office was established as Gazelle in 1870 by E. B. Edson (Luecke, 1982:34). The first school in Gazelle, called the Shasta Valley School, was established in 1865 and located at the junction of Callahan Road and the California-Oregon Stage Road. In 1891, the Shasta Valley School changed its name to Gazelle Union School District, and another school was established four miles north of town.

Grenada

The stage station at this location in 1860 is listed as Starveout, due to the lack of water; but when the railroad came through in 1887, it was named Juliens. Initially, it was a flag stop, but by 1917 when the post office was established and named Grenada, it became a regular train stop (Luecke, 1982:38).

Hawkinsville

Hawkinsville was originally named Frogtown or Lower Town when it was first established on Yreka Creek. When it was moved to higher ground, it was renamed Hawkinsville for Jacob Hawkins. In 1858, there was a shoe store, butcher shop, blacksmith shop, dry goods store, and "a Chinese store" and by 1881, there was a general store, saloons, and the Yreka Creek Mining Company boarding house. The post office was established in 1880, closed in 1890, started again in 1895, then finally moved to Yreka in 1913 (Luecke, 1982:40).

Little Shasta

John Rohrer was the first settler here in 1853, and, shortly thereafter, R. Breed and his partner built the first sawmill in the area near Table Rock, and Schlicht and Smith built the first flour mill on the Shasta River. In 1880, the population was 175, and the post office was originally called Mount Shasta. The name was changed to Little Shasta in March 1888, and in September 1920, the post office moved to Montague (Luecke, 1982:56).

Montague

The town of Montague was established in 1887 as a stop on the Central Pacific Railroad line after surveyors decided to find a cheaper route through Shasta Valley than their original plan to pass through the city of Yreka. The town was named for Samuel S. Montague, chief engineer of the Central Pacific Railroad, who engineered the transcontinental railroad from Sacramento to Promontory, Utah. The Montague Post Office was established in 1887 (Luecke, 1982:61).

Weed

The history of Weed is closely tied to the development of the logging industry in the region and its founder Abner Weed. The following is excerpted from Linville (2000:1-2).

> The town inherited its unusual name from its founder, Abner Weed, who saw a vast potential for the area's lush timber and abundant water supplies. Because of its unique location at the base of Mt. Shasta, Weed experiences almost a constant breeze that ascends over Black Butte summit in a northward thrust. As they descend, the air currents swirl around the hills with a tremendous force, often causing a swirling patch of clouds to appear over the peak of Mt. Shasta. Weed noticed this and saw that he could harness the wind to his lumber operation to help in the drying of the green lumber. He purchased a 280-acre site in the path of the wind from the Siskiyou Lumber and Mercantile in 1897 and thus came the birth of the town.

Mr. Weed developed an extensive railroad logging operation, and the California & Oregon Railroad was extended into the area to accommodate the factory business. Weed Lumber

Company furnished employment and housing and provided mercantile goods and social services to its workers. In 1902, this “company town” included the cookhouse and bunkhouse, a post office, two mills, a box factory and boarding house, a store, and several homes. The company was taken over by Long Bell Lumber Company circa 1906, which operated the mill until 1956 when it was purchased by International Paper Company. The town of Weed was incorporated in 1959.

Yreka

Yreka was originally named Thompson’s Dry Diggings in 1851 after Abraham Thompson, who discovered gold there, and “two thousand miners arrived when the news got out.” Within a year’s time, the town’s name changed five times from Thompson’s Dry Diggings to Shasta Butte City to Shasta Plains to Ieka to Wyreka, and finally Yreka in 1852 (Luecke, 1982:85). The latter name for the town is from a bastardization of the Shasta Indian word for Mount Shasta which was *Wy-e-kah* (Silva and Arnold, 1999:19).

Joaquin Miller described Yreka during 1853-1854 as a bustling place with “. . . a tide of people up and down and across other streets, as strong as if in New York” (MSRTC, 2006). Yreka was incorporated in 1854. The first newspaper, the *Mountain Herald*, was printed in June 1853, and the post office was established in August of the same year.

By 1885, the mining boom was nearly over, but the town had a population of 1,400 and boasted a court house, churches, hotels, a school, an express and telegraph office, and numerous other businesses (Luecke, 1982:85), and settlers were well established in Shasta Valley, primarily as ranchers and farmers. The growth of Yreka and the surrounding area prompted the construction in 1889 of a shortline railroad to connect Yreka with the Southern Pacific’s west coast line. Hundreds to thousands of Chinese laborers were used to construct the shortline, and they established two large commercial, cultural, and social centers, known as Chinatowns, in Yreka (MSRTC, 2006).

During the first quarter of the twentieth century, logging grew as the economic mainstay of Siskiyou County, along with ranching and agriculture. Sufficient roads and bridges into the County were vital to the growth of the local economy, yet pleas for funding were ignored by California state government. Because of their discontent, various attempts were made beginning in 1852 by several northern California and southern Oregon counties who were trying to secede from their respective states to form a new state called Jefferson. The most recent attempt was in 1941, but the outbreak of World War II interrupted their efforts (Rock, 1985).

In the mid-1940s, Highway 97, better known as the Al-Can Highway, which runs from Weed, California to Alaska, was completed. In the following decades, Siskiyou County has remained a quiet, sparsely populated area. Changing government regulations have led to the decline of logging in the area, which has been replaced in part by tourism and outdoor recreation. The alignment of Interstate-5 through Weed and Yreka was finalized in the mid-1960s by the State of California.

3.5.2 Literature and Record Search Results

An in-depth review of archaeological records which would have produced a bibliography and maps for all previously-conducted archaeological surveys and previously-recorded archaeological sites within the watershed was not completed for this Draft Environmental Impact Report (EIR). Instead, Trudy Vaughan, Coyote & Fox Enterprises,[1] at the Northeast Center of the California Historical Resources Information System, California State University, Chico (NE/CHRIS), conducted cursory review of maps and records in March 2007, with an update in September 2008, to provide general information on the extent of archaeological surveys within the watershed and the number and types of prehistoric and historic sites recorded.

Cultural resources include prehistoric and historic archaeological sites, districts, and objects, standing historic structures, locations of important historic events, and sites of traditional cultural properties. Prehistoric resources include sites, features, and artifacts associated with indigenous Californians, generally prior to contact with people of European descent. Historic resources include structures, features, artifacts, and sites that date from Euroamerican settlement of the region; and to be an “historic” resource, it must be more than 50 years old.

The review of records at NE/CHRIS consisted of a review of the NE/CHRIS atlas of all 7.5' USGS topographic maps within the watershed, noting the extent of archaeological surveys and the number and types of prehistoric and historic sites recorded. Also, the following documents were reviewed: *National Register of Historic Places - Listed Properties and Determined Eligible Properties* (National Park Service, 2008), the *California Register of Historic Resources* (California Department of Parks and Recreation, 2002), *California Points of Historical Interest* (California Department of Parks and Recreation, 1992), *California Historical Landmarks* (California Department of Parks and Recreation, 1996), and the NE/CHRIS Historic Property Data File for Siskiyou County. Several sites in Shasta Valley are listed on the National Register of Historic Places: a historic store in Edgewood which dates to 1875, the Weed Lumber Company Boarding House in Weed dating to 1900, and, in Yreka, the downtown historic district at West Miner and Third Streets dating to 1850, the Falkenstein/Lewis/Sarter House dating to 1850, and the Carnegie Library dating to 1900. Also, Mount Shasta was determined eligible for inclusion on the National Register in March 1994 because of its historical, traditional, cultural and spiritual importance to the local Native American tribes whose territory surrounds the mountain. The boundary of this site, identified as CA-SIS-1821, is indefinite, but roughly encompasses an area approximately seven miles diameter or 25,600 acres.

Records indicate that archaeological surveys have been conducted over approximately 30 percent, of the watershed. Most of the surveys have been conducted on the eastern side of the watershed on Klamath National Forest lands (e.g., Vann, 2002), on Bureau of Land Management parcels (e.g., Hamusek et al., 1997), and on private timber lands. The latter surveys have mostly been conducted by Registered Professional Foresters (RPFs), with two examples being Lewis (2004) on 3,500 acres and Ravenscroft (2005) on 1,200 acres. RPFs have received training in the

1 Trudy Vaughan is Principal of Coyote & Fox Enterprises (CFE), a subcontractor to Environmental Science Associates to prepare the Cultural Resources section of this document.

identification and recording of cultural resources through the California Department of Forestry and Fire Protection (CDF), and they are only authorized to conduct this work for CDF. These surveys, therefore, while providing some information on the cultural resources in the area, are not accepted under federal and state laws as meeting the cultural resource requirements of a professional archaeologist.

Several linear surveys have been conducted through the Shasta Valley both for power lines and fiber optic cable routes (e.g., Arrington, 2007; Brown, 2001; Peak, 1988) and for road improvements (e.g., Vaughan, 1997a, 1999a, 2002). There have also been approximately 80 small surveys covering from five acres up to 500+/- acres for private parcel splits and small development projects. These are scattered throughout the watershed, but most are concentrated around Yreka, Montague, and Weed. Examples of these surveys include Jensen (1994), Manning (1982), Vann (2004), and Vaughan (2002b).

Specific to the current Program, numerous small cultural resource surveys have been conducted for such undertakings as fencing projects to keep wildlife from streams, fish screens, bank stabilization, and instream restoration projects. Examples of these are Vann (2005), and Vaughan (1997b, 1999b, 1999c).

The review of maps at NE/CHRIS showed that approximately 260 archaeological sites have been recorded to date within the Shasta River watershed, approximately 40 percent of which are prehistoric and 60 percent are historic. Fifty of these sites were recorded around Grass Lake[2] at a ratio of approximately 1:1 for prehistoric and historic sites; and in another area of intensive survey covering almost four sections of land (Hamusek et al., 1997), 16 sites were recorded, four of which were historic and 12 prehistoric. These examples indicate that site density within the watershed is relatively high, particularly around water sources, and there are undoubtedly many more historic and prehistoric sites in the large portion of the watershed which has not yet had an archaeological survey conducted by a professional archaeologist.

As noted above, time did not permit a review of all site forms. Prehistoric site forms reviewed indicate that most of prehistoric sites are lithic scatters, with a few village and midden sites. Some of the larger prehistoric sites are those at which archaeological investigations have been conducted, as discussed above in the Prehistory section. There are several large linear historic sites including the railroad logging system of Weed and Long Bell Lumber Companies (CA-SIS-3391H), the Yreka Trail (CA-SIS-1828H), and the Yreka Ditch (CA-SIS-2252H). The most common site types among the historic sites are historic debris scatters and segments of rock walls/fences. Other site types include cabins, structure remains, railroad logging and logging camps, and segments of water conveyance ditch for mining and/or irrigation. For both the prehistoric and historic sites, only a few have been evaluated for eligibility to the National Register of Historic Places, and, therefore, most sites must be considered potentially eligible until such time as each can be formally evaluated.

[2] Grass Lake is along the eastern edge of the Shasta River watershed. Currently, no Covered Activities are planned in this area.

3.5.3 Regulatory Setting

Federal Regulations

If a Covered Activity performed under the Program falls under the jurisdiction of a federal agency, either through federal funding, or the requirement of a federal permit, section 106 of the National Historic Preservation Act of 1966 (Preservation Act) and its amendments; the regulations that implement section 106 (36 Code of Federal Regulations Part 800); section 101(b)(4) in the National Environmental Policy Act; and the Archaeological Resources Protection Act would apply. Under the Preservation Act, if a historic resource (a prehistoric or historic archaeological site) is recorded within the impact area of a specific project and the site cannot be avoided, it must be evaluated for its eligibility for inclusion on the National Register of Historic Places.

State Regulations

The California Environmental Quality Act (CEQA) requires that public or private projects financed or approved by public agencies must assess the effects of the project on historical resources. CEQA also applies to effects on archaeological sites, which may be included among "historical resources" as defined by CEQA *Guidelines*, § 15064.5(a), or, in the alternative, may be subject to the provisions of Public Resources Code, § 21083.2, which governs review of "unique archaeological resources." Historical resources may generally include buildings, sites, structures, objects or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance.

Under CEQA, "historical resources" include the following:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the California Register of Historical Resources (CRHR) (Public Resources Code, § 5024.1.)

(2) A resource included in a local register of historical resources, as defined in Public Resources Code, § 5020.1(k) or identified as significant in a historical resource survey meeting the requirements in Public Resources Code, § 5024.1(g), shall be presumed to be historically or culturally significant. Public agencies must treat any such resources as significant, unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the CRHR (Public Resources Code, § 5024.1):

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; or

(B) Is associated with the lives of persons important in our past; or

(C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(D) Has yielded, or may be likely to yield, information important in prehistory or history.

(4) The fact that a resource is not listed in or determined to be eligible for listing in the CRHR, is not included in a local register of historical resources (pursuant to Public Resources Code, § 5020.1(k)), or is not identified in a historical resources survey (meeting the criteria in Public Resources Code, § 5024.1(g)) does not preclude a lead agency from determining that the resource may be a historical resource as defined in Public Resources Code, § 5020.1(j) or § 5024.1.

Archaeological resources that are not "historical resources" according to the above definitions may be "unique archaeological resources" as defined in Public Resources Code, § 21083.2, which also generally provides that "non-unique archaeological resources" do not receive any protection under CEQA. If an archaeological resource is neither a "unique archaeological" nor an "historical resource," the effects of the Program on those resources will not be considered a significant effect on the environment. It will be sufficient that both the resource and the impact on it are noted in the EIR, but they need not be considered further in the CEQA process.

In summary, CEQA requires that if a project (in this case, the Program) results in an effect that may cause a substantial adverse change in the significance of a historical resource, or would cause significant effects on a unique archaeological resource, then alternatives to the Program or mitigation measures must be considered.

Local Regulations

Most of the Shasta River watershed, and all of the areas where Covered Activities would occur, falls under the land use jurisdiction of Siskiyou County. Different sections in the County's General Plan have been updated over time. The Siskiyou County General Plan Land Use and Circulation Element was last updated in 1980, while the Conservation Element was updated in 1973. The General Plan provides only broad recommendations for the protection of cultural resources. The Archaeology section in the Conservation Element of the General Plan (pp. 104-108) states that Siskiyou County "has a wealth of archaeological history within its borders" and the County shall "preserve, protect, and develop the County's Archaeological, Paleontological, and Historic as well as Geologic sites." To that end, the General Plan requires the County to: 1) strictly enforce state laws which prohibit unauthorized excavation on all lands under its jurisdiction; and 2) encourage scientific excavation, with all projects directed to the Siskiyou County Museum or Historical Society for guidance to assure that the proper procedures are followed which will insure the validity and authenticity of any and all finds.

3.5.4 Impacts and Mitigation Measures

Significance Criteria

For the purposes of this Draft EIR, and based on Appendix G in the CEQA *Guidelines*, the Program would have a significant impact on cultural resources if it were to do any of the following:

a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA *Guidelines*, § 15064.5;

b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA *Guidelines*, § 15064.5;

c) Directly or indirectly destroy a unique paleontological resource or site; or

d) Disturb any human remains, including those interred outside of formal cemeteries.

Impact Analysis

Impact 3.5-1: Impacts to known and unknown cultural resources may result either directly or indirectly during the implementation and operational phases of a Covered Activity under the Program (Significant).

Impacts on cultural resources could result from ground-disturbing activities and/or other activities that damage, destroy, or alter historic structures. Ground-disturbing activities, which include Program-related excavation, grading, trenching, or other surface and subsurface disturbance, could damage or destroy historic structures and both surface and buried archaeological resources, including prehistoric and historic remains, paleontological resources and human burials. Program measures to address potential impacts to paleontological resources and human remains are described in greater detail in Impacts 3.5-2 and 3.5-3.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.5-1a: Master List of Terms and Conditions (MLTC) Condition 111c ~~102~~ states that prior to any ground-disturbing activities, the responsible party shall contract with at least one qualified archaeologist and paleontologist ~~to~~. The archaeologist/paleontologist will complete cultural and paleontological resource surveys, to identify any previously recorded and unknown historical resources, unique archeological resources, or unique paleontological resources, using standard survey protocols. The survey report must be provided to the California Department of Fish and Game (CDFG) for review and approval prior to any ground-disturbing activities.

Mitigation Measure 3.5-1b: MLTC Condition 112 ~~103~~ notes that if any potentially significant historical resources, unique archaeological resources and/or paleontological resources are identified at the work site, CDFG shall consult with the consulting archaeologist or paleontologist to identify one or more of the following protective measures, or site specific measures, to be implemented at the project site before work may proceed:

- Redesign of proposed work to avoid disturbance of cultural or paleontological resources;
- Fencing to prevent accidental disturbance of cultural or paleontological resources during construction; and/or
- On-site monitoring by a cultural and/or paleontological resource professional during construction to assure that resources are not disturbed.

Mitigation Measure 3.5-1c: MLTC Condition 116 ~~104~~ states that the responsible party shall report any previously unknown historical resources, unique archaeological resources, and paleontological remains discovered at the site to CDFG and other appropriate agencies.

Mitigation Measure 3.5-1d: MLTC Condition 117 ~~105~~ states that if cultural resources such as lithic debitage, groundstone, historic debris, building foundations, or bone are discovered during ground-disturbing activities, work shall cease within 20 meters (66 feet) of the discovery. Furthermore, work near archaeological finds shall not resume until a professional archaeologist has evaluated the materials and offered recommendations for further action.

Mitigation Measure 3.5-1e: MLTC Condition 122 ~~108~~ states that the responsible party shall instruct all persons who will be completing any ground-disturbing activity at a worksite to comply with conditions set forth in the SAA MOU and to inspect each work site before, during and after completion of ground-disturbing activity at the work site.

Mitigation Measures Identified in this Draft EIR

Mitigation Measure 3.5-1f: Prior to carrying out MLTC Condition 111c ~~102~~, the archaeologist/paleontologist shall; a.) contact the Native American Heritage Commission for a Sacred Lands File check and a list of appropriate Native American contacts for consultation concerning the project site and, if necessary, to assist with the development of mitigation measures; and b.) make a determination ~~shall first be made~~ as to whether the area has had an adequate archaeological survey by a professional archaeologist and whether any historic or prehistoric sites have been recorded within a ¼-mile radius of the project area. This records review may be conducted at NE/CHRIS on a case-by-case basis for each project. Alternatively, a professional archaeologist will be contracted to conduct a watershed-wide records search at NE/CHRIS and prepare a map showing the previous surveys and recorded sites. An update of this information would then be prepared at least every two years. This map, which will show the locations of archaeological sites, would be considered confidential and made available only to individuals on an as-needed basis.

Mitigation Measure 3.5-1g: If none of the protective measures described in MLTC Condition 112 ~~103~~ can be implemented, then an archaeological data recovery program (ADRP) shall be implemented, unless the professional archaeologist determines that the archaeological resource is of greater interpretive use than research significance and that interpretive use of the resource is feasible. The project archaeologist and CDFG shall meet and consult to determine the scope of the ADRP, and the project archaeologist shall prepare a research design for the project which shall be submitted to CDFG for review and approval. This document shall identify how the proposed data recovery program would preserve the significant information the archaeological resource is expected to contain. The document will specifically identify the scientific/historical research questions being asked, the archaeological resources' expected data classes, and how the expected data classes would address the applicable research questions. Following approval of the plan by CDFG, the ADRP shall be implemented and a report prepared.

Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical. All significant cultural materials recovered shall be, as necessary, subject to scientific analysis, professional museum curation, and a report shall be prepared by a qualified archaeologist according to current professional standards. If the recovered artifacts are from a prehistoric site, the local Native American groups will be consulted relative to the disposition of these materials.

Mitigation Measure 3.5-1h: If built historical resources (e.g., structures, buildings, or similar) that qualify for listing in the California Register of Historic Resources (CEQA *Guidelines*, § 15064.5)) are identified through the implementation of measure MLTC Condition 111c ~~102~~ and cannot be avoided through implementation of measure MLTC Condition 112 ~~103~~, SVRCD or the Agricultural Operator will comply with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (Standards) which would, in accordance with CEQA *Guidelines*, § 15064.5(b)(3), reduce potential impacts associated with the alteration or modification of a historical resource (including historic districts and individually eligible resources) to a less-than-significant level.

If both avoidance and compliance with the Standards are infeasible, the Covered Activity in question shall be changed or not pursued, such that the historical resource is not destroyed or altered. Activities that would result in such disturbance are not authorized under the Program because SVRCD or the Agricultural Operator would be unable to mitigate the impact to a point where clearly no significant effect on the environment would occur.

Level of Significance after Mitigation

Implementation of Mitigation Measures 3.5-1a through 3.5-1h would reduce the potential impacts to known and unknown cultural resources to a less than significant level.

Impact 3.5-2: Covered Activities could adversely affect known or unknown paleontological resources (Significant).

As described in Impact 3.5-1, impacts on paleontological resources could result from ground-disturbing activities covered under the Program. This would be considered a significant impact.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.5-2a: Implement **Mitigation Measures 3.5-1a – 3.5-1e** (MLTC Conditions 111, 112, 116, 117, and 122 ~~102, 103, 104, 105, and 108~~), as described above.

Mitigation Measures Identified in This Draft EIR

Mitigation Measure 3.5-2b: MLTC Condition 117 ~~10~~5 (see Mitigation Measure 3.5-1d) states that if cultural resources such as lithic debitage, groundstone, historic debris, building foundations, or bone are discovered during ground-disturbing activities, work shall cease within 20 meters (66 feet) of the discovery. Work near the archaeological finds shall not resume until a professional archaeologist has evaluated the materials and offered recommendations for further action. This measure does not, however, specify the criteria for protecting paleontological resources. Therefore, in the event of an unanticipated paleontological discovery during ground-disturbing activities, the following measure shall be implemented:

- Temporarily halt or divert work within 20 meters (66 feet) of the find until the discovery is examined by a qualified paleontologist (per Society of Vertebrate Paleontology standards[3]).
- Document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA *Guidelines*, § 15064.5.
- Notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find.
- If CDFG determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important, and such plan shall be implemented. The plan shall be submitted to the CDFG for review and approval.

Level of Significance after Mitigation

Implementation of Mitigation Measures 3.5a and 3.5-2b would reduce the potential impacts to paleontological resources to a less than significant level.

Impact 3.5-3: Covered Activities could result in damage to previously unidentified human remains (Less than Significant).

Impacts on unidentified human remains could result from ground-disturbing activities. Ground-disturbing activities, which include project-related excavation, grading, trenching, or other surface and subsurface disturbance, could damage or destroy buried human remains. The Program includes the following measures to address this potential impact:

- MLTC Condition 119 ~~106~~, which states, “In the event of inadvertent discovery of human remains during project construction, work shall cease within 20 meters (66 feet) of the discovery location, and any nearby area reasonably suspected to overlie adjacent to human remains (See Public Resources Code, § 7050.5). The county coroner shall be contacted to determine if the cause of death must be investigated. If the coroner determines that the remains are of Native American origin, the responsible party shall comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (NAHC) (Public Resources Code, § 5097).” The Coroner shall contact the NAHC, who shall contact the descendants or most likely descendants of the deceased.

[3] Society of Vertebrate Paleontology professional standards may be found at: http://www.vertpaleo.org/society/ethics.cfm

- MLTC Condition 120 ~~107~~, which states, "The responsible party shall insure that the immediate vicinity where Native American human remains are located, according to generally accepted cultural or archeological standards or practices, is not damaged or disturbed by further ground-disturbing activity until the responsible party has discussed and conferred with the most likely descendents regarding their wishes, taking into account the possibility of multiple human remains, as provided in Public Resources Code, § 5097.98. Work may resume if NAHC is unable to identify a descendant, or the descendant fails to make a recommendation."

- MLTC Condition 122 ~~108~~, which states, "[T]he responsible party shall instruct all persons who will be completing any ground-disturbing activity at a worksite to comply with conditions set forth in this Agreement and shall inspect each work site before, during and after completion of ground-disturbing activity at the work site."

MLTC Conditions 119, 120, and 122 ~~106, 107, and 108~~ would ensure that impacts to previously undiscovered human remains are less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures are required.

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CHAPTER 3.6
Hazards and Hazardous Materials

This Chapter discusses the potential for the Shasta River Watershed-wide Permitting Program (Program) to cause hazards or to produce, emit, or encounter hazardous materials and identifies mitigation measures for those impacts determined to be potentially significant.

3.6.1 Setting

Hazardous Materials

Materials and waste may be considered hazardous if they are poisonous (toxicity), can be ignited by open flame (ignitability), corrode other materials (corrosivity), or react violently, explode or generate vapors when mixed with water (reactivity). The term “hazardous material” is defined in law as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.[1] In some cases, past industrial or commercial uses on a site can result in spills or leaks of hazardous materials and petroleum to the ground; thus resulting in soil and groundwater contamination. Federal and state laws require that soils having concentrations of contaminants such as lead, gasoline, or industrial solvents that are higher than certain acceptable levels must be handled and disposed as hazardous waste during excavation, transportation, and disposal. California Code of Regulations (CCR), title 22, § 66261.20-24 contains technical descriptions of characteristics that would cause a soil to be classified as a hazardous waste. The use of hazardous materials and disposal of hazardous wastes are subject to numerous laws and regulations at all levels of government.

Except in residential areas (for which hazardous materials usage is generally minimal), the types of bulk hazardous materials currently stored and/or used in the Program Area would most likely be petroleum hydrocarbons found in underground storage tanks, such as those at service stations or auto repair shops; or in aboveground storage tanks, such as those at farm or ranch operation centers. Within Siskiyou County, there are 62 known active leaking underground storage tank (LUST) sites; 32 active cease and desist order (CDO) and corrective action order (CAO) sites; and one hazardous waste and substances site. The majority of these sites are located in the cities of Weed and Yreka; however, several of the sites are located elsewhere within the Shasta River watershed (Cal-EPA, 2006). Of relevance to the Program would be any underground storage tanks within or near riparian areas that could be affected by Covered Activities.

1 Health and Safety Code, § 25501(o).

Wildland Fire Conditions

The combination of highly flammable vegetative fuel, long dry summers and steep slopes, and the intermix of urban and wildland land uses creates a natural hazard of wildland fires in many areas of the Shasta River watershed. Fuel types range from grassy flats and hills to timbered mountains. Wildland fires can result in death, injury, economic losses, and a large public investment in fire fighting efforts. Woodlands and other natural vegetation can be destroyed resulting in the loss of timber, wildlife habitat, scenic quality, and recreational opportunities. Soil erosion, sedimentation of streams and waterways, and downstream flooding can also result.

The California Department of Forestry and Fire Protection (CDF) has mapped much of the Shasta River watershed as "wildland areas that may contain substantial forest fire risks and hazards," pursuant to Public Resources Code, § 4125 (CDF, 2000). Areas not within this map classification include the agricultural areas of the northern Shasta Valley and along old Highway 99, and the cities of Weed, Yreka, and Montague.

Wildland fire protection services for unincorporated Siskiyou County are provided by CDF. CDF's Siskiyou Unit manages seven fire stations, and one conservation camp. During fire season, 13 Schedule "B" engines and two dozers are staffed. The County provides funding under the Amador Plan for three stations to remain open year-round (CDF, 2005). Siskiyou Unit Battalion 2, Shasta Valley, provides wildland fire protection services within the vicinity of the Program Area (CDF, 2005).

3.6.2 Regulatory Framework

State and Federal Laws and Regulations

Table 3.6-1 provides a brief overview of federal and state hazardous materials laws and regulations followed by a more detailed discussion.

Soil Contamination

Soils having concentrations of contaminants higher than certain acceptable levels must be handled and disposed as hazardous waste when excavated. CCR, title 22, § 66261.20-24 contains technical descriptions of characteristics that would classify a soil as a hazardous waste.

Hazardous Materials Management

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires that businesses handling hazardous materials prepare a business plan. In January 1996, the California Environmental Protection Agency (Cal-EPA) adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The program has six elements: hazardous waste generators and hazardous waste on-site treatment; underground storage tanks (USTs); aboveground storage tanks (ASTs); hazardous materials release response plans and inventories; risk management and prevention programs; and Unified Fire Code hazardous materials

TABLE 3.6-1
FEDERAL AND STATE LAWS AND REGULATIONS REGARDING HAZARDOUS MATERIALS

Hazardous Materials Management	State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. These laws require hazardous materials users to prepare written plans, such as Hazard Communication Plans, Hazardous Materials Business Plans, and Chemical Hygiene Plans. Laws and regulations require hazardous materials users to store these materials appropriately and to train employees to manage them safely. A number of agencies participate in enforcing hazardous materials management requirements.
Hazardous Waste Handling	The California Department of Toxic Substances Control (DTSC) regulates the generation, transportation, treatment, storage, and disposal of hazardous material waste. These laws impose “cradle-to-grave” regulatory systems that require generators of hazardous materials waste to handle it in a manner that protects human health and the environment to the extent possible. DTSC permits and oversees hazardous materials waste treatment, long-term storage, and disposal facilities.
Hazardous Materials Transportation	The U.S. Department of Transportation (U.S. DOT) regulates the transportation of hazardous materials between states. Within California, the state agencies with primary responsibility for enforcing federal and state regulations, and for responding to transportation emergencies, are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). Together, federal and state agencies determine driver-training requirements, load labeling procedures, and container specifications. Although special requirements apply to transporting hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous waste on public roads.
Soil and Groundwater Contamination	The Comprehensive Environmental Response, Compensation, and Liability Act and associated Superfund Amendments provide the U.S. Environmental Protection Agency (USEPA) with the authority to identify hazardous sites, to require site remediation, and to recover the costs of site remediation from polluters. California has enacted similar laws intended to supplement the federal program. DTSC is primarily responsible for implementing California’s Superfund Law.

management plans and inventories. The plan is implemented at the local level, and the agency responsible for the implementation of the Unified Program is called the Certified Unified Program Agency (CUPA).

Hazardous Waste Management and Handling

Under the Resource Conservation and Recovery Act (RCRA), individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as federal RCRA requirements. USEPA must approve state programs intended to implement federal regulations. In California, Cal-EPA and California Department of Toxic Substances Control (DTSC), a department within Cal-EPA, regulate the generation, transportation, treatment, storage, and disposal of hazardous wastes. The USEPA approved California’s RCRA program, called the Hazardous Waste Control Law (HWCL), in 1992. DTSC has primary hazardous material regulatory responsibility, but can delegate enforcement responsibilities to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of the HWCL.

The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe the management of hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in ordinary landfills. Hazardous waste manifests must be retained by the generator for a minimum of three years. Hazardous waste manifests provide a description of the waste, its intended destination, and regulatory information about the waste. A copy of each manifest must be filed with the state. The generator must match copies of hazardous waste manifests with receipts from treatment, storage, and disposal facilities.

Contaminated soils and other hazardous materials removed from a site during construction or remediation may need to be handled as hazardous waste.

Hazardous Materials Transportation

The State of California has adopted U.S. Department of Transportation (DOT) regulations for the intrastate movement of hazardous materials. In addition, the State of California regulates the transportation of hazardous waste originating in the state and passing through the state. The regulations that govern these activities are in CCR title 26.

The two state agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and Caltrans. CHP enforces hazardous material and hazardous waste labeling and packing regulations to prevent leakage and spills of material in transit and to provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are the responsibility of CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill identification teams at as many as 72 locations throughout the state that can respond quickly in the event of a spill.

Common carriers are licensed by CHP, pursuant to California Vehicle Code, § 32000. This section requires the licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time, and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards.

Every hazardous waste package type used by a hazardous materials shipper must undergo tests that imitate some of the possible rigors of travel. Every package is not put through every test. However, most packages must be able to be kept under running water for a time without leaking; dropped, fully loaded, onto a concrete floor; compressed from both sides for a period of time; subjected to low and high pressure; and frozen and heated alternately.

Fire Management

The CDF *Siskiyou Unit Fire Management Plan* addresses wildfire hazards in Siskiyou County. In line with the stated goals of the California Fire Plan and the mission of CDF, maintaining life and property are the highest priorities of the Plan. The Plan is a dynamic, working plan that provides for an ongoing assessment of the fire situation in the Siskiyou Unit. The document includes stakeholder contributions and priorities and identifies targets for pre-fire management as defined by those who live and work with the local fire problem (CDF, 2005).

Local

Siskiyou County Environmental Health Services Division

The Siskiyou County Public Health Department, Environmental Health Services Division's role is to protect the health and welfare of the general public and environment through prevention and control of disease and pollutants. The Environmental Health Services Division is divided into three programs: Consumer Protection, Hazardous Materials Management/Certified Unified Program Agency (CUPA), and Land Use.

The Hazardous Materials Management Group implements the Unified Program (UP) at the local government level pursuant to CCR, title 27, § 15110(a)(2). The Environmental Health Services became the CUPA on January 1, 1997. The Environmental Health Services Division is certified by the Cal-EPA Secretary to implement the Unified Program specified by Health and Safety Code (Health & Safety Code, § 25404(a)(1)(A)) within Siskiyou County. The CUPA program regulates underground tanks, hazardous materials (including but not limited to: hazardous substances, hazardous waste, and any material which a handler or the CUPA has reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment (Health & Safety Code, § 25501) and any unauthorized release of hazardous material. In addition, the Hazardous Material Management Group regulates final disposal/transfer activities of solid waste (Siskiyou County, 2006). A county-wide 911 system is in place, which is serviced in unincorporated areas of by the Siskiyou County Sheriff's Department.

3.6.3 Impacts and Mitigation Measures

Significance Criteria

This section addresses potential Program hazards and hazardous materials impacts. The significance criteria are based on guidance regarding significant environmental effects in CEQA *Guidelines,* §§ 15065 and 15126 and Appendix G. Specifically, an impact related to hazards and hazardous materials a project or program could cause would be significant if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- For a program located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the program would result in a safety hazard for people residing or working in the Program Area;

- For a project within the vicinity of a private airstrip, the program would result in a safety hazard for people residing or working in the Program Area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code, § 65962.5 and, as a result, would create a significant hazard to the public or the environment; or
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Impact Analysis

In regard to the first six significance criteria listed above, the Initial Study for the Program (Appendix D) found either no impact or a less than significant impact, and therefore they are not further analyzed in this Draft Environmental Impact Report (EIR). The impacts associated with the remaining two criteria (i.e., Program sites located on hazardous materials sites and exposure of people or structures to wildland fires) that the Initial Study found to be potentially significant are discussed below.

Impact 3.6-1: Construction activities could result in discovery and release of previously unidentified hazardous materials into the environment (Significant).

Covered Activities would primarily occur in agricultural areas within the Shasta Valley and would not likely be located on known hazardous materials contamination sites. However, construction associated with some of the Covered Activities (e.g., installation of fish screens and the removal of stream barriers) may require some limited ground disturbance that could disturb previously unidentified subsurface contamination.

While, the potential to encounter, release, and mobilize previously unidentified hazardous materials would be relatively low, the mere potential to do so renders this impact significant.

Mitigation Measures Proposed as Part of the Program

Mitigation Measure 3.6-1a: The Program's incidental take permit (ITP) General condition (b) (Article XIII.E.1) states that the Shasta Valley Resource Conservation District (SVRCD) "and any sub-permittee shall immediately stop, contain, and clean-up any fuel, lubricants, or other hazardous materials that leak or spill while engaged in a Covered Activity. SVRCD or the sub-permittee shall notify the Department immediately of any leak or spill of hazardous materials into a stream or in a place where it can pass into a stream. While engaged in a covered activity, SVRCD and all sub-permittees shall store and handle hazardous materials at least 150 feet away from the edge of mean high water elevation of any stream and properly dispose any unused or leftover hazardous materials offsite. Exceptions to this provision may be provided in individual sub-permits for pre-existing structures with adequate containment facilities." Conditions 76 through 84 ~~68 through 75~~ of the Program's streambed alteration agreement Master List of Terms and Conditions (MLTC) contain similar provisions.

Mitigation Measures Identified in This Draft EIR

Mitigation Measure 3.6-1b: SVRCD shall prepare a standard Hazardous Substance Discovery Plan that shall include provisions that would be implemented if any subsurface hazardous materials are encountered during construction. Provisions outlined in the Plan shall be followed by SVRCD and/or any sub-permitee and shall include immediately stopping work in a contaminated area and contacting appropriate resource agencies, including the California Department of Fish and Game's (CDFG) designated monitor, upon discovery of subsurface hazardous materials. The plan shall include the phone numbers of county and state agencies and primary, secondary, and final cleanup procedures. The Hazardous Substance Discovery Plan shall be submitted to CDFG for review and approval prior to the commencement of Program construction activities.

Level of Significance after Mitigation

Mitigation Measures 3.6.1a and 3.6.1b would reduce this impact to a less than significant level.

Impact 3.6-2: Program construction activities could ignite dry vegetation and start a wildland fire (Significant).

The majority of the Program activities would occur in agricultural areas within Shasta Valley, and as such, there would be little risk of wildfire associated with them. However, some activities may occur on the urban or wildland fringe that is susceptible to wildland fires. Heat or sparks from construction vehicles or equipment have the potential to ignite dry vegetation and cause a fire. Therefore, a high to moderate fire hazard would likely exist during construction of Program activities between late spring and early fall. This would be a significant impact.

Mitigation Measures Proposed as Part of the Program

No mitigation measures are included in the proposed MLTC or ITP.

Mitigation Measures Identified in This Draft EIR

Mitigation Measure 3.6-2: Water tanks and/or fire extinguishers shall be sited at Covered Activity construction sites and shall be available for fire protection during the fire season (approximately late spring to early fall). All construction vehicles shall have fire suppression equipment and construction personnel shall be required to park vehicles away from dry vegetation. SVRCD and/or sub-permittees shall contact and coordinate with CDF to determine the minimum amounts of fire equipment to be carried on the vehicles and appropriate locations for the water tanks/fire extinguishers. SVRCD and/or sub-permittees shall submit verification of its consultation with the CDF to CDFG.

Level of Significance after Mitigation

Mitigation Measure 3.6.2 would reduce this impact to a less than significant level.

References

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CHAPTER 3.7
Public Utilities, Service Systems, and Energy

This Chapter examines the potential for the proposed Shasta River Watershed-wide Permitting Program (Program) to adversely affect public utilities, service systems, and energy generation and consumption, and identifies mitigation measures for those impacts determined to be potentially significant.

3.7.1 Setting

The Program is located entirely within the Shasta River watershed (Program Area) within Siskiyou County, California. As mentioned earlier in Chapter 3.1, the incorporated cities of Weed, Yreka, and Montague are not participating in the Program. The Shasta River Valley is served by several public utilities and service systems, described below.

Water

The Program Area consists of rural agricultural landscapes and forested uplands. Residential and commercial developments are scattered and of low density throughout the agricultural areas, and are even more sparse in the forested areas. Much of the high country in the mountains to the north, east and south of Shasta Valley are federally-designated wilderness areas. Water for irrigation is from two primary sources: surface water diversions and groundwater (see Chapter 3.1).[1] Most surface water diversions use a system of seasonal checkdams, headgates, and ditches to convey water by gravity from the stream of origin to the point of use. Although many individual farmers own and operate individual irrigation systems within Shasta Valley, several large water user associations operate in the area. These water user associations operate and manage large irrigation water systems that share the costs of maintaining and operating the system, and provide an allocation mechanism for water distribution amongst local farmers. The principal water user associations within the Shasta Valley are the Grenada Irrigation District (GID), the Shasta River Water Association (SRWA), and the Montague Water Conservation District (MWCD). In addition, the smaller Big Springs Irrigation District (BSID) operates in the Shasta Valley. The following general descriptions identify the key characteristics on general water availability and pricing information for the major water districts in the Shasta Valley:[2]

1 Domestic water supply is not analyzed under this Draft Environmental Impact Report because the Program only addresses agricultural diversions and modifications to agricultural water supply systems. While there are public entities that supply water to local residences and businesses, these systems will not be modified or changed by the Program.

2 Comparisons of the delivered water prices between these districts are difficult because prices fluctuate with each district's annualized expenses for both capital improvements and its operations and maintenance costs (Webb, 2007).

Grenada Irrigation District. GID serves an approximately 1,600 acre area of farmland, of which approximately 700 acres are actively irrigated. This property tax-based district charges users on a per-acre basis. The majority of GID users are relatively far west of the mainstem Shasta River. Agricultural producers not currently being supplied water must pay a "stand-by" charge to help cover GID's fixed overhead cost of maintaining GID's infrastructure, such as pumps, ditches, and buildings. Agricultural producers receiving GID water deliveries pay "regular fees" that include the additional electricity charge for water pumping and delivery. The "stand-by" charge for GID agricultural producers is typically around $27/acre (in 2007 dollars), and "regular fees" for irrigation are approximately $149/acre (in 2007 dollars) (Webb, 2007).

Shasta River Water Association. SRWA is a farmers' cooperative that provides irrigation water to roughly 4,200 acres of farmland located on the west side of the Shasta River in the northern Shasta Valley. Each landowner who is a member of SRWA is entitled to a share of the available water, and is required to pay a portion of SRWA's annual overhead and delivery costs even if they do not take water for irrigation. The annual costs for members are generally between $50-$60/acre (Webb, 2007).

Montague Water Conservation District. MWCD provides water to a service area of approximately 19,500 ~~13,000~~ acres ~~of farmland~~ located primarily in the area north of the Little Shasta River and east of the Shasta River, and also to the City of Montague. The MWCD's water is transferred from storage in Lake Shastina along more than 20 miles of primary irrigation supply canal. Additional deliveries are made to farmers located just north of Lake Shastina. Landowners within the district are entitled to a share of the available water at a baseline cost and when it is available can buy additional water at a higher cost. Water costs for MWCD can fluctuate greatly, with high water costs during drought years when MWCD's fixed operating costs must be covered by relatively small amounts of water sales (Webb, 2007).

Big Springs Irrigation District. BSID provides water to a maximum of 2,500 acres of farmland located in the vicinity of Big Springs, northeast of the Shasta River. In 2007, approximately 1,450 acres were actively irrigated. There are three tiers of rates based on a user's needs: active; ½ standby; and contract. The active ratepayer pays $5.65/irrigable acre. The ½ standby ratepayer does not receive water in a given year, but would be eligible to receive water the following year. The rate for this category is $2.83/irrigable acre. The contract ratepayer signs a contract that he will not need water from BSID for five years, and pays only $0.55/irrigable acre. Contract ratepayers must inform BSID two years in advance in order to be brought into rotation. The current cost of water is $19/acre-foot (Faris, 2007).

Sanitary Sewer

Within the unincorporated area of Siskiyou County, individual properties are serviced by on-site sewage disposal systems under permits issued by the Siskiyou County Public Health Department (Navarre, 2006). The Public Health Department follows a set of Sewage Disposal Codes that apply to all new construction, relocated buildings, and trailers and to all alterations, repairs, or reconstruction within the unincorporated area of the County (Siskiyou County, 2006).

Electricity and Natural Gas

Electrical service in the Program Area is provided by Pacific Power, a division of PacifiCorp. Siskiyou County does not have access to natural gas; however, several local companies provide propane to individual residences and businesses (Siskiyou County Economic Development Council, 2006).

Solid Waste and Recycling Service

The Yreka Solid Waste Landfill in Yreka provides refuse disposal and recycling services to residents and businesses in the Program Area. This landfill currently has a remaining permitted capacity of approximately 4.7 million cubic yards and is not projected to reach capacity until 2065 (CIWMB, 2006a).

3.7.2 Global Climate Change

The International Panel on Climate Change (IPCC) states that human activities contribute to climate change by causing changes in Earth's atmosphere in the amounts of greenhouse gases (GHGs), aerosols (small particles), and cloudiness (IPCC, 2007a). The largest known contribution comes from the burning of fossil fuels, which releases carbon dioxide gas to the atmosphere. GHGs and aerosols affect climate by altering incoming solar radiation and outgoing infrared (thermal) radiation that are part of Earth's energy balance. Changing the atmospheric abundance or properties of these gases and particles can lead to a warming or cooling of the climate system. Since the start of the industrial era (about 1750), the overall effect of human activities on climate has been a warming influence. The human impact on climate during this era greatly exceeds that due to known changes in natural processes, such as solar changes and volcanic eruptions (IPCC, 2007a).

Human activities result in emissions of four principal GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and the halocarbons (a group of gases containing fluorine, chlorine, and bromine). These gases are long-lived and accumulate in the atmosphere, causing concentrations to increase with time. Significant increases in all of these gases have occurred in the industrial era. All of these increases are attributable to human activities.

- Carbon dioxide has increased from fossil fuel use in transportation, building heating and cooling, and manufacturing. Deforestation releases CO_2 and reduces its uptake by plants. Carbon dioxide is also released in natural processes such as the decay of plant matter.

- Methane has increased as a result of human activities related to agriculture, natural gas distribution, and landfills. Methane is also released from natural processes that occur, for example, in wetlands. Methane concentrations are not currently increasing in the atmosphere because growth rates decreased over the last two decades, but current atmospheric levels are approximately three times higher than the pre-industrial period. Methane has an influence on climate ("global warming potential" or GWP) estimated to be 25 times that of CO_2 (IPCC, 2007a).

- Nitrous oxide is also emitted by human activities such as fertilizer use and fossil fuel burning. Natural processes in soils and the oceans also release N_2O. N_2O has a GWP 298 times that of CO_2 (IPCC, 2007a).

- Increases in halocarbon gas concentrations are primarily due to human activities, though natural processes are also a small source. Principal halocarbons include the chlorofluorocarbons (e.g., CFC-11 and CFC-12), which were used extensively as refrigeration agents and in other industrial processes before their presence in the atmosphere was found to cause stratospheric ozone depletion. The abundance of chlorofluorocarbon gases is decreasing as a result of international regulations designed to protect the ozone layer. These gases, however, have GWPs many hundreds or thousands of times that of CO_2. (IPCC, 2007a)

Some of the potential resulting effects in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CARB, 2006). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2007b):

- Higher maximum temperatures and more hot days over nearly all land areas;

- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;

- Reduced diurnal temperature range over most land areas;

- Increase of heat index over land areas; and

- More intense precipitation events.

There are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, Global Climate Change has the potential to cause catastrophic environmental, social, and economic consequences.

The California Energy Commission (CEC) estimated that in 2004, California produced 492 million metric tons of CO_2-equivalent (mmt-eCO_2) GHG emissions (CEC, 2006). The CEC found that transportation is the source of 41 percent of the state's GHG emissions; followed by electricity generation at 22 percent; and industrial sources at 21 percent.

3.7.3 Regulatory Framework

State

Waste Management

Assembly Bill 939 (AB 939), enacted in 1989 and known as the Integrated Waste Management Act, required each city and/or county's Source Reduction and Recycling Element to reduce the amount of waste being disposed to landfills, with diversion goals of 50 percent by the year 2000. Siskiyou County has an adopted Countywide Source Reduction and Recycling Element that establishes goals and methods for compliance with AB 939. Siskiyou County's diversion rate in 2002 was 53 percent, which met the requirement of AB 939 (CIWMB, 2006b). The California Integrated Waste Management Board's Recycling Market Development Zone program helps the County meet this goal. This program includes the entire County and offers low-interest loans up to $1 million, technical assistance on financing strategies, and assistance with marketing nationally and internationally.

Global Climate Change

Concern about the disproportionately negative impacts global climate change is expected to have on the California environment and economy has led the state legislature to pass several climate change-related bills in the past five years. These bills aim to control and reduce the emission of GHGs in order to slow the effects of global climate change, and provide guidance as to determining the impact of individual projects on global climate change.

Assembly Bill 1493

Assembly Bill 1493 (AB 1493) was signed into law by the California Governor on July 22, 2002. This legislation required the California Air Resources Board (CARB) to adopt regulations, by January 1, 2005, that would result in the achievement of the "maximum feasible" reduction in GHG emissions from vehicles used in the state primarily for noncommercial personal transportation. As enacted, the AB 1493 regulations were to become effective January 1, 2006, and apply to passenger vehicles and light-duty trucks manufactured for the 2009 model year or later. AB 1493 prohibited CARB from requiring: (1) any additional tax on vehicles, fuel, or driving distance; (2) a ban on the sale of certain vehicle categories; (3) a reduction in vehicle weight; or (4) a limitation on or reduction of speed limits and vehicle miles traveled.

Although the regulation of tailpipe emissions traditionally is subject to the jurisdiction of the U.S. Environmental Protection Agency (USEPA), CARB has some regulatory authority due to the severe air quality issues in California. In fact, pursuant to the federal Clean Air Act, CARB may implement stricter regulations on automobile tailpipe emissions than the USEPA, provided a waiver from the USEPA is obtained.

In September 2004, CARB adopted AB 1493-mandated regulations and incorporated those standards into the Low-Emission Vehicle (LEV) program. The regulations set fleet-wide average GHG emission requirements for two vehicle categories: passenger car/light duty truck (type 1) and light-duty truck (type 2). The standards take into account the different GWPs of the several

GHGs emitted by motor vehicles, and would phase in during the 2009 through 2016 model years. If implemented, these regulations would produce a nearly 30 percent decrease in GHG emissions from light-duty vehicles by 2030.

In December 2004, these regulations were challenged in federal court by the Alliance of Automobile Manufacturers, who claimed that the regulations attempted to regulate vehicle fuel economy, a matter that lies within the exclusive jurisdiction of the federal government. In a decision rendered in December 2007, the U.S. District Court for the Eastern District of California rejected key elements of the automakers' challenge and concluded that CARB's regulations are neither precluded nor preempted by federal statutes and policy.

While the litigation described above was pending, in December 2005, CARB submitted a waiver application to the USEPA. After waiting nearly two years for a decision from the USEPA, in November 2007, California filed a lawsuit alleging that the USEPA failed to consider the waiver application in a timely fashion. The USEPA's chief promised to issue a decision on the application by December 31, 2007, and, in mid-December 2007, the USEPA's chief fulfilled his promise by issuing a decision denying California's waiver application. The denial was based on the assertion that new federal automobile fuel economy requirements achieve what California sought to accomplish *via* the AB 1493 regulations. The denial of California's waiver application has precluded as many as 16 other states from implementing tailpipe emission regulations similar to those adopted by California under AB 1493. In response to this denial, California filed a lawsuit, with the support of 15 other states, challenging the USEPA's decision.

Shortly after the USEPA issued its denial of California's waiver application, the Senate Environment and Public Works Committee and the House Oversight and Government Reform Committee (both led by Californians) made an official demand for all documents concerning the USEPA's decision to deny California's waiver application. (This request includes communications with the White House.) The USEPA has signaled that it would comply with this request for documents and any further Congressional investigation that follows.

Assembly Bill 32

Citing concerns similar to those enumerated in AB 1493, the California State Assembly also passed the California Global Warming Solutions Act of 2006 in August 2006. Also known as Assembly Bill 32 (AB 32), the law instructs CARB to set reporting requirements for GHG emissions and to devise rules and regulations that will achieve the maximum technologically feasible and cost-effective GHG emissions reduction, achieving a reduction in statewide GHG emissions to 1990 levels by 2020, and further reductions in future years.[3] While AB 32 sets out a timeline for the adoption of measures to evaluate and reduce GHG emissions across all source categories, it does not articulate these measures itself; instead, these measures will be determined in subsequent processes. The specific GHG emission reduction measures that will be required of facilities as result of the passage of AB 32 have not yet been set but currently are being devised.

3 Prior to the enactment of AB 32, Governor Schwarzenegger signed Executive Order No. S-3-05 on June 1, 2005, mandating a reduction to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. Although the 2020 target is the core of AB 32, and has been incorporated into AB 32, the 2050 target remains the goal of the Executive Order only, as AB 32 does not speak to the 2050 target.

Under AB 32, by January 1, 2008, CARB was required to determine what statewide GHG emissions were in 1990 and set the 2020 limit equivalent to that level. In that regard, CARB determined that the 1990 GHG emissions level (and the 2020 statewide cap) was 427 million tonnes of eCO_2. Accordingly, the current estimate of reductions necessary to achieve AB 32's goal is 174 million tonnes of eCO_2. CARB staff estimates that the proposed discrete early action measures, discussed further below, will provide approximately 16 million tonnes of eCO_2 reductions, while the other early action measures will provide approximately 26 million tonnes of eCO_2 reductions. It is further anticipated that an additional 30 million tonnes of eCO_2 reductions will be secured through the passage of anti-idling measures and AB 1493. The remaining 102 million tonnes of eCO_2 needed to reduce California's GHG emissions to 1990 levels would be achieved through implementation of CARB's Scoping Plan and other regulatory efforts.

In addition, also by January 1, 2008, CARB was required to adopt mandatory GHG reporting and verification regulations. Accordingly, on December 6, 2007, CARB adopted regulations requiring the largest facilities in California to report their annual GHG emissions. These regulations require the facilities to begin tracking their GHG emissions in 2008, with reporting to be submitted in 2009. The facilities identified in the regulations account for 94 percent of California's emissions from industrial and commercial stationary sources, and the regulations cover approximately 800 separate sources (*e.g.*, electricity generating facilities and retail providers; oil refineries; hydrogen plants; cement plants; cogeneration facilities; and industrial sources that emit more than 25,000 tonnes of eCO_2 per year from an on-site stationary source).

CARB also has adopted its first set of GHG emission reduction measures, known as the "early action measures." At this time, CARB has approved 44 early action measures. These early action measures either are currently underway or are to be initiated by CARB in the 2007-2012 timeframe. A subset of these measures, known as "discrete early action measures," must be adopted by regulation by January 1, 2010, as required by AB 32. The early action measures cover a number of sectors including transportation, fuels, and agriculture.

Emission reduction measures that cannot be initiated in the 2007-2012 timeframe will be considered in the Scoping Plan. CARB issued a draft Scoping Plan in June, 2008 (CARB, 2008), which includes recommendations for the following emission reduction programs:

1. California Cap-and-Trade Program Linked to Western Climate Initiative
2. California Light-Duty Vehicle GHG Standards
3. Energy Efficiency
4. Renewables Portfolio Standard
5. Low Carbon Fuel Standard
6. High GWP Gases
7. Sustainable Forests
8. Water
9. Vehicle Efficiency Measures
10. Goods Movement
11. Heavy/Medium-Duty Vehicles
12. Million Solar Roofs Program
13. Local Government Actions and Regional Targets

14. High Speed Rail
15. Recycling and Waste
16. Agriculture
17. Energy Efficiency and Co-Benefits Audits for Large Industrial Sources

CARB accepted comments on the Draft Scoping Plan during the summer of 2008; AB 32 requires that CARB adopt the Scoping Plan before January 1, 2009. GHG emission limits and emission reduction measures from the Scoping Plan must be adopted by regulation on or before January 1, 2011, for enforcement by January 1, 2012. By January 1, 2014 and every five years thereafter, CARB will update its Scoping Plan.

AB 32 specifically allows CARB to consider a market-based compliance mechanism. A Market Advisory Committee (MAC) was formed under Governor Schwarzenegger's Executive Order No. S-20-06 in order to make recommendations to CARB on the design of a cap-and-trade mechanism for reducing GHG emissions. The MAC issued its final report in June 2007 to CARB for consideration. In general, the MAC proposed to include as many sources and sectors in the cap-and-trade program as practicable. The MAC also is recommending that emission allowances be auctioned rather than freely distributed. In addition, the MAC recommended that offsets be allowed to satisfy GHG limits and that linkages to other existing GHG markets be allowed. CARB currently is considering the recommendations of the MAC for inclusion into the Scoping Plan.

Senate Bill 97

With respect to CEQA, in 2007, the State Legislature passed Senate Bill 97 (SB 97), which addresses GHG analysis under CEQA. The bill exempts transportation projects funded under the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, and projects funded under the Disaster Preparedness and Flood Prevention Bond Act of 2006, from analysis of GHG emissions under CEQA. In addition, SB 97 requires the Office of Planning and Research, by July 1, 2009, to develop and transmit to the California Resources Agency guidelines for the mitigation of GHG emissions and their effects. The California Resources Agency will be required to adopt the regulations by January 1, 2010.

In addition to these bills, the California Legislature has introduced numerous other bills that range in scope from establishing market based compliance mechanisms to reduce GHG emissions to renewable energy standards for utilities in the state. It is unclear which, if any, of these bills eventually will be enacted.

Local

Siskiyou County General Plan

The Siskiyou County Conservation Element (1973) includes policies that assure adequate water supply and sewage disposal. The following Conservation Element objective related to water supply would be applicable to the Program:

- Preserve the quality of the existing water supply in Siskiyou County and adequately plan for the expansion and retention of valuable water supplies for future generations (Siskiyou County, 1973).

Greenhouse Gas Emissions

Siskiyou County does not have any rules or regulations that govern GHG emissions.

3.7.4 Impacts and Mitigation Measures

Significance Criteria

Based on Appendix G in the CEQA *Guidelines,* the Program may be deemed to have a significant adverse effect on the environment if it were to do any of the following:

a) Conflict with wastewater treatment requirements of the applicable Regional Water Quality Control Board;

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

c) Require or result in the construction of new storm water drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects;

d) Require new or expanded water supply resources or entitlements;

e) Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments;

f) Be served by a landfill with insufficient permitted capacity to accommodate the project’s solid waste disposal needs;

g) Comply with federal, state, and local statutes and regulations related to solid waste.

Greenhouse Gases

Appendix G of the CEQA *Guidelines* sets forth “Air Quality” significance criteria used to evaluate project impacts, and states, “where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make” a significance determination. However, Appendix G is written for criteria pollutants which are regulated by both an air quality management plan and numerous regulations and standards. GHGs are not criteria pollutants, and do not have resulting regulations or ambient air quality standards. As a result, the thresholds of significance set forth in Appendix G are not appropriate for use in analyzing the potential impacts of the Program on global climate change related to emissions of GHGs. Also, as discussed above in Section 3.7.2, no state or local agency has established significance thresholds for the analysis of GHG emissions under CEQA. Nonetheless, for purposes of this Draft EIR, the following significance threshold has been created and utilized in assessing the impacts of the Program's GHG emissions on global climate change:

> The threshold will be determined by whether the Program's GHG emissions impede compliance with the GHG emissions reduction goals mandated in AB 32.

Effects Found Not to be Significant

The Initial Study for the Program (see Appendix D) found that potential impacts of the Program that relate to criteria *a-c* and *e-g* above would not be significant. Therefore, this Chapter only addresses impacts associated with criterion *d* (require new or expanded water supply resources or entitlements), as well as potential impacts on energy supply and emissions of GHGs.

Impact Analysis

Impact 3.7-1: The Program could result in the modification or expansion of existing water supply systems (Less than Significant).

The Program includes several minimization, avoidance, and mitigation measures that would involve changes to the existing systems of water diversion, conveyance, and application for irrigation and stock watering. These include: moving points of diversion; piping and lining ditches; realigning ditches; and removing barriers to fish passage. Several projects are specified, including the construction of a new diversion structure to replace the existing GID diversion. Construction of these and other projects could result in various impacts, which are evaluated in Chapters 3.2, 3.3, 3.4, 3.5, and 3.6.

Construction within stream channels is limited in the Program to the period of July 1-October 15 ~~31~~. This overlaps with the diversion season. It is possible, therefore, that some water supply construction projects could interrupt service. Periods of service interruption are, however, likely to be temporary and of short duration, and are therefore considered less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

Impact 3.7-2: Construction activities could inadvertently contact underground utility lines and/or facilities during excavation and other ground disturbance, possibly leading to short-term utility service interruptions (Less than Significant).

Some construction activities associated with Covered Activities would involve earth moving activities. In the course of such activities, underground utility lines could be encountered and damaged or disturbed, potentially interrupting services. Government Code, § 4216 requires pre-construction notification of the Underground Service Administration (USA) between two and 14 days before an underground activity that could disturb utility lines. Because of this requirement, the impact is considered less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

Impact 3.7-3: Replacement of gravity-based surface water diversions with diversions or wells utilizing pumps, would increase power consumption and air emissions (Less than Significant).

Several of the Flow Enhancement Mitigation Measures contained in the Program's proposed Incidental Take Permit (ITP) involve changes in surface water diversions, including moving points of diversion downstream closer to the point of use, and switching from surface water diversions to groundwater pumping for fall stock watering. Most existing surface water diversions are gravity-based and do not use electric or fuel-powered pumps. The Flow Enhancement Mitigation Measures would in some instances substitute electric or fuel-powered pumps for existing gravity-based systems, either to lift surface water to an irrigation ditch or to the point of use, or to pump groundwater. This would result in increased demand for electric power and fuel.

The number of diversions that would be affected, their location, and the types and sizes of pumps involved in fulfilling the requirements of the Flow Enhancement Mitigation Measures is unknown. For the purposes of this analysis, it was assumed that at the peak of the diversion season up to 230 cfs would be pumped instead of gravity-diverted, and that half of this would be with electric pumps and half with fuel-powered pumps (assuming that electric pumps would be used where possible). As a worst-case scenario, it was assumed that all fuel-powered pumps would use diesel fuel, and that all electrical pumps would be powered from the electrical grid. It was further assumed that the average vertical lift for all pumps would be 30 feet, and that there would be 50 individual pumped diversions. Ten of the pumped diversions would be larger, with a capacity of 15 cfs each, and 40 would be smaller, with a capacity of 2 cfs each.

Based on a rough estimate that five horsepower is required to lift 1 cfs 30 vertical feet, pumping requirements could be met with a combination of 20 ten-horsepower electric pumps and five 75-horsepower electric pumps, and the same number and size of diesel-powered pumps. Using a standard conversion for horsepower to electrical power consumption, the total power requirement for the electrical pumps would be about 429 kilowatts (kW), or 10,295 kilowatt hours per day (kWH/d) if they were operated 24 hours. These figures are shown in **Table 3.7-1**. Table 3.7-1 also shows the estimated emissions of criteria air pollutants from anticipated diesel pump operation. The table indicates that total emissions of criteria air pollutants would fall well below the significance thresholds set by the Siskiyou County Air Pollution Control District (SCAPCD) (see the Air Quality analysis in Appendix D, Initial Study).

According to PacifiCorp, which supplies electricity to the Shasta Valley, there is sufficient transmission capacity to supply the anticipated additional electrical power demand that the Program may create (Chambers, 2007). Some areas of the Shasta Valley have limited

TABLE 3.7-1
POWER CONSUMPTION AND EMISSIONS FROM PUMPS

Diesel Pumps		Quantity of Equip	Program Specific Equipment HP	State Average HP	Equipment Usage - Program	
Equipment	**Fuel**				**Hours/ day**	**Days/year**
Small Diesel Pumps (2 cfs each)	diesel	20	10	10	24	198
Large Diesel Pumps (15 cfs)	diesel	5	75	70	24	198

Diesel Pump Emissions	Equipment Emissions (lbs/day) - Based on OFFROAD 2007 Emissions Model					
	ROG	**CO**	**NOx**	**CO_2**	**SO_2**	**PM-10**
Small Diesel Pumps	7.8	26.3	45	3,560	0.1	3.4
Large Diesel Pumps	20.8	67.2	130	10,013	0.1	10.3
TOTAL - lbs/day	28.6	93.5	175	13,573	0.2	13.7
TOTAL Tons per Year*	2.8	9.3	17.3	1,219	0.02	1.4
Siskiyou Co. Air Pollution Control District Threshold (short tons/year)	40	100	40	NA	40	15

* CO2 figure is metric tons per year; others are short tons per year.

Electric Pumps: CO2 Emissions	Value	Unit
1cfs, 30 ft head to Horsepower	5	hp
Total Volume Pumped	115	cfs
Horsepower requirement	575	hp
Horsepower to kW	429	kW
Energy Consumption, 24 hours	10,295	kWH/day
Energy Consumption, Annual (198 days)	2,038,370	kWH
$C0_2$ Emission factor	0.00036551	Mg/kWH
Annual CO_2 Emissions	745	Mg
Project Lifecycle CO_2 Emissions (10 years)	7,450	Mg

Key:
- ROG: reactive organic compounds
- CO: carbon monoxide
- Nox: oxides of nitrogen
- CO_2: carbon dioxide
- SO_2: sulfur dioxide
- PM-10: Particulate matter less than 10 microns
- hp: horsepower
- cfs: cubic feet per second
- kW: kilowatt
- kWH: kilowatt hour
- Mg: million grams (1 million grams = 1 metric ton)

Notes:
- 1 horsepower hour = 0.745 699 861 kilowatt hour (from onlineconversion.com)
- CO_2 emissions for electricity generation for California calculated from factors in CA Climate Action Registry, 2007

SOURCE: Chambers, 2007; ESA

transmission capacity that may limit the ability to use larger pumps; this would have to be assessed on a case-by-case basis.

Because sufficient electrical transmission capacity exists to supply the anticipated increase in demand, and because the potential for increased emissions of criteria air pollutants falls below SCAPCD thresholds, this impact is considered less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

Impact 3.7-4: Construction activities and water pumping associated with Covered Activities and ITP mitigation measures would generate greenhouse gas emissions, which would make a contribution to global warming (Less than Significant).

Projects associated with some of the Program's Covered Activities would generate GHG emissions in the form of CO_2. Small amounts of other GHGs could also be emitted. GHG emissions would be generated by construction activities and by water diversions that would use diesel or electric powered pumps.

Most existing diversions are gravity-based and do not use other power sources. As described in Chapter 2, Project Description, ITP Flow Enhancement Mitigations 2 and 4 (ITP Article XIII.E.2(a)(ii) and (iv)) would in some instances use electric or fuel-powered pumps in place of existing gravity-based systems, either to lift surface water to an irrigation ditch further downstream from the existing point of diversion, or directly to the point of use; pumps would also be used to pump groundwater for alternative stock watering systems, and to pressurize more water-conserving irrigation systems.

Several of the Covered Activities in the ITP and the Master List of Terms and Conditions (MLTC) involve construction activities, including instream and riparian restoration activities, and construction and installation of headgates, boulder weirs, fish screens, and measuring devices. Similar activities already occur on an annual basis, but because the Program specifically includes certain construction activities, and would likely result in other activities such as the installation and operation of pumps that would emit GHGs, these activities and their related emissions are considered to be part of the Program.

Estimated GHG emissions that would be generated with implementation of the Program are presented in **Table 3.7-2**, and are estimated to be approximately 2,358 metric tons per year of eCO_2. Over the ten-year span of the Program, emissions are expected to be 23,577 metric tons of eCO_2.

Other aspects of the Program would result in reduction of GHG emissions or emission offsets. Water efficiency measures required by the Program (see Project Description, Chapter 2) would

TABLE 3.7-2
ESTIMATED GREENHOUSE GAS EMISSIONS
FIGURES ARE MILLIONS OF GRAMS (METRIC TONS) OF CARBON DIOXIDE EQUIVALENT

Activity and Equipment	Annual Emissions Mg eCO_2	Program Lifecycle Emissions[a] Mg eCO_2
Emission Sources		
Construction Equipment Emissions	154	1,535
Vehicle Emissions	240	2,402
Pump Emissions: Diesel	1,219	12,190
Pump Emissions: Electric	745	7,450
Subtotal: Emission Sources	**2,358**	**23,577**
Emission Reductions and Off-Sets		
Riparian Revegetation and Fencing	-984	-24,589
Water Use Efficiency (15% Reduction in pump emissions)	-295	-2,946
Subtotal: Program Reductions and Off-Sets	**-1,279**	**-27,535**
Net Greenhouse Gas Emissions of Program	**1,079**	-3,958
Optional Mitigation Measures		
Use of renewable energy for pumping (10% of pumping)[b]	-167	-1,669
Use of Biodiesel Blend[c]	-197	-1,965
Subtotal: Optional Mitigation Measures	**-393**	**-3,929**
Net Greenhouse Gas Emissions with Optional Measures	**686**	**-7,887**

[a] Program lifecycle emissions are based on a ten-year period, except for riparian revegetation and fencing, which is based on 25 years of forest growth.
b 15 percent water use efficiency factored into this emission reduction calculation.
[c] Emission reduction calculation for biodiesel based on use of 20 percent biodiesel blend for all construction equipment and diesel-powered pumps, and half of vehicle emissions; 15 percent water efficiency also factored into emission reduction from pumps.

reduce the need for pumping by an estimated 10 to 20 percent. Therefore, a 15 percent reduction in pump emissions has been applied to the emissions presented in Table 3.7-2.

Two aspects of the Program are intended to result in plantings along portions of the Shasta River's riparian corridor. These are ITP Mitigation Obligation E.2.b.iii (Article XIII), which requires the SVRCD to plant eight linear miles of riparian forest over the ten-year term of the ITP; and Additional Avoidance and Minimization Measure E (Article XV), which requires SVRCD and sub-permittees to prepare a Riparian Fencing Plan and submit it to CDFG for approval within one year of the effective date of the Program; and in each of the successive nine years to install an average of two miles of exclusionary fencing in areas identified in a priority list that will be developed as part of the plan. Fencing would be approximately 35 feet from the edge of the streambank. Sub-permittees would be required to make reasonable efforts to include the existing riparian vegetation within the fenced area.

As plants grow, they use CO_2 in the process of photosynthesis and store carbon in their cell walls. As a forest matures, a considerable volume of carbon is accumulated and stored in standing live and dead trees, understory vegetation, downed dead wood, litter on the forest floor, and in the soil. The accumulation, or sequestration, of carbon in forests is recognized as an important mechanism for reducing the concentration of CO_2 in the atmosphere, and is an essential tool in combating global warming (Nabuurs et al, 2007).

The U.S. Department of Agriculture has developed methods for estimating carbon sequestration in forests in the United States, as part of the Department of Energy's Voluntary Reporting of Greenhouse Gases Program, also known as the 1605(b) Program (USDA, 2007). The simplest of these methods uses "look-up tables" in which the average amount of carbon in a forest stand (referred to as "carbon stock") is given for different regional forest types in the years following a clearcut. This method was used for estimating the amount of carbon that can be expected to be sequestered in the riparian forest areas that will be revegetated and protected under the Program.[4] The results for carbon sequestration are shown as the total amount of carbon, expressed both as carbon contained in plant matter, and its CO_2 equivalent, that would accumulate during the 25 years following revegetation and fencing. 24,589 metric tons of CO_2 equivalent can be expected to be sequestered due to the reforestation activities associated with the Program (**Table 3.7-3**).

Table 3.7-2 indicates that over the ten-year life of the ITP, Program activities will result in the emission of 23,577 tons of CO_2. Table 3.7-2 also shows that water conservation and reforestation measures that are part of the Program will result in reduction and offset of over 27,500 tons of CO_2 equivalent. As a result, the Program is expected to result in a net decrease in GHG emissions over the life of the Program, and so will not impede compliance with the GHG emissions reduction goals mandated in AB 32. Therefore, any potential impact the Program will have on global climate change is considered less than significant.

Mitigation Measures

This potential impact was determined to be less than significant. No mitigation measures required.

Additional Mitigation Measures Identified in This Draft EIR

The mitigation measures discussed below were identified as part of this Draft EIR. While these measures are not required to reduce this impact to less than significant, they are technically feasible. Still, CDFG does not have the statutory or regulatory authority to impose these requirements. As a result, they will only be implemented voluntarily or by another regulatory agency (e.g., CARB) that has the authority to require them, whether now or in the future.

[4] Table A-21 from USDA, 2007 provides estimates of carbon stock of alder-maple stands on forest land after clearcut harvest in the Pacific Northwest, western area. For the analysis, it was assumed that areas that would be revegetated under the Program would have a carbon stock equivalent to a recently clearcut forest, except that carbon stored in down dead wood would be less. For areas that would be fenced, it was assumed that the carbon stock at the time of fencing would be equivalent to a forest 15 years after clearcut.

TABLE 3.7-3
CARBON SEQUESTRATION FROM REFORESTATION

Program Element	Description	Assumed Carbon Stock at Beginning of Program[1,2] (Mg per Acre)	Assumed Carbon Stock 25 years after beginning of Program[1] (Mg per Acre)	Increase in Carbon Stock (Mg per Acre)	Area Affected (Acres)	Lifecycle Increase in Carbon Stock (Mg)	Carbon Dioxide Equivalent (Mg)
SVRCD Mitigation Obligation b.iii	Riparian forest planting (8 linear miles; assume 35 foot width)	9.4	53.4	44.1	34	1,498	5,497
Additional Minimization and Avoidance Measure E	Install 2 miles per year (years 2-10) riparian fencing 35 feet from channel	22.1	90.6	68.5	76	5,202	19,092
TOTAL					110	6,700	24,589

Key:
Mg = million grams, or metric tons

Notes:
1 Values for carbon stock from USDA, 2007, look-up table A21 for Alder-Maple forest stands in the Pacific Northwest, West region.
2 For areas targeted for planting, assumes no standing vegetation at beginning of program. Look-up table value adjusted to account for assumed lower amount of down deadwood; for areas targeted for fencing assumes forest stand is equivalent to 15 years after clearcut.

SOURCE: CDFG, USDA, 2007, ESA

Mitigation Measure 3.7-4a: Program participants are encouraged to fuel all diesel equipment, including pumps, vehicles, and construction equipment, with a minimum 20 percent biodiesel (maximum 80 percent conventional diesel) blend (B-20). B-20 biodiesel is currently available commercially in Siskiyou County.[5] A blend of 20 percent biodiesel will reduce CO_2 emissions by approximately 15 percent (USDOE, 2005), although with a slight increase in NOx (the increase in NOx emissions would not exceed significance thresholds established by SQAPCD – see the emissions calculations in the technical appendix to the Initial Study in Appendix D).

Mitigation Measure 3.7-4b: Renewable energy sources such as photovoltaic or wind power could be used to power some pumps installed to meet Program requirements for stock watering and moving points of diversion downstream.

Table 3.7-2 shows the reduction in emissions achieved by using renewable energy sources for 10 percent of the projected increase in pumping due to the Program.

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CHAPTER 4

Cumulative Effects and Other Required Topics

This Chapter summarizes the findings with respect to cumulative impacts, growth-inducing impacts, significant, unavoidable environmental impacts, and significant irreversible environmental changes that could result from implementing the proposed Shasta River Watershed-wide Permitting Program (Program).

4.1 Cumulative Impacts

A cumulative impact is created when “two or more individual effects, when considered together, are considerable or compound or increase other environmental impacts.” (CEQA *Guidelines*, § 15355.) The “individual effects” could be “changes resulting from a single project or a number of separate projects.” (CEQA *Guidelines*, § 15355(a)) “The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely-related, past, present and reasonably foreseeable probable future projects.” (CEQA *Guidelines*, § 15355(b).)

The purpose of this cumulative impacts analysis is to disclose the potential for significant cumulative impacts that could result from the Program in combination with other closely-related, past, present and reasonably foreseeable probable projects or programs.

CEQA *Guidelines*, § 15130 requires that environmental impact reports (EIR) discuss the cumulative impacts of a project or program when its incremental effect is “cumulatively considerable,” meaning that the project’s incremental effects are considerable when viewed in connection with the effects of past, current, and probable future projects. The discussion of cumulative impacts should include:

- Either: (1) a list of past, present, and probable future projects producing related or cumulative impacts; or (2) a summary of projections contained in an adopted general plan or similar document, or in an adopted or certified environmental document, that described or evaluated conditions contributing to a cumulative impact. This Draft EIR uses a listing approach;
- A discussion of the geographic scope of the area affected by the cumulative impact;
- A summary of expected environmental effects to be produced by these projects;

- An assessment of whether such effects are significant, and if they are, whether the project's contribution to such significant impacts is cumulatively considerable; and
- Reasonable, feasible options for mitigating or avoiding a project's contribution to any significant cumulative effects.

4.1.1 Approach to Analysis

As described in Chapter 1, Introduction, a primary objective of the Program is to facilitate, through voluntary participation in the Program, compliance with Fish and Game Code, § 1600 *et seq.* and/or the California Endangered Species Act (CESA) by the Shasta Valley Resource Conservation District (SVRCD), Agricultural Operators, and California Department of Water Resources (DWR) when conducting Covered Activities, many of which are ongoing, historic activities. Because the Program is a regulatory program, this Chapter examines similar past, present, and reasonably foreseeable probable future government regulatory initiatives that have affected, are presently affecting, and/or will likely affect in the future activities similar to the activities the Program covers and/or their related impacts, as described in this Draft EIR. This Chapter also examines similar past, present, and reasonably foreseeable probable future activities similar to the activities the Program covers, including restoration activities, and their related impacts regardless of whether they are subject to any regulatory initiatives.

An impact analysis follows this discussion to evaluate whether the incremental impacts of the Program and the activities it covers when added to the potential impacts of the regulatory initiatives and activities similar to the Covered Activities that could cause related impacts, as described above, will be cumulatively considerable.

4.1.2 Past, Present, and Reasonably Foreseeable Future Regulatory Initiatives

This section provides a description of the existing and reasonably foreseeable regulatory environment that could affect activities in the Program Area similar to the Covered Activities. Recent and proposed regulatory plans, policies, and programs (collectively, initiatives) include those that relate or respond to the listing of coho salmon (*Oncorhyncus kisutch*) as a threatened species under CESA and the Endangered Species Act (ESA);[1] CDFG's Lake and Streambed Alteration Program; the 1994 Northwest Forest Plan (NWFP); the Shasta River Total Maximum Daily Loads (TMDL) Action Plan; the Water Quality Control Plan for the North Coast Region (Basin Plan), and proposed amendment of the Basin Plan; Pacific Fishery Management Council's (PFMC) Salmon Fishery Management Plan; and the Klamath Fishery Management Council's (KFMC) long-term plan for the management of in-river and ocean harvest of Klamath Basin anadromous fish. These initiatives have been enacted to reduce impacts to protected species, riparian and aquatic habitats, water quality, and overall watershed health, and ultimately result in a net-benefit to these resources. In the Impact Analysis section of this Chapter, we examine

[1] Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat, includes an overview of CESA and ESA.

whether these regulatory actions could combine with the Program's impact on the resources described in Chapters 3.1 to 3.7 in this Draft EIR to produce a cumulatively considerable impact.

Regulation of Special-Status Species

Federal Listing of Southern Oregon/Northern California Coho Salmon

The National Marine Fisheries Service (NMFS) is responsible for conducting ESA status reviews and making listing determinations for anadromous fishes on the West Coast, including Pacific salmon and steelhead. In 1997, NMFS issued a final determination that the Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU) of coho salmon is a "species" under ESA, and listed coho salmon as a threatened species under ESA (Federal Register, 1997). Its threatened status was reaffirmed in 2005 (Federal Register, 2005). The ESU includes all naturally-spawning populations of coho salmon in coastal streams between Cape Blanco, Oregon, and Punta Gorda, California, as well as three artificial propagation programs: the Cole Rivers Hatchery (ODFW stock #52), Trinity River Hatchery, and Iron Gate Hatchery coho salmon hatchery programs. A federal recovery plan which provides prioritized actions for restoring coho salmon in the Klamath River basin was recently completed (NMFS, 2007).

State Listing of Coho Salmon (San Francisco to the Oregon Border)

In 2004, the California Fish and Game Commission (Commission) approved new protections for coho salmon by adding coho salmon between San Francisco and Punta Gorda (Humboldt County) to the list of endangered species under CESA, and by adding coho salmon between Punta Gorda and the Oregon border to the list of threatened species under CESA. The Commission's decision to list coho salmon under CESA concluded a lengthy process that began in August 2002, when it found that populations of coho salmon warranted new protections (CDFG, 2004a). The effective date of listing for coho salmon in the Program Area was March 30, 2005 (CDFG, 2006).

Federal Land Management Planning Related to Special-Status Species

Northwest Forest Plan

The mission of the NWFP is to adopt coordinated management direction for the lands administered by the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) and to adopt complementary approaches by other federal agencies within the range of the northern spotted owl.[2] This plan was the result of a focused federal effort to respond to timber management conflicts on old growth forests of the Pacific Northwest within the range of the northern spotted owl and other listed species. In 1993, the Forest Ecosystem Management Assessment Team (FEMAT) convened to present and analyze alternatives for ecosystem management of these old-growth forests. Within a year, FEMAT published a report that presented

[2] Eight federal agencies have developed an implementation and effectiveness monitoring program encompassing federal land managed by USFS, BLM, and the National Park Service in western Washington, Oregon, and northwest California. This program focuses on important regional scale questions about older forests, listed species (including Northern spotted owls and marbled murrelets), watershed health, federal agency relationships with Tribes, and changing socio-economic conditions in communities closely tied to federal lands. The Regional Monitoring program receives its own funding and is a separately managed interagency program.

10 forest management alternatives. Of these 10 options, former President Clinton selected Option 9 as the course of action. An Environmental Impact Statement followed based on the FEMAT report and Option 9, which resulted in the approval of the currently implemented NWFP. The NWFP covers 24.5 million acres in Oregon, Washington, and northern California that are managed by a variety of federal agencies.

In the Program Area, the NWFP applies to the Klamath National Forest (KNF) and Shasta-Trinity National Forest. The Land and Resource Management Plans (LRMP) of both National Forests reflect the requirements of the NWFP, and "…use active stewardship and participative [sic] management to provide for environmental health and community stability in a sustainable manner." Timber production within the Program Area and neighboring Scott River watershed has been on the decline over the past several decades, both in the years leading up to the approval of the NWFP and following implementation (KNF, 1993).

State and Federal Water Quality Plans and Policies

Water Quality Control Plan for the North Coast Region

As described in Chapter 3.2, Geomorphology, Hydrology and Water Quality, the North Coast Regional Water Quality Control Board (NCRWQCB) is responsible for the protection of the beneficial uses of waters within Siskiyou County. NCRWQCB uses its planning, permitting, and enforcement authorities to meet this responsibility and has adopted the Water Quality Control Plan for the North Coast Region (Basin Plan) to implement plans, policies, and provisions for water quality management. The most recent version of the adopted Basin Plan was published by NCRWQCB in September, 2006 (NCRWQCB, 2006a). The Basin Plan and relevant beneficial uses are discussed in Chapter 3.2, Geomorphology, Hydrology and Water Quality.

Stream and Wetlands System Protection Policy - Proposed Amendment to the North Coast Basin Plan

NCRWQCB and the San Francisco Bay Regional Water Quality Control Board have been working to develop an amendment to the Basin Plans for the North Coast and San Francisco Bay Regions that will protect stream and wetlands systems, including measures to protect riparian areas and floodplains. This amendment, if approved, would be known as the Stream and Wetlands System Protection Policy (Policy) which would establish new beneficial uses and water quality objectives, and include an implementation plan to protect stream and wetland systems in the North Coast and San Francisco Bay Regions.[3] The goals of the proposed Policy are:

- to achieve water quality standards and protect beneficial uses of waters of the state;
- to protect drinking water through natural water quality enhancement and protection of groundwater recharge zones;
- to restore habitat and protect aquatic species and wildlife;
- to enhance flood protection through natural functions of stream and wetlands systems;

3 A single policy is being proposed for Basin Plan adoption to improve regulatory consistency.

- to restore the associated recreational opportunities, green spaces, and neighborhood amenities that water resources provide;
- to protect property values and community welfare by protecting natural environments;
- to encourage local watershed planning and support local oversight of water resources; and
- to improve Regional Water Board permitting and program efficiency.

The proposed Policy recognizes that it is necessary to protect and restore the physical characteristics of stream and wetlands systems-stream channels, wetlands, riparian areas, and floodplains, including their connectivity and natural hydrologic regimes, to achieve water quality standards and protect beneficial uses. The Policy, if approved, would serve as a model for the other RWQCBs and the state to protect water quality. The Policy would also promote regulatory efficiency by linking to existing relevant permit conditions and provisions in section 401 water quality certifications, timber harvesting plans (THPs), waste discharge requirements (WDR), WDR waivers, and urban runoff National Pollutant Discharge Elimination System (NPDES) permits. The Policy would also promote general efficiency by linking to RWQCBs' monitoring programs (e.g., Surface Water Ambient Monitoring Program) and grants program.

The Policy would also provide incentives for local jurisdictions to develop watershed management plans that can be used by project applicants to offset impacts to stream and wetland functions when on-site avoidance of impacts is impossible. In this way the Policy would create a vehicle for working with local jurisdictions to develop effective implementation strategies consistent with local stakeholder interests. This Policy is currently undergoing public review.

Shasta River TMDL Action Plan

The U.S. Environmental Protection Agency added the Shasta River to California's 303(d) impaired waters list in 1992 due to organic enrichment/low dissolved oxygen (DO), and in 1994 due to elevated temperatures. The beneficial uses impaired in the Shasta River watershed by high temperature and low DO are primarily those associated with the cold-water salmonid fishery (commercial and sport fishing; cold freshwater habitat; rare, threatened and endangered species; migration of aquatic organisms; spawning, reproduction, and/or early development of fish, and recreation (NCRWQCB, 2006b). Downstream uses in the Klamath River, including the Native American Cultural Use and the Subsistence Fishing use, are also considered impaired (NCRWQCB, 2006b). The *Staff Report for the Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads* was published in 2006 (NCRWQCB, 2006b) (Shasta River TMDL Action Plan). In general, this document identifies and describes causes of impairment, recommended levels for water temperature and DO, and an implementation plan.

The goal of the Shasta River TMDL Action Plan is to achieve the temperature and DO water quality objectives, and restore and protect the beneficial uses of water in the Shasta River watershed (NCRWQCB, 2006b). Specific implementation actions are necessary in order to attain the DO and temperature TMDLs, achieve DO and temperature-related water quality standards, and protect the beneficial uses of water in the Shasta River watershed. The voluntary implementation actions of this plan are designed to encourage and build upon ongoing, proactive restoration and enhancement efforts, and to comply with the state's *Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program*. Should any of the voluntary implementation actions fail to be implemented by the responsible party, or should the voluntary implementation actions prove to be inadequate, the RWQCB would take appropriate permitting and/or enforcement actions (NCRWQCB, 2006b). The implementation actions address sediment waste discharges, water temperature and vegetation by focusing on:

- Increasing riparian vegetation along the Shasta River and its tributaries as a mechanism to lower water temperatures and promote stream bank stability;
- Controlling tailwater to prevent the discharge of nutrient enriched and elevated temperature return flow to the Shasta River and its tributaries;
- Encouraging efficient water use in the Shasta River watershed to increase dedicated cold water flow in the Shasta River;
- Removing, re-engineering, or limiting construction of minor instream impoundments or other structures capable of impeding free flow of water conveyance as a mechanism to decrease oxygen demanding sources in the Shasta River;
- Bringing the discharge of Dwinnell Dam into compliance with the DO TMDL;
- Bringing the Yreka wastewater treatment facility into compliance with existing Regional Water Board Orders and compliance with the DO TMDL;
- Preventing the discharge of polluted urban and suburban runoff from entering Shasta River or its tributaries;
- Addressing activities on USFS and BLM lands;
- Addressing activities conducted as part of timber harvest activities on non-federal lands, and
- Addressing discharge from state-controlled roads.

The Plan is geared toward using ongoing efforts and existing regulatory standards and enforcement tools more effectively than in the past, using available watershed-specific information and applicable science to inform those efforts (NCRWQCB, 2006b).

Regulation of the Pacific Salmon Fishery: the Pacific Fishery Management Council and the Klamath Fishery Management Council

PFMC is one of eight regional fishery management councils established by the federal Magnuson Fishery Conservation and Management Act of 1976 for the purpose of managing fisheries three to 200 miles offshore of the U.S. coastline. PFMC is responsible for fisheries off the coasts of California, Oregon, and Washington.

Pacific coast salmon fisheries in PFMC-managed waters focus on Chinook or king salmon and coho or silver salmon. Small numbers of pink salmon are also harvested, especially in odd-numbered years. There are no directed fisheries for other salmon species such as sockeye, steelhead and chum in PFMC-managed waters.

PFMC's Salmon Fishery Management Plan (PFMC, 1999) describes the goals and methods for salmon management. Management tools such as season length, quotas, and bag limits vary depending on how many salmon are present. There are two central parts of the Plan: an annual goal for the number of spawners of the major salmon stocks ("spawner escapement goals"), and allocation of the harvest among different groups of fishers (commercial, recreational, tribal, various ports, ocean, and inland). PFMC must also comply with ESA and other federal laws.

Every year, PFMC follows a pre-season process to develop recommendations for management of the ocean fisheries. Public involvement begins in late February when reports describing the previous season and estimating salmon abundance for the coming season are released. These reports are followed by a meeting early in March to propose season options. Public hearings on these options are held in late March or early April, and the final recommendations are adopted at a meeting in April. Recommendations are implemented by NMFS on May 1 (PFMC, 2007). In 2006 and 2007, the PFMC severely limited the allowable catch of salmon off the California and Oregon coasts, in order to protect the depleted Klamath stocks. For 2008, the PFMC took the unprecedented action of completely closing the salmon fishing season off the California coast due to severely depressed Sacramento River stocks. While the intent of the restrictions is to rebuild salmon stocks, they have also had the consequence of impairing the commercial, recreational, and tribal salmon fisheries.

The Klamath Fishery Management Council. KFMC was an 11-member federal advisory committee that brought together commercial and recreational fishermen, Tribes, and state and federal agencies to work by consensus to manage harvests and ensure continued viable populations of anadromous fish in the Klamath Basin.

KFMC developed a long-term plan for the management of in-river and ocean harvest of Klamath Basin anadromous fish. Members included representatives from commercial and recreational ocean fisheries, the in-river sport fishing community, tribal fisheries, and agencies (CDFG, Oregon Department of Fish and Wildlife, National Marine Fisheries Service, and U.S. Department of the Interior).

Before the Klamath Act expired in 2006, the KFMC met three times each spring to review the past year's harvest of Chinook salmon, and to review predictions of Chinook salmon ocean abundance and harvests in the upcoming year developed by their Technical Advisory Team. KFMC then made specific recommendations to the agencies that regulate the harvest of Klamath Basin fish. These agencies included PFMC, the Commission, Oregon Department of Fish and Wildlife, Yurok Tribal Fisheries, and Hoopa Tribal Fisheries. KFMC recommendations to PFMC were used to develop ocean salmon fishing seasons. PFMC then passed its recommended fishing seasons to the Department of Commerce, which has final authority in setting regulations for the ocean fishery (KFMC, 2008).

The Klamath Act expired on October 1, 2006, and was not reauthorized by Congress. The funding for the Klamath Fishery Management Council was eliminated and the charter was discontinued.

4.1.3 Activities Similar to Covered Activities

This Chapter examines similar past, present, and reasonably foreseeable probable future activities similar to the activities the Program covers, including restoration activities, and their related impacts regardless of whether they are subject to any regulatory initiatives. Such activities include those associated with agricultural operations and private development projects, among others, by individuals, CDFG, Natural Resources Conservation Service (NRCS), Department of Water Resources (DWR), SVRCD, Siskiyou County and Five Counties Salmon Conservation Program, University of California Cooperative Extension (UCCE), and U.S. Fish and Wildlife Service (USFWS). These activities are examined here because the activities the Program covers and their potential impacts are closely related to those other activities. As a result, it is possible that the incremental impact of the Program and the activities it covers in combination with the potential impacts of these other activities could be cumulatively considerable.

Projects Subject to Fish and Game Code, § 1600 *et seq.*

An entity must notify CDFG before beginning an activity that will substantially divert or obstruct the natural flow of, or substantially change or use material from the bed, channel, or bank of a river, stream, or lake, such as the Shasta River and its tributaries, are subject to the notification requirement in Fish and Game Code, § 1602. Such activities could include restoration projects to enhance coho salmon habitat. If CDFG determines that the activity described in the notification could substantially adversely affect an existing fish or wildlife resource, the entity must obtain a streambed alteration agreement (SAA) before beginning the activity. CDFG maintains a database of all notifications it has received for projects in Siskiyou County since 2002. Of the projects listed in the database, 70 occurred in the Shasta River watershed (see **Table 4-1**). Many of the projects included in Table 4-1 are representative of activities the Program covers, including those relating to ongoing routine agricultural operations and restoration projects. Table 4-1 also list projects outside the scope of the Program. These include culvert repair, bridge work, gravel extraction, timber harvest plans, and emergency repair work in the watershed.[4] Although these projects are outside the scope of the Program, they are representative of the type of projects that could occur in the future in the Program Area. Together, these projects comprise activities that will have short- and long-term impacts in the Program Area, both adverse and beneficial.

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4 Emergency work is not subject to the notification and SAA requirements in Fish and Game Code, § 1602. Instead, the entity performing the emergency work must simply notify CDFG of the work within 14 days of beginning the work. (Fish and Game Code, § 1610.) In 2006, a myriad of emergency projects were completed in response the December 2005/January 2006 flooding events. The projects included road repair, bank stabilization, channel maintenance and modifications, culvert installation, debris removal, replacement weirs for diversion ditches, and gravel berm placement throughout the watershed, specifically within Little Shasta River, Shasta River, and Parks, Dry, Willow, Yreka, Juniper, Rock Creeks. Projects without an issuance date recorded in the SAA database are marked with an asterisk in Table 4-1.

TABLE 4-1
SUMMARY OF CDFG-TRACKED ACTIVITIES IN THE BED, BANKS, AND CHANNEL OF THE SHASTA RIVER WATERSHED (2002–JUNE 2008)

Project Name	Year Initiated	Project Description	Water	Receiving Water
2002				
Parks Creek Fish Passage	*2002**	*Fish passage improvement*	*Parks Creek*	*Shasta River*
2003				
Boles Creek Restoration Project	2003	Riparian restoration, flood management, recreational access	Boles Creek	Lake Shastina
Doug Harper	2003	Culvert installation	Unnamed	Willow Creek
Nielsen and Beck Irrigation Takeouts and Road Crossings	2003	Driveway installation, irrigation takeout	Squaw Creek, Willow Creek	Unnamed, Unnamed
Hart's Diversion Improvement Project	*2003**	*Rock weir maintenance*	*Little Shasta River*	*Shasta River*
Scott/Shasta Stream Gage Installation Project	*2003**	*Stream gage installation and maintenance*	*Shasta River*	*Shasta River*
2004				
Grass Lake THP	2004	Timber Harvest Plan	Bearwallow Spring, Dairy Creek	Grass Lake
Hammond Ranch 2005	2004	Description not available	Dale Creek	Shasta River
Riprap Installation	2004	Bank stabilization	Yreka Creek	Shasta River
Shasta River Riparian Area Cattle Exclusion Fence	2004	Riparian fencing	Shasta River	Klamath River
Precidio Bank Stabilization	*2004**	*Bank stabilization*	*Yreka Creek*	*Shasta River*
2005				
McLean Power Extension - w.o. # 2519911	2005	Culvert installation, driveway access	Unnamed	Shasta River
Shasta River Watershed	*2005**	*Proposed Project*	*Little Shasta River, Parks Creek, Shasta River, Yreka Creek*	*Klamath River*
Programmatic Authorization for Caltrans' Routine Maintenance and Repair Activities Related to Aquatic/Riparian Resources, Districts 1, 2, and 4.	*2005**	*General routine maintenance and repair at existing Caltrans facilities.*		
2006				
Edson-Foulke Fish Screen	2006	Fish screen and bypass pipe installation	Parks Creek	Shasta River
Mole-Richardson Farms Fish Screens, Head Gates and Boxes	2006	Fish screen, headgate, and measuring box installation on 6 diversion; Related restoration	Parks Creek	Shasta River

TABLE 4-1 (continued)
SUMMARY OF CDFG-TRACKED ACTIVITIES IN THE BED, BANKS AND CHANNEL OF THE SHASTA RIVER WATERSHED (2002–JUNE 2008)

Project Name	Year Initiated	Project Description	Water	Receiving Water
2006 (cont.)				
2006 Storm Damage Restoration Bacigalupi	*2006**	*Diversion replacement, debris removal, stream bank restoration, cow crossing and stock water pump improvements*	*Little Shasta River*	*Shasta River*
Burke Mills	*2006**	*Temporary culvert and reestablish rock ford*	*Little Shasta River*	*Klamath River*
Central Oregon and Pacific Railroad	*2006**	*Channel realignment, gravel bar removal*	*Shasta River*	*Unnamed*
Fish and Game Emergency work on Parks Creek	*2006**	*Fish passage improvements*	*Parks Creek*	*Shasta River*
Gregerson Emergency repair to road	*2006**	*Culvert installation*	*Unnamed*	*Willow Creek*
John B. Foster on Yreka Creek	*2006**	*Riparian restoration, flood management*	*Yreka Creek*	*Shasta River*
Kennedy Flood Damage Repair	*2006**	*House removal; soil replacement*	*Juniper Creek*	*Yreka Creek*
Little Shasta River Diversion #457 Emergency	*2006**	*Headgate and weir repairs*	*Little Shasta River*	*Shasta River*
Little Shasta River Emergency Project Flood 05/06	*2006**	*Debris removal*	*Little Shasta River*	*Shasta River*
Love Lace on Juliet Creek, Shasta River Emergency Project	*2006**	*Debris removal*	*Julien Creek*	*Shasta River*
Melvin Crawford Debris Removal	*2006**	*Woody debris and gravel removal, culvert maintenance*	*Unnamed*	*Klamath River*
Miller on Yreka Creek Emergency Riprap Project	*2006**	*Bank stabilization, wall rebuilding*	*Yreka Creek*	*Shasta River*
Moody on Yreka Creek Emergency Debris/Gravel Removal	*2006**	*Debris removal, stream maintenance*	*Yreka Creek*	*Shasta River*
Mountain Meadows Residential Subdivision	*2006**	*Box culvert installation, road fill, fencing*	*Unnamed*	*Boles Creek*
Rizzo Real Estate Emergency Rip rap	*2006**	*Bank stabilization*	*Yreka Creek*	*Shasta River*
Shasta River Water Association Sediment Removal 2007	*2006**	*Sediment removal*	*Shasta River*	*Klamath River*
South Weed Infrastructure	*2006**	*Stream crossing, sewer line installation*	*Black Butte Spring*	*Boles Creek*
Watton Place Emergency Work	*2006**	*Debris removal*	*Julien Creek*	*Shasta River*
Weston Emergency Work	*2006**	*Bank stabilization*	*Juniper Creek*	*Yreka Creek*
Wiiaka Trailer Park on Yreka Creek Bank stabilization Emergency Project	*2006**	*Debris removal, channel maintenance, bank stabilization*	*Yreka Creek*	*Shasta River*
Yreka/Weed Transmission Upgrade Project	*2006**	*Installation of transmission poles*	*Unnamed*	*Shasta River*

TABLE 4-1 (continued)
SUMMARY OF CDFG-TRACKED ACTIVITIES IN THE BED, BANKS AND CHANNEL OF THE SHASTA RIVER WATERSHED (2002–JUNE2008)

Project Name	Year Initiated	Project Description	Water	Receiving Water
2007				
Miner Street East Wall Project	*2007**	*Channel maintenance, flood control, bank stabilization*	*Yreka Creek*	*Klamath River*
Well Storage Tank Julien Creek	2007	Install a new well water storage tank and replace most of the existing water transmission main for the town of Grenada	Julien Creek	Shasta River
Miner Street East Wall Project	2007	Includes sand bagging creek for a distance of approx 90' drying out area and then dumping in high strength rapid set concrete. Retaining wall has been drilled to allow moisture to escape from behind the wall.	Yreka Creek	Klamath River
Hawk Residence Driveway	2007	Culvert across ‘irrigation’ ditch	Unnamed	Spring Creek
Hawk Residence Driveway	2007	Install a 15" culvert to build a driveway access to a house site	Unnamed	Spring Creek
Mole Richardson Farms Shasta River Irrigation Takeout	2007	Remove sand and silt just ahead of our take out pipe from Shasta River; work will be done with excavator.	Shasta River	Pacific Ocean
South Weed Infrastructure - Mary's Drive Improvement Project	2007	The project consists of widening Black Butte Drive, Kellogg Drive, and Mary's Drive in the City of Weed; reconstruction of an existing roadside ditch.	Unnamed	Boles Creek
Yreka Creek Floodplain Restoration Plan	2007	Fill removal and floodplain restoration along Yreka Creek	Yreka Creek	Shasta River
City of Yreka Floodwater Detention Basin Project	2007	Implement several of the storm drainage improvements recommended in the City of Yreka Master Plan of Drainage.	Little Humbug Creek | Unnamed	Yreka Creek | Yreka Creek
Greenhorn Reservoir Dredging Project	2007	Remove approximately 40000 c y of sediment and underlying dredger tailing substrate material from Greenhorn Reservoir	Greenhorn Reservoir	Greenhorn Creek
Greenhorn Creek Floodplain Restoration Project	2007		Greenhorn Creek	Yreka Creek
Houston Creek	2007			
Araujo Fish Passage and Water Quality Improvements	2007	New set of pumps, inlet structure, and a fish screen will be installed	Shasta River	Klamath River
Shasta River Water Association Fish Passage and Water Quality Improvements Project	2007	New set of pumps, intake structure and a fish screen will be installed at the existing intake	Shasta River	Klamath River

TABLE 4-1 (continued)
SUMMARY OF CDFG-TRACKED ACTIVITIES IN THE BED, BANKS AND CHANNEL OF THE SHASTA RIVER WATERSHED (2002–JUNE 2008)

Project Name	Year Initiated	Project Description	Water	Receiving Water
2007 (cont.)				
Kennedy Project Filter Cloth under rip rap	2007		Juniper Creek	Yreka Creek
Black Butte Creek Wetlands Restoration	2007		Black Butte Lake	Boles Creek
Nelson Fence	2007	Watering access lanes.	Shasta River	Klamath River
Yreka Ditch Fish Ladder	2007	Fish ladder installed. A low flow control structure will also be installed near the diversion to control pool depth and to ensure a minimum of 0.65 cubic feet per second passage bypass flow be maintained through the fish ladder added to the EFYD diversion dam.	Shasta River	Lake Shastina
Montague Culverts	2007		Shasta River	Unnamed
Yreka Creek Storm Drains Upgrade Project	2007	Replacing existing storm drains located in Yreka Street. Upgrading storm drain line pipe size from 24-30 inches to 48-60 inches. Boulders will be replaced as well	Yreka Creek	Shasta River
Marion Ranch Riparian Fencing Project	2007	Cattle watering access lanes	Shasta River	Klamath River
Munn Property Pond	2007	Pond to be dug in an existing ravine swale that a nearby irrigation ditch has overflowed into and made a secondary ditch. Culvert to be 2-3' in diameter.	Unnamed	Unnamed
Black Butte Springs Creek Restoration Project	2007	Six to eight non mechanically manipulated pools as natural weirs.	Unnamed	Unnamed
Yreka Weed Transmission Line Upgrade Project (non jurisdictional)	2007	Upgrade existing transmission lines. Construction may require crossing some agricultural ditches.	Beaughton Creek	Shasta River
Shasta River Diversion Improvements and Fish Screen Installation	2007		Shasta River 60-000 Dam	Klamath River
Bumblebee	2007	Timber Harvest Plan		
Shastina Rock and Aggregates, Lp	2007	New quarry to be built over Ephemeral blue line stream bed. No water or signs of flow are evidenced, railroad fill totally blocks stream channel above with no culverts in place	Unnamed	Beaughton Creek
Fiock Manley Pipeline	2007	Irrigation Pipeline	Unnamed	Shasta River

TABLE 4-1 (continued)
SUMMARY OF CDFG-TRACKED ACTIVITIES IN THE BED, BANKS AND CHANNEL OF THE SHASTA RIVER WATERSHED (2002–JUNE2008)

Project Name	Year Initiated	Project Description	Water	Receiving Water
2007 (cont.)				
Quarry Berm Slope Protection	2008	Rip rap will be rock 1-3' in diameter and mechanically placed with backhoes or excavator with thumb to grab rock and lock into place. Rock vane located approx 30' upstream from eroded area and 8-10' long and taper from 1-3' wide 6" bury and 2 ' high location of slope protection and rock vane shall be done on site by engineer.	Willow Creek	Shasta River
WWTP Dike Repairs	2008	Stabilize the replaced dike to prevent soil from entering Yreka Creek, create a 1.5:1 slope with stream gravel and fabric slope protection.	Yreka Creek	Shasta River
Flippen Highbanking project	2008	Water diversion	Yreka Creek	Shasta River
Mountain Meadows Residential Subdivision Project	2008	Subdivision	Ditch Creek	Boles Creek

NOTE: Projects denoted with an * indicate projects that did not have a streambed alteration agreement (SAA) issuance date noted in the database. It is assumed that these were conducted under Operational Law or as Emergency Work.
In addition to the projects detailed above, there were three additional projects that did not have the year of initiation identified. The projects were as follows:

Culvert installation/maintenance: 1 project   Gravel removal: 1 projects   Fisheries – related: 1 project

SOURCE: CDFG, 2008

While it is not possible to predict the exact number and types of projects in or near the Shasta River, its tributaries, and other rivers, streams, and lakes in the Program Area that will be subject to Fish and Game Code, § 1602, it is reasonably foreseeable that such projects will continue to occur in the future, and that the entities responsible for those projects will notify CDFG in accordance with the requirements in Fish and Game Code, § 1602, or in the case of emergency projects, Fish and Game Code, § 1610 (see footnote 4).

As mentioned above and described elsewhere in this Draft EIR, the Covered Activities include coho salmon restoration projects. To evaluate cumulative impacts that relate to those projects, a discussion of past, present, and reasonably foreseeable restoration projects are discussed below.

The list below includes most of the agency and non-profit programs that conduct and/or funded restoration activities in the Shasta River watershed.

- Bureau of Reclamation (BOR)– Klamath Watershed Restoration Program
- CDFG Fisheries Restoration Grant Program
- CDFG Klamath River Restoration Grant Program
- NRCS Water Quality and River Restoration Program
- National Oceanic and Atmospheric Administration (NOAA) Community Based Restoration Grant Program
- NMFS Southwest Region Arcata Office
- Siskiyou County Department of Public Works and Five Counties Salmonid Conservation Program
- Shasta Valley Resource Conservation District
- Shasta Valley Coordinated Resources Management and Planning Committee (Shasta Valley CRMP)
- USFWS Klamath Restoration Program

All of these entities have funded or conducted instream, riparian, and other related projects subject to the notification requirements in Fish and Game Code, § 1602. These restoration and fish passage, habitat, and water quality improvement projects are representative of the variety of activities that have occurred throughout the watershed within the past five years. They also represent the types of projects that will continue to be funded and implemented in the watershed. For the purpose of this section, past projects are defined as instream, riparian, and other related activities that were initiated between 2002 and 2005. New projects are defined as instream, riparian, and other related activities that were funded in 2006 and 2007. Projects funded in 2006 were typically implemented in 2007. Projects funded in 2007 will be implemented in 2008 and beyond.

Restoration and Enhancement-Related Projects Implemented in the Shasta River Watershed

CDFG Fisheries Restoration Grant Program

CDFG administers the Fisheries Restoration Grant Program (FRGP) for watershed restoration projects within the coastal watersheds of California. The focus of FRGP is to restore anadromous salmonid habitat with the goal of ensuring the survival and protection of coho salmon, steelhead trout, Chinook salmon, and cutthroat trout in coastal watersheds of California. Since 1981, there has been a collaborative effort with more than 600 stakeholders to restore declining salmon and steelhead trout habitat. Over the last 24 years, FRGP has invested over $170 million and supported approximately 2,600 salmonid restoration projects throughout the state's coastal watersheds.

Projects range from education and instream barrier removal, to riparian restoration and project monitoring. These projects are consistent with the Steelhead Restoration and Management Plan for California and the Recovery Strategy for California Coho Salmon. The success of these projects has contributed to an evolving program that directly benefits threatened and endangered anadromous salmonids in coastal California. Local partners in the Shasta River watershed have received many FRGP grants since the Program's inception. Since 2001, CDFG has funded 22 instream and upslope projects (**Table 4-2**).

Table 4-2 is organized by the year that projects were funded. To clarify, projects are typically funded in one year and implemented the following year. Hence, projects funded in fiscal year (FY) 2006/2007 were implemented in 2007 and beyond, and projects funded in FY 2007/008 are being implemented in 2008 and beyond. For that reason, Table 4-2 includes past and present projects.

It is reasonably foreseeable that CDFG will continue to fund fisheries restoration projects in the Shasta River watershed in the future, but it is difficult to project funding levels or funding priorities for FRGP. Future funding is determined during the annual budget process. For FY2007/2008, FRGP received $7.8 million from NOAA, and $8.5 million in state funding came from the General Fund, Wildlife Conservation Board, and Proposition 84 allocations. In FY2008/09, CDFG will likely receive $10.9 million in Proposition 84 funds (according to the May 2008 revision of the Governor's budget), and $9.5 million from NOAA (Flosi, 2008).

CDFG Klamath River Restoration Grant Program

In FY 2006/2007, CDFG received a one-time budget augmentation to fund the Klamath River Restoration Grant Program (KRGP). This program funds projects that have immediate benefits for salmon and steelhead. The emphasis was on projects to remove permanent or seasonal migration barriers in otherwise functioning historical salmon and steelhead streams. CDFG has directed funds for projects that provide fish passage, including removal of flashboard dams and screening of diversions (**Table 4-3**). All projects funded in the Shasta River watershed are being implemented by the project applicant. Similar to FRGP, all projects that were funded in 2006 have been disbursed for project implementation in 2007. Depending on the nature of the project,

TABLE 4-2
CDFG-FUNDED FISHERIES RESTORATION GRANT PROGRAM
INSTREAM AND UPSLOPE PROJECTS IN THE SHASTA RIVER WATERSHED (2001–2007)

Project Name	Stream Location	Project Type
2001		
Kuck Ranch Riparian Livestock Exclusion Fence Project	Shasta River	Riparian Restoration
Cowley Ranch Riparian Livestock Exclusion Fence Project	Little Shasta River	Riparian Restoration
Rice Ranch Riparian Livestock Exclusion Fence Project	Shasta River	Riparian Restoration
2002		
Beck Irrigation Tailwater Capture Project	Shasta River	Tailwater Management
RY Ranch Tail Water Management #5	Shasta River	Tailwater Management
Shasta River CRMP Tree Wrapping for Beaver Control Proposal	Shasta River	Riparian Restoration
Shasta River Riparian Cattle Exclusion Fence	Shasta River	Riparian Restoration
Meamber Tailwater Project	Oregon Slough	Tailwater Management
Hart Ranch Exclusion Fence	Little Shasta River	Riparian Restoration
2003		
Kuck Ranch Riparian Tree Planting	Shasta River	Riparian Restoration
2005		
Jim Rice Riparian Planting	Shasta River	Riparian Restoration
Joe Rice Ranch Exclusion Fence & Planting Project	Shasta River	Riparian Restoration
Nelson Livestock Exclusion Fence	Shasta River	Riparian Restoration
Shasta Water Association Dam Removal & Water Efficiency Measures Construction Engineering	Shasta River	Watershed Evaluation, Assessment, and Planning
Root Ranch Riparian Fence	Shasta River	Riparian Restoration
Marion Ranch Riparian Fencing	Shasta River	Riparian Restoration
2006		
Edson-Foulke Fish Screen	Parks Creek	Fish Screening of Diversions
Joe Rice Fish Screen	Shasta River	Fish Screening of Diversions
Oregon Slough Meamber Riparian Planting	Oregon Slough	Riparian Restoration
Ekstrom Fish Screen	Shasta River	Fish Screening of Diversions
Beck Livestock Exclusion Fence	Shasta River	Riparian Restoration
2007		
Little Shasta Fish Passage and Screening Project	Little Shasta River	Fish Screen and Passage

SOURCE: CDFG, 2007

TABLE 4-3
CDFG KLAMATH RIVER RESTORATION GRANT PROGRAM PROJECTS IN THE SHASTA RIVER WATERSHED (FY 2006/2007)

Project Name	Project Type	Location
Shasta River Fish Passage Improvement	Fish Passage	Shasta River
Parks Creek Fish Screen Project	Fish Screen	Parks Creek
Little Shasta Fish Screen Project	Fish Screen	Little Shasta River
Araujo Fish Passage Project	Fish Passage	Shasta River
Fiock Fish Screen Upgrade	Fish Screen Maintenance	Shasta River
Micke Fish Screen Project	Fish Screen	Shasta River
Shasta River Water Association Fish Passage and Water Quality Project	Fish Passage and Water Quality	Shasta River
Parks Creek Fish Passage at I-5	Fish Passage	Parks Creek
Huseman Ditch Association Water Quality Improvement Project	Fish Screen and Water Conservation	Shasta River
Shasta River Head Gates and Measuring Weirs	Water conservation	Little Springs

SOURCE: CDFG, 2008

some projects will continue through 2008. KRGP was not reauthorized for additional funding in FY2007/2008 (Scott, 2007). Consequently, it is reasonably foreseeable that the current listed projects will be the only projects funded through KRGP. These projects will be covered by individual SAAs.

NRCS Water Quality and River Restoration Program

In addition to several other conservation programs, NRCS administers the Environmental Quality Incentives Program (EQIP) in the Program Area. EQIP provides individuals engaged in livestock and agricultural production with incentive payments and cost-share benefits to implement conservation measures on agricultural lands in the Shasta Valley. Commonly funded EQIP projects include implementation of ground and surface water conservation measures, riparian fencing, and healthy forest and fuel load projects. The highest priority is agricultural improvements will help meet water quality objectives (NRCS, 2007a).

From 2002 to the present, NRCS has allocated approximately $3.16 million to projects in the Shasta Valley primarily from two funding sources – the Klamath sub-fund and the general EQIP fund (Patterson, 2008). Klamath sub-fund projects have included improved water delivery systems (e.g., shifting from flood irrigation to pivot sprinkler systems) and improved irrigation water management (e.g., installing soil moisture sensors and providing technical assistance to use them).

The general EQIP fund has awarded a wide variety of contracts to implement grazing, open space, and wildlife habitat improvements. Most recently, general EQIP funds have been allocated to forest/fuel load management contracts in the Shasta River watershed. These contracts have been a complement to the more focused Klamath sub-fund projects (Patterson, 2007).

In addition to EQIP, Conservation Reserve Program[5] contracts are available to farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as native and non-native grasses, trees, filterstrips, and riparian buffers (Patterson, 2007). Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices (NRCS, 2007b). These activities contribute to improved water quality, habitat enhancement, and water usage efficiency.

NOAA Community-Based Restoration Program

NOAA Restoration Center has administered its Community-based Restoration Program since 1996 in order to restore NOAA trust resources and to improve the environmental quality of local communities.[6] This program uses a grassroots approach to actively engage communities in fisheries habitat restoration. In 2004, NOAA partnered with American Rivers and SVRCD to fund the Parks Creek Fish Passage Restoration project. The objective of this project was to restore fish passage for adult and juvenile salmon and steelhead to 14 miles of Parks Creek upstream of Interstate 5 where access had been limited by a low flow concrete crossing. It allowed adult fish to access extensive spawning habitat and allowed juveniles to access cold-water refugia areas in the headwaters of Parks Creek. It also enabled access to essential rearing habitat.

NOAA Restoration Center, along with CDFG, provided grant support to the SVRCD for the instream work required to remove the Shasta Water Users Association dam as part of the Shasta River Water Association Fish Passage and Water Quality Improvement Project at River Mile 17.8 of the Shasta River. In August 2008, this project removed a partial migration barrier, providing improved access to an additional 8.4 river miles of habitat for anadromous fish. Other portions of this project were made possible by funding from other contributing partners, including USFWS, NRCS, NMFS Southwest Region Arcata Office, and State Water Resources Control Board. NOAA Restoration Center and NMFS Southwest Region Arcata Office has also agreed to support the SVRCD for fish habitat and floodplain restoration along Yreka Creek within the City of Yreka on the “Yreka North Parcel” owned by the City of Yreka (Mahan, 2008). It is reasonably foreseeable that NOAA will continue to contribute additional funding for projects in the Shasta River watershed (Flickinger, 2007).

Siskiyou County Department of Public Works and Five Counties Salmonid Conservation Program

In response to the listing of coho salmon under the ESA, five counties in northern California – Siskiyou, Del Norte, Humboldt, Trinity, and Mendocino – joined together to form the Five Counties Salmonid Conservation Program (5C Program). These five counties are within the “Transboundary Evolutionarily Significant Unit (ESU)” for coho salmon (CFSP, 2007). The

5 The Conservation Reserve Program is administered through the Farm Service Agency, a partner organization of NRCS.

6 NOAA’s NMFS acts on behalf of the U.S. Department of Commerce as a trustee for coastal and marine resources, including commercial and recreational fishery resources; anadromous and catadromous species; marine mammals; endangered and threatened marine species and their habitats; marshes, mangroves, seagrass beds, coral reefs, and other coastal habitats; and resources associated with National Marine Sanctuaries and National Estuarine Research Reserves.

mission of the 5C Program is to strive to protect the economic and social resources of Northwestern California by providing for the conservation and restoration of salmonid populations to healthy and sustainable levels and to base decisions on watershed rather than county boundaries. Siskiyou County Department of Public Works (DPW) is the County-liaison for the 5C Program.

As part of this joint effort, UCCE and County staff developed a "Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds." The purpose of this manual is to provide a "user-friendly, fish-friendly" guide for County road maintenance staff as part of each county's primary mission to provide a safe and open road system for the traveling public. DPW staff has been trained to use this manual and to implement sediment control practices related to bridge maintenance, road redesign and reconstruction, as well as remediation of fish passage barriers.

The 5C Program has been a catalyst for several county-wide assessments. In 2000, an assessment of culvert fish barriers was conducted. Subsequently, the County has completed several barrier removal projects involving the replacement of culverts with bridges. Future projects of this kind are contingent on available grant money and staff time (Sumner, 2007). During the spring of 2006, DPW received authorization to initiate a Direct Inventory of Roads and Treatments (DIRT), using the 5C Program protocols, for the Scott and Salmon River watersheds. The goal of the DIRT is to identify specific sites along county roads and facilities that are contributing sediment to waterways and to develop and prioritize implementation treatments (5C Program, 2007). Using grant monies from CDFG, DPW completed an inventory of 377 miles of county-maintained roads in the Salmon and Scott River watersheds (Sumner, 2008). An inventory has not been scheduled for the Shasta River watershed at this time. If the need is validated and funds are made available via the 5C program, a DIRT inventory is reasonably foreseeable for this basin.

Shasta Valley Resource Conservation District Projects

In addition to developing the Program with CDFG, SVRCD has been conducting a variety of conservation and restoration projects over the years on public and private lands within the District by providing technical, financial, and educational support to willing landowners. In order to do so, SVRCD has sought funding from a variety of sources, including CDFG, to implement on-the-ground restoration and habitat enhancement projects.

Table 4-4 provides a summary of recently completed SVRCD activities. **Table 4-5** provides a summary of current and planned on-the-ground projects (2007-2008) (Garayalde, 2008). These tables provide a clear picture of the on-the-ground implementation work in which SVRCD has been engaged. Some of these projects overlap with projects administered by CDFG, USWFS, and NOAA.

Shasta River Coordinated Resources Management and Planning Committee

The Shasta CRMP is an informal working group of the SVRCD that works with landowners to discuss, plan, secure funding for, and carry out conservation projects on the Shasta River and its tributaries. Many projects listed in Tables 4-4 and 4-5 have Shasta River CRMP involvement.

TABLE 4-4
SVRCD PROJECT ACCOMPLISHMENTS (2002-2007)

Project Name	Project Location	Project Type	Grant Recipient/Partner
2002			
Freeman 1 Fish Screen	Shasta River	Fish screening	Freeman
Kuck Ranch Riparian Livestock Exclusion Fence Project	Shasta River	Riparian fencing	Great Northern
Little Shasta River Passage and Screen Project	Little Shasta	Fish passage, screening	Resources Mgmt
Rice Fence 2002	Shasta River	Riparian fencing	Great Northern
Tree Wrapping for Beaver Control on Shasta River	Shasta River	Riparian planting and shading	Great Northern
2003			
Beck Irrigation Tailwater Capture Project	Shasta River	Water quality improvements	SVRCD
Freeman Fish Screen 2	Shasta River	Fish screening	Freeman
Frey Tailwater	Shasta River	Water quality improvement	Resources Mgmt
Hart Little Shasta Fence 1 & 2	Little Shasta	Riparian fencing	Resources Mgmt
Kuck Bioengineered Bank Protection (Dept. Fish and Game)	Shasta River	Sediment reduction	Great Northern
Meamber Ranch Fence	Oregon Slough	Riparian fencing	Resources Mgmt
Meamber Tailwater Project	Shasta River	Water quality improvement	Great Northern
2004			
Eric Peters Fish Screen	Shasta River	Fish screening	Great Northern
Jim Rice Fence	Shasta River	Riparian fencing	Resources Mgmt
Meamber Tailwater on Oregon Slough	Oregon Slough	Water quality improvements	Resources Mgmt
Montague Clean Water Project	Oregon Slough	Water quality improvements	Resources Mgmt
Parks Creek Fish Passage	Parks Creek	Fish passage	SVRCD
Rice Planting	Shasta River	Riparian planting and shading	Resources Mgmt Management
Six Fish Screens	Klamath Basin	Fish screens	Resources Mgmt
Tube Screens	Klamath, Shasta	Fish screening	SVRCD
2005			
Kuck Planting	Shasta River	Riparian planting and shading	Resource Mgmt
Marion Fence	Shasta River	Riparian fencing	SVRCD
Nicoletti Ranch Riparian Fencing	Shasta River	Riparian fencing	SVRCD
2006			
Araujo Dam Demolition Phase I	Shasta River	Fish passage, screening water quality	SVRCD
Beck Fence	Shasta River	Riparian fencing	SVRCD
DWR Urban Parkways prop acquisition and floodplain	Yreka Creek	Water quality improvement	City of Yreka
Fish Passage at Shasta River Water Association (SRWA)	Shasta River	Fish passage, screening water quality	SVRCD
Parks Creek Screens	Parks Creek	Fish screens	SVRCD
Root Riparian Fence	Shasta River	Riparian fencing	SVRCD
SRWA Dam Demolition	Shasta River	Fish passage, screening water quality	SVRCD
SRWA Fish Passage Structure	Shasta River	Fish passage, screening water quality	SVRCD

TABLE 4-4 (Continued)
SVRCD PROJECT ACCOMPLISHMENTS (2002-2007)

Project Name	Project Location	Project Type	Grant Recipient/Partner
2007			
Araujo NRCS Project Oversight	Shasta River	Water use efficiency	SVRCD
Edson Foulke Fish Screen	Parks Creek	Fish screen	SVRCD
Ekstrom screen	Shasta River	Fish screen	Resources Mgmt
Greco Screen	Klamath River	Fish screen	SVRCD
Joe Rice Fence	Shasta River	Riparian fencing	Resources Mgmt
Klamath Special Araujo	Shasta River	Fish passage, screening	SVRCD
Micke Screen	Shasta River	Fish screen	SVRCD
Nelson Riparian Fence 2	Shasta River	Riparian fencing	SVRCD
Prop 50 Araujo	Shasta River	Fish passage, screening, water efficiency	SVRCD
Prop 50 SRWA	Shasta River	Fish passage, screening, water efficiency	SVRCD
Joe Rice screen	Shasta River	Fish screen	Resources Mgmt
Soule Little Shasta screen	Little Shasta	Fish screen	SVRCD

SOURCE: SVRCD, 2006.

Since 1986, with over $7 million in funding derived from local, state, and federal agencies, SVRCD and the Shasta River CRMP have been collaboratively involved in developing and implementing many significant and beneficial water quality projects. Common projects include, but are not limited to, riparian fencing, riparian planting, bank stabilization, habitat restoration, agricultural tailwater management, water quality and flow monitoring, fish screens and fish passage, pulsed flows, and monitoring.

U.S. Fish and Wildlife Service Klamath Restoration Program

USFWS administers the Klamath Restoration Program, which funds projects that provide fish passage improvements, fish screen repairs, habitat restoration, and community education. These projects benefit federal trust species (such as salmon, trout, and other species important to Tribal traditions), as well as recreational and commercial fisheries (USFWS, 2006). Projects are funded through three funding streams: Jobs in the Woods (JITW), Partners for Fish and Wildlife, and the Fish Passage Program. JITW program was the USFWS' contribution to the NWFP's watershed restoration activities. The Partners for Fish and Wildlife Program provides technical land financial assistance to private landowners for riparian and instream habitat restoration, and the Fish Passage Program provides funds to improve fish passage through waterways. The program continues to fund restoration projects despite the expiration of the Klamath Act as a funding source (Eastman, 2008). Projects shown in **Table 4-6** were funded in the Program Area.

TABLE 4-5
CURRENT AND REASONABLY FORESEEABLE SVRCD PROJECTS (2008)

Project Name	Project Location	Project Type	Grant Recipient/Partner
2008			
Araujo dam removal/pipelines Araujo Dam-NRCS (Wildlife Habitat Incentives Program)	Shasta River	Water use efficiency	SVRCD
Seiad screens	Seiad Creek (Klamath Trib)	Fish screens	SVRCD
Yreka Creek Floodplain Restoration Project	Yreka Creek	Water quality improvement	City of Yreka
Consolidated SRWA/Shasta Water Association dam removal/pipelines	Shasta River	Fish passage, screening, water use efficiency/habitat improvement	SVRCD
	Shasta River	Water use efficiency/Habitat improvement/Fish passage	SVRCD
Fiock Fish Screen	Shasta River	Fish screen	SVRCD
Grenada Irrigation District Fish Passage	Shasta River	Fish passage/Water Quality	SVRCD
Hotlum Fire	Big Springs	Vegetation Management	SVRCD
Little Shasta Fish Screen and Passage	Little Shasta River	Fish screen, passage	SVRCD
Rotary Trap 2008	Shasta River watershed		SVRCD/CDFG
Tailwater Reduction	Shasta River watershed	Assessment and priority projects list/demonstration projects	SVRCD
Yreka Creek Aquatic and Uplands Assessment	Yreka Creek	Water quality/habitat improvement	City of Yreka

SOURCE: SVRCD, 2008

4.1.4 Other Activities

In addition to the activities and projects described above, there are four ongoing projects that in combination with the Covered Activities could make the impacts from those activities cumulatively considerable.[7] They include: 1) the Federal Energy Regulatory Commission's (FERC) re-licensing of the Klamath Hydroelectric Project; 2) Fruit Growers Supply Company's (FGSC) preparation of a multispecies Habitat Conservation Plan (HCP); 3) recent changes to the State Watermaster Program by the State Legislature and DWR; and 4) the companion Scott River Watershed-wide Permitting Program.

7 "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future project (projects (CEQA *Guidelines,* § 15065).

TABLE 4-6
SHASTA RIVER WATERSHED PROJECTS FUNDED BY
USFWS KLAMATH RESTORATION PROGRAM (2001–2008)

Project Name	Project Type	Location
2001		
Little Shasta River Fish Passage and Screening Project	Fish Passage	Little Shasta River
Shasta River Flow and Temperature Modeling Study	Habitat Protection	Shasta River
Bosch Habitat Improvement Project	Habitat Restoration	TBD- emailed Darla
2002		
Hart Cold Water Refugia Protection Fencing Project	Habitat Restoration	Little Shasta River
Frey Ranch Tailwater Capture Project	Water Efficiency and Habitat Restoration	Shasta River
RY Ranch Wetlands Project	Riparian Habitat Restoration	Shasta River
2003		
Shasta River Irrigation District Water Efficiency	Habitat Protection	Shasta River
Water Conservation Through Landowner Education on Irrigation Management	Education	Shasta River Watershed
Parks Creek Fish Passage	Fish Passage and Habitat Restoration	Parks Creek
To complete compliance for Parks Creek Fish Passage with TF funds	Riparian and Habitat Restoration	Parks Creek
2004		
Fish Passage Structure at Shasta Water Users Association Dam	Fish Passage	Shasta River
Shasta River Riparian Cattle Exclusion Fence	Jobs in the Woods	Shasta River
2005		
Araujo Dam Demobilization & Water Quality Improvement Project, Phase 1	Fish Passage and Water Quality	Shasta River
Nelson Ranch Shasta River Mainstem Refugia Area Fence	Habitat Restoration	Shasta River
Shasta Water User Association Dam Demobilization and Water Quality Improvements Project	Fish Passage and Water Quality	Shasta River
2006		
Implementation of Programmatic Permit Programs in the Shasta River Valley	Implementation	Shasta River Watershed
Fish Passage Structure at Shasta Water User Association Dam II	Fish Passage	Shasta River
Fish Screen Installation at Parks Creek	Fish Passage	Parks Creek
Greenhorn Creek Floodplain Restoration	Riparian and Habitat Restoration	Greenhorn Creek
Araujo Diversion Structure Removal Project	Fish Passage and Habitat Restoration	Shasta River
Shasta River and Wetland Fencing	Riparian and Habitat Restoration	Shasta River

TABLE 4-6 (Continued)
SHASTA RIVER WATERSHED PROJECTS FUNDED BY
USFWS KLAMATH RESTORATION PROGRAM (2001–2008)

Project Name	Project Type	Location
2007		
Grenada Irrigation District Fish Passage Improvement	Fish Passage	Shasta River
Shasta River Riparian Exclusion Fencing	Habitat Restoration	Shasta River
Shasta River Riparian Exclusion Fencing	Habitat Restoration	Shasta River
Shasta River Riparian Planting	Habitat Restoration	Shasta River
Upper Shasta River Diversion Improvement and Fish Screen Installation	Fish Passage and Water Quality	Shasta River
2008		
Yreka Creek Greenway Riparian and Aquatic Habitat Enhancement Project	Riparian and Habitat Restoration	Shasta River
Edson-Foulk Fish Passage	Fish Passage	Shasta River
Parks Creek Riparian Fencing/Cattle Exclusion (Mole-Richardson	Habitat Restoration and Water Quality	Parks Creek
Nelson Ranch Shasta River Riparian Planting	Habitat and Riparian Restoration	Shasta River
Grenada Irrigation District Fish Passage Improvement Project	Fish Passage	Shasta River

NOTE: This table includes on-the-ground projects only. It does not include USFWS-funding for planning, coordination, fisheries studies nor habitat analyses. This table overlaps with projects identified in Tables 4-5 and 4-6 that were implemented by the SVRCD.

SOURCE: USFWS, 2008

FERC Relicensing of the Klamath Hydroelectric Project

FERC is currently considering PacifiCorp's application to relicense its Klamath Hydroelectric Project. PacifiCorp is a subsidiary of MidAmerican Energy Holdings Company. The Klamath Hydroelectric Project encompasses six hydropower dams in Oregon and California, including Irongate, Copco No. 1, Copco No. 2, and J.C. Boyle on the mainstem Klamath River in California, all of which block passage of anadromous fish to spawning and rearing areas in the upper Klamath Basin. Water quality problems in the Klamath River have also been implicated in the decline of the Klamath River's anadromous fish runs. The Klamath is included on California's 2002 section 303d list of impaired water bodies for nutrients, organic enrichment/low dissolved oxygen, and temperature (SWRCB, 2003). Water quality problems are associated with polluted runoff and massive changes to the natural hydrology of the Upper Klamath Basin, and with the effects of the PacifiCorp reservoirs themselves, including the growth of the blue-green algae *Microcystis aeruginosa*, which produces a toxin that is harmful to both fish and human health (Kaley, 2005). In addition, recent studies have documented significant mortality in juvenile salmon and steelhead populations in the Klamath River downstream of Irongate Dam due to infectious disease, primarily caused by the endemic parasites. In 2004, infection rates in juvenile Chinook salmon ranged from about 20 to 70 percent for *Ceratomyxa shasta* and from 40 to

96 percent for *Parvicapsula minibicornis.* In 2005, dual infection rates at or near 100 percent were observed for consecutive weeks in April, a critical period for outmigration of juvenile anadromous fishes[8] (USFWS, 2006).

Adult salmonids have also been susceptible to infectious disease in the Klamath River. As described in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat, a major adult salmonid mortality event occurred in 2002. At least 33,000 adult salmonids died in the lower 36 miles of the Klamath River between mid- to late-September (CDFG, 2004b). Fall-run Chinook salmon were the primary species affected, but coho salmon, steelhead, and other fish species also suffered losses.

The decline of the fishery has had a severe impact on local economies dependent on the salmon runs, including the Klamath River Tribes (the Yurok, Karuk, Hoopa) and the Klamath Tribes of Oregon; commercial fishing and related enterprises on the California and Oregon coasts; and the sports fishing industry (FERC, 2007).

FERC released a Final Environmental Impact Statement (EIS) for relicensing of the Klamath Hydroelectric Project on November 16, 2007 pursuant to the National Environmental Policy Act (FERC, 2007). According to the Final EIS, the project currently has a generating capacity of 161 megawatts and generates on average 716,820 megawatt-hours of electricity annually. In the Final EIS, FERC assessed the environmental and economic effects of the project as proposed by PacifiCorp and identified the following five alternatives:

1. Continuing to operate the project with no changes or enhancements (no-action alternative);
2. Operating the project as proposed by PacifiCorp with additional or modified environmental measures (staff alternative);
3. Staff alternative with conditions filed by the Department's of the Interior and Commerce;
4. Retirement of the Iron Gate and Copco No. 1 developments with additional or modified measures for the remaining developments; and
5. Retirement of the Iron Gate, Copco No. 2, Copco No. 1, and J.C. Boyle developments, with additional or modified measures for the remaining developments.

Based on the analysis in the Final EIS, FERC staff concluded that the best alternative for the Klamath Hydroelectric Project would be to issue a new license consistent with the environmental measures specified in the Staff Alternative, but the Commission itself has not yet made a licensing decision.

8 USFWS, in cooperation with the Hoopa, Yurok, and Karuk Tribes, is conducting ongoing studies of pathogen infection and anadromous fish health in the Klamath River.

The Klamath Settlement Group, a coalition of tribal, commercial and sports fishing, agricultural, and environmental interests, working with state, local, and federal government agencies, released for public review the "Proposed Klamath Basin Restoration Agreement" on January 15, 2008 (Klamath Settlement Group, 2008).[9,10] The agreement seeks to rebuild fisheries, sustain agricultural communities, and resolve other longstanding disputes related to the allocation of water resources in the Klamath Basin. Key provisions of the Proposed Agreement include:

- A comprehensive program to rebuild Klamath River fish populations sufficient for sustainable tribal, recreational, and commercial fisheries. Elements include actions to restore fish populations and habitats, including a program to reintroduce anadromous species in currently-blocked parts of the Basin; actions to improve fish survival by enhancing the amount of water available for fish, particularly in drier years; and other efforts to support tribes in fisheries reintroduction and restoration efforts;

- A reliable and certain allocation of water sufficient for a sustainable agricultural community and national wildlife refuges;

- A program to stabilize power costs for the Upper Basin's family farms, ranches, and for the two national wildlife refuges;

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9 The proposed agreement lists the following as parties to the agreement:

United States
U.S. Department of Agriculture, Forest Service
U.S. Department of Commerce's National Marine Fisheries Service
U.S. Department of the Interior, including Bureau of Indian Affairs, Bureau of Land
Management, Bureau of Reclamation, and Fish and Wildlife Service

State of California
California Department of Fish and Game

State of Oregon
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Water Resources Department

Tribes
Hoopa Valley Tribe
Karuk Tribe
Klamath Tribes
Yurok Tribe

Counties
Humboldt County, California
Klamath County, Oregon
Siskiyou County, California

Parties Related to Klamath Reclamation Project
Tulelake Irrigation District
Klamath Irrigation District
Klamath Drainage District
Klamath Basin Improvement District
Ady District Improvement Company
Enterprise Irrigation District
Malin Irrigation District
Midland District Improvement Company
Pine Grove Irrigation District
Pioneer District Improvement Company
Poe Valley Improvement District
Shasta View Irrigation District
Sunnyside Irrigation District
Don Johnston & Son
Modoc Lumber Company
Bradley S. Luscombe
Randy Walthall and Inter-County Title Company
Reames Golf and Country Club
Winema Hunting Lodge, Inc.
Van Brimmer Ditch Company
Collins Products, LLC
Plevna District Improvement Company
Klamath Water Users Association
Klamath Water and Power Agency

Klamath Off-Project Water Users Association

Non-Governmental Organizations
American Rivers
California Trout
Friends of the River
Klamath Forest Alliance
National Center for Conservation Science and Policy
Northcoast Environmental Center
Northern California/Nevada Council Federation of Fly Fishers
Pacific Coast Federation of Fishermen's Associations
Salmon River Restoration Council
Trout Unlimited.

10 Federal agencies did not release the Proposed Agreement.

- A program intended to insure mitigation for counties that may be impacted by the removal of the hydroelectric facilities.

The Group is presently negotiating with PacifiCorp in an effort to reach a separate "Hydropower Agreement" that would include removal of the four lower Klamath River dams, as contemplated in the fifth Final EIS alternative. The Group sees dam removal as a necessary part of the overall effort to restore the Klamath River. As of September 2008, PacifiCorp had not signed onto either agreement, and FERC had not yet made a decision on the relicensing of the Klamath Project.

The alternatives analyzed in the Final EIS would result in varying degrees of benefit to the entire Klamath River fishery, including the Program Area. The No-Action Alternative, would result in the continued impairment of water quality and the salmonid fishery. This would affect not only the mainstem Klamath and the areas above the dams, but the entire Klamath River watershed including the Program Area. The remaining alternatives represent, in general, progressively more effective means of addressing the existing water quality, flow, and migration barrier issues affecting the Klamath fishery, with the likelihood that the greatest benefits would be realized through implementation of the last alternative, which would involve retirement and removal of the four dams.

It is premature at this time to determine which alternative will be selected by FERC. However, to be conservative in the cumulative impact analysis, it is assumed that the No-Action Alternative is implemented.

Fruit Growers Supply Company Multispecies Habitat Conservation Plan

FGSC plans to submit applications to USFWS and NMFS for ITPs authorizing potential incidental take of federal endangered and threatened species during their otherwise lawful timber harvesting activities. FGSC intends to request coverage from NMFS for potential take of coho salmon and unlisted Chinook salmon (*O. tschawytscha*) and steelhead (*O. mykiss*). FGSC also intends to request coverage from USFWS for northern spotted owl, (*Strix occidentalis caurina*) and Yreka phlox (*Phlox hirsute*), although take of listed plant species is not prohibited under ESA. Take authorization for unlisted covered species would become effective upon listing. Pursuant to ESA section 10, FGSC's ITP applications will include a multispecies HCP which will apply to approximately 154,000 acres of commercial timber land owned by FGSC in Siskiyou County. On February 22, 2008, USFWS and NMFS issued a Notice of Public Scoping and Intent to Prepare a Joint EIS (USFWS-NMFS, 2008) with comments due on or before April 7, 2008.

To comply with CESA, FGSC intends to request a Consistency Determination under Fish and Game Code, § 2080 (see Chapter 5, section 5.1.1 for information on Fish and Game Code, § 2080). FGSC also intends to request a master SAA from CDFG. CDFG has been a party to the discussions between FGSC, USFWS, and NMFS and the best management practices to protect federal and state listed species which will be incorporated into the HCP have been developed in cooperation with CDFG. CDFG intends to use the EIS as a CEQA equivalent document in accordance with Fish and Game Code, § 15221 in its consideration of the master SAA.

Changes to the State Watermaster Program

DWR established the state-wide watermaster program in 1924 to provide for general public welfare and safety after many injuries and some deaths resulted from disputes over adjudicated water rights. The main purpose of the watermaster program is to ensure water is allocated according to established water rights as determined by court adjudications or agreements by an unbiased, qualified person, thereby reducing water rights court litigation, civil lawsuits, and law enforcement workload. It also helps prevent the waste or unreasonable use of water (DWR, 2007). In 1934 many of the adjudicated water users in the Shasta Valley were placed under watermaster supervision during the irrigation season. That program continues to the present day.

Until recently, DWR charged the agricultural producers a total of $85,000 per year to cover one half of the expenses associated with the program in Siskiyou County. A tax assessment was established for water users as the method for collecting payment for these charges. Watermaster charges have historically been assessed among individual water users using a formula of 10 percent based on per capita and 90 percent based on the total water right (Krum, 2007). In the past the state has covered the other half of the total program cost which, up to FY 2003/2004, was reported at $170,000.

In 2003, the California Water Code was amended so that the General Fund no longer pays for half the cost of watermaster service. As a result, the entire cost will become the responsibility of the water users. In addition to this change, DWR has changed its cost allocation procedures, and subsequently DWR has proposed an increase of 2.5–3.5 times the existing watermaster service rate. The combination of the proposed rate increase and new payment structure could ultimately result in a five- to seven-fold cost increase for watermaster service in both the Shasta and the Scott watersheds.

For the past several years, the State Legislature and BOR have provided financial relief from these watermaster service cost increases. Most recently, the State Legislature reversed a decision to increase the tax assessment by 300–500 percent over the historic $85,000 watermaster fee. However, this decision was not permanent and does not provide any legislative guarantees that fees will remain at the current rate. Any future cost increases would apply to all water users receiving watermaster services from DWR. Many landowners feel that increased watermastering costs, in addition to increasing costs associated with environmental regulatory compliance, could present a cumulative contribution to land use change.

The Save our Shasta and Scott Valleys Coalition worked with local legislators to achieve the passage of AB1580 (Chapter 416, Statutes of 2007) which creates a joint Scott Valley and Shasta Valley Watermaster District (District). This bill gives the District the power to act as watermaster over decreed water rights instead of DWR, and gives the District the power to adopt ordinances and regulations, acquire and dispose of property, appoint employees, enter contracts, and charge fees. In February 2008, the Siskiyou County Board of Supervisors appointed the initial Board of Directors for the District, consisting of seven members (henceforth five board directors will be elected and two appointed by the Board of Supervisors). The Board of Directors held its initial organizational meeting in February 2008. Efforts are currently underway to collect the requisite signatures from District members to be presented to the Siskiyou County Superior Court to request transfer of watermaster responsibilities in the Scott and Shasta Valleys from DWR to the District (Krum, 2008). The minimum legal requirement for the Court to hold a hearing to initiate this change is approval by 15 percent of the "conduits" which in this case is synonymous with "diversions." As of June 2008 the District had obtained signatures from approximately 40 percent of the conduit holders. The District is continuing to collect signatures and it is anticipated that at some time in the near future they will present their request to the Court. The District is capable of fulfilling the watermastering requirements of the Shasta River Decree. This cumulative analysis conservatively assumes that individuals receiving watermaster service will be subject to an increase in cost for this service in the near future and that this could have implications for viability of agricultural operations.

Scott River Watershed-wide Permitting Program

CDFG and the Siskiyou Resource Conservation District (SQRCD) have developed a similar watershed-wide permitting program for the Scott River watershed, also in Siskiyou County. On March 29, 2005, SQRCD submitted an application to CDFG for a watershed-wide incidental take permit (ITP) pursuant to Fish and Game Code, § 2081(b) and (c). On April 22, 2005, SQRCD submitted a notification to CDFG pursuant to Fish and Game Code, § 1602. Thereafter, CDFG worked with the SQRCD and Agricultural Operators to develop the Scott River Watershed-wide Permitting Program (Scott River Program) including the ITP (ITP No. 2081-2005-027-01) and MOU and MLTC. Together, the ITP, MOU and MLTC, and individual sub-permits and SAAs comprise the Scott River Program. Similar to the Program for the Shasta River, under the Scott River Program SQRCD, DWR, and participating Agricultural Operators will conduct Covered Activities in accordance with the conditions in their SAAs to protect fish and wildlife resources, including coho salmon, and the avoidance, minimization, and mitigation measures specified in the ITP and sub-permits. During the first five years of the Program, the original term of any SAA CDFG issues under the Program will be five years. CDFG may extend the term one time for a period of up to five years if the SAA holder requests an extension prior to the SAA's expiration. All SAAs issued or extended after the first five years of the Program will expire on the expiration date of the ITP (i.e., the expiration date of the Program). The term of the ITP will be 10 years and all sub-permits will be written to expire on the expiration date of the ITP. The Scott River Program is currently undergoing CEQA review. The cumulative analysis conservatively assumes that the Program will be approved and that Covered Activities will be implemented according to the terms and conditions of the SAA MOU and MLTC and ITP throughout the entire Scott River watershed.

4.2 Cumulative Impacts and Mitigation Measures

Potential cumulative impacts of the Program on the resources described in Chapters 3.1 through 3.7 are described below. As explained in Section 4.1 above, the purpose of this analysis is to determine whether the impacts of the Program will be cumulatively considerable in combination with the potential impacts of past, present, and probable future government regulatory initiatives and similar past, present, and probable future activities similar to the activities the Program covers, including restoration activities, and their related impacts.

4.2.1 Land Use and Agriculture

The following analysis seeks to determine whether Impact 3.1.1 ("The Program could result in the conversion of agricultural land within the Shasta River watershed to non-agricultural uses") from Chapter 3.1, Land Use and Agriculture, which is found to be less than significant, could combine with impacts of other recent and related regulatory actions to cause a cumulatively considerable impact on land use, particularly whether these actions taken together would likely result in a conversion of agricultural land to non-agricultural uses.

Today, the resource-based economy of the Shasta River watershed is primarily ranching and farming. Historically mining, farming, ranching and logging were mainstays of the Shasta Valley and neighboring Scott Valley economy (Charnley et al., 2006). Mining diminished in the 1950s, with only small-scale operations continuing to occur in the neighboring Scott River watershed. In the 1970s, the downturn in the timber economy began and timber workers began leaving the local area (Charnley et al., 2006). Further declines in timber production on the Klamath and Shasta-Trinity National Forests, in the years immediately preceding the NWFP, dramatically affected the community's remaining timber workers. Most of the timber workers who still lived in the community chose to leave Siskiyou County with their families in the early 1990s.

Ranchers and farmers in the Shasta Valley community, whose families have been ranching and cultivating crops for generations, have also experienced economic stress over the last decade and have a difficult time maintaining their way of life. The pressures have many sides: fluctuations in beef, alfalfa, and hay prices in the face of rising labor costs and rising production costs; drought; and the increased cost, responsibility, and liability associated with complying with new environmental regulations imposed to protect endangered species and improve water quality. These regulations have modified land management practices on federal lands (including grazing allotments) and resulted in greater restrictions on activities within the bed, banks, and channel of streams. Each of these regulations has its own set of requirements and costs.

As noted in Section 4.1.4, Agricultural Operators who divert water according to the Shasta Decree (1932) are expected to experience an increased economic burden related to an expected increase in watermaster service cost. Agricultural Operators with riparian rights not subject to the decree, or who are otherwise currently not paying for watermaster service, who choose to participate in the Program, will be paying for costs of water use verification for the first time. Any water diverter who has riparian rights, or who currently is not watermastered, will be required to participate in a verification process for the use of water in accordance with a valid right. Whether this verification is done by the newly-formed District or in some other way, this would be a new cost for Agricultural Operators who do not currently receive watermaster service.

As identified in Impact 3.1-1, the cost to participate in the Program (including performing specific avoidance and minimization measures) could potentially reduce net income for participating Agricultural Operators. Future net income reductions could possibly undermine the financial viability of some existing agricultural operations. The cumulative impact of environmental regulations, watermaster fees, and Program-related fees may cause landowners of properties with less viable agricultural operations to feel increased pressure to convert or sell their land. However, the cost and effort for those who choose to comply with Fish and Game Code, § 1600 *et seq.* and CESA outside the Program would likely be much greater than for Program participants. In some cases, this could result in conversion to non-agricultural uses, including attempts to subdivide agricultural land for rural residential or “ranchette” development.

The incremental impact on land use and agriculture from the Program, when combined with impacts from similar past, present, and probable future regulatory programs, will not be cumulatively considerable because the costs and effort associated with complying with these requirements individually, i.e., outside the Program, would likely be much greater than for Program participants; the net effect of the Program, compared to existing conditions, is considered beneficial. The Program would therefore not contribute to loss of economic viability of farming and ranching enterprises, and so would not cumulatively contribute to pressures to convert prime farmland, unique farmland, or farmland of statewide importance to non-agricultural uses, and would not be expected to cause new conflicts with existing zoning for agricultural use or Williamson Act contracts.

4.2.2 Geomorphology, Hydrology, and Water Quality

Short-term impacts to water quality, stream channel configuration, and stream flow are identified as significant impacts in Chapter 3.2, Geomorphology, Hydrology, and Water Quality (Impacts 3.2-1 and 3.2-3). These impacts are related to construction activities in and around the bed, banks, and channel of streams, and operation and maintenance of instream structures. While Impacts 3.2-1 and 3.2-3 can be reduced to less than significant with the mitigation measures identified in this report, some residual, short-term impacts would remain. These would include short-term (i.e., during construction and during the first winter after construction) increases in turbidity and sedimentation, short-term alteration of flows, and alterations to the configuration of stream channels. Overall, these residual, short-term impacts would be considered less than significant. Chapter 3.2 also identifies two less than significant impacts on hydrology and water quality: Impacts 3.2.2 (certain instream structures proposed to increase fish habitat as part of the Program would be installed within a flood hazard area and could impede or redirect flood flows) and 3.2.4 (the Program could result in an increase in the extraction of groundwater, which in turn could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries).

As described above, there have been over 81 projects completed near and in the Shasta River, its tributaries, and other rivers and streams in the watershed over the past several years, with more projects currently being implemented or planned. Like construction and maintenance activities associated with the Program, other projects that involve heavy equipment at instream, riparian, or nearby upland locations have the potential to cause short-term increases in erosion, sedimentation, and/ or pollutant loading (i.e., fuels and lubricants, due to spills and accidents) to surface waterways. As a consequence, there can be minor, temporary impacts to water quality, fishery resources, and vegetation. While these projects typically include similar measures to reduce impacts to water quality and streamflow (e.g., through SAA conditions), they, too, may have short-term, residual impacts. Similar to the Program, the impact of these activities is not likely to rise to a level of significance because the effects would not accumulate but rather would be site specific, short-term, and transitory in nature.

The incremental impacts on geomorphology, hydrology, and water quality from the activities the Program covers when combined with similar past, present, and probable future activities will not be cumulatively considerable because:

- Specified terms and conditions contained in SAAs for these activities typically mitigate their impacts to less-than-significant levels;
- Residual impacts after mitigation, if any, tend to be short-term, site-specific and transitory in nature;
- Many instream projects, including many of the Covered Activities, aim to improve water quality and to restore channel structure; short-term impacts are therefore often mitigated by long-term gains;
- The Program (with mitigation measures identified in this Draft EIR) would improve water quality and contribute to restoration of a more natural hydrograph and channel morphology and function in the streams of the Shasta River watershed;
- Several other programs, particularly implementation of TMDLs in the watershed, the state and federal listing of coho salmon, the 5C Program, and the NWFP, also serve to protect and improve water quality and stream conditions. In sum, these programmatic and regulatory efforts, in combination with voluntary efforts on the part of individual landowners, SVRCD, the Shasta Valley CRMP, and others, are having, and will continue to have, a cumulative beneficial impact on water quality and hydrology; and
- Mitigation measures specified for Impacts 3.2-1 and 3.2-3 would reduce these impacts to the point that they would not make a considerable contribution to combined impacts of other past, present, and probable future similar or closely related projects.

Based on the above, where activities similar to those covered by the Program will result in impacts to geomorphology, hydrology, and water quality, those caused by the Program when combined with those impacts will not be cumulatively considerable. As a result, no mitigation measures beyond those specified for Impacts 3.2-1 and 3.2-3 are required.

4.2.3 Biological Resources: Fisheries and Aquatic Habitat

Impact 3.3-1 in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat, identifies a significant impact of the Program associated with direct and indirect effects of instream and near-stream construction activities on coho salmon and other fish species and their habitat. Impacts could result from such actions as ground clearing, channel and bank excavation, backfilling, earthmoving, stockpiling and/or compaction, grading, and concrete work. These activities could result in the following impacts to coho salmon and CDFG fish species of special concern, which are described more fully in Impact 3.3-1:

- Short-term increases in sedimentation and turbidity;
- Accidental spills and use of hazardous materials;

- Direct injury or mortality resulting from equipment use and dewatering activities; and/or
- Temporary loss, alteration, or reduction of habitat.

As noted in the discussion of Impact 3.3-1, these effects are expected to be reduced to less than significant by complying with the terms and conditions of the SAAs, the ITP, and sub-permits issued under the Program. Chapter 3.3 also identifies one less than significant impact, Impact 3.3-2 (increased extraction of groundwater could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries, thereby impacting coldwater fish habitat).

As described in Section 4.1.3 above, there have been over 81 projects near or in the Shasta River, its tributaries, and other rivers and streams in the watershed in recent years, and more are currently being implemented or planned. These have ranged from stream restoration projects, to emergency repair projects, to construction projects, among others. Most of these projects have the potential to cause impacts like those listed above that could adversely affect fish and aquatic habitat.

However, most of these projects will be subject to mitigation measures similar to those specified in the Program. Further, many of these projects are intended to improve habitat conditions for fish species, particularly coho salmon. These include terms and conditions in SAAs that place limits on season of construction, limits on equipment use, prohibitions against discharging wastes into the stream during construction, procedures to minimize damage from spills and upsets, and requirements for fish removal and exclusion and for erosion control.

The incremental impacts on fisheries and aquatic habitat from the activities the Program covers when combined with similar past, present, and probable future activities will not be cumulatively considerable for the following reasons:

- Specified terms and conditions in SAAs and other permits required for projects of this kind usually mitigate impacts to less-than-significant levels;

- Residual impacts after mitigation tend to be short-term, site-specific, and transitory in nature;

- Many instream projects, including many of the Covered Activities, aim to improve fish habitat and passage, such that short-term impacts are mitigated by long-term gains in habitat quality and access;

- The Program (with mitigation measures identified in this Draft EIR) would reduce take of coho salmon in the Shasta River watershed, and would improve habitat (including increased access to and from spawning and rearing areas) for coho salmon and other anadromous fish; and

- Several other regulatory programs, plans and policies, particularly implementation of TMDLs in the Watershed, the state and federal listing of coho salmon, and the implementation of the NWFP, also serve to protect and improve stream habitat and to benefit coho salmon and other anadromous fish. In sum, these regulatory efforts, in combination with voluntary efforts on the part of individual landowners, SVRCD, the

> Shasta Valley CRMP, and others, are having, and will continue to have, a cumulative beneficial impact on anadromous and other fish in the Shasta River watershed.

Based on the above, where activities similar to those covered by the Program will result in impacts on fisheries and aquatic habitat, those caused by the Program when combined with those impacts will not be cumulatively considerable. As a result, no mitigation measures beyond those specified for Impacts 3.3-1 are required.

4.2.4 Biological Resources: Botany, Wildlife, and Wetlands

Overall, the Program will provide additional protections to riparian and wetland plant and animal species and habitats. Several other regulatory programs identified in this Chapter, in addition to individual actions of private landowners, SVRCD, Shasta Valley CRMP, and others have increased protection for such resources, and have restored riparian and wetland areas. The overall impact of these new regulatory programs, combined with protection and restoration projects, is therefore beneficial for botany, wildlife, and wetland resources.

Impacts 3.4-1, 3.4-3, and 3.4-5 identify potentially significant impacts of Covered Activities on sensitive plant and animal species and habitats associated with construction activities and agricultural operations in and around streams and riparian areas. Impacts 3.4-2 and 3.4-4 identify additional impacts that are found to be less than significant. These impacts include effects such as the following:

- Direct mortality to special-status plant species from removal of individual special-status plant species or their seed banks;
- Special-status animals can be killed by vehicles and equipment, their burrows or other retreats may be crushed, or they may be killed if buried by new or maintained instream structures;
- Loss of downstream seasonal ponds due to flow modification; and/or
- Nest abandonment due to noise and human activity during construction periods.

Although disturbances are temporary and intermittent, movement of livestock and vehicles can mobilize silt and small gravel, decreasing habitat quality for aquatic species, destabilize streambeds and banks, inhibit the growth or reduce the vigor of riparian or instream vegetation. Impacts 3.4-1, 3.4-3, and 3.4-5 can, however, be mitigated to less than significant with the measures described in this Draft EIR. Projects and activities carried out under other programs identified in this Chapter could have impacts of a similar nature. Most of these projects and activities do, however, also include mitigation measures similar to those specified in the Program. These include terms and conditions in SAAs that place limits on season of construction, limits on equipment use, prohibitions against discharging wastes into the stream during construction, procedures to minimize damage from spills and upsets, and requirements for fish removal and exclusion and for erosion control.

The incremental impacts on botany, wildlife, and wetland resources from the activities the Program covers when combined with similar past, present, and probable future activities will not be cumulatively considerable for the following reasons:

- Specified terms and conditions contained in SAAs are intended to mitigate biological resource impacts to less-than-significant levels;
- Habitat quality for fish includes a more robust and complex vegetation assemblage in and adjacent to the Shasta River, which in turn will support more riparian-dependent plants and animals; and
- Seasonal restrictions on equipment operations reduce direct effects on breeding birds and special-status species, if present. Pre-construction plant, and nesting bird surveys, and resulting activity restrictions will avoid impacts to these species.

Based on the above, where activities similar to those covered by the Program will result in impacts on botany, wildlife, and wetland resources, those caused by the Program when combined with those impacts will not be cumulatively considerable. As a result, no mitigation measures beyond those specified for Impacts 3.4-1, 3.4-3, and 3.4-5 are required.

4.2.5 Cultural Resources

Impacts 3.5-1, 3.5-2, and 3.5-3 in Chapter 3.5 identify potential impacts on cultural resources associated with construction and operation activities the Program covers; the first two are found to be significant, but can be mitigated; Impact 3.5-3 is found to be less than significant. The impacts are similar to potential impacts from similar past, present, and probable future projects. While both Covered Activities and similar projects could have potential impacts on known and unknown cultural resources, paleontological resources, and buried human remains, the standard mitigation measures specified for these impacts under the Program would mitigate them to less than significant.

The incremental impacts on cultural resources from the activities the Program covers when combined with similar past, present, and probable future activities will not be cumulatively considerable for the following reasons:

- The impacts of the Program are mitigated to less than significant, as described in Chapter 3.5;
- The impacts of related projects would also be mitigated to less than significant, assuming incorporation of similar mitigation measures, which are standard for projects of this kind; and
- Impacts of this nature are usually site-specific, and do not tend to combine in a cumulative sense with impacts at other sites.

The regulatory programs discussed in this Chapter, including TMDLs, the NWFP, and the state and federal listing of coho salmon, bring a broader range of activities under increased regulatory oversight. It is likely that as a result of these programs, more cultural resources would be identified and preserved or properly recorded.

Based on the above, where activities similar to those covered by the Program will result in impacts on cultural resources, those caused by the Program when combined with those impacts will not be cumulatively considerable. As a result, no mitigation measures beyond those specified for Impacts 3.5-1 and 3.5-2 required.

4.2.6 Hazards and Hazardous Materials

Impacts 3.6-1 and 3.6-2 in Chapter 3.6, Hazards and Hazardous Materials, identify the accidental discovery of hazardous materials and the risk of causing wildfires (e.g., from sparks from heavy equipment operating in areas with dry vegetation on the edge of forest land) as potential Program impacts.

The incremental hazard- and hazardous materials-related impacts from the activities the Program covers when combined with similar past, present, and probable future activities will not be cumulatively considerable for the following reasons:

- Impacts of this nature tend to be site-specific and short-term, and do not tend to combine in a cumulative sense with impacts at other sites;
- The mitigation measures identified for Impacts 3.6-1 and 3.6-2 would mitigate these impacts to less than significant; and
- It is assumed that conditions placed on other related projects would similarly mitigate those impacts to less than significant, and to the degree that, when all cumulative activities are considered collectively, there would be no significant cumulative effect.

The regulatory programs described in this Chapter do not directly affect the regulation of hazardous materials. The NWFP does contain elements related to fuel management to reduce the risk of wildfire and damage caused by wildfire. Because the regulatory actions described in this Chapter bring a broader range of activities under increased regulatory oversight, including the necessity to incorporate basic safeguards into project planning and implementation, it is likely that risks associated with accidental discovery of unknown hazardous materials and the risk of wildfire will be reduced.

Based on the above, where activities similar to those covered by the Program will result in hazard- and hazardous materials-related impacts, those caused by the Program when combined with those impacts will not be cumulatively considerable. As a result, no mitigation measures beyond those specified for Impacts 3.6-1 and 3.6-2 are required.

4.2.7 Public Utilities, Service Systems and Energy

Impact 3.7-1 in Chapter 3.7, Public Utilities, Service Systems and Energy (the Program could result in the modification or expansion of existing water supply systems) is found to be less than significant. Because such effects are local in nature, this less than significant impact is not expected to combine with impacts of other programs in a cumulatively considerable manner.

Impact 3.7-2, identifies the consequences of accidental contact with and damage to underground utilities and facilities during construction of projects covered under the Program as less than significant. Similar projects would have the potential for similar impacts.

The incremental impacts on public utilities, service systems, and energy from the activities the Program covers when combined with similar past, present, and probable future activities will not be cumulatively considerable for the following reasons:

- Effects of this kind are site-specific and do not combine with similar effects of related projects in a cumulative sense; and
- As discussed in Impact 3.7-2, Government Code, § 4216 requires notification of the Underground Service Administration between two and 14 days before any activity that could disturb underground utilities.

Impact 3.7-3 identifies a less than significant impact on energy consumption and air emissions related to increased use of pumps for water diversions. Other projects identified in this Chapter would not tend to increase energy consumption, so there is no potential for a cumulative impact on energy consumption. If FERC does not relicense the Klamath Hydroelectric Project, there will be a minor effect on energy supply in the region; however, it is anticipated that this effect can be compensated by existing power generation facilities and likely new generation, including natural-gas fired plants and renewable sources (FERC, 2007).[11]

Impact 3.7-4 identifies the contribution of the Program to global climate change due to emissions of greenhouse gases (GHG) as less than significant. This effect is in itself cumulative in nature, as all such emissions contribute to a build-up of these gases in the atmosphere. The combination of reduced carbon emissions and sequestration of carbon from the atmosphere is expected to outweigh new GHG emissions associated with Program activities, such that the overall effect of the Program on global climate change is expected to be beneficial. Implementation of Mitigation Measures 3.7-4a-b, either voluntarily or by another agency could further reduce GHG.

Based on the above, where activities similar to those covered by the Program will result in impacts on public services, utilities, and energy, those caused by the Program when combined with those impacts will not be cumulatively considerable. As a result, no mitigation measures beyond those specified for Impacts 3.7-1 through 3.7-4 are required.

[11] FERC (2007, Chapter 4) describes in detail the amount of power generation capacity that would be lost with decommissioning of the Klamath Hydroelectric Project dams, and also planned and potential new generation sources.

4.2.8 Other Issue Areas

Other issue areas normally considered in an EIR, such as Air Quality, Traffic and Transportation, Population and Housing, Mineral Resources, and Recreation, are not discussed in depth in this Draft EIR because CDFG determined in the Initial Study (see Appendix D) that the Program does not have the potential to cause a significant impact on these resources. Hence, even if other regulatory programs and activities similar to those covered by the Program were to have such impacts, where it was determined that the Program would have no impact, it would not contribute to them, or where it was determined that the Program's impacts would be less than significant, they would be so minor that when combined with the impacts of non-Program activities, they would not be cumulatively considerable.

4.3 Growth-Inducement

CEQA *Guidelines*, § 15126.2(d) requires that an EIR evaluate the growth-inducing impact of a proposed action. That section describes a growth-inducing impact as follows:

> The ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a water treatment plant might, for example, allow for more construction in service areas) . . . It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

The environmental effects of the growth a proposed project could induce are considered secondary, or indirect, impacts. Secondary effects of growth can result in significant increased demand on community and public service infrastructures, increased traffic, noise, degradation of air and water quality, and the conversion of agricultural and open space land to urbanized uses.

On the basis of the definition above, assessing the growth inducement potential of the Program rests on the following question: would approval and implementation of the Program directly or indirectly support more economic or population growth or residential construction? The Program does not cover activities that involve construction of new homes, businesses, roads, or infrastructure. Therefore, it would not induce substantial population growth, either directly or indirectly. With respect to employment, the Program would not provide for or result in substantial, long-term employment opportunities. Program participants would be required to comply with specified avoidance, minimization, and mitigation measures in their SAAs, the ITP, and sub-permits when conducting an activity the Program covers. However, most of those activities are related to existing, routine agricultural activities or restoration projects. Some of those projects might require additional workers, but the work would be temporary in nature. Adding temporary workers would not induce substantial population growth, either directly or indirectly. Therefore, there would be no impact of this nature as a result of the Program.

4.4 Significant and Irreversible Environmental Changes

CEQA *Guidelines,* § 15126.2(c) states that impacts associated with a proposed project or program may be considered to be significant and irreversible if:

- The project would involve a commitment of non-renewable resources (such as fossil fuels).
- The primary and secondary impacts of a project would generally commit future generations to similar uses (such as a highway improvement that provides access to a previously inaccessible area).
- The project involves uses in which irreversible damage could result from potential environmental accidents associated with the project.

Activities implemented by Program participants would result in irretrievable and irreversible commitment of natural resources through direct consumption of fossil fuels during implementation of the Covered Activities and any related avoidance, minimization, and mitigation measures in the Program Area. However, such consumption would be minor, and therefore the irretrievable and irreversible commitment of natural resource it represents would not be significant.

Activities implemented by Program participants would not commit future generations to undesirable uses and would not involve a use from which irreversible damage could result. Although the activities the Program covers would in some case require the use of petroleum products and hazardous materials, it is unlikely that the amount used would result in an environmental accident or other damage so severe as to be irreversible. Also, as explained in Section 4.2.1 in this Chapter, the Program's incremental impacts in regard to land use conversion when combined with the potential impacts of similar activities would not be cumulatively considerable. Therefore, the Program would not cause a significant irreversible effect in regard to land use conversion.

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CHAPTER 5
Alternatives to the Program

The California Environmental Quality Act (CEQA) requires an evaluation of the comparative effects of a range of reasonable alternatives to a project[1] that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects (CEQA *Guidelines,* § 15126.6(a)). The environmental impact report (EIR) must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. The nature and scope of the alternatives to be discussed is governed by the "rule of reason" (CEQA *Guidelines*, § 15126.6(f)). A discussion on alternatives should include alternatives to the project or its location that are capable of avoiding or substantially lessening any of the project's significant effects, even if these alternatives would impede, to some degree, the attainment of the project's objectives, or would be more costly (CEQA *Guidelines,* § 15126.6(b)).

The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination (CEQA *Guidelines,* § 15126.6(c)). The EIR should include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project (CEQA *Guidelines,* § 15126.6(d)). Evaluation of a "no project" alternative is required to allow decision-makers to compare the impacts of approving the project with the impacts of not approving the project. The "no project" alternative analysis should discuss existing conditions at the time the environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved (CEQA *Guidelines,* § 15126.6(e)).

In accordance with the above, the range of potential alternatives to the Shasta River Watershed-wide Permitting Program (Program) discussed in this Chapter include those that could feasibly accomplish most of the basic objectives of the Program but could avoid or substantially lessen one or more of the Program's significant adverse effects on the environment. Specifically, the Draft EIR considers three alternatives. Those alternatives and the specific reasons for selecting them are:

1 For purposes of this Draft EIR the Shasta Watershed-wide Permitting Program ("Program") is the project being analyzed pursuant to CEQA.

Alternative	Reasons for Selection
1. No Program Alternative	Consideration of this alternative is mandatory.
2. Instream Flow Alternative	This alternative provides an analysis of an approach that would include all the provisions of the Program plus additional measures to increase streamflow in the Shasta River and tributaries for the benefit of coho salmon (*Oncorhynchus kisutch*).
3. Parks Creek – Upper Shasta River Bypass	This alternative presents another approach to providing increased spawning and rearing habitat for coho salmon and other salmonids in the Shasta River.

Each of the three alternatives, its potential environmental impacts, and its ability to meet basic Program objectives as compared with the Program is described below. As part of evaluation and comparison of alternatives, the CEQA *Guidelines* require that if the “no project” alternative is identified as the environmentally superior alternative, the EIR must also identify the environmentally superior alternative among the other alternatives (CEQA *Guidelines,* § 15126.6(e)(2)). A lead agency is not compelled to adopt the environmentally superior alternative. However, if a lead agency rejects an alternative that would substantially reduce the environmental impacts of the project under consideration, the lead agency must, when certifying the EIR, make findings that describe the specific reasons for rejecting the alternative. Reasons may include specific economic, legal, social, technological, or other considerations that make the alternative infeasible (CEQA *Guidelines,* § 15091(a)(3)).

5.1 Alternatives Considered but Rejected

In addition to the three alternatives selected for this analysis, the California Department of Fish and Game (CDFG) considered seven other possible alternatives. Upon consideration, however, these alternatives were rejected for one of three reasons: the alternative failed to meet most of the basic Program objectives; the alternative was found to be infeasible; or the alternative did not have the ability to avoid or substantially lessen one or more of the Program’s significant adverse effects on the environment. The rejected alternatives are discussed briefly, along with the specific reasons they were rejected.

5.1.1 Rejected Alternative 1: Consistency Determination

California Fish and Game Code (Fish and Game Code), § 2080.1[2] provides that no further state authorization or approval is needed for the incidental take of a species listed as endangered or threatened under both the California Endangered Species Act (CESA) and the Endangered Species Act (ESA) if a person has obtained an incidental take permit (pursuant to ESA section 10) or Incidental Take Statement (pursuant to ESA section 7) from the Secretary of the Interior or the Secretary of Commerce, and the Director of CDFG determines that the conditions of the federal take authorization are consistent with Fish and Game Code, § 2081(b) and (c), including the requirement to fully mitigate the authorized take. If the Director makes such a determination, CDFG would issue a "consistency determination," rather than an incidental take permit (ITP). Under this alternative, CDFG would not issue the ITP and sub-permits under the Program authorizing the incidental for take of coho salmon, but instead, upon written request from individual project proponents, would review any take authorization issued by the National Marine Fisheries Service (NMFS) for coho salmon that applies to the same project for consistency with CESA. Streambed alteration agreements (SAA) would still be required for water diversions and other Covered Activities.

CDFG frequently issues consistency determinations for projects that involve incidental take of species dually-listed under CESA and ESA. However, in those instances, a federal permit (e.g., a CWA section 404 permit from the U.S. Army Corps of Engineers) has been issued for the project. In those cases, if the project could result in take of a listed species, the federal agency issuing the permit will have obtained from NMFS or the U.S. Fish and Wildlife Service (USFWS) incidental take authorization in the form of an Incidental Take Statement which NMFS or USFWS will include in its biological opinion. Coho salmon in the Program Area are listed under both CESA and ESA, but in order for SVRCD and Agricultural Operators to obtain a consistency determination from CDFG, they would need to first obtain a federal permit for the Covered Activity they want to complete, and the federal agency issuing the permit would need to consult with NMFS and obtain incidental take authorization for the activity the permit covers in accordance with ESA section 7. This assumes, of course, that the Covered Activity would require a federal permit in the first place. If a federal permit were not required and SVRCD and

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2 In part, Fish and Game Code, § 2080.1 reads as follows:

"(a) ...[I]f any person obtains from the Secretary of the Interior or the Secretary of Commerce an incidental take statement pursuant to section 1536 of Title 16 of the United States Code or an incidental take permit pursuant to section 1539 of Title 16 of the United States Code that authorizes the taking of an endangered species or a threatened species that is listed pursuant to section 1533 of Title 16 of the United States Code and that is an endangered species, threatened species, or a candidate species pursuant to this chapter, no further authorization or approval is necessary under this chapter for that person to take that endangered species, threatened species, or candidate species identified in, and in accordance with, the incidental take statement or incidental take permit, if that person does both of the following:

(1) Notifies the director in writing that the person has received an incidental take statement or an incidental take permit issued pursuant to the Endangered Species Act of 1973 (16 U.S.C.A. § 1531 *et seq*.).

(2) Includes in the notice to the director a copy of the incidental take statement or incidental take permit.

(c) Within 30 days after the director has received the notice described in subdivision (a) that an incidental take statement or an incidental take permit has been issued pursuant to the Endangered Species Act of 1973, the director shall determine whether the incidental take statement or incidental take permit is consistent with this chapter. If the director determines within that 30-day period, based upon substantial evidence, that the incidental take statement "or incidental take permit is not consistent with this chapter, then the taking of that species may only be authorized pursuant to this chapter."

Agricultural Operators wanted to obtain a consistency determination from CDFG, they would need to separately apply for an incidental take permit under ESA section 10 by submitting a Habitat Conservation Plan, obtain the permit, and then seek a consistency determination. Both processes to obtain incidental take authorization under ESA, and thereafter a consistency determination from CDFG would be costly, would take a long time (years in the case of the ESA section 10 process) to complete, and would not apply to all Agricultural Operators.

As a result, under this alternative, take authorization under CESA for the activities covered by the Program would be substantially delayed. That delay, in turn, would impede implementation of coho salmon recovery tasks and CESA compliance by Agricultural Operators, among other objectives of the Program. In the meantime, many if not all of the ongoing, historic activities the Program covers would continue along with any impacts they might have on coho salmon. Also, as mentioned above, SAAs would still be required for water diversions and other Covered Activities under this alternative. However, because CDFG may elect not to issue SAAs for projects that are not in compliance with CESA or other provisions in the Fish and Game Code under Fish and Game Code, § 1613, and each SAA issued under the Program will include the general condition that the SAA holder is responsible for complying with all applicable state laws to conduct the activity or activities the SAA covers, under this alternative, obtaining a consistency determination would in effect be a pre-requisite to obtaining a SAA or beginning the activity or activities to which the SAA applies. Such an outcome would only serve to maintain the status quo in the Program Area for a longer period of time, thereby defeating most, if not all of the Program's basic objectives. For the foregoing reasons, this alternative is not considered feasible, and therefore is rejected from further consideration.

5.1.2 Rejected Alternative 2: Adjudication of Water Rights

Statutory adjudication is a process by which the comprehensive determination of all water rights in a stream system is made by the State Water Resources Control Board (SWRCB). The process begins when a claimant petitions SWRCB for an adjudication and SWRCB finds the action necessary and in the public interest. The California Supreme Court has held that claimants or petitioners may include not only water users, but also those seeking recognition of public trust values on a stream-wide basis. If SWRCB grants the petition, SWRCB staff would investigate the matter and issue a report which would include a draft Order of Determination. A hearing would then be held on objections to the draft report, after which SWRCB would adopt a final Order of Determination and file it with the appropriate superior court. Any objections to SWRCB's final order would be heard by the court, after which the court would render a decision. The final step in the process is a decree by the court that determines all water rights within the disputed system (SWRCB, 2007). Typically, this process takes 10 to 20 years to complete.

All appropriative water rights in the Shasta River and its tributaries were adjudicated in 1932 by the Siskiyou County Superior Court, rather than SWRCB. As a result, under this alternative, the water rights the decree covers would be re-adjudicated to protect public trust values, particularly the salmonid fishery in the Shasta River and its tributaries, primarily by reducing the volume and restricting the timing of surface water diversions, as well as interconnected groundwater withdrawals. While this alternative could be effective in avoiding or lessening some of the Program's significant impacts, it would not meet the Program's basic objectives to implement selected key coho salmon recovery tasks (other than increasing streamflow) and to facilitate compliance by the Shasta Valley Resource Conservation District (SVRCD), Agricultural Operators, and the California Department of Water Resources (DWR) with Fish and Game Code, § 1600 *et seq.* and/or CESA, which the Program would accomplish in part by establishing a watershed-wide set of terms, conditions, and mitigation measures for ongoing agricultural operations to ensure that take of coho salmon is avoided, minimized, and mitigated. Also, any re-adjudication would not apply to any water rights based on riparian claim unless the court or SWRCB[3] agreed to include those claims as part of the re-adjudication. In order to implement this alternative, there must be at least one willing party affected by the decree to petition the court or SWRCB in the first place, but that party has not been identified at this time. As mentioned above, re-opening the decree would be a very time-consuming and expensive alternative that given the multitude of interested parties would be very controversial and uncertain in its outcome. Any expense would substantially increase if SWRCB conducted the re-adjudication, and in doing so were required to comply with CEQA. Finally, it is not certain that any re-adjudication would go far enough to adequately protect public trust resources. For the foregoing reasons, this alternative is rejected from further consideration.

5.1.3 Rejected Alternative 3: Hatcheries

This alternative would involve operation of one or more hatcheries on the Shasta River to augment or replace natural reproduction of coho salmon. Rather than taking measures to ensure that natural coho salmon spawning and rearing habitat are protected and enhanced, this alternative would substitute natural reproduction and rearing with hatchery reproduction and rearing. The alternative is rejected because it does not meet two basic objectives of the Program: the implementation of selected key coho salmon recovery tasks and compliance Fish and Game Code, § 1600 *et seq.* and/or CESA by SVRCD, Agricultural Operators, and DWR in the Program Area.

5.1.4 Rejected Alternative 4: Expanded Program Area

The total area within SVRCD's boundaries is considerably larger than the Program Area, as defined for the Program. The Shasta River watershed makes up only a portion of the district, which also includes much of the Upper McCloud River watershed, the Upper Sacramento River watershed, and the Middle Klamath River watershed (SVRCD, 2001). Under this alternative, the geographic scope of the Program would be expanded to include all areas within SVRCD's boundaries.

3 It is not clear whether the court, SWRCB, or both has authority to modify the decree. Section X of the decree (pages 243-244) provides, "That jurisdiction of this cause shall be retained for a period of three years to entertain a motion or application by the state water commission [now SWRCB], or any party affected by this judgment and decree, at any time within said three years from date of entry hereof, for a modification of the decree in so far as the same determines quantities of water, and after hearing said motion or application and any competent and admissible evidence offered in support of or against said motion or application the court may modify this decree by increasing or decreasing the quantities of water herein allowed as the interests of justice may require."

This alternative would meet most the Program's objectives because the only difference would be to expand the geographic scope of the Program. However, because two sub-basins within SVRCD's boundaries are outside of the range of anadromous salmonids and agricultural areas outside of the Shasta River watershed are few, sparse, and limited in extent, this alternative would have little additional benefit compared to the Program. Furthermore, because this alternative simply expands the geographic scope of the Program, it would not avoid or substantially lessen any of the significant impacts of the Program. For the foregoing reasons, this alternative is rejected from further consideration.

5.1.5 Rejected Alternative 5: Trap and Truck

Dwinnell Dam, located on the Shasta River approximately 37 miles upstream of its confluence with the Klamath River, was constructed in 1928 and is operated by the Montague Water Conservation District (MWCD). The dam presents a total barrier to salmonid migration. The watershed areas upstream of the dam are known or assumed to contain prime spawning and rearing habitat for salmonids (CDFG, 1997) although no habitat surveys of these streams have been conducted. CDFG estimates that the construction of Dwinnell Dam eliminated access to approximately 22 percent of the total spawning habitat formerly available to salmon and steelhead (CDFG, 1997). In addition, Lake Shastina contains populations of non-native predatory fish species that may be transferred to the Shasta River through unscreened releases.

ITP Additional SVRCD and Sub-Permitee Avoidance and Minimization Obligation J – Dwinnell Dam and the Montague Water Conservation District (Article XV) includes the requirement that MWCD prepare a feasibility study that would evaluate, among other issues, the possibility of providing fish passage at Dwinnell Dam. However, due to the warm water conditions of the reservoir and the presence of predatory species, traditional passage facilities such as a fish ladder may expose coho salmon and other anadromous salmonids to excessive temperature and predation pressures during their up- and downstream migrations through the reservoir.

This alternative would require MWCD to study the general feasibility of a trap-and-truck operation at Dwinnell Dam for the purpose of enabling upstream and downstream migration of coho salmon and other salmonids. A typical trap-and-truck operation would require a downstream collection facility to trap up-migrating adults, transporting them by truck into the upper watershed for release during the winter, and a similar facility above the reservoir to trap down-migrating smolts in the spring, transporting them to reaches downstream of the dam. Activities related to capturing, handling, transporting, and releasing adult and smolt coho and other salmonids would subject fish to a considerable amount of stress and incidental mortalities would be expected. Because an actual trap-and-truck operation at Dwinnell Dam could result in considerable take of coho salmon with dubious benefits for recovery of the species, and such take would need to be fully mitigated under CESA, it would serve no purpose to study its feasibility. For the foregoing reasons, this alternative is rejected from further consideration.

5.1.6 Rejected Alternative 6: Expanded Range of Covered Activities Alternative[4]

Under this alternative, the scope of the Program would be increased to include not only the activities of SVRCD, Agricultural Operators, and DWR, but also other types of water diversions (e.g., industrial, municipal, or domestic) and other non-agricultural activities within the Shasta River watershed, such as timber harvest, forest and ranch road building and maintenance, and grading, that have the potential to result in take of coho salmon. This alternative would also provide for purchase from willing ranchers and farmers of conservation easements over agricultural lands, lands adjacent to watercourses to establish or widen riparian buffer zones, or other lands that if protected by a conservation easement would benefit fish and wildlife species in the Program Area.

This alternative would greatly increase the number of parties eligible for participation in the Program and result in a major increase in the number of activities CDFG would need to analyze under CEQA and for which CDFG would need to issue SAAs and sub-permits. This would significantly increase CDFG's and SVRCD's workload under the Program to a degree that could make the Program infeasible. Also, because this alternative would expand the number and types of activities under the Program, it would not serve to avoid or substantially lessen the Program's potential significant effects unless those effects were offset by any conservation easements acquired under this alternative. The degree to which the conservation easement element under this alternative would further the objectives of the Program, as well as its feasibility, depends on many variables, including the number of willing sellers; purchase, transaction, and maintenance costs; available monies to cover those costs; and the location of the "conservation lands." Finally, conservation easements currently can be purchased from willing sellers outside the Program. For the foregoing reasons, it is rejected from further consideration.

5.1.7 Rejected Alternative 7: Dwinnell Dam Removal

Dwinnell Dam was completed in 1928 without provision for fish passage. As mentioned above, the dam, which creates Lake Shastina, is owned and operated by MWCD. Although it was built to impound 74,000 acre feet, the Department of Water Resources currently limits storage to 50,000 acre feet. MWCD supplies water to the City of Montague and to agricultural operators through a 60-mile long canal and ditch system. Lake Shastina receives the full flow of the upper Shasta River and its tributaries, and a portion of the flow of Parks Creek through the Parks Creek diversion ditch.

CDFG estimates that the construction of Dwinnell Dam eliminated access to approximately 22 percent of the total spawning habitat formerly available to salmon and steelhead in the Shasta River watershed (CDFG, 1997). In addition, Lake Shastina harbors populations of non-native predatory fish species that may be transferred to the Shasta River through unscreened releases.

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[4] This alternative was developed partially to address scoping comments which suggested the purchase of conservation easements from farmers and ranchers to establish a sufficiently wide riparian zone for protection of coho salmon.

The National Research Council states that the benefits of removal of Dwinnell Dam for coho salmon should be seriously evaluated on the grounds that it blocks substantial amounts of coho habitat and degrades downstream habitat (NRC, 2004). The Recovery Strategy for California Coho Salmon (Coho Recovery Strategy) includes a recommendation (Task HM-2b) to conduct an assessment of options and to develop a long-term solution for fish passage at Dwinnell Dam (and also Greenhorn Dam on Greenhorn Creek, a tributary to Yreka Creek), including consideration of modification or removal of the dam (CDFG, 2004).

ITP Additional SVRCD and Sub-Permitee Avoidance and Minimization Obligation J – Dwinnell Dam and the Montague Water Conservation District (Article XV) requires MWCD, as a sub-permittee, to prepare a feasibility study to evaluate, among other issues, the possibility of providing fish passage at Dwinnell Dam. Due to the warm water conditions of the reservoir and the presence of predatory species, however, traditional passage facilities such as a fish ladder may expose coho salmon and other anadromous salmonids to excessive temperature and predation pressures during their up- and downstream migrations through the reservoir.

This rejected alternative would require MWCD, as a sub-permittee, to decommission and dismantle Dwinnell Dam and some associated facilities, in order to avoid, minimize, and mitigate take currently associated with the dam. This would restore a free-flowing river and enable passage of coho salmon and other anadromous fish to spawning and rearing habitat in the upper Shasta River and its tributaries. These streams may feature cold water, relatively unimpaired flow, abundant spawning gravel, and good riparian conditions, but habitat surveys of these streams have not been conducted. Removal of the dam and establishment of summer bypass flows would eliminate the problem of predatory warm water fish breeding in the reservoir, and would improve water quality in the Shasta River below the dam site.

The major adverse impacts associated with removal of Dwinnell Dam would include effects on existing water supply systems, loss of recreational opportunities, and effects associated with construction of new off-stream storage capacity and related diversion and conveyance features. There is insufficient information to discern the severity of other impacts, including release of sediments from behind the dam (and the quality of these sediments) and effects on flooding in the Shasta Valley, as well as the benefits of dam removal.

Decommissioning and dismantling Dwinnell Dam and some associated facilities would be feasible if it could be accomplished in a manner that would preserve the ability of MWCD to divert and deliver water. MWCD currently delivers approximately 17,000 acre feet of water per year over the six-month irrigation season (for an average of approximately 94 acre feet per day). Water conservation programs could reduce the demand for water and decrease the volume of water to be diverted, stored, and delivered. Continuation of water deliveries could possibly be accomplished through a combination of surface water diversions directly into MWCD's canal and ditch system during the spring and early summer and off-stream storage in surface reservoirs or through infiltration into an aquifer filled from high spring flows. All diversions would be screened according to NMFS – CDFG guidelines, and fish passage would be built into any diversion structure. However, even if MCWD were able to continue diverting and delivering water without Dwinnell Dam, CDFG does not have the statutory authority to require MCWD to decommission and dismantle the dam, and it does not appear that other governmental agencies have such authority. For that reason alone, this alternative might not be feasible.

More fundamentally, Dwinnell Dam and its impacts on the hydrology and aquatic resources of the Shasta River are part of existing physical conditions in the Program Area (i.e., it is part of the baseline), which will continue with or without the Program. Hence, this alternative would not avoid or directly mitigate the impacts associated with the Program. Still, decommissioning and dismantling the dam might serve to facilitate some of the Program's objectives in regard to recovery of coho and other salmonids, but even that depends on the suitability and extent of the spawning and rearing habitat in the upper Shasta River and its tributaries that coho salmon and other salmonids would have access to if the dam were removed.

Finally, this alternative would not meet the other objectives of the Program, including, for example, compliance by Agricultural Operators with Fish and Game Code, § 1600 *et seq.* and CESA and implementation of other coho recovery tasks. That would not be the case if removing Dwinnell Dam were included as another element of the Program, but it would make little sense to do so because, as explained above, removal of Dwinnell Dam does not appear feasible in the first instance, whether by itself or as part of the Program.

Based on the foregoing, this alternative is rejected from further consideration.

5.2 Alternatives Considered

The three alternatives evaluated in this Draft EIR are described and analyzed below. The two tables at the end of this Chapter compare the alternatives with the Program. **Table 5-1** compares the impacts associated with each alternative to the Program's impacts; **Table 5-2** compares the ability of each alternative to meet the Program's objectives.

5.2.1 No Program Alternative

Alternative Description

Discussion of the "no program" alternative (No Program Alternative) must examine the existing conditions and reasonably foreseeable future conditions that would exist if the Program were not approved (CEQA *Guidelines*, § 15126.6(e)). Under the No Program Alternative, CDFG would not issue a watershed-wide ITP or enter into a watershed-wide SAA Memorandum of Understanding (MOU) and Master List of Terms and Conditions (MLTC). Instead, SVRCD, DWR, and each Agricultural Operator would need to comply with Fish and Game Code, § 1600 *et seq.* and/or CESA on an individual basis. CDFG would prepare individual ITPs and SAAs as it received notifications and ITP applications. Under this approach, CDFG would need to conduct an appropriate level of CEQA review prior to issuing each individual ITP and SAA.

Individual applicants would be responsible for reimbursing CDFG for the cost of preparing the CEQA document for their ITPs and SAAs. The time required to prepare individual CEQA documents for a large number of agricultural diversions in the Shasta River watershed could cause construction delays for Agricultural Operators. It is likely that many Agricultural Operators could not afford or would choose not to go through with an individual permitting process, potentially resulting in some Agricultural Operators operating either out of compliance with Fish and Game Code, § 1600 *et seq.* and CESA or terminating their usual operations.

Environmental Impacts

Aesthetics

The Program would not result in any significant aesthetic impacts. Similarly, the No Program Alternative would not have significant aesthetic impacts.

Air Quality

Neither the Program nor the No Program Alternative would have a significant impact on air quality.

Biological Resources: Fisheries and Aquatic Habitat

The No Program Alternative would not provide a programmatic framework to facilitate implementation of selected key coho salmon recovery tasks, as identified in the Shasta-Scott Recovery Team Recommendations for Coho Salmon, nor feature a watershed-wide set of terms, conditions, and mitigation measures for ongoing agricultural operations. In summary, the No Program Alternative would likely result in a higher level of unauthorized and unmitigated take of coho salmon, and more severe impacts on other fish species when compared with the Program as proposed. However, compared to existing conditions without the Program, this alternative's impacts on fisheries and aquatic habitat would be the same.

Biological Resources: Botany, Wildlife, and Wetlands

The No Program Alternative would not provide a watershed-wide set of terms, conditions, and mitigation measures protecting not only coho salmon, but also riparian, terrestrial, and wetland biological resources. The result would likely be more instances of disturbance or destruction of sensitive biological resources, compared with the Program, although conditions protecting resources would be included in individual ITPs and SAAs.

Geology, Soils, and Seismicity

Neither the Program nor the No Program Alternative would be expected to have a substantial adverse impact on geology, soils, or seismicity. See the following section for geophysical effects.

Geomorphology, Hydrology and Water Quality

Because the No Program Alternative would not include watershed-wide measures to restore coho salmon habitat and to modify surface water diversions and other agricultural practices, it is likely that this alternative would involve fewer construction activities than the Program. Construction-related impacts to streams in the Shasta River watershed would therefore likely be less widespread under this alternative.

Even if individual SAAs and ITPs issued under this alternative included measures to enhance streamflow, it is unlikely that such measures would be as well-coordinated or as widespread as those that would occur under the Program as proposed. Therefore, such measures would be unlikely to be as effective as they would be under the Program, and compared with the Program as proposed, the resulting conditions of streams and water quality would be worse. They would be the same as with existing conditions.

Land Use and Agriculture

It is likely that compliance with Fish and Game Code, § 1600 *et seq.* and CESA under the No Program Alternative would be more costly and time-consuming for Agricultural Operators. Individual Agricultural Operators would be responsible for submitting an ITP application through the standard process and notifying CDFG of diversions and work in and around the bed, banks, and channel of streams. The No Program Alternative also would not have the Program's advantage of relatively available funding to cover costs of Program requirements. Agricultural Operators and SVRCD would continue to have to seek funding from a variety of competitive funding sources (CDFG, NMFS, Natural Resources Conservation Service, and USFWS).

It is likely, therefore, that the No Program Alternative would have a greater adverse impact on maintaining a viable agricultural enterprise while simultaneously complying with Fish and Game Code, § 1600 *et seq.* and CESA. For this reason, and using the same logic as discussed in Impact 3.1-1 in Chapter 3.1, Land Use and Agriculture, it is likely that the No Program Alternative would result in a more severe impact associated with the potential pressure for agricultural land use conversion. This would be a potentially significant impact of this alternative.

Noise

Neither the Program nor the No Program Alternative would be expected to have a substantial noise impact.

Public Utilities, Service Systems and Energy

Because the No Program Alternative would not provide incidental take authorization for Covered Activities, or facilitate Agricultural Operators' compliance with Fish and Game Code, § 1600 *et seq*., this alternative would be expected to result in fewer construction projects and fewer alterations to the existing system of diverting and conveying irrigation water. Therefore, this alternative would be expected to have similar, but less severe impacts to public utilities, service systems, and energy than the Program.

Hazards and Hazardous Materials

As stated in the previous paragraph, the No Program Alternative would likely result in fewer construction projects, and would therefore be less likely to encounter previously unknown hazardous materials, or to cause wildfire. On the other hand, more haphazard permitting and implementation of projects under this alternative could result in less uniform and less stringent application of protective measures to prevent or mitigate for such occurrences. On balance, this alternative would have about the same level of impacts of this kind as the Program.

Cultural Resources

Cultural resources impacts of the No Program Alternative would be about the same as the Program: ongoing land disturbance associated with agricultural activities and stream habitat restoration projects could cause significant impacts, but these could be reduced to less than significant with feasible mitigation measures.

Transportation and Traffic

Because this alternative would not generate substantial new traffic or affect existing roadways, it would not be expected to have a substantial adverse impact on traffic.

Mineral Resources

Because this alternative would not affect the ability to recover identified mineral deposits, it would not be expected to have significant impacts on mineral resources.

Population and Housing

There are no population and housing impacts of the Program, or of this alternative.

Public Health and Safety

Neither the Program nor this alternative would be expected to have a substantial impact on public health and safety.

Recreation

Neither this alternative nor the Program is expected to affect existing recreational uses in the Program Area, or to generate demand for new recreational uses. Therefore, neither the Program as proposed, nor this alternative, would have an impact on recreation.

Ability of the No Program Alternative to Meet Program Objectives

Although the implementation of the No Program Alternative would meet several of the stated objectives of the Program (see Table 5-2), it would not be as effective or efficient at bringing existing agricultural water diverters into compliance with Fish and Game Code, § 1600 *et seq.* and CESA. Most importantly, the No Program Alternative would be less effective at accomplishing or implementing mitigation measures identified in the ITP, accomplishing watershed-wide coordination and implementation of selected key coho salmon recovery tasks, and would not be consistent with commitments identified in the Coho Recovery Strategy.

5.2.2 Instream Flow Alternative

Alternative Description

The Instream Flow Alternative would include the Program as proposed and would also include other measures to increase streamflow in the Shasta River, including the development of off-stream surface water storage reservoirs to capture winter runoff. The stored water would be used to benefit the cold water fisheries by increasing streamflow as necessary to assist fish migration, increase rearing habitat, maintain cooler water temperatures, and improve the potential for riparian vegetation survival. All of these issues are identified in the Limiting Factors Analysis in Chapter 3.3, Biological Resources: Fisheries and Aquatic Habitat, as major factors limiting coho salmon production in the Shasta River watershed. Where practical, water may be piped or pumped from reservoirs directly into existing water conveyance systems in exchange for reductions in the volume of water diverted from the Shasta River and tributaries. The stored water would not be used to increase the existing irrigated acreage or allow for additional water to be diverted for agricultural purposes.

The Program already contains several provisions to increase instream flows, including SVRCD's ITP Flow Enhancement Mitigation Obligation (Article XIII.E.2.(a)), Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligation A: Water Management (Article XV), and MLTC Conditions 26 ~~25~~ (bypass flows at diversions).

The Shasta-Scott Pilot Program of the Coho Recovery Strategy contains additional recommendations for "water augmentation" actions for the Shasta River watershed, including the following:

- If feasible, construct large (off-stream) surface-water storage reservoirs;
- If feasible, raise the level of existing small lakes or create storage using small off-stream reservoirs rather than one large reservoir; and
- If legal and feasible, create a new diversion from the Klamath River above Irongate Dam to the Shasta Valley, to provide irrigation water to the Shasta Valley and reduce local surface water diversions and groundwater pumping.

The Instream Flow Alternative would be identical to the Program except that it would also include the additional measures from the Coho Recovery Strategy listed above. Specifically, this alternative would involve implementing those Coho Recovery Strategy recommendations regarding water augmentation which are found to be feasible and appropriate. While no single alternative water supply may be sufficient to result in significant gains in instream flows, a combination of the potential sources discussed above may provide for more suitable water flows and temperatures for rearing coho during the summer and fall months. Furthermore, until the studies are conducted to determine the feasibility of the various measures considered for development of new water supplies, the type and extent of physical impacts of this alternative cannot be determined. Therefore, the following analysis assumes that all of the additional measures listed above would be found to be feasible and appropriate, and would be implemented under this alternative in addition to all of the flow enhancement provisions of the Program as proposed.

Environmental Impacts

Aesthetics

Some of the aspects of this alternative, such as development of large reservoirs and construction of a conveyance facility to bring water from the Klamath River to the Shasta Valley, would alter the visual character of the area, and may cause a significant aesthetic impact not caused by the Program itself; thus, significant aesthetic impacts may be expected to occur under this alternative.

Air Quality

Some aspects of this alternative, particularly construction of a large surface reservoir and a pipeline to deliver water from the Klamath River to the Shasta River (Klamath pipeline), could have air quality impacts related to use of heavy equipment and earth-moving, as well as potential effects on air quality of the reservoir itself (notably the potential for production of methane, a potent greenhouse gas), not experienced by the Program. While such impacts could be at least partially mitigated, there is insufficient information available to determine whether, after mitigation, the impacts would remain significant. This alternative's air quality impacts are, therefore, potentially more severe than those of the Program as proposed, and have the potential to be significant.

Biological Resources: Fisheries and Aquatic Habitat

A new, large diversion from the Klamath River could have consequences for the fisheries of the mainstem Klamath. Since, however, the Shasta River enters the Klamath a short distance below Irongate Dam, increased coldwater flows from the Shasta into the Klamath would be expected to compensate for potential effects further upstream. Nevertheless, there could be local impacts to fisheries. In sum, this alternative could result in beneficial impacts to fisheries and aquatic habitat not associated with the Program as proposed, but could also cause significant impacts not associated with the Program.

Biological Resources: Botany, Wildlife, and Wetlands

This alternative could have an adverse impact on terrestrial and wetland biological resources. Again, most impacts of this nature would be associated with development of large surface reservoirs and construction of conveyance facilities to bring water from reservoirs to existing agricultural ditches (where practical) or from the mainstem Klamath to the Shasta Valley. Impacts could be significant and unavoidable, and more severe than with the Program.

Geology, Soils, and Seismicity

Several aspects of this alternative, including the development of one or more large reservoirs and the eventual construction of conveyance facilities to bring water from reservoirs to existing agricultural ditches (where practical) or from the mainstem Klamath to the Shasta Valley, could cause short-term and long-term erosion problems. Areas where reservoirs would be situated would have to be evaluated for dynamic (seismic) and static stability, risk of landslide, and other geological risks. In all, this alternative poses greater potential for significant impacts of this nature than the Program.

Geomorphology, Hydrology and Water Quality

This alternative would have the potential for restoring the natural hydrologic regime in some tributary streams, and perhaps in the mainstem Shasta River (if it were coupled with modification of Dwinnell Dam operations or the removal of Dwinnell Dam). However, it is unclear how high winter and spring flows would be captured for storage. Also unclear is whether such major changes could be effected given existing water rights and the 1932 Shasta River Adjudication and Proceedings Judgment and Decree. Because this alternative may seek to replace some existing diversions with other water sources that would have less of an effect on stream flows and water quality, it could be expected to have fewer and less severe impacts of this nature, compared with the Program as proposed, however, there would be the potential for significant localized impacts not associated with the Program.

Land Use and Agriculture

The Instream Flow Alternative could require the alteration of some existing land uses and land use designations in the Shasta River watershed, for example, the conversion of agricultural land or forest land to reservoirs; this could cause a significant impact not associated with the Program as proposed.

It is unclear what effect this alternative would have on the income of agricultural operations, and by extension on pressures to convert agricultural land to other uses. On the one hand, new water storage and conveyance facilities could provide a more predictable water supply in most years, and so could increase and stabilize farm income, thereby decreasing pressures to convert agricultural land to other uses. On the other hand, the new system would be expensive to construct and to operate, perhaps resulting in higher cost to Agricultural Operators for irrigation water, which would increase pressures to convert agricultural land to other uses. In all, this alternative would potentially have more impacts, including potentially significant impacts on existing land uses, including agriculture, than the Program.

Noise

Noise from equipment and activities associated with new reservoir and Klamath pipeline construction may introduce new noise sources into areas with sensitive receptors, causing a noise impact not associated with the Program.

Public Utilities, Service Systems, and Energy

The Instream Flow Alternative, with its creation of new surface reservoirs would also require, in some areas, construction of new lateral ditches and pipes, or alteration of existing ones, to convey water from the reservoir(s) to any existing conveyance ditches (where feasible). Overall, there is a potential for this alternative to have significant impacts on Public Utilities, Service Systems, and Energy, but mitigation measures may be available to reduce some or all such impacts. In summary, these impacts are likely to be more extensive and more severe than similar impacts of the Program as proposed, and there is the potential for significant unavoidable impacts.

Hazards and Hazardous Materials

Because the Instream Flow Alternative would potentially disturb more area than the Program, and involve larger, more extensive construction projects, it would have a greater chance of encountering previously unknown hazardous materials, of causing wildfire, and of an accidental spill or upset. These impacts would likely be significant, but could be mitigated to a less than significant impact with the measures specified for the Program as proposed.

Cultural Resources

Because areas of disturbance under this alternative would be greater, e.g., from constructing one or more surface water impoundments and a major pipeline, cultural resources impacts of this alternative could potentially be greater than with the Program, and would likely be significant. Depending on the location of surface water impoundments and the Klamath pipeline, impacts could be significant and unavoidable.

Transportation and Traffic

Potential transportation and traffic effects associated with the Instream Flow Alternative may include roadway impacts from heavy equipment and materials transport for reservoirs and Klamath pipeline construction and the possible need to construct new roads to reservoir sites. If a large surface water impoundment were to have recreational uses, it could cause an increase in traffic over sparsely used roadways in the Shasta Valley. In sum, transportation and traffic impacts could be significant, and may be expected to be more severe than those associated with the Program as proposed.

Mineral Resources

Neither the Program nor this alternative is expected to have significant impacts on mineral resources.

Population and Housing

There are no population and housing impacts of the Program, or of this alternative.

Public Health and Safety

Neither the Program nor this alternative would be expected to have a substantial impact on public health and safety.

Recreation

Development of a large reservoir under this alternative could create new recreational opportunities in the Shasta Valley. Changes to operations at Lake Shastina could, however, adversely affect existing recreational uses. In sum, recreational impacts could be significant, and more severe than with the Program as proposed, but could be expected to be mitigated.

Ability of the Alternative to Meet Program Objectives

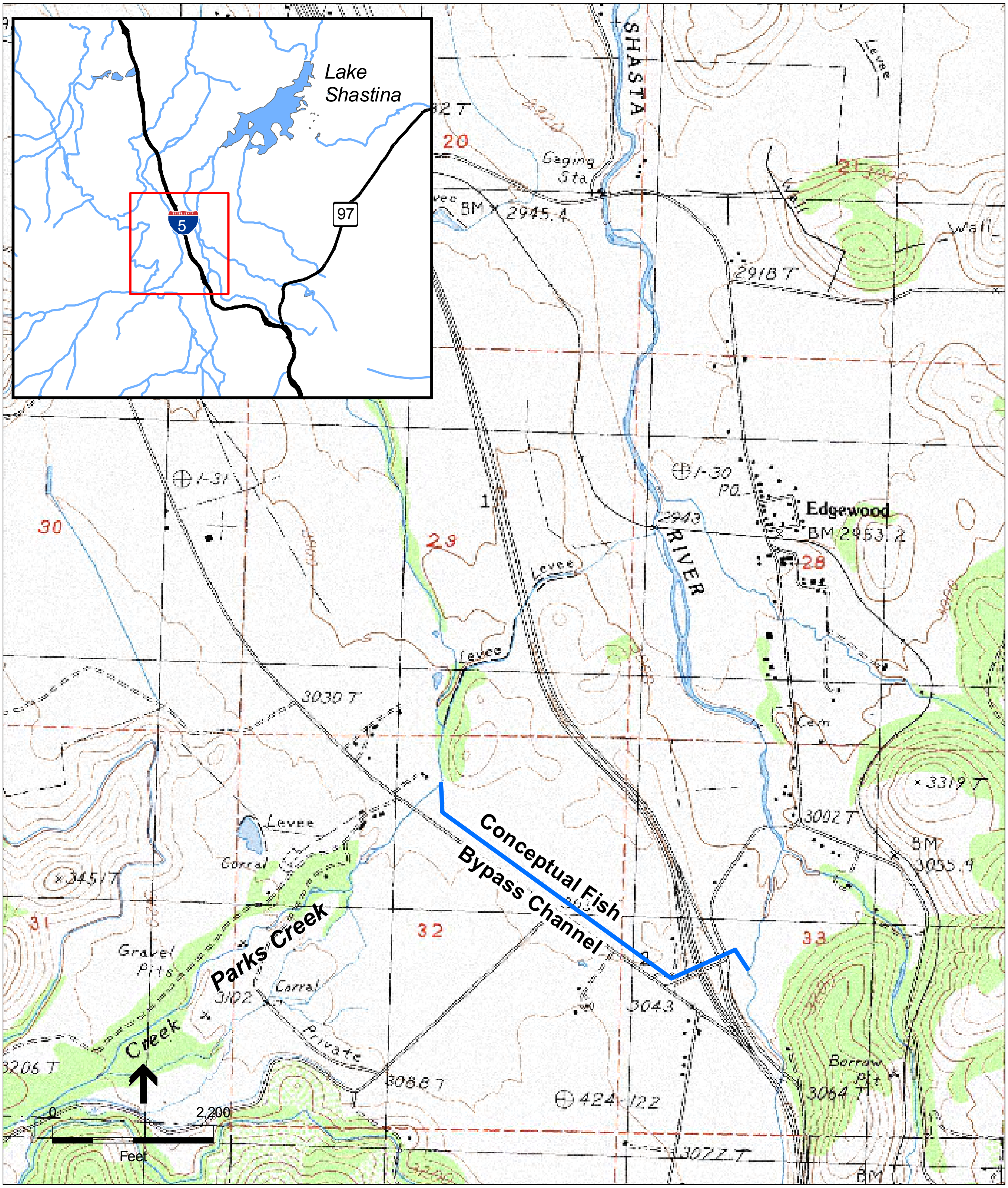
Under the Instream Flow Alternative, all of the objectives of the Program would be met and, if feasible, water augmentation measures identified in the Coho Recovery Strategy would be implemented. Where the potential for take of coho salmon still existed, such as ongoing surface water diversion and other agricultural activities and restoration actions undertaken by SVRCD, ITPs and SAAs still would be required. Impacts from this alternative, particularly those associated with reservoir and Klamath pipeline construction, would be greater than those of the Program. The feasibility, costs, and funding mechanisms for this alternative, and for its individual elements (including development of new off-stream reservoirs and any conveyance facilities) have not yet been studied, nor have such studies themselves been funded; therefore the feasibility of this alternative is questionable.

5.2.3 Parks Creek-Upper Shasta River Fish Bypass Channel

This alternative would add to the Program the additional element of fish passage to the Shasta River above Lake Shastina. Under this alternative, MWCD would be required to work with CDFG and other agencies and, if necessary, private landowners, to construct a fish bypass channel from Parks Creek to the Shasta River above the lake.

The bypass channel could be in the vicinity and upstream of the existing Parks Creek diversion operated by MWCD, but would flow in the opposite direction. The Parks Creek Diversion flows from Parks Creek into the Shasta River; the fish bypass channel would flow from the Shasta River into Parks Creek. The channel would be operated during spawning migration and smolt out-migration, i.e., approximately October 1 to June 1. During spawning migration coho salmon and other anadromous species could migrate up Parks Creek to the point where the bypass channel would enter Parks Creek as a tributary. Fish would have the opportunity to continue up Parks Creek, or into the bypass channel and thence into the upper Shasta River. During smolt out-migration, fish would travel down the bypass channel into Parks Creek, and from there to the mainstem Shasta River below Dwinnell Dam. It would be necessary to place fish screens on the mainstem Shasta just downstream of the bypass channel to prevent smolts from entering Lake Shastina, and to prevent spawners from straying downstream. Assuming the channel would enter Parks Creek above the existing diversion, a fish screen would be necessary on the Parks Creek diversion to prevent smolts from returning to the Shasta River. MWCD is currently investigating the feasibility of installing a fish screen at this location. A preliminary conceptual alignment for the Parks Creek-Upper Shasta River Fish Bypass Channel is shown in **Figure 5-1**. In this figure, the channel crosses Interstate 5 at an existing underpass (at the Edgewood-Gazelle exit off of Interstate-5) and continues along Old Highway 99 for most of its length.

A determination of the technical feasibility of a Parks Creek-Upper Shasta River Fish Bypass Channel is beyond the scope of this Draft EIR. Preliminarily, there appear to be two major technical issues: 1) maintenance of an adequate flow through the channel during the fall spawning migration to attract fish and to sustain adequate conditions for fish survival and passage within the channel itself; and 2) screening both the mainstem Shasta below the bypass channel and also



Project Name . 206063

SOURCE: USGS, 2005; ESA, 2006

Figure 5-1
Parks Creek-Upper Shasta River Fish Bypass: Preliminary Conceptual Alignment

the existing Parks Creek diversion channel. In addition, this alternative would require establishment of a right-of-way for the channel; the land through which the by-pass would flow is in both public and private ownership. While these are potentially substantial impediments to the implementation of this alternative, they do not necessarily render it infeasible. While this alternative could affect existing water rights, it is assumed that water diverted out of the mainstem Shasta into Parks Creek would be diverted back to the mainstem Shasta through the existing diversion channel.

Environmental Impacts

Aesthetics

Construction of a Parks Creek-Upper Shasta River fish bypass channel would not be expected to affect scenic views or to alter substantially the character of the area, and would therefore not be expected to have a significant aesthetic impact. Construction and maintenance of a fish screen on the Shasta River could be visible from Interstate 5 or from local roads, but likely would cause a less-than-significant impact that would not be more severe than impacts under the Program as proposed.

Air Quality

Construction of a Parks Creek-Upper Shasta River fish bypass channel would not be expected to have significant air quality impacts. The only associated air quality impacts would be short-term, relatively minor emissions related to construction of the bypass channel. Air quality impacts would therefore be the same as with the Program as proposed.

Biological Resources: Fisheries and Aquatic Habitat

Construction of a Parks Creek-Upper Shasta River fish bypass channel would likely have a positive net benefit for all three of the anadromous species that inhabit the Shasta River watershed. There would, however, likely be some take associated with the fish screens on the Shasta River and on Parks Creek. With good design, construction, and operation of screens (assuming they are feasible), take could be avoided or minimized. Restoring access to miles of spawning and rearing habitat would be expected to mitigate for any take that would occur. Overall, this alternative would have a greater net benefit for coho salmon and other salmonids than the Program as proposed.

Biological Resources: Botany, Wildlife, and Wetlands

Construction of a Parks Creek-Upper Shasta River fish bypass channel could have an impact on other biological resources, depending on the alignment of the bypass channel. It is likely that any such impacts would be limited to a small area and could be mitigated to less than significant. Overall, impacts of this nature would be abut the same as with the Program as proposed.

Geology, Soils, and Seismicity

Construction of a Parks Creek-Upper Shasta River fish bypass channel would not be expected to have a significant impact on soil stability or on geologic features, and therefore – like the Program itself – would not be expected to have a significant impact of this kind.

Geomorphology, Hydrology and Water Quality

Construction of a Parks Creek-Upper Shasta River fish bypass channel would alter the flow of the Shasta River and Parks Creek, and would create a new artificial channel. Flows necessary to attract migrating adults would have to be maintained; these may range from 5 to 10 cfs. As noted in the description of this alternative, the same volume of water could be re-directed to the Shasta River through the existing diversion ditch.

The presence of the bypass channel, and of the associated fish screen, could also have an effect on sediment transport in both the Shasta River and Parks Creek. Such effects would have to be evaluated in the study of this alternative's feasibility. Until then, it should be assumed that this alternative could have significant effects on sediment transport or streamflow, and that such effects may be greater than the Program as proposed.

Land Use and Agriculture

The bypass channel would not be expected to have a deleterious effect or to be incompatible with existing land uses along its alignment, nor to conflict with local land use and environmental plans and policies, though it would be necessary to secure a right-of-way for the channel over both private and public lands. As it would not affect existing water rights, this alternative would not be expected to have a significant adverse impact on agriculture, beyond that anticipated for the Program as proposed. In sum, effects of this nature would be the same as with the Program as proposed.

Noise

Noise from equipment and activities associated with construction of a Parks Creek-Upper Shasta River fish bypass channel could cause minor, short-term noise impacts not associated with the Program as proposed. Such impacts would be expected to be less than significant, and no greater than the Program as proposed.

Public Utilities, Service Systems, and Energy

This alternative would not be expected to have significant adverse impacts on public utilities, service systems, or energy, beyond those of the Program as proposed. This alternative would not affect MCWD's ability to delivery water.

Hazards and Hazardous Materials

It is possible that previously unknown hazardous materials could be unearthed and released to the environment during construction of the bypass channel. Mitigation measures specified for the Program would apply to this alternative as well, and would be expected to reduce any such impact to less than significant.

Cultural Resources

It is possible that previously unknown cultural resources or human remains could be unearthed during excavation of the bypass channel. Mitigation measures specified for the Program would apply to this Program component as well, and would be expected to reduce any such impact to less than significant.

Transportation and Traffic

Because the alignment of the bypass channel would have to cross Interstate 5, and perhaps also one or more local roads (such as Edgewood Road) there would be the potential for short-term disruption of traffic, which could result in traffic delays. Any disruption would be expected to be brief and a less-than-significant impact.

Mineral Resources

Neither the Program nor this alternative is expected to have significant impacts on mineral resources.

Population and Housing

Assuming that the alignment of the bypass channel would not pass through or near existing housing, this alternative would not have an impact on population and housing; similarly, the Program as proposed would not have an impact on population and housing.

Public Health and Safety

Neither the Program nor this alternative would be expected to have a substantial impact on public health and safety.

Recreation

Since no recreational facilities exist in the vicinity of the possible alignment of the bypass channel, and since neither the Shasta River in the affected reach nor Parks Creek has recreational use, this alternative would not be expected to have an adverse impact on existing recreational uses; such impacts would be the same as with the Program as proposed.

Ability of the Alternative to Meet Program Objectives

Because the Parks Creek-Upper Shasta River Fish Bypass Alternative would simply add a new element to the Program (i.e, a bypass channel), it would meet the same objectives as the Program, including reducing take while allowing for the continuation of agricultural operations. In addition, if the technical and legal hurdles could be overcome to implement this alternative, it would likely have a greater benefit for coho salmon and other native fisheries in the Shasta River watershed by restoring access to habitat currently unavailable due to Dwinnell Dam and Lake Shastina.

5.3 Environmentally Superior Alternative

As part of evaluation and comparison of alternatives, the CEQA *Guidelines* require that if the "no project" alternative is identified as the environmentally superior alternative, the EIR must also identify the environmentally superior alternative among the other alternatives (CEQA *Guidelines*, § 15126.6(e)(2).) The No Program Alternative is not identified in this Draft EIR as the environmentally superior alternative and, as a result, no environmentally superior alternative is identified. However, for the reasons highlighted above, CDFG generally believes the Program is environmentally superior to the alternatives considered here.

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TABLE 5-1
IMPACTS AND SIGNIFICANCE LEVELS OF ALTERNATIVES IN COMPARISON WITH THE PROGRAM

Impact and Significance Level with Mitigation Measures Identified in This Report	No Program	Instream Flow	Parks Creek Bypass
Land Use and Agriculture			
Impact 3.1-1: The Program could result in the conversion of agricultural land within the Shasta River watershed to non-agricultural uses (Less than Significant).	Greater Impact	Greater Impact	Same Impact
Geomorphology, Hydrology and Water Quality			
Impact 3.2-1: Certain construction activities performed under the Program could result in increased erosion and sedimentation and/or pollutant (e.g., fuels and lubricants) loading to surface waterways, which could increase turbidity, suspended solids, settleable solids, or otherwise decrease water quality in surface waterways (Less Than Significant with Mitigation).	Lesser Impact	Greater Impact	Greater Impact
Impact 3.2-2: Certain instream structures proposed to increase fish habitat as part of the Program would be installed within a flood hazard area and could impede or redirect flood flows (Less Than Significant).	Lesser Impact	Same Impact	Same Impact
Impact 3.2-3: Installation and operation of instream structures permitted under the Program could alter channel stability and degrade water quality by increasing turbidity downstream (Less Than Significant with Mitigation).	Same Impact	Same Impact	Same Impact
Impact 3.2-4: The Program could result in an increase in the extraction of groundwater, which could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries (Less Than Significant).	Lesser Impact	Lesser Impact	Same Impact
Biological Resources: Fisheries and Aquatic Habitat			
Impact 3.3-1: Construction, maintenance, and other instream activities associated with various Covered Activities may result in impacts to fisheries resources and their habitat (Less Than Significant with Mitigation).	Greater Impact	Same Impact	Same Impact
Impact 3.3-2: Increased extraction of groundwater could contribute to decreased baseflows and increased ambient water temperatures in the Shasta River and its tributaries, thereby impacting coldwater fish habitat (Less Than Significant).	Lesser Impact	Lesser Impact	Same Impact
Biological Resources: Botany, Wildlife, and Wetlands			
Impact 3.4-1: The Program could result in impacts to special-status plant or animal species (Less Than Significant with Mitigation).	Greater Impact	Greater Impact	Same Impact
Impact 3.4-2: Construction of new and maintenance and repair of existing stream access and crossings could result in impacts to special-status plant or animal species (Less Than Significant).	Greater Impact	Same Impact	Same Impact
Impact 3.4-3: ITP Covered Activity 10, the grazing of livestock within the riparian exclusion zone ~~bed, bank, or channel~~ of a stream different from current operations (i.e., not part of baseline conditions), could impact sensitive habitat and special-status species (Less Than Significant with Mitigation).	Greater Impact	Same Impact	Same Impact
Impact 3.4-4: ITP Covered Activities may result in incidental discharge of fill into wetlands under federal jurisdiction causing temporary direct and indirect impacts to wetland function (Less Than Significant).	Greater Impact	Greater Impact	Same Impact
Impact 3.4-5: Water efficiency measures required by the Program could in some instances significantly impact nesting special-status birds (Less Than Significant with Mitigation).	Greater Impact	Same Impact	Same Impact

Comparison of severity of impacts of Alternatives with impacts of the Program, as mitigated in this EIR.

Greater Impact = The Alternative would have a greater (or less favorable) impact than under the proposed Program.
Lesser Impact = The Alternative would have a lesser (or more favorable) impact than under the proposed Program.
Same Impact = The Alternative would have about the same level of impact as the proposed Program.

This table presents a comparison of environmental impacts that were identified under the proposed Program with each of the Alternatives. Any additional environmental impacts that would potentially occur under each of the Alternatives are presented in the text discussion.

TABLE 5-1 (continued)
IMPACTS AND SIGNIFICANCE LEVELS OF ALTERNATIVES IN COMPARISON WITH THE PROGRAM

Impact and Significance Level with Mitigation Measures Identified in This Report	No Program	Instream Flow	Parks Creek Bypass
Cultural Resources			
Impact 3.5.1: Impacts to known and unknown cultural resources may result either directly or indirectly during the implementation and operational phases of a Covered Activity under the Program (Less Than Significant with Mitigation).	Same Impact	Greater Impact	Same Impact
Impact 3.5.2: Covered Activities could adversely affect known or unknown paleontological resources (Less Than Significant with Mitigation).	Same Impact	Greater Impact	Same Impact
Impact 3.5.3: Covered Activities could result in damage to previously unidentified human remains (Less Than Significant).	Same Impact	Greater Impact	Same Impact
Hazards and Hazardous Materials			
Impact 3.6-1: Construction activities could result in discovery and release of previously unidentified hazardous materials into the environment (Less Than Significant with Mitigation).	Same Impact	Greater Impact	Same Impact
Impact 3.6-2: Program construction activities could ignite dry vegetation and start a wildland fire (Less Than Significant with Mitigation).	Same Impact	Greater Impact	Same Impact
Public Utilities, Service Systems and Energy			
Impact 3.7-1: The Program could result in the modification or expansion of existing water supply systems (Less than Significant).	Lesser Impact	Greater Impact	Greater Impact
Impact 3.7-2: Construction activities could inadvertently contact underground utility lines and/or facilities during excavation and other ground disturbance, possibly leading to short-term utility service interruptions (Less than Significant).	Lesser Impact	Greater Impact	Same Impact
Impact 3.7-3: Replacement of gravity-based surface water diversions with diversions or wells utilizing pumps, would increase power consumption and air emissions (Less Than Significant).	Lesser Impact	Greater Impact	Same Impact
Impact 3.7-4: Construction activities and water pumping associated with Covered Activities and ITP mitigation measures would generate greenhouse gas emissions, which would make a contribution to global warming (Less than Significant.	Lesser Impact	Greater Impact	Same Impact
Aesthetics Program would have no significant impacts	Same Impact	Greater Impact	Same Impact
Air Quality Program would have no significant impacts	Same Impact	Greater Impact	Same Impact
Geology, Soils and Seismicity Program would have no significant impacts	Same Impact	Greater Impact	Same Impact
Noise Program would have no significant impacts	Same Impact	Greater Impact	Same Impact
Public Health and Safety Program would have no significant impacts	Same Impact	Same Impact	Same Impact

Comparison of severity of impacts of Alternatives with impacts of the Program, as mitigated in this EIR.

Greater Impact = The Alternative would have a greater (or less favorable) impact than under the proposed Program.
Lesser Impact = The Alternative would have a lesser (or more favorable) impact than under the proposed Program.
Same Impact = The Alternative would have about the same level of impact as the proposed Program.

This table presents a comparison of environmental impacts that were identified under the proposed Program with each of the Alternatives. Any additional environmental impacts that would potentially occur under each of the Alternatives are presented in the text discussion.

TABLE 5-1 (continued)
IMPACTS AND SIGNIFICANCE LEVELS OF ALTERNATIVES IN COMPARISON WITH THE PROGRAM

Impact and Significance Level with Mitigation Measures Identified in This Report	No Program	Instream Flow	Parks Creek Bypass
Transportation and Traffic	Same Impact	Greater Impact	Same Impact
Program would have no significant impacts			
Mineral Resources	Same Impact	Same Impact	Same Impact
Program would have no significant impacts			
Population and Housing	Same Impact	Same Impact	Same Impact
Program would have no significant impacts			
Recreation			
Program would have no significant impacts	Same Impact	Greater Impact	Same Impact

Comparison of severity of impacts of Alternatives with impacts of the Program, as mitigated in this EIR.

Greater Impact = The Alternative would have a greater (or less favorable) impact than under the proposed Program.
Lesser Impact = The Alternative would have a lesser (or more favorable) impact than under the proposed Program.
Same Impact = The Alternative would have about the same level of impact as the proposed Program.

This table presents a comparison of environmental impacts that were identified under the proposed Program with each of the Alternatives. Any additional environmental impacts that would potentially occur under each of the Alternatives are presented in the text discussion.

TABLE 5-2
ABILITY OF THE PROGRAM AND ALTERNATIVES TO MEET PROGRAM OBJECTIVES

Ability of Alternatives to Meet Program Objectives	Proposed Program	No Program Alternative	Instream Flow Alternative	Parks Creek Bypass
SVRCD's Objectives				
Support landowner activities (both private and public) in order to enhance the conservation and economic stability of Siskiyou County's natural resources.	Yes	No	Yes	Yes
Assist Agricultural Operators in completing projects consistent with the tasks identified in the "Recovery Strategy for California Coho Salmon."	Yes	No	Yes	Yes
Assist Agricultural Operators in meeting the requirements of Fish and Game Code, § 1600 *et seq.* and CESA by working with CDFG to develop a Program that streamlines the process to obtain streambed alteration agreements (SAA) under Fish and Game Code, § 1600 *et seq.* and incidental take authorization under CESA.	Yes	No	Yes	Yes
Comply with Fish and Game Code, § 1600 *et seq.* and CESA while performing instream and/or near stream coho salmon restoration activities.	Yes	No	Yes	Yes
Provide incentives for Agricultural Operators in the Shasta River watershed to implement coho salmon recovery tasks.	Yes	No	Yes	Yes
Increase the viability of coho salmon and other plant, fish and wildlife resources in the Shasta River watershed by improving water quality and riparian habitat, minimizing any adverse effects from agricultural activities, and restoring habitat by providing a clear set of activities and conditions to Agricultural Operators.	Yes	No	Yes	Yes
Protect and improve the biological functioning of the Shasta River watershed and natural resources while maintaining the economic viability of agriculture.	Yes	No	Yes	Yes
Implement the permit conditions identified in the Program for coho salmon and other stream resources in the Shasta River watershed.	Yes	No	Yes	Yes
CDFG's Objectives				
Fulfill the commitment to develop a permitting framework within the context of the Shasta-Scott Pilot Program in the "Recovery Strategy for California Coho Salmon."	Yes	No	Yes	Yes
Work with SVRCD and Agricultural Operators to develop a watershed-wide permitting program that covers agricultural water diversions and other agricultural activities related to those diversions in the Shasta River watershed.	Yes	No	Yes	Yes
Protect and conserve coho salmon when authorizing activities in the Shasta River watershed that may affect the species.	Yes	No	Yes	Yes
Eliminate unauthorized take of coho salmon caused by water diversions in the Shasta River watershed and avoid, minimize and fully mitigate take of coho salmon incidental to valid water diversions, recovery actions, and other lawful activities.	Yes	No	Yes	Yes
Implement selected key coho salmon recovery tasks that are essential to improving habitat conditions for coho salmon in the Shasta River watershed.	Yes	No	Yes	Yes
Bring existing agricultural water diverters into compliance with Fish and Game Code, § 1600 *et seq.* and CESA.	Yes	No	Yes	Yes

TABLE 5-2 (continued)
ABILITY OF THE PROGRAM AND ALTERNATIVES TO MEET PROGRAM OBJECTIVES

Ability of Alternatives to Meet Program Objectives	Proposed Program	No Program Alternative	Instream Flow Alternative	Parks Creek Bypass
Agricultural Operators' Objectives				
Protect and conserve coho salmon and other plant, fish, and wildlife resources while maintaining the economic viability of their agricultural operations in the Shasta River watershed.	Yes	No	Yes	Yes
Comply with Fish and Game Code, § 1600 *et seq.* and CESA in conducting the activities the Program covers subject to those statutes.	Yes	Partly	Yes	Yes
Department of Water Resources Objective				
Implement the Shasta River Decree pursuant to applicable provisions in the California Water Code	Yes	Partly	Yes	Yes
Ensure watermastering activities are in compliance with CESA	Yes	Partly	Yes	Yes
Verify that watermastered diverters are is in compliance with their respective adjudicated water right(s).	Yes	Partly	Yes	Yes
Work with CDFG to avoid or minimize the stranding of coho salmon when CDFG determines that a permitted water diversion is causing or will cause stranding.	Yes	Partly	Yes	Yes

References

National Research Council (NRC), *Endangered and Threatened Fishes in the Klamath River Basin: Causes of Decline and Strategies for Recovery*, Committee on Endangered and Threatened Fishes in the Klamath River Basin, National Academies Press, Washington, DC, 2004.

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State of California, CDFG, *Recovery Strategy for California Coho Salmon*, Report to the California Fish and Game Commission, February 2004.

State of California, State Water Resources Control Board (SWRCB), *The Water Right Process*. www.waterrights.ca.gov/html/wr_process.htm, accessed March 5, 2007.

Shasta Valley Resource Conservation District (SVRCD), *Shasta Valley Resource Conservation District Long Range Plan 2001-2005*, Yreka, SVRCD, 2001.

CHAPTER 6
Draft EIR Authors, Persons, and Organizations Contacted

6.1 Lead Agency Authors

California Department of Fish and Game
601 Locust Street
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Caitlin Bean, Staff Environmental Scientist
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Kris Vyverberg, Senior Engineering Geologist

6.2 EIR Consultants

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Project Manager:	Dan Sicular
Deputy Project Managers:	Leah Katz, Erin Higbee
Project Description:	Dan Sicular, Leah Katz
Land Use and Agriculture Section:	Leah Katz, Nik Carlson, Dan Sicular
Geomorphology, Hydrology & Water Quality Section:	Justin Gragg, Bill Weaver[1]
Biological Resources: Fisheries and Aquatic Habitat Section:	Mike Podlech
Biological Resources: Botany, Wildlife, and Wetlands Section:	Tom Roberts
Cultural Resources Section:	Trudy Vaughn[2]
Hazards and Hazardous Materials Section:	Matt Fagundes, Dan Sicular
Public Utilities, Service Systems, and Energy Section:	Matt Fagundes, Dan Sicular
Cumulative Effects and Other Required Topics:	Leah Katz, Dan Sicular
Alternatives to the Project:	Dan Sicular
GIS:	Bill Boynton, Fletcher Clover
Graphics:	Ron Teitel, Linda Uehara
Word Processing:	Lisa Bautista, Gus JaFolla
Legal Review:	Anna Shimko[3]
Public Outreach	John Clerici and Carol Glatfelter[4]

6.3 Persons and Organizations Consulted

Other people and organizations consulted are identified in the references at the end of each section.

1 Bill Weaver is with Pacific Watershed Associates of Arcata, California, a subcontractor to ESA.
2 Trudy Vaughn is with Coyote & Fox Enterprises of Redding, California, a subcontractor to ESA.
3 Anna Shimko is with Cassidy Shimko Dawson & Kawakami, PC, a subcontractor to ESA.
4 John Clerici and Carol Glatfelter are with CirclePoint of Sacramento, California, a subcontractor to ESA.

APPENDIX A
Draft Incidental Take Permit

(Current version provided in FEIR Volume 2)

APPENDIX B

Draft Streambed Alteration Agreement MOU and Master List of Terms and Conditions

(Current version in FEIR Volume 2)

APPENDIX C
Notice of Preparation

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State of California

Memorandum

To: State Clearinghouse
1400 Tenth Street
Sacramento, California 95814

Date: October 19, 2006

for

From: **DONALD B. KOCH**, Regional Manager
Northern California-North Coast Region
Department of Fish and Game
601 Locust Street
Redding, California 96001

Subject: Notice of Preparation of a Draft Environmental Impact Report for the Shasta River Watershed-Wide Permitting Program, Siskiyou County

The California Department of Fish and Game (CDFG) will prepare an environmental impact report (EIR) for a proposed watershedwide permitting program in the Shasta River Watershed, Siskiyou County. The Program has been developed by the CDFG in consultation with the Shasta Valley Resource Conservation District (SVRCD) and implements key coho salmon recovery tasks while facilitating agricultural operators and SVRCD compliance with the California Endangered Species Act and Fish and Game Code Section 1602 by establishing a streamlined process for the issuance of incidental take permits and streambed alteration agreements. The Program's description, covered activities, avoidance, minimization, and mitigation measures, and probable environmental effects are contained in the enclosed Initial Study. The Initial Study is also available at: http://www.dfg.ca.gov/hcpb/whatsnew/whatsnew.shtml.

We need to know your views as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities or specific concerns that must be included in the Draft EIR. This includes significant environmental issues, reasonable alternatives, and mitigation measures that a responsible agency will need to have explored in the Draft EIR and whether your agency will be a responsible agency or trustee agency for the proposed program.

Pursuant to Public Resources Code Section 21080.4 (CEQA) and California Code of Regulations Section 15082 (CEQA Guidelines), we request comments by agencies be submitted within 30 days after receipt of this letter. Please send you response to:

Mr. Bob Williams
California Department of Fish and Game
601 Locust Street
Redding, California 96001
bwilliams@dfg.ca.gov
530-225-2365

All comments received including names and addresses, will become part of the official administrative record

Interested public agencies and members of the public are also invited to a scoping meeting where they may submit oral and written comments and suggestions regarding the scope of the EIR to help identify the range of actions, alternatives, mitigation measures, and significant environmental effects to be analyzed in relation to the proposed project. Prior to the scoping meeting interested parties may attend a workshop providing an overview of the review process under CEQA and information on how the public may participate in that process. The workshop and scoping meeting will be held:

- Tuesday, October 24
  Location: Miner's Inn, 122 E. Miner Street, Yreka.
  The public workshop will be from 3:00 to 5:00 p.m.
  The scoping meeting will run from 6:30 to 8:30 p.m.

For more information, please contact Staff Environmental Scientist Bob Williams at 530-225-2365 or bwilliams@dfg.ca.gov.

Enclosures

Williams:pm
R:\Williams\Coho EIR\Shasta NOP Memo to Clearing House 10-16-06.doc

NOTICE OF PREPARATION OF A

DRAFT ENVIRONMENTAL IMPACT REPORT

SHASTA RIVER WATERSHED-WIDE PERMITTING PROGRAM

CALIFORNIA DEPARTMENT OF FISH AND GAME

To Responsible and Trustee Agencies and All Interested Parties:

The California Department of Fish and Game (CDFG) and the Shasta Valley Resource Conservation District (SVRCD) have developed a watershed-wide permitting program for the Shasta River watershed (Program). The Program is designed to implement key coho salmon (*Oncorhynchus kisutch*) recovery tasks while facilitating compliance by agricultural operators and those implementing coho salmon restoration projects with the California Endangered Species Act (CESA) (Fish and G. Code, § 2050 *et seq.*) and Fish and Game Code section 1602 (section 1602). For purposes of the Program, "agricultural operator" means: 1) any person who lawfully diverts water from a stream in the Shasta River watershed (Program Area) for an agricultural purpose; and/or 2) any person involved in a lawful agricultural operation on property in the Program Area through which or adjacent to which a stream flows.

CDFG has determined that the Program and the activities authorized under it through a watershed-wide Master Streambed Alteration Agreement (MSAA) and Incidental Take Permit (ITP) have the potential to cause significant adverse environmental effects. As a result, it is preparing an environmental impact report (EIR) pursuant to the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 *et seq.*).

CDFG is the lead agency for the purpose of reviewing the Program and the activities it will authorize under the Program because CDFG has principal responsibility for approving and administering the Program (Cal. Code Regs., tit. 14, § 15367). The activities CDFG will authorize are referred to in the ITP and MSAA as "Covered Activities." CDFG has identified the North Coast Regional Water Quality Control Board as a responsible agency because it may have discretionary approval over some of the Covered Activities the Program will authorize (Cal. Code Regs., tit. 14, § 15381). A "trustee agency" is a state agency that has jurisdiction over natural resources held in trust for the people of the state that could be affected by a project (Cal. Code Regs., tit. 14, § 15386). CDFG has identified the State Lands Commission (SLC) as a trustee agency because the Covered Activities authorized under the Program could affect the beds of navigable waters and other "state owned 'sovereign' land" which are within SLC's jurisdiction (Cal. Code Regs., tit. 14, § 15386, subd. (b)).

CDFG needs to know your views regarding the scope and content of the environmental information in connection with the Program. The initial study that has been prepared for the Program is attached as Attachment 4 and is also available for review at: http://www.dfg.ca.gov/hcpb/whatsnew/whatsnew.shtml

You may also request a copy of the initial study from CDFG (see below). CEQA requires that you submit any response to CDFG at the earliest possible date, but not later than 30 days after receipt of this notice.

Requests for a copy of the initial study or any other information regarding the Program, and all responses to this notice should be sent to:

Bob Williams, Staff Environmental Scientist
Conservation Planning
California Department of Fish and Game
601 Locust Street
Redding, CA 96001
530-225-2365

Four documents are attached to this notice. Attachment 1 provides an overview of the Program, the scoping process, and the draft EIR schedule. Attachment 2 shows the location of the Shasta River Watershed. Attachment 3 shows the environmental factors potentially affected by the Program that the EIR will address. Attachment 4 is the Initial Study.

Date: October 19, 2006

for **DONALD B. KOCH**, Regional Manager
Northern California North Coast Region
California Department of Fish and Game
530-225-2363

ATTACHMENT 1

Background

The Shasta River Watershed-wide Permitting Program (Program) is designed to implement key coho salmon (*Oncorhynchus kisutch*) recovery tasks while facilitating compliance by agricultural operators and those implementing coho salmon restoration projects with the California Endangered Species Act (CESA) (Fish and G. Code, § 2050 *et seq.*) and Fish and Game Code section 1602 (section 1602). Compliance with those laws is necessary because both agricultural water diversions and recovery efforts could result in temporary or long-term adverse effects on coho salmon and other stream resources. Currently, agricultural operators in the Shasta River watershed (Program Area) can comply with CESA by applying to CDFG for an individual incidental take permit, and with section 1602 by submitting a notification and obtaining a streambed alteration agreement (SAA). To facilitate such compliance, CDFG and the Shasta Valley Resource Conservation District (SVRCD) developed the Program as an alternative to the standard process an agricultural operator would need to follow to obtain an ITP and SAA.

On March 29, 2005, SVRCD submitted an application to CDFG for a watershed-wide ITP pursuant to Fish and Game Code section 2081(b) and (c). On April 1, 2005, SVRCD submitted a notification to CDFG for a Master Streambed Alteration Agreement (MSAA). Thereafter, CDFG has worked to prepare a draft watershed-wide ITP and MSAA in cooperation with SVRCD and agricultural operators. The Program will enable agricultural operators and those implementing coho salmon restoration activities, including SVRCD, to obtain coverage for their activities through the issuance of the ITP and sub-permits (for CESA) and individual SAAs (for section 1602). The sub-permits and SAAs will include those conditions in the watershed-wide ITP and MSAA that apply to the activities the ITP and MSAA authorized, referred to as "Covered Activities."

The ITP, MSAA, and individual sub-permits and SAAs comprise the Program. The Program will authorize SVRCD and participating agricultural operators to conduct a range of Covered Activities specified in the ITP and MSAA within and adjacent to the Shasta River and its tributaries, provided they conduct the activities in accordance with the avoidance, minimization, and mitigation measures specified in the ITP (for SVRCD only), and the avoidance and minimization measures specified in the sub-permits (for the agricultural operators only), and SAAs (for SVRCD and the agricultural operators) to protect fish and wildlife resources, including coho salmon. The term of the ITP will be 10 years. The term of the MSAA will be 5 years, which CDFG may extend for a second 5 year period.

CDFG and the Siskiyou Resource Conservation District are developing a similar watershed-wide permitting program for the Scott River watershed, also in Siskiyou

County. That program is the subject of a separate environmental review process under CEQA.

Master Streambed Alteration Agreement

CDFG and SVRCD have developed a Memorandum of Understanding which identifies their roles and responsibilities in administering and implementing the MSAA. The MSAA, which is currently in draft form, will identify specific Covered Activities. The MSAA also will include measures necessary to protect fish and wildlife resources that any of the Covered Activities may substantially adversely affect. Each participating agricultural operator who intends to conduct a Covered Activity will be required to complete an application, referred to as a "notification" with SVRCD's assistance. SVRCD will also be required to notify CDFG to conduct a Covered Activity. After CDFG receives the notification, it will confirm the proposed activity is covered by the MSAA, and thereafter prepare a SAA for the participating agricultural operator or SVRCD which includes the particular set of protective measures in the MSAA that are assigned to that activity. The EIR will analyze the potential environmental effects of the Covered Activities in the MSAA. Requests for SAAs which include activities not identified within the MSAA may require additional environmental review.

Incidental Take Permit

Under CESA, a person may not "take"[1] a species listed as threatened or endangered unless the take is incidental to an otherwise lawful activity and the person obtains take authorization from CDFG in the form of an incidental take permit. CDFG and SVRCD have worked together to develop a watershed-wide ITP as part of the Program, which is currently in draft form. The ITP will establish a program through which SVRCD and participating agricultural operators will be authorized to take coho salmon incidental to otherwise lawful Covered Activities. Specifically, CDFG would issue sub-permits to participating agricultural operators who intend to complete a Covered Activity, thereby making them sub-permittees. SVRCD will be covered by the ITP rather than by a separate sub-permit. As a condition of the ITP and each sub-permit, SVRCD and sub-permittees will be required to comply with specific avoidance and minimization measures identified in the watershed-wide ITP and sub-permit. In additions, SVRCD will be required to perform the mitigation measures identified in the ITP to fully mitigate take of coho salmon, and to monitor and report on the Covered Activities and avoidance, minimization, and mitigation measures.

Program Advantages

Participation in the Program has many advantages, including the following:

- The Program represents a comprehensive, watershed-wide effort to implement key coho salmon recovery actions.

[1] Pursuant to Fish and Game Code section 86, "take" means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.

- The Program will bring existing agricultural water diverters into compliance with CESA and section 1602
- SVRCD will have one watershed-wide ITP for their many restoration projects, which will minimize the time and effort needed to obtain individual take authorization on a project-by-project basis. With the MSAA and ITP, it will take much less time for CDFG to develop individual SAAs for each SVRCD project subject to section 1602 and sub-permits for participating agricultural operators.
- SVRCD will assist participating agricultural operators to prepare their SAA notifications and those operators will not be required to pay a notification fee to CDFG.
- SVRCD (through the ITP) and agricultural operators (through their sub-permits) will be authorized to take coho salmon incidental to the Covered Activities in the ITP.
- SVRCD and participating agricultural operators will not be responsible for CDFG's cost to prepare the EIR for the Program and, in most instances; CDFG will not need to prepare an additional environmental document under CEQA before issuing a sub-permit or SAA.
- CDFG will avoid the time needed to prepare multiple incidental take permits for multiple SVRCD activities.
- The Program provides a coordinated approach to implement restoration projects critical for recovering coho salmon.

Scoping and Public Information Meetings

CDFG is seeking input on the scope and content of environmental information relevant to the Program and the Covered Activities authorized under it. To that end, CDFG will hold a public scoping meeting on **October 24, 2006,** from 6:30 to 8:30 p.m. The scoping meeting will provide the public an opportunity to comment on the scope of the environmental analysis in the EIR, and to raise issues, concerns, and ideas regarding potential impacts of the program and the projects authorized under it, feasible mitigation measures, and possible alternatives to the Program.

Prior to the public scoping meeting, CDFG will hold a workshop on techniques for effective participation in the CEQA environmental review process from 3:00 to 5:00 p.m. Workshop topics will include an overview of the environmental review process and information on the many ways the public can participate in the process. Workshop topics will include an overview of the review process under CEQA and information on how the public may participate in that process. It will not necessary to attend the CEQA workshop in order to participate in the public scoping meeting.

The scoping and public information meetings will be held at the Miner's Inn located at 122 E. Miner Street in Yreka.

Draft EIR Schedule

The Draft EIR is scheduled for circulation in spring 2007.

Other CDFG Projects

Other significant CDFG projects near the Program Area include the Scott River watershed-wide permitting program and the petition in front of the Fish and Game Commission to remove the Siskiyou Mountains Salamander from the state list of threatened species under the California Endangered Species Act

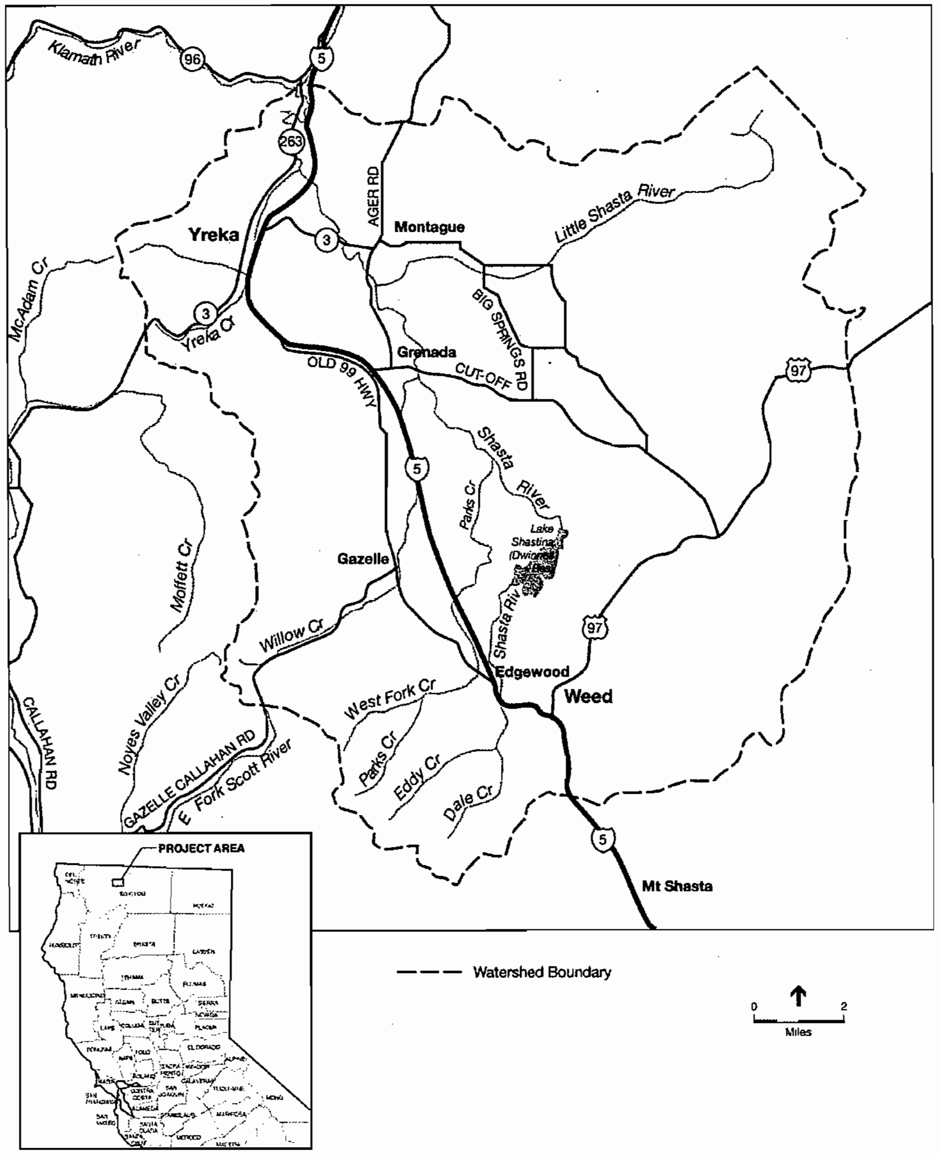
Additional Information

Additional information about the Shasta River Watershed-wide Permitting Program may be obtained from CDFG's website at:
http://www.dfg.ca.gov/hcpb/whatsnew/whatsnew.shtml

CDFG's contact person for any questions regarding the Program is:

> Bob Williams, Staff Environmental Scientist
> Conservation Planning
> California Department of Fish and Game
> 601 Locust Street
> Redding, CA 96001
> 530-225-2365

ATTACHMENT 2



SOURCE: ESA

Shasta River Watershed-Wide Permitting Program . 206063

Figure 1
Project Location

Attachment 3

Environmental Factors Potentially Affected

The environmental factors checked below potentially would be affected by this project, involving at least one impact that is a "potentially significant impact."

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

Mail to: State Clearinghouse, 1400 Tenth Street, Sacramento, CA 95814 – 916/445-0613

ENVIRONMENTAL DOCUMENT TRANSMITTAL FORM

See *NOTE* BELOW

SCH# ____________

1. Project Title: Shasta River Watershed-wide Permitting Program
2. Lead Agency: California Department of Fish and Game
3. Contact Person: Bob Williams
3. Contact Person: ____________
3a. Street Address: 601 Locust Street
3b. City: Redding
3c. County: Shasta
3d. Zip: 96001
3e. Phone: 530-225-2365

PROJECT LOCATION

4. County: Siskiyou
4a. City/Community: NA
4b. Assessor's Parcel No.: NA
4c. Section: NA Twp.: NA Range: NA
5a. Cross Streets: NA
5b. For Rural, Nearest Community: ____________
6. With 2 miles: a. State Hwy# NA
   b. Airports: NA
   c. Railways: NA
   d. Waterways: Shasta River and its tributaries

7. Document Type

CEQA
01. ☒ NOP
02. ☐ Early Cons
03. ☐ Neg Dec
04. ☐ Draft EIR
05. ☐ Supplement/Subsequent EIR (Prior SCH No.: ____________)
06: ☐ NOE
07: ☐ NOC
08. ☐ NOD

NEPA
09. ☐ NOI
10. ☐ FONSI
11. ☐ Draft EIS
12. ☐ EA

OTHER
13. ☐ Joint Document
14. ☐ Final Document
15. ☐ Other ____________

8. Local Action Type

01. ☐ General Plan Update
02. ☐ New Element
03. ☐ General Plan Amendment
04. ☐ Master Plan
05. ☐ Annexation
06. ☐ Specific Plan
07. ☐ Community Plan
08. ☐ Redevelopment
09. ☐ Rezone
10. ☐ Land Division (Subdivision, Parcel Map, Tract Map, etc.)
11. ☐ Use Permit
12. ☐ Waste Mgmt Plan
13. ☐ Cancel Ag Preserve
14. ☒ Other

9. Development Type

01. ☐ Residential: Units ____ Acres ____
02. ☐ Office: Sq.ft. ____ Acres ____ Employees ____
03. ☐ Shopping/Commercial: Sq.ft. ____ Acres ____ Employees ____
04. ☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
05. ☐ Water Facilities: MGD ____
06. ☐ Transportation: Type ____
07. ☐ Mining: Mineral ____
08. ☐ Power: Type ____ Watts ____
09. ☐ Waste Treatment: Type ____
10. ☐ OCS Related
11. ☒ Other: Incidental Take Permit
Streambed Alteration Agreement

10. TOTAL ACRES: Approximately 1,176,160 acres

11. Total Jobs Created: *NA*

12. Project Issues Discussed in Document

01. ☐ Aesthetic/Visual
02. ☒ Agricultural Land
03. ☐ Air Quality
04. ☒ Archaeological/Historical
05. ☐ Coastal Zone
06. ☐ Economic
07. ☐ Fire Hazard
08. ☐ Flooding/Drainage
09 ☐ Geologic/Seismic
10. ☐ Jobs/Housing Balance
11. ☐ Minerals
12. ☐ Noise
13. ☒ Public Services
14. ☐ Schools
15. ☐ Septic Systems
16. ☐ Sewer Capacity
17. ☐ Social
18. ☒ Soil Erosion
19. ☐ Solid Waste
20. ☒ Toxic/Hazardous
21. ☐ Traffic/Circulation
22. ☒ Vegetation
23. ☒ Water Quality
24. ☒ Water Supply
25. ☒ Wetland/Riparian
26. ☒ Wildlife
27. ☐ Growth Inducing
28. ☐ Incompatible Land Use
29. ☒ Cumulative Effects
30. ☐ Other ____________

13. FUNDING **(APPROX.)** ***Federal $*** **0** ***State $*** **0** ***Total $*** ____

Form Revised 4/86 – Replaces CA 189 Mark Distribution on Reverse

14. Present Land Use and Zoning

Varies. Most of the Program Area is mapped as Prime Agricultural Soils in the Siskiyou County General Plan (1980).

15. Project Description

The name of the project is the Shasta River Watershed-Wide Permitting Program (Program). The Program is designed to implement key coho salmon (*Oncorhynchus kisutch*) recovery tasks while facilitating compliance by agricultural operators and those implementing coho salmon restoration projects with the California Endangered Species Act (CESA) (Fish and G. Code, § 2050 *et seq.*) and Fish and Game Code section 1602 (section 1602). Compliance with those laws is necessary because both agricultural water diversions and recovery efforts could result in temporary or long-term adverse effects on coho salmon and other stream resources. Currently, agricultural operators in the Shasta River watershed (Program Area) can comply with CESA by applying to CDFG for an individual incidental take permit, and with section 1602 by submitting a notification and obtaining a streambed alteration agreement (SAA). To facilitate such compliance, CDFG and the Shasta Valley Resource Conservation District (SVRCD) developed the Program as an alternative to the standard process an agricultural operator would need to follow to obtain an incidental take permit and SAA.

On March 29, 2005, SVRCD submitted an application to CDFG for a watershed-wide ITP (ITP) pursuant to Fish and Game Code section 2081(b) and (c). On April 22, 2005, SVRCD submitted a notification to CDFG for a Master Streambed Alteration Agreement (MSAA). Thereafter, CDFG prepared a draft ITP and MSAA in cooperation with SVRCD and worked with SVRCD and agricultural operators to develop a Program. The Program will enable agricultural operators and those implementing coho salmon restoration projects, including SVRCD, to obtain coverage for the activities covered by the ITP and MSAA, referred to as "Covered Activities," through the issuance of the ITP and sub-permits (for CESA) and SAAs (for section 1602). The sub-permits and SAAs will include those conditions in the ITP and MSAA that apply to the Covered Activities being authorized.

The ITP, MSAA, and individual sub-permits and SAAs comprise the Program. The Program will authorize SVRCD and participating agricultural operators to conduct a range of Covered Activities specified in the ITP and MSAA within and adjacent to the Shasta River and its tributaries, provided they conduct the Covered Activities in accordance with the avoidance, minimization, and mitigation measures specified in the ITP (for SVRCD), sub-permits (for agricultural operators), and SAAs (for SVRCD and agricultural operators) to protect fish and wildlife resources, including coho salmon. The term of the ITP will 10 years. The term of the MSAA will be 5 years, which CDFG may extend for a second 5 year period prior to its expiration.

16. SIGNATURE OF LEAD AGENCY REPRESENTATIVE

Matt Short

for **DONALD B. KOCH,** Regional Manager

Date October 19, 2006

NOTE: Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g., from a Notice of Preparation or previous draft document) please fill it in.

Form Revised 4/86 – Replaces CA 189 Mark Distribution on Reverse

REVIEWING AGENCIES

- ☒ Resources
- ☐ Boating / Waterways
- ☒ Conservation
- ☒ Fish and Game
- ☒ Forestry
- ☐ Colorado River Board
- ☒ Dept. Water Resources
- ☐ Reclamation
- ☐ Parks and Recreation
- ☒ Office of Historic Preservation
- ☒ Native American Heritage Commission
- ☐ S.F. Bay Conservation and Development Commission
- ☐ Coastal Commission
- ☐ Energy Commission
- ☒ State Lands Commission
- ☐ Air Resources Board
- ☐ Solid Waste Management Board
- ☒ SWRCB: Sacramento
- ☒ RWQCB: Region #1 North Coast
- ☒ Water Rights
- ☒ Water Quality
- ☐ Caltrans District #4
- ☐ Dept. of Transportation Planning
- ☐ Aeronautics
- ☐ California Highway Patrol
- ☐ Housing and Community Development
- ☐ Statewide Health Planning
- ☐ Health
- ☐ Food and Agriculture
- ☐ Public Utilities Commission
- ☐ Public Works
- ☐ Corrections
- ☐ General Services
- ☐ OLA
- ☐ Santa Monica Mountains
- ☐ TRPA
- ☐ OPR – OLGA
- ☐ OPR – Coastal
- ☐ Bureau of Land Management
- ☐ Forest Service
- ☐ Other
- ☐ Other

For SCH Use Only:

Date Received at SCH ______________ Catalog Number ______________

Date Review Starts ______________ Applicant ______________

Date to Agencies ______________ Consultant ______________

Date to SCH ______________ Contact ______________ Phone ______________

Clearance Date ______________ Address ______________

Notes: ______________

APPENDIX D
Initial Study

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ENVIRONMENTAL CHECKLIST

Initial Study

1. Project Title:	Shasta River Watershed-Wide Permitting Program
2. Lead Agency Name and Address:	California Department of Fish and Game 601 Locust Street Redding, CA 96001
3. Contact Person and Phone Number:	Bob Williams Staff Environmental Scientist Conservation Planning Department of Fish and Game 530-225-2365
4. Project Location:	Shasta River Watershed, Siskiyou County
5. Project Sponsor's Name and Address:	Shasta Valley Resource Conservation District 215 Executive Court, Suite A Yreka, CA 96097
6. General Plan Designation(s):	Various. Most lands within the Program Area are mapped as Prime Agricultural Soils in the Siskiyou County General Plan (1980)
7. Zoning Designation(s):	Various. Mostly AG-I

8. Project Description

8.1 Project Overview

This section describes the California Department of Fish and Game's (CDFG) Shasta River Watershed-Wide Permitting Program (Program). CDFG developed the Program in consultation with the Shasta Valley Resource Conservation District (SVRCD) and agricultural operators[1] within the Shasta River watershed (Program Area). The Program is designed to implement key coho salmon (*Oncorhynchus kisutch*) recovery tasks while facilitating compliance by agricultural operators and those implementing coho salmon

[1] "Agricultural operator" means: 1) any person who lawfully diverts water from a stream in the Program Area for an agricultural purpose; and/or 2) any person involved in a lawful agricultural operation on property in the Program Area through which or adjacent to which a stream flows.

restoration projects with the California Endangered Species Act (CESA) (Fish and G. Code, § 2050 *et seq.*) and Fish and Game Code section 1602 (section 1602). Compliance with those laws is necessary because both agricultural water diversions and recovery efforts could result in temporary or long-term adverse effects on coho salmon and other stream resources. Currently, agricultural operators in the Shasta River watershed can comply with CESA by applying to CDFG for an individual incidental take permit, and with section 1602 by submitting a notification and obtaining a streambed alteration agreement (SAA). To facilitate such compliance, CDFG and the Shasta Valley Resource Conservation District (SVRCD) developed the Program as an alternative to the standard process an agricultural operator would need to follow to obtain an incidental take permit and SAA.

On March 29, 2005, SVRCD submitted an application to CDFG for a watershed-wide incidental take permit (ITP) pursuant to Fish and Game Code section 2081(b) and (c). On April 1, 2005, SVRCD submitted a notification to CDFG for a Master Streambed Alteration Agreement (MSAA). Thereafter, CDFG prepared an ITP and MSAA in cooperation with SVRCD and worked with SVRCD and agricultural operators to develop a Program. The Program, if implemented, will enable agricultural operators and those implementing coho salmon restoration activities, including SVRCD, to obtain coverage for their activities through the issuance of sub-permits (for CESA) and SAAs (for section 1602). The sub-permits and SAAs will include those conditions in the ITP and MSAA that apply to the activities the ITP and MSAA cover, referred to in each as "Covered Activities."

The ITP, MSAA, and individual sub-permits and SAAs comprise the Program. The Program will authorize SVRCD and participating agricultural operators to conduct a range of Covered Activities specified in the ITP and MSAA within and adjacent to the Shasta River and its tributaries, provided they conduct the activities in accordance with the avoidance, minimization, and mitigation measures specified in the ITP and the conditions specified in the MSAA to protect fish and wildlife resources, including coho salmon. The term of the ITP will be ten years. The term of the MSAA will be five years, which CDFG may extend for a second five-year period prior to its expiration.

CDFG and the Siskiyou Resource Conservation District are developing a similar watershed-wide permitting program for the Scott River watershed, also in Siskiyou County. That program is the subject of a separate environmental review process under CEQA.

Master Streambed Alteration Agreement

CDFG and SVRCD have developed a Memorandum of Understanding which identifies their roles and responsibilities in administering and implementing the MSAA. The MSAA, which is currently in draft form, will identify the activities it will cover, referred to in the MSAA as "Covered Activities." The MSAA also will include measures necessary to protect fish and wildlife resources that any of the Covered Activities could substantially adversely affect. Each participating agricultural operator and SVRCD will be required to complete an application, referred to as a "notification," for the implementation of any Covered Activity. SVRCD will assist agricultural operators with the preparation of their notifications. After CDFG receives a notification, it will confirm the activity is covered by the MSAA, and thereafter prepare a SAA for the SVRCD or the participating agricultural operator which includes the particular set of protective measures in the MSAA that are assigned to that activity. The EIR will analyze the potential environmental effects of the Covered Activities in the MSAA. Requests for SAAs which may have site specific impacts not analyzed in the EIR or which includes activities not identified within the MSAA may require additional environmental review.

Incidental Take Permit

Under CESA, a person may not "take"[2] a species listed as threatened or endangered unless the take is incidental to an otherwise lawful activity and the person obtains take authorization from the Department in the form of an incidental take permit. CDFG and SVRCD have worked together to develop an ITP as part of the Program, which is currently in draft form. The ITP will establish a program through which SVRCD and participating agricultural operators will be authorized to take coho salmon incidental to otherwise lawful activities identified as "Covered Activities" in the ITP. Specifically, CDFG would issue sub-permits to participating agricultural operators who intend to complete a Covered Activity, thereby making them sub-permittees. SVRCD will be covered by the ITP. As a condition of the ITP and each sub-permit, SVRCD and sub-permittees will be required to comply with the specific minimization and avoidance measures included in the ITP and sub-permits for their own projects, and SVRCD will be required to perform the mitigation measures identified in the ITP to fully mitigate take of coho salmon, and to monitor and report on the Covered Activities and avoidance, minimization, and mitigation measures.

Program Advantages

Participation in the Program has many advantages, including the following:

- The Program represents a comprehensive, watershed-wide effort to implement key coho salmon recovery actions.
- The Program will bring existing agricultural water diverters into compliance with CESA and section 1602.
- SVRCD will have one watershed-wide ITP for their many restoration projects, which will minimize the time and effort needed to obtain individual take authorization on a project-by-project basis. With the MSAA and ITP, it will take much less time for CDFG to develop individual SAAs for each SVRCD project subject to section 1602 and sub-permits for participating agricultural operators. .
- SVRCD will assist participating agricultural operators to prepare their SAA notifications and those operators will not be required to pay a notification fee to CDFG.
- SVRCD (through the ITP) and agricultural operators (through their sub-permits) will be authorized to take coho salmon incidental to the Covered Activities in the ITP.
- SVRCD and participating agricultural operators will not be responsible for CDFG's cost to prepare the EIR for the Program and, in most instances, CDFG will not need to prepare an additional environmental document under CEQA before issuing a sub-permit or SAA.

[2] "Take" means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. (Fish & G. Code, § 86.)

- CDFG will avoid the time needed to prepare multiple incidental take permits for multiple SVRCD activities.
- The Program provides a coordinated approach to implement restoration projects critical for recovering coho salmon..

Role of SVRCD

SVRCD will play a central role in assisting agricultural operators to obtain sub-permits and SAAs. SVRCD also will be responsible for implementing the mitigation and monitoring requirements specified in the ITP and conducting an education program on coho salmon, CESA, and the terms of the ITP.

8.2 Program Need and Objectives

8.2.1 Background and Need for the Program

In early 2002, the Salmon and Steelhead Recovery Coalition petitioned the Fish and Game Commission (Commission) to list coho salmon north of San Francisco as an endangered species under the CESA. In response, CDFG issued a coho salmon status report to the Commission, recommending that coho salmon from San Francisco north to Punta Gorda be listed as endangered, and that coho salmon from Punta Gorda north to the Oregon border be listed as threatened pursuant to CESA (CDFG, 2004).[3] The Commission found that coho salmon warranted listing in accordance with CDFG's recommendations. These recommendations and subsequent decision were based on the best available information, which indicated that coho salmon have experienced a significant decline in the last half century.

In February 2004, the Commission adopted the Recovery Strategy for California Coho Salmon (Recovery Strategy). The Recovery Strategy emphasizes cooperation and collaboration, and recognizes the need for funding, public and private support for restoration actions, and maintaining a balance between regulatory and voluntary efforts to meet the goals of the Recovery Strategy. The Shasta and Scott River watersheds were identified for a pilot program to address coho salmon recovery issues and solutions related to agriculture and agricultural water use in Siskiyou County. In addition to identifying recommendations for the pilot program, the Shasta-Scott Recovery Team identified the need to develop a programmatic implementation framework (i.e., an ITP program) that works toward the recovery of coho salmon, while providing authorization to take coho incidental to otherwise lawful activities in the Shasta and Scott watersheds. The avoidance, minimization, and mitigation measures included in the ITP are consistent with the recovery tasks identified in the Shasta-Scott Pilot Program of the Recovery Strategy.

8.2.2 Program Objectives

Objectives differ for the different parties involved in the Program: SVRCD, CDFG, and participating agricultural operators.

[3] Coho salmon north of Punta Gorda are within the Southern Oregon-Northern California Coasts (SONCC) Coho Evolutionarily Significant Unit (ESU).

Shasta Valley Resource Conservation District's Objectives

SVRCD is a non-profit public agency, organized under Division 9 of the California Public Resources Code. The mission of SVRCD is to enhance the conservation and economic stability of natural resources by coordinating and supporting landowner activities, both public and private, and by providing information, education, and project implementation to residents within all watersheds in the district boundaries. SVRCD works closely with other public agencies, districts, private entities, and private individuals to accomplish its goals and objectives.

SVRCD's objectives for the Program are as follows:

- Support landowner activities (both private and public) in order to enhance the conservation and economic stability of Siskiyou County's natural resources;
- Assist agricultural operators in completing projects consistent with the tasks identified in the Recovery Strategy;
- Facilitate the development of the Program to streamline the process for the agricultural operators it serves to obtain incidental take permits and SAAs;
- Comply with CESA and section 1602 while performing instream and/or near stream coho salmon restoration measures;
- Assist agricultural operators in complying with CESA and section 1602;
- Provide incentives for agricultural operators in the Shasta River watershed to implement coho salmon recovery tasks;
- Increase the viability of coho salmon and other plant, fish, and wildlife resources in the Shasta River watershed by improving water quality and riparian habitat, minimizing any adverse effects from agricultural activities, and restoring habitat by providing a clear set of activities and conditions to agricultural operators;
- Protect and improve the biological functioning of the Shasta River watershed and natural resources while maintaining the economic viability of agriculture; and
- Implement the permit conditions identified in the watershed-wide ITP and MSAA for coho salmon in the Shasta River watershed.

California Department of Fish and Game's Objectives

CDFG is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. CDFG seeks to issue an ITP, sub-permits and SAAs as part of a watershed-wide program to minimize impacts to coho salmon from agricultural activities in the Shasta River watershed and to enhance coho salmon habitat through the implementation of key coho salmon recovery tasks in the Shasta River watershed with SVRCD's assistance. CDFG's objectives in developing the Program are as follows:

- Fulfill the commitment to develop a permitting framework within the context of the Shasta-Scott Pilot Program in the Recovery Strategy;
- Work with SVRCD and agricultural operators to develop a watershed-wide permit program that covers agricultural water diversions and other agricultural activities in the Shasta River watershed;
- Protect and conserve coho salmon when authorizing activities in the Shasta River watershed that may result in the incidental take of coho salmon and/or are subject to section 1602;
- Implement key coho salmon recovery tasks essential to improving habitat conditions for coho salmon in the Shasta River watershed;
- Eliminate unauthorized take of coho salmon caused by water diversions in the Shasta River watershed and minimize and fully mitigate take of coho salmon incidental to legal water diversions, recovery actions, and other lawful activities;
- Establish mitigation measures that are proportionate to the level of impact from existing legal water diversions; and
- Bring existing agricultural water diverters into compliance with CESA and section 1602.

Agricultural Operators' Objectives

The objectives of agricultural operators' participating in the Program are as follows:

- Protect and conserve coho salmon and other plant, fish, and wildlife resources while maintaining the economic viability of agricultural operations in the Shasta River watershed; and
- Comply with CESA and section 1602 in conducting Covered Activities subject to those statutes.
- Participation in the Program assists small family owned farms and ranches in meeting the financial and regulatory requirements of CESA and Section 1602.

8.3 Environmental Baseline

Environmental review under CEQA analyzes the difference in environmental effects between baseline conditions and the likely conditions that would be realized if the Program were approved and implemented. The environmental analysis is restricted to those effects that spring from the incremental increase in activity or action that would result from Program implementation. CDFG has determined the physical environmental conditions in the Program Area as they existed at the time SVRCD submitted its application for an ITP and MSAA notification constitute the baseline physical conditions by which a determination will be made as to whether an impact is significant. For the purposes of the EIR, these conditions include legal agricultural operations, including legal water diversions, which were occurring in the Program Area at that time.

8.4 Program Characteristics

The proposed ITP and MSAA cover specific activities that typically occur within the Program Area, which the ITP and MSAA refer to as "Covered Activities". Those activities include agricultural operations, including water diversions, and actions to restore or improve coho salmon habitat. The first nine Covered Activities listed below are included in both the ITP and MSAA. The five remaining Covered Activities are included only in the ITP because they have the potential to impact coho salmon but are not activities subject to Section 1602.[4]

Both the ITP and MSAA include conditions of approval. For the ITP, the conditions include general conditions to avoid and minimize take of coho salmon which pertain to both the SVRCD and the sub-permittees. It also contains mitigation, monitoring, and reporting requirements that SVRCD must implement. Conditions in the MSAA include general conditions that apply to all Covered Activities, and specific conditions that apply to a specific Covered Activity. In writing a SAA for the SVRCD or an agricultural operator, DFG will include the general conditions and the conditions which apply to the specific Covered Activity being performed.

8.4.1 Covered Activities

Below is a summary of the activities that are covered in the ITP and MSAA.

ITP and MSAA Covered Activity 1: Water Diversion Pursuant to a Legal Water Right. This activity includes the active or passive diversion of surface water through a conduit from streams, channels, or sloughs in the Shasta River watershed by an agricultural operator for agricultural or domestic uses in accordance with a legal water right in the Shasta River Adjudication and Proceedings Judgment and Decree (1932).

ITP and MSAA Covered Activity 2: Water Diversion Structures. This activity includes ongoing management/maintenance and the installation and removal of structures used to control or divert water, including:

- ***Ongoing management/maintenance of existing flashboard dams.*** This activity includes the placement of boards into concrete abutments across the wetted channel to build head to divert water.

- ***Gravel push-up dams.*** This activity includes use of loaders, backhoes, excavators, or hand work to move gravel/rock within the stream channel to form a flow barrier that seasonally blocks the flow of the stream/river.

- ***Other temporary structures.*** This activity includes the installation of those dams that are made of hay bales, hand-stacked rocks/cobble, and/or tarps, and those temporary dams that are otherwise not gravel push-up dams.

[4] Section 1602 requires an entity to notify the Department before substantially diverting or obstructing the natural flow of, or substantially changing or using any material from the bed, channel, or bank of, any river, stream, or lake, or depositing or disposing of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

- ***Pumps and sump ponds.*** This activity includes placement of pumps and maintenance of existing sumps within or adjacent to the active channel. Maintenance activities include the potential use of large machinery within the bed, bank or channel.

- ***Headgates.*** This activity includes the installation of head gates on the bank of the channel. Generally, the site is excavated to proper elevation with large machinery, the head gate, which must meet Department of Water Resources (DWR) standards, is positioned at the appropriate elevation, and rock armoring is often installed around the head gate to protect the structure.

ITP and MSAA Covered Activity 3: Fish Screens. Installation and maintenance of fish screens meeting CDFG/National Marine Fisheries Service (NMFS) criteria for coho salmon as they exist at the time the screen will be installed at stream diversions or pumping locations. These include:

- ***Self-cleaning screens,*** including flat plate self-cleaning screens, and other self-cleaning designs, including rotary drum screens and cone screens with a variety of cleaning mechanisms.

- ***Non-self cleaning screens***, including tubular, box, and other designs consistent with CDFG/NMFS screening criteria.

Generally, the installation of a fish screen includes site excavation for the fish screen and a bypass pipe or channel at proper elevation using large machinery along the banks of the creek. If fish screen placement is within or near flood prone areas, rock armoring is installed to protect the structure. Activity within the bed or bank of the stream is usually limited to the installation of the bypass pipe. Disturbance from installing the bypass pipe or channel is limited to an estimated average of 40 square feet and no more than 100 square feet of stream bank.

ITP and MSAA Covered Activity 4: Construction and Maintenance of Stream Access and Crossings. This activity includes the movement of livestock and vehicles across flowing streams or intermittent channels and/or constructing stream crossings at designated locations where potential spawning gravels, incubating eggs or fry are not present based on repeated site specific surveys.

ITP and MSAA Covered Activity 5: Installation of Fencing. This activity includes the installation and maintenance of livestock exclusion fencing and associated stock watering lanes to protect the riparian zone of the rivers and streams in the Shasta River watershed.

ITP and MSAA Covered Activity 6: Riparian Restoration and Revegetation. This activity includes riparian restoration or revegetation, activities that are consistent with CDFG's *Salmonid Stream Habitat Restoration Manual, 3rd Edition*, or are otherwise specifically approved in writing by CDFG.

ITP and MSAA Covered Activity 7: Instream Structures. This activity includes the installation, maintenance, and repair of instream structures intended to provide habitat for coho salmon, and are consistent with the methods specified in CDFG's *Salmonid Stream Habitat Restoration Manual, 3rd Edition.*

Typical instream structures include the following:

- streambed and bank protection;
- installation of bioengineered habitat structures;
- installation of deflectors;
- installation of boulder clusters;
- installation of boulder weirs for instream habitat or to replace flashboard dams, gravel push up dams and other temporary diversion structures;
- placement of large woody debris; and.
- placement of gravel for spawning habitat enhancement.

ITP and MSAA Covered Activity 8: Installation and Maintenance of Stream Gages. This activity includes the placement and maintenance of an approximately 2- to 6-inch diameter pipe into the active stream channel. The pipe is secured to the bank by attachment to the bedrock, a boulder, or a concrete buttress. The use of heavy equipment is generally not necessary for this activity.

ITP and MSAA Covered Activity 9: Barrier Removal Projects/Fish Passage. The ITP and MSAA cover several specific projects to remove barriers to fish passage. The projects include the following:

- Aruajo Dam demobilization and water quality improvement project;
- Shasta Water Association's dam demobilization and water quality improvement project;
- Grenada Irrigation District fish barrier removal project; and
- Additional future enhancement projects consistent with the Program.

ITP Covered Activity 10: Grazing Livestock. This activity includes grazing livestock adjacent to the channel or within the bed, bank, or channel of the Shasta River or its tributaries in accordance with a grazing management plan approved by CDFG. The grazing plan will address the timing, duration, and intensity of livestock grazing to minimize adverse impacts to the stream ecosystem.

ITP Covered Activity 11: Water Management. This activity includes water management, water monitoring, and watermastering activities, including the operation of headgates in conjunction with measuring devices to assure that each diversion is operated in compliance with its associated water right. Flow measuring weirs are generally placed off stream within the diversion ditch.

ITP Covered Activity 12: Permit Implementation. This includes other activities associated with the implementation of avoidance, minimization, and mitigation measures required by the ITP.

ITP Covered Activity 13: Monitoring. This includes activities associated with the implementation of compliance, implementation, and effectiveness monitoring required by the watershed wide ITP (see below).

ITP Covered Activity 14: Research. This includes activities associated with conducting studies to improve our understanding of salmonid distribution, natural history, and population dynamics in the Shasta River watershed.

8.4.2 Conditions of Approval

The proposed ITP includes avoidance and minimization measures that will apply to SVRCD and participating agricultural operators (through their sub-permits) for their own Covered Activities. The ITP also includes measures to mitigate the incidental take of coho salmon for all Covered Activities that SVRCD, rather than individual agricultural operators, will be responsible for implementing. CDFG may include measures in a sub-permit that are not included in the ITP if it determines that the additional measures are necessary to avoid and minimize the take of coho salmon incidental to the activity covered in the sub-permit. The MSAA includes avoidance and minimization measures which the party receiving the SAA will be responsible for implementing when performing their specific Covered Activities.

General Conditions of the ITP

The draft ITP contains general conditions that will apply to both SVRCD and, through their sub-permits, participating agricultural operators, as summarized below.

ITP General Condition A: This condition requires SVRCD to conduct an education program for all sub-permittees within 60 days of the close of each sub-permittee enrollment period (After the ITP takes effect, a 90-day sub-permittee enrollment period will begin. Any agricultural operator who would like to enroll in the Program after the initial enrollment period closes may do so from January 1 to February 28 each year). The education program will consist of a presentation by a person or persons knowledgeable about the biology of coho salmon, the terms of the ITP, and CESA. The education program will include a discussion of the biology of coho salmon, their habitat needs, their threatened status under CESA, and the avoidance, minimization, and mitigation measures required by the ITP.

ITP General Condition B: This condition requires SVRCD and any sub-permittee to immediately stop, contain, and clean-up any fuel, lubricants, or other hazardous materials that leak or spill while engaged in a Covered Activity; to notify CDFG immediately of any leak or spill of hazardous materials into a stream or in a place where it can pass into a stream; and to store and handle hazardous materials at least 150 feet away from the edge of mean high water elevation of any stream, unless adequate containment for an existing facility is provided and approved by CDFG..

ITP General Condition C: This condition requires sub-permittees to provide non-enforcement CDFG representatives written consent to access the sub-permittee's property for the purpose of verifying compliance with, or the effectiveness of, required avoidance, minimization, and mitigation measures and/or for the purpose of fish population monitoring, provided CDFG notifies the sub-permittee at least 48 hours in advance.

ITP General Condition D: Under this condition, each sub-permittee will be solely responsible for any costs the sub-permittee incurs to implement any avoidance or minimization measures required under the ITP, unless CDFG specifies otherwise; and SVRCD shall be solely responsible for any costs it incurs to implement any mitigation and monitoring measures required under the ITP, unless CDFG specifies otherwise.

ITP General Condition E: This condition specifies that SVRCD's obligations under the ITP will end only after CDFG certifies that SVRCD has implemented the avoidance, minimization, and mitigation measures in the ITP for which it is responsible, and CDFG accepts SVRCD's Final Report (described below) as complete.

ITP General Condition F: This condition requires SVRCD to submit to CDFG an irrevocable letter of credit or another form of financial security other than a bond (Security) approved by CDFG's Office of the General Counsel in the principal sum of $100,000. The Security must allow CDFG to draw on the principal sum if CDFG, in its sole discretion, determines that SVRCD or a sub-permittee has failed to comply with any of the avoidance, minimization, mitigation, or monitoring measures for which SVRCD or sub-permittee is responsible.

If CDFG draws on the Security, it must use the amount drawn to implement the measure(s) SVRCD or sub-permittee has failed to implement, or some other measure(s) within the Program Area that will more effectively avoid, minimize, or mitigate impacts on coho salmon caused by a Covered Activity.

ITP General Condition G: This condition allows instream work on structural restoration projects by SVRCD or a sub-permittee to occur only from July 1 to October 31 when coho salmon are least likely to be present and/or when water temperatures exceed the tolerance levels of coho salmon. If the work needs to be completed before July 1 or after October 31, SVRCD or the sub-permittee may request a variance from CDFG in writing. If CDFG grants the request, the work must be completed in accordance with the avoidance, minimization, mitigation, and monitoring measures CDFG might specify in granting the variance.

ITP General Condition H: Under this condition, instream equipment operations by SVRCD or a sub-permittee may occur when coho salmon are least likely to be present and/or when water temperatures exceed the tolerance levels of coho salmon, which is generally from July 1 to October 31. SVRCD must contact CDFG to verify when such operations may begin each year prior to their commencement. The condition also specifies that to the extent possible, all such work must be done from outside the channel. All refueling of machinery must be done no less than 150 feet away from the edge of the mean high water elevation of any stream.

ITP General Condition I: This condition requires SVRCD and each sub-permittee to comply with Fish and Game Code section 1600 *et seq.* before beginning any near-or in-stream work described in section 1602, subdivision (a).

<u>Additional SVRCD and Sub-Permittee Avoidance and Minimization Obligations Under the ITP</u>

In addition to any other obligations, the ITP contains specific obligations that SVRCD and each sub-permittee must implement in order to avoid and minimize the incidental take of adult and juvenile coho salmon in the Shasta River and its tributaries when engaged in a Covered Activity. Those obligations are briefly summarized below.

ITP Additional Avoidance and Minimization Obligation A: Water Management. This includes compliance with water rights, verification of the quantity of water diverted, and a requirement to install headgates and water measuring devices on water diversion structures.

ITP Additional Avoidance and Minimization Obligation B: Fish Screens. This includes fitting diversions with fish screens that meet CDFG and NMFS screening criteria for steelhead fry, annual inspection of screens during the irrigation season, provision of a bypass channel or device to enable fish to return to the main stream channel, cleaning and maintenance requirements, and high flow provisions to either prevent fish from being carried past the fish screen or allow them to return to the main stream channel.

ITP Additional Avoidance and Minimization Obligation C: Fish Passage Improvements. SVRCD and each sub-permittee with fish passage issues will implement specified requirements in an effort to eliminate 100% of the fish barriers on a scheduled basis over the term of the ITP. This obligation requires SVRCD to create a priority list of diversions that impede fish passage, and to submit this list to CDFG for review and approval within one year of the effective date of the ITP. SVRCD must also coordinate with CDFG to develop and conduct a fish passage workshop for those who own, operate, or use diversions that are likely to obstruct fish passage. The workshop will be held within one year of the effective date of the ITP.

In addition to the above, each sub-permittee will be required to provide permanent volitional fish passage for both adult and juvenile coho salmon, both upstream and downstream, at each diversion prior to the expiration of the ITP. Where such passage appears to be inadequate, the sub-permittee must submit plans to CDFG for review and approval. As a part of the review, CDFG will make a determination regarding whether or not engineered drawings are necessary for the project. If engineered drawings are deemed necessary, they will be submitted for review and approval prior to implementing the project. Annual reports that document progress to provide adequate fish passage at these diversions will be provided to SVRCD by the owner of the diversion.

ITP Additional Avoidance and Minimization Obligation D: Livestock and Vehicle Crossings. The draft ITP contains several "Avoidance and Minimization Obligations" to reduce the potential for take of coho salmon from livestock and vehicles crossing streams. Those obligations include: a prohibition on livestock and vehicles crossing flowing streams between October 15 and May 15, except in designated, CDFG-approved crossing lanes; criteria for site selection and crossing design, construction, periodic inspection, and maintenance. Crossing sites will be selected to avoid impacts on potential spawning habitat and coho salmon redds.

ITP Additional Avoidance and Minimization Obligation E. **Riparian Fencing/Grazing of Livestock in Riparian Areas.** The draft ITP includes several provisions for riparian fencing and restriction of livestock from riparian areas intended to improve the condition of the riparian vegetation for the benefit of coho salmon. Those include a requirement that SVRCD develop a Riparian Fencing Plan for CDFG review and approval that prioritizes areas for riparian protection; a requirement for sub-permittees to install, maintain, and repair exclusion fencing in accordance with the Riparian Fencing Plan; a requirement for sub-permittees to allow the planting of riparian revegetation and installation of exclusion fencing along designated stream reaches located on their property, and restrictions on sub-permittees' grazing of livestock within a fenced riparian area.

ITP Additional Avoidance and Minimization Obligation F: Gravel Push-Up Dams. The draft ITP requires SVRCD to consult with CDFG to prepare and adopt a set of Best Management Practices (BMPs) that govern the construction, operation, and removal of gravel push-up dams. The BMPs will specify the conditions under which such dams may be constructed, including work windows and the type of equipment that may be used for construction and removal; provisions to allow fish passage; and measures to minimize stream sedimentation and other water quality issues. Within two years of the effective date of the ITP, any sub-permittee who uses gravel push-up dams in the Shasta River or its tributaries will be required to request SVRCD and CDFG to assess the dam. If CDFG determines that a gravel push-up dam is the best method to divert water and complies with the Fish and Game Code, specific BMPs will be added to the sub-permit to minimize dam-related impacts. Within four years of the effective date of their sub-permit, sub-permittees will be required to replace their gravel push-up dams with vortex weirs or other structures, provided it is technically feasible to do so and CDFG approves the structure.

ITP Additional Avoidance and Minimization Obligation G: Bioengineered Bank Stabilization. In areas where the slopes of stream banks on a sub-permittee's property have become unstable and stabilization measures are necessary to re-establish vegetation, the sub-permittee will be required to implement bioengineered bank stabilization techniques[5] to prevent additional erosion from occurring. The techniques to be implemented must be consistent with methods identified in the most recent version of the CDFG's California Salmonid Stream Habitat Restoration Manual, and must be approved by CDFG on a site-by-site basis.

ITP Additional Avoidance and Minimization Obligation H: Irrigation Tailwater Reduction and/or Capture. Under the ITP, SVRCD will be required to assist sub-permittees in the design and implementation of tailwater reduction and capture systems. SVRCD will inventory and prioritize tailwater sources for remediation and submit the priority list of sites to CDFG for its review and approval within two years of the effective date of the ITP. Tailwater capture systems will be consistent with the standards contained in U.S. Department of Agriculture's Natural Resources Conservation Service guidelines, and constructed so as not to have negative impacts on the stream either during or after construction. Any sub-permittee whose property is on the priority list must have tailwater reduction and capture systems in place by the expiration of their sub-permit.

ITP Additional Avoidance and Minimization Obligation I: Dwinnell Dam and the Montague Water Conservation District. Since 1928, Dwinnell Reservoir has stored water for the Montague Water Conservation District (MWCD) which releases the stored water to

[5] Bioengineered bank stabilization structures use a combination of living plants, such as willow or other riparian trees, shrubs, and inert materials such as gravel and rip-rap. Bioengineered structures tend to provide more aquatic and riparian habitat attributes than conventional bank stabilization structures.

district members for irrigation purposes. Dwinnell Reservoir contains populations of non-native fish. Therefore, release from the reservoir likely exacerbates existing problems of predation on coho salmon. To avoid this problem, MWCD will screen their summer discharge from Dwinnell Reservoir into the Shasta River. In addition, MWCD shall prepare a feasibility study to investigate the design and implementation of fish screens on both the Parks Creek and Little Shasta River diversions. The feasibility study shall evaluate the water budget for intake and delivery operations and proposed water management measures at Dwinnell Dam to improve coho salmon habitat downstream of the dam. The feasibility study shall also investigate the possibility of providing fish passage at Dwinnell Dam.

Mitigation Obligations of SVRCD Under the ITP: Flow Enhancement, Habitat Improvement, and Barrier Removal and Fish Passage

The ITP contains mitigation measures that the SVRCD will be required to implement. Those mitigation measures are required to mitigate potential take of coho salmon incidental to the Covered Activities. The mitigation measures also require the involvement of sub-permittees, and in some instances other entities. The mitigation measures are summarized below.

A. Flow Enhancement Mitigation Obligations

To mitigate potential take of coho salmon from the diversion of water in streams where coho salmon occur, SVRCD will implement the programs listed below to provide for or support the instream needs of coho salmon at specific life-cycle stages.

Flow Enhancement Mitigation 1: Development and Implementation of Scott River Water Trust. SVRCD will be required to develop a locally-based Shasta River Water Trust (Water Trust). The Water Trust will lease or purchase water from sub-permittees for instream beneficial use in accordance with guidelines prepared by SVRCD and approved by CDFG.

Flow Enhancement Mitigation 2: Improve Baseline Instream Flows Via Water Efficiency Improvements. The ITP will require SVRCD to improve baseline instream flows within critical reaches of the Shasta River and its tributaries and at critical life stages of coho salmon by installing water efficiency improvement projects on sub-permittees' properties or by changing or adding points of diversion to keep flows instream to point of use. SVRCD will work with the CDFG to develop priority stream reaches based on life stage need, and will work with sub-permittees to upgrade their overall irrigation efficiency and delivery systems to enhance instream flows. Projects that may be implemented to improve instream flows include: 1) the upgrade of water delivery systems to reduce waste; 2) the upgrade of water application systems; and 3) moving or adding points of diversion downstream closer to the point of use. Generally, a water transfer or dedication for instream benefits pursuant to Water Code section 1707 will be an element of water efficiency projects.[6]

[6] Water Code section 1707 authorizes the State Water Resources Control Board to approve a petition to change an existing water right specifically for the purpose of preserving or enhancing wetlands, fish and wildlife, or recreation in or on the water. Such a change requires that the original use under the existing right cease or be reduced in the amount of the change.

Flow Enhancement Mitigation 3: Develop and implement a Contingency Plan for Dry and Critically-Dry Water Years. Under the ITP, SVRCD will be required to submit a detailed Contingency Plan for Dry and Critically-Dry Water Years to CDFG for review and approval within one year of the effective date of the ITP. The Contingency Plan will identify the criteria to determine when a year is dry or critically-dry and describe a process by which SVRCD will coordinate with sub-permittees to augment stream flows. SVRCD will determine whether the water year will be dry or critically-dry by April 15. SVRCD shall include the following measures in the Contingency Plan:

- **Contingency Plan Measure 1: Augmentation of Stream Flow.** In dry and critically-dry years, instead of directly diverting water from the stream for irrigation uses, pumping water from wells may be necessary to improve over-summering habitat and migration conditions for coho salmon in the fall. To meet that objective, all sub-permits shall require the sub-permittee to make available to the Program any excess irrigation and stock water well capacity in dry or critically-dry years in accordance with the Contingency Plan, provided the sub-permittee is reimbursed for any pump operation costs the sub-permittee incurs to meet this requirement using funds from the Water Trust, or from some other source.

- **Contingency Plan Measure 2: Develop and Implement a Diversion Ramp-Up Management Plan.** Significant changes in stream flow occur when agricultural water users begin diverting water at the same time. A rapid decrease in flow can result in the stranding of fish in shallow pools and side channels below diversions. To address this problem, SVRCD, in consultation with CDFG and DWR, shall develop and implement a Diversion Ramp-Up Management Plan to coordinate and monitor irrigation so as to minimize rapid reductions in instream flows and the possible stranding of coho salmon at the beginning of, and during the irrigation season. SVRCD shall submit the Management Plan to the CDFG for its review and approval within one year from the effective date of the Permit. SVRCD and the sub-permittees shall begin implementing the Management Plan immediately upon the CDFG's approval.

Flow Enhancement Mitigation 4: Install Alternative Stock Water Systems. Water is diverted for stock watering purposes in October, November, and December each year after diversions for irrigation cease. In those years when the seasonal rains arrive late, such stock water diversions can limit the ability of returning adult coho salmon to reach spawning areas. To address that problem, SVRCD shall identify priority areas where additional instream flows in the fall will contribute significantly to adult coho salmon migration. A priority plan shall be prepared by SVRCD that identifies where, if any, alternative stock watering systems may be beneficial for coho salmon. During the term of the ITP, SVRCD shall install an average of two alternative stock watering systems per year, if deemed necessary by the priority plan. The watering systems will use groundwater rather than surface water in order to increase stream flows. Higher stream flows will facilitate adult coho salmon access to spawning areas. For purposes of the ITP, an alternative stock water system means the wells, pumps, water lines, watering troughs, and other physical components used to provide groundwater to livestock.

B. Habitat Improvement Mitigation Obligations Under the ITP

The ITP will obligate SVRCD to undertake habitat improvement projects to mitigate impacts to coho salmon habitat.

Habitat Improvement Mitigation 1: Spawning Gravel Enhancement. Under the ITP, SVRCD will be required to work with CDFG to develop and implement a Spawning Gravel Enhancement Plan (Gravel Enhancement Plan). The Gravel Enhancement Plan will identify areas where gravel for coho salmon spawning needs to be placed and where gravel can be recruited, and prioritize immediately-needed gravel enhancement projects throughout the Program Area. SVRCD will submit the Gravel Enhancement Plan to CDFG for review and approval within two years from the effective date of the ITP.

SVRCD will identify in the Gravel Enhancement Plan priority areas for the placement of gravel and/or flows which will maintain gravel quality. The SVRCD will design and install constrictors and/or other spawning will design and install constrictors and/or other spawning area enhancement structures at a total of five priority stream reaches where spawning gravels are not plentiful, if deemed necessary in the Gravel Enhancement Plan. SVRCD will complete all gravel enhancement projects prior to the expiration of the ITP.

Habitat Improvement Mitigation 2: Instream habitat improvement structures. SVRCD, in consultation with CDFG, will identify locations in the Program Area where instream habitat improvement structures would benefit coho salmon, and list those locations in order of priority. SVRCD will finalize the list within one year from the effective date the ITP. SVRCD will install at least twenty instream habitat improvement structures at sites identified on the priority list.

Habitat Improvement Mitigation 3: Riparian Planting. The ITP will require SVRCD to submit to CDFG for its review and approval a priority list of areas currently being used by coho salmon for spawning and rearing. The list must be submitted within two years of the effective date of the ITP. Before the ITP expires, SVRCD will plant eight linear miles of streambank (measured on one side of the river) of riparian habitat in the areas included on the priority list to improve instream cover and shade canopy, improve channel stabilization, and trap or hold sediment. Three miles of streambank will be planted within five years of the effective date of the ITP.

C. Barrier Removal and Fish Passage Mitigation Obligations Under the ITP

Significant barriers exist in the Shasta River system that prevent fish passage or limit historical access. Because removal of fish passage barriers can have short-term negative effects, possibly including take of coho salmon, these mitigation measures are also a Covered Activity (see ITP and MSAA Covered Activities 9 above).

Some older structures that impede fish passage are considered "legacy projects"[7]. Restoring passage at those sites are considered mitigation measures for purposes of the ITP. The ITP requires SVRCD to continue to work toward eliminating the fish passage barriers identified below.

Barrier Removal And Fish Passage Mitigation Obligation 1 Araujo Dam Demobilization and Water Quality Improvement Project. SVRCD will continue to work with CDFG on the permanent removal of Araujo Dam, a seasonally-used flashboard dam built in 1856 that five landowners use to irrigate agricultural lands.

Barrier Removal and Fish Passage Mitigation Obligations 2: Shasta Water Association's Dam Demobilization and Water Quality Improvement Project. SVRCD shall continue to work with CDFG on the removal of a flashboard dam built in 1912 that approximately 130 individual landowners use.

Barrier Removal and Fish Passage Mitigation Obligations 3: Grenada Irrigation District Fish Barrier Removal Project. SVRCD will develop final engineered drawings for removal of the fish passage barrier at the Grenada Irrigation District diversion and develop funding to implement the new diversion structure design by the expiration of the ITP.

8.5.3 Monitoring and Adaptive Management Program Under the ITP

The draft ITP requires SVRCD and sub-permittees to participate in a program to monitor compliance with the conditions of the ITP, the implementation of mitigation, minimization, and avoidance measures, and the effectiveness of those measures in protecting coho salmon.

Under the terms of the ITP, SVRCD will be responsible for monitoring the sub-permittees' compliance with the terms and conditions of their sub-permits by instituting a comprehensive compliance monitoring program. The monitoring program will include a means to: (1) confirm and monitor the implementation of the minimization and avoidance measures for which the sub-permittees are responsible; and (2) identify sub-permittees who are not in compliance with the terms and conditions of their sub-permits. SVRCD will be required to notify CDFG immediately of sub-permittees who are not in compliance with a term or condition of their sub-permit, or who are unlikely or unwilling to implement required avoidance and minimization measures within the time periods specified in the sub-permit. SVRCD will not be responsible for enforcement; that responsibility is reserved to CDFG.

[7] Legacy projects are defined as those projects that address historic management practices that have been usurped by new laws and regulations. An example of a legacy project is a water association dam that has been in place since the 1920's. No single person is accountable for the dam and the restoration value of improving passage exceeds the value of non-legacy projects.

SVRCD's monitoring program will also be used to determine the effectiveness of the avoidance, minimization, and mitigation measures required by the ITP, and the extent to which the objectives of those measures have been met. The results of the effectiveness monitoring would be used as a basis for an adaptive management program, to refine future avoidance, minimization, and mitigation measures.

8.5.4 Reporting Requirements of SVRCD Under the ITP

The draft ITP includes several reporting requirements that SVRCD would be subject to. This includes an Annual Report for each year that the ITP is in effect, a Five-Year Report, and a Final Report.

Each Annual Report will include the following information: 1) a general description of the status of the Program, including a description of all avoidance, minimization, and mitigation measures that were implemented during the previous year; 2) a copy of an implementation database with notes showing the current implementation status of each avoidance, minimization, and mitigation measure; 3) the results of all compliance, implementation, and effectiveness monitoring conducted pursuant to the ITP; and 4) all monitoring data.

Five years after the effective date of the ITP, SVRCD will be required to conduct a comprehensive review of the Program and submit its findings in the form of a Five-Year Report to CDFG. As part of its review, SVRCD will evaluate coho salmon recovery task implementation and community participation. The Five-Year Report will include an analysis of the Program beginning on the effective date of the ITP, as well as the activities that have been implemented since that time. The Five-Year Report would include recommended adaptive management actions to improve operations.

No later than six months after the expiration of the ITP, SVRCD will be required to submit a Final Report to CDFG. The Final Report will include: 1) a copy of the implementation database with notes showing when each avoidance, minimization, and mitigation measure was implemented; 2) all available information about the incidental take of coho salmon the ITP covers; 3) information about the impacts the Covered Activities have had on coho salmon, notwithstanding the implementation of the avoidance, minimization, and mitigation measures; 4) the beginning and ending dates of all construction activities the ITP or any sub-permit covers; 5) an assessment of the effectiveness of the ITP's and sub-permits' terms and conditions to avoid, minimize, and mitigate impacts on coho salmon; 6) recommendations on how those terms and conditions might be changed to more effectively avoid, minimize, and mitigate such impacts in the future; and 7) any other pertinent information.

General Conditions of the MSAA

The draft MSAA contains several general conditions that will apply to the SVRCD and agricultural operators who obtain SAAs. Most of the general conditions are compatible with those contained in the draft ITP. In addition, the MSAA states SVRCD and any agricultural operator who obtains a SAA must comply with all local, state, and federal laws to conduct a Covered Activity, including CESA, and, where applicable, possess a valid water right.

Specific Project Activity Conditions of the MSAA

Under the MSAA, specific conditions of approval are termed "Specific Project Activity Conditions" and will be apply to the SVRCD's and agricultural operator's SAA when conducting a particular Covered Activity. In general, the conditions are similar to or compatible with the avoidance and minimization measures in the draft ITP

8.5.5 Department of Water Resources (DWR) Sub-Permit Obligations

The draft ITP includes special provisions for DWR, under the assumption that DWR will be a sub-permittee. As such, DWR will be responsible for complying with the following terms and conditions:

1. To assist with the implementation of the ITP and sub-permits, DWR will provide to CDFG water use data for all diversions with watermaster service in the Program Area, including, but not limited to, the name of the diverter, the location of the diversion, the quantity of water that may lawfully be diverted and used, the dates the watermaster visits each diversion, and the estimated or measured quantity of water diverted by the watermaster on each visit. DWR will provide the data in the form of a database on a monthly basis from April to November each year by the second week of each month following data collection.

2. DWR will implement the Shasta River decree pursuant to provisions of the Water Code in the adjudicated portions of the Shasta River watershed. As part of that responsibility, the DWR watermaster, or a functional equivalent, will verify that each sub-permittee is in compliance with their respective water right(s). The watermaster will create a database of all diversions visited on a monthly basis to verify compliance with water rights and will provide those data monthly to CDFG.

3. Notwithstanding the above, DWR will implement the provisions of the Shasta River decree consistent with CESA.

References

California Department of Fish and Game, *Salmonid Stream Habitat Restoration Manual, 3rd Edition*, Flosi *et al.*, Sacramento, CA, revised and updated in 2003.

California Department of Fish and Game, *Recovery Strategy for California Coho Salmon.* Report to the Fish and Game Commission, February 4, 2004.

California State Water Resources Control Board, *Water Transfer Issues in California*. Final report of the Water Transfer Workgroup to the SWRCB. Sacramento, June, 2002.

Scott River Watershed Council, *Initial Phase of the Scott River Watershed Council Action Plan: Update.* Etna, CA, October, 2005.

Siskiyou County Resource Conservation District, *Incidental Take Permit Application for Coho Salmon.* Submitted to California Department of Fish and Game on March 29, 2005.

9. Surrounding Land Uses and Setting.

The Shasta River is one of four main tributaries to the Klamath River, the others being the Trinity, Salmon, and Scott Rivers. The Program Area is the Shasta River watershed, including the Shasta River and its tributaries, in Siskiyou County. This includes the northwestern slope of Mount Shasta, the Shasta Valley, and the main tributaries to the Shasta River: Parks Creek, Willow Creek, Yreka Creek, and the Little Shasta River. The entire watershed, which covers about 792 square miles, is within Siskiyou County, Northern California. The Shasta River flows roughly northwest, from the northern flank of Mt. Shasta, through the Shasta Valley, then through a bedrock canyon to its confluence with the Klamath River.

There are several towns and cities in the watershed that are excluded from the program, including Weed, Yreka, Gazelle, Edgewood, Montague, and Grenada. Dwinnell Dam and Lake Shastina are major features located in the Shasta Valley. Interstate 5 runs through the Shasta Valley and is the main north-south transportation corridor. State Routes 3, 263, and 99, and U.S. 97 also run through the watershed.

Most of the lands where covered activities occur are in the lowland, agricultural areas of the Shasta Valley. Raising of field crops, including alfalfa and other hay crops, and stock-raising are the principal agricultural pursuits. Water rights in the Shasta River watershed are subject to the Shasta River Adjudication and Proceedings Judgment and Decree (1932). DWR provides watermastering services.

10. Other Public Agencies Whose Approval is Required

The primary discretionary actions for the Program are CDFG's issuance of the ITP to the SVRCD and approval of the MOU which includes the MSAA. After the ITP is issued and the MOU signed, CDFG may issue the ITP to the SVRCD and individual sub-permits and SAAs to the SVRCD and participating agricultural operators. The sub-permits and individual SAAs include general and specific measures included in the ITP and MSAA based on the Covered Activity to be complete. It is these discretionary actions which trigger requirements for environmental review under CEQA. Additional discretionary actions by state and local agencies may include actions to allow activities within the waters of the state by the Regional Water Quality Control Board and the State Lands Commission. Water transfers pursuant to Water Code section 1707 would require approval by the State Water Resources Control Board. If any of the Covered Activities could disturb historic or cultural resources, approval by the State Historic Officer may be required.

Environmental Factors Potentially Affected

The Program and the Covered Activities authorized under it could potentially affect the environmental factors checked below. A more detailed checklist and discussion of each environmental factor follows the checklist below. "Project" or "proposed project" in any of the checklists below means the Program, and hereafter, "Program" includes the Covered Activities authorized under it.

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

DETERMINATION

On the basis of this initial study:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

Signature

October 19, 2006
Date

Mark C. Stopher
Printed Name

Donald B. Koch, Regional Manager
For

Section 15128 of the CEQA Guidelines (Cal. Code Regs., tit. 14, §15000 *et seq.*) requires that an environmental impact report (EIR) contain a statement briefly indicating why various possible effects were found "not to be significant and were therefore not discussed in detail in the EIR." The CEQA Guidelines also generally encourage agencies to prepare EIRs that focus on issues and effects that are potentially significant and to minimize other discussions that are clearly less important.

In preparing this initial study, CDFG considered the potential for significant impacts to a variety of environmental factors. It was determined that many of those factors would not be affected or, if impacts could potentially occur, would be affected at a less than significant level. Many of the environmental factors falling in the "less than significant" category are further analyzed in this initial study to enable the reader to better understand CDFG's determination regarding impacts. Unless comments received during the comment period indicate additional analysis is necessary, those environmental factors will not be discussed in additional detail in the EIR. For purposes of the analysis below, "Covered Activities" includes the activities authorized under the ITP and MSAA, as well as the general and specific avoidance, minimization, and mitigation measures included in the ITP and MSAA.

Environmental Checklist

Aesthetics

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

Discussion

a) The Program covers specified, lawful activities that are typical within a working agricultural landscape, such as the installation of instream structures to divert water. It also requires actions to restore and improve coho salmon habitat, such as the installation of fish-screens and exclusionary riparian fencing. Most of such structures are or will be located either in or near the stream channel. They would not impede scenic vistas, and typically would be visible at medium- (>20 feet) to close-range (10-20 feet). In most cases, after the construction has been completed, a project site might contain a diversion structure, exclusionary fencing, or riparian vegetation that is relatively indistinguishable from other baseline agricultural operations occurring throughout the landscape. Therefore, the Program would have a less-than-significant impact on a scenic vista.

b) The Shasta River watershed, and Siskiyou County in general, do not contain officially designated state scenic highways. However there are state scenic highways throughout the county that are eligible for state designation. These eligible state scenic highways are also identified in the Siskiyou General Plan (1980) Scenic Roads Element. Eligible highways that traverse the Shasta River watershed include: US Route-97 from the Oregon border south to I-5 in Weed, Interstate 5 from the Oregon line to its intersection with State Route-3 in Yreka, SR-3 from Montague to the Trinity County line, and SR-263 from Yreka to Hwy 96 at the confluence of the Shasta and Klamath Rivers. Most Covered Activities will take place either in or near the stream channel and will not damage resources within a scenic corridor. In some cases, Covered Activities, such as riparian revegetation, will be a long-term improvement to the visual landscape. While there is potential for vegetation removal during construction activities, including clearing and grubbing to remove fish passage barriers or to install fish screens, conditions of approval in the ITP and MSAA would minimize and mitigate for vegetation disturbance. There are also potential aesthetic improvements resulting from ITP Covered Activity 6: Riparian Restoration and Revegetation. Riparian planting is commonly conducted within or adjacent to the active channel and often near the wetted channel. For these reasons, the Program would have a less-significant-impact on scenic resources such as trees, rock outcroppings, and historic buildings within a state scenic highway corridor.

c) Covered Activities would have an appearance similar to other baseline activities (e.g., water diversion structures, installation of fish screens, fencing installation) or would have no visual impact (e.g., monitoring, research, permit implementation). Covered Activities that involve heavy equipment, such as loaders, backhoes, and excavators, would introduce changes to the visual landscape; however, those effects would be temporary during construction of Covered Activities, and would not significantly affect the visual character of the area. Once construction has been completed, there would be structures (e.g., livestock fencing, instream diversion structure) that would be virtually indistinguishable from the rest of the working agricultural landscape. In some cases, Covered Activities such as replacement of gravel push-up dams with boulder weirs or other, more natural-appearing structures, as well as riparian revegetation, would result in long-term aesthetic improvements to areas in and along waterways. Therefore, the Program would have a less-than-significant impact on the existing visual character.

d) Most Covered Activities involve natural materials (e.g., boulders, hay bales, rocks/cobble, large woody debris, gravel, bio-engineered habitat structures, riparian plantings, and quarry rock) that would blend in with the natural environment. Fish screens and livestock exclusion fencing are matte in color and do not contribute substantial glare that would adversely affect daytime or nighttime views in the area. There are no Covered Activities that require either nighttime construction lighting or illumination once a structure has been installed. Therefore, the Program would have a less-than-significant impact of creating new light or glare.

References

Caltrans, *California Scenic Highway Mapping System, Siskiyou County,* accessed on September 25, 2006: http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm

Siskiyou County, *Siskiyou County General Plan, Scenic Highways Element*, 1980.

Agricultural Resources

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

Discussion

a,b,c) The Program provides participants take authorization under CESA and coverage under section 1602 for specific Covered Activities. Those activities include, but are not limited, to water diversions and actions to restore coho salmon habitat (see ITP and MSAA Covered Activities above). The ITP requires specific avoidance, minimization, and mitigation measures to protect coho salmon and to implement key coho salmon recovery tasks (see Conditions of Approval above). Implementation of the Program has the potential to affect agricultural resources and will be evaluated in the EIR.

Reference

Siskiyou County, *Siskiyou County General Plan, Land Use and Circulation Element,* 1980.

Air Quality

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
3. AIR QUALITY Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **Would the project:**				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Setting

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, which affects air quality.

Regional Topography, Meteorology, and Climate

The potential for high pollutant concentrations developing at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the air pollutants. The atmospheric pollution potential, as the term is used in this Initial Study, is independent of the location of emission sources and is instead a function of factors such as topography and meteorology.

The Program Area is the Shasta Valley watershed, located in north-central Siskiyou County, California, at the base of the Cascade Range in the Northeast Plateau Air Basin. In this area of California, the Klamath Mountains merge with the Cascade Range to create an extensive area of rugged mountain terrain more than 200 miles in width. The Cascades range from approximately 5,000 to 10,000 feet in height, with Mt. Shasta rising to 14,161 feet above sea level (WRCC, 2006a). Shasta Valley generally rises to the south towards Mount Shasta, with the elevation of Weed at approximately 3,600 feet above mean sea level and the elevation of Yreka at approximately 2,600 feet above mean sea level (WRCC, 2006a). This unique variation of elevation and rugged terrain contributes to the fluctuating climate in the Program Area.

Warm winters, cool summers, small daily and seasonal temperature ranges, and high relative humidity are characteristic of the area nearest the Pacific Ocean. With increasing distance inland, the maritime influence decreases. Areas that are well protected from the ocean, such as Shasta Valley, experience a more continental climate type with warmer summers, colder winters, greater daily and seasonal temperature ranges, and generally lower relative humidity.

The northwestern part of the Program Area near Yreka typically has average maximum and minimum winter (i.e., January) temperatures of 44 ° F and 24 ° F, respectively, while average summer (i.e., July) maximum and minimum temperatures are 91 ° F and 52 ° F, respectively. The southern part of the Program Area near Weed typically has average maximum and minimum winter (i.e., January) temperatures of 43 ° F and 23 ° F, respectively. Average summer (i.e., July) maximum and minimum temperatures in the southern part of the Program Area are approximately five degrees colder then the northern part of the Program Area at 85 ° F and 48 ° F, respectively. Precipitation in Yreka averages approximately 20 inches per year, with 18 inches of snowfall, and precipitation in Weed averages approximately 26 inches per year, with 19 inches of snowfall (WRCC, 2006b).

Existing Air Quality

The Siskiyou County Air Pollution Control District (SCAPCD) operates a regional monitoring network that measures the ambient concentrations of criteria pollutants. Existing levels of air quality in the Program Area can generally be inferred from ambient air quality measurements conducted by SCAPCD at its Yreka – Foothill Drive monitoring station. The Yreka monitoring station measures ozone, particulate matter equal to or less than 10 microns (PM_{10}), and particulate matter less than 2.5 microns ($PM_{2.5}$) concentrations.

Background ambient concentrations of pollutants are determined by pollutant emissions in a given area as well as wind patterns and meteorological conditions for that area. As a result, background concentrations can vary among different locations within an area. However, areas located close together and exposed to similar wind conditions can be expected to have similar background pollutant concentrations. Table 3-1 shows a five-year (2001 – 2005) summary of monitoring data collected from the Yreka station, compared with California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). As indicated in the table, no exceedences of the ozone or $PM_{2.5}$ standards were recorded in Yreka during the five year study period. There were an estimated six days during 2002 when the PM_{10} 24-hour standard was exceeded. It should be noted that the 8-hour ozone State Standard of 0.07 parts per million (ppm became effective

May 17, 2006, and the number of exccedences of the new standard prior to 2006 are not available. However as of late September, 2006, the new 8-hour standard had been exceeded twice in 2006 at the Yreka monitoring station (SCAPCD, 2006).

TABLE 3-1
AIR QUALITY DATA SUMMARY (2001–2005) FOR THE PROGRAM AREA

Pollutant	Standard	Monitoring Data by Year				
		2001	2002	2003	2004	2005
Ozone						
Highest 1 Hour Average (ppm)		0.049	0.087	0.089	0.077	0.070
Days over State Standard	0.09	0	0	0	0	0
Days over National Standard	0.12	0	0	0	0	0
Highest 8 Hour Average (ppm)		0.038	0.075	0.074	0.071	0.064
Days over National Standard	0.08	0	0	—	0	0
Days over State Standard	0.07*	0	NA	NA	NA	0
Particulate Matter ($PM_{2.5}$)						
Highest 24 Hour Average (µg/m³)		NA	NA	NA	NA	26.0
Days over National Standard	65	—	—	—	—	0
Particulate Matter (PM_{10}):						
Highest 24 Hour Average (µg/m³)		33.0	**69.0**	31.0	26.0	27.0
Estimated Days over State Standard	50	0	**6**	0	0	0
Annual Average (µg/m³)	30	NA	17.5	12.8	12.8	13.3

NOTES: *This new ozone 8-hour State Standard became effective May 17, 2006. Values in **bold** are in excess of applicable standard. NA = Data not available. ppm = parts per million; µg/m³ = micrograms per cubic meter
SOURCE: CARB 2006a

Sensitive Receptors

For the purposes of air quality and public health and safety, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust and air pollutant concentrations, or other disruptions associated with project construction and/or operation. Sensitive receptor land uses generally include schools, day care centers, libraries, hospitals, residential area, and parks. Some sensitive receptors are considered to be more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

Regulatory Context

Air quality within the air basin is addressed through the efforts of various federal, State, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern, agencies primarily responsible for improving the air quality within the air basin, and the pertinent regulations are discussed below.

Criteria Air Pollutants

Regulation of air pollution is achieved through both national and State ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act, the USEPA has identified criteria pollutants and has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead (Pb). These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

To protect human health and the environment, the USEPA has set "primary" and "secondary" maximum ambient thresholds for all seven criteria pollutants. Primary thresholds were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

The NAAQS are defined as the maximum acceptable concentrations that may be reached, but not exceeded more than once per year. California has adopted more stringent ambient air quality standards for most of the criteria air pollutants. Table 3-2 presents both sets of ambient air quality standards (i.e., national and State) and provides a brief discussion of the related health effects and principal sources for each pollutant. California has also established State ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, air emissions of these pollutants are not expected under the Program and thus, there is no further mention of these pollutants in this Initial Study. The Northeast Plateau Air Basin generally has good air quality and is in attainment or unclassified for all federal and State ambient air quality standards, except for the State's new 8-hour ozone standard, which became effective in May, 2006. Based on 2003 through 2005 data, the California Air Resources Board (CARB) designated Siskiyou County as non-attainment of the 8-hour ozone standard in August, 2006 (CARB, 2006b).

TABLE 3-2
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm 0.07 ppm	– 0.08 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases and NO_x react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	1 Hour Annual	0.25 ppm –	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM_{10})	24 Hour Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 50 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)	24 Hour Annual	– 12 µg/m^3	65 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_x, SO_2, and organics.
Lead	Monthly Quarterly	1.5 µg/m^3 –	– 1.5 µg/m^3	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

ppm = parts per million
µg/m^3 = micrograms per cubic meter

SOURCE: CARB 2006c and SCAQMD, 1993

Regulatory Agencies

Federal

USEPA is responsible for implementing the myriad programs established under the federal Clean Air Act, such as establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIPs), but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

State

CARB is responsible for establishing and reviewing the state standards, compiling the California SIP, securing approval of that plan from USEPA, and identifying toxic air contaminants. CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality management districts, which are organized at the County or regional level. County or regional air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act.

The regional air quality plans prepared by air districts throughout the State are compiled by CARB to form the SIP. The local air districts also have the responsibility and authority to adopt transportation control and emission reduction programs for indirect and area-wide emission sources.

Siskiyou County

The Program Area is within the jurisdiction of the Siskiyou County Air Pollution Control District (SCAPCD), which regulates air pollutant emissions for all sources other than motor vehicles throughout Siskiyou County. The SCAPCD enforces regulations and administers permits governing stationary sources.

As required by the federal Clean Air Act and the California Clean Air Act, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the standards have been achieved. Jurisdictions of nonattainment areas are also required to prepare air quality plans that include strategies for achieving attainment. Siskiyou County is in attainment or unclassified status for all of the NAAQS and the CAAQS, except for the State eight-hour ozone standard (SCAPCD, 2006). However, based on current data for the year, CARB may re-designate Siskiyou County as attainment of the State eight-hour standard by the end of 2006. If the County achieves attainment of the eight-hour standard, then an air quality attainment plan would not be required to be prepared. Currently, there are no air quality plans applicable to the County (CARB, 2006b).

The Siskiyou County General Plan does not address any requirements regarding the protection and enhancement of air quality in the region and does not have any air quality protection policies that are applicable to the Program.

Air Quality Impacts and Mitigation Measures

a) There is no air quality plan that is applicable to the Program Area. Therefore, the Program would not conflict with or obstruct an applicable air quality plan. No impact would occur.

b) Construction associated with some of the Program activities (e.g., installation of water diversion structures, fish screens, removal of stream barrier, etc.) would generate emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. However, implementation of the Program would result in only minor changes to existing, ongoing, legal water diversions and other in-stream and near-stream activities. Therefore, there would be little change in overall emissions associated with the Program. Nonetheless, this analysis includes Program emission estimates even though the emissions are technically part of the Program baseline and do not represent emission increases.

The SCAPCD does not have established significance criteria to determine the significance of CEQA projects such as the Program. However, the SCAPCD does have criteria pollutant significance thresholds for new or modified stationary source projects in the County. In lieu of significance thresholds for construction emissions, the SCAPCD has recommended comparing estimated Program emissions to its new or modified stationary source significance thresholds, which are 40 tons/year for ROG, NO_2, and SO_2, 100 tons/year for CO, and 15 tons/year for PM_{10} (SCAPCD, 2006).

Onsite emissions would include equipment exhaust from construction equipment used to construct some of the covered Program activities. Onsite fugitive dust emissions are related to ground disturbance (conservatively assumed to be one acre/day) that would occur at the various Program activity sites. Offsite emissions are those that would be generated by worker vehicles that would be used to commute to the various sites associated with the Program and those that would be emitted by trucks and other equipment hauling materials and debris to and from construction sites.

Projected construction emissions are presented in Table 3-3, broken down by onsite and offsite emissions. Refer to Appendix AQ for the detailed assumptions that were used to estimate the worst case Program emissions. Because SCAPCD does not maintain construction equipment emission factors, South Coast Air Quality Management District (SCAQMD) emission factors for off road construction equipment were used to estimate onsite emissions sources. For the purposes of this analysis, it was assumed that three pieces of heavy construction equipment (one dozer, loader, and backhoe) would operate simultaneously within the Program Area eight hours per day, five days per week, from July 1 through October 31. This assumption represents daily concurrent construction associated with three Program activities that require heavy equipment.

CARB's EMFAC2002 model was used to develop emission factors for on-road vehicles, including pickup and diesel semi-trucks. Using the three concurrent Program activities scenario, it is assumed that 30 workers (10 per site) would each commute to the various Program activity sites and nine semi-tractor truck trips (three per site) would be required.

Fugitive dust emissions were developed based on guidance from the Bay Area Air Quality Management District (BAAQMD). Based on approximate emission factors developed by the USEPA for construction emissions, uncontrolled project construction-related PM_{10} emissions are 0.77 tons per acre per month and 51 pounds per acre per day (BAAQMD, 1999).

TABLE 3-3
ESTIMATED PROGRAM CONSTRUCTION EMISSIONS (tons/year)

Activity and Equipment	ROG	CO	NO_2	SO_2	PM_{10}
Onsite					
Equipment Exhaust	0.63	1.59	0.09	0.26	0.15
Fugitive Dust	—	—	3.08	—	—
Offsite					
Worker Vehicle and Haul Truck Trips	2.55	1.37	0.01	0.01	0.11
TOTAL	3.18	2.96	3.18	0.27	0.26
Significance Thresholds (tons/year)	40	100	40	40	15
Significant Impact?	No	No	No	No	No

As shown in Table 3-3, estimated emissions that would be associated with the Program would be well below the significance thresholds recommended by the SCAPCD. Therefore construction emissions associated with the Program would be less than significant, and would not violate any air quality standard or contribute substantially to a projected or existing violation.

c) Siskiyou County is currently non-attainment of the State 8-hour ozone standard. However, as described under a), above, implementation of the Program would result in only minor changes to existing, ongoing, legal water diversions and other in-stream and near-stream activities and there would be little to no change in overall ozone precursor emissions associated with the Program. Therefore, there would be no cumulatively considerable net increase of a criteria pollutant that is non-attainment in the Program Area and no impact related to a criteria pollutant that is non-attainment in the area would occur.

d) It is anticipated that construction activities associated with the proposed Program would occur almost exclusively on private agricultural property in the rural areas of north-central Siskiyou County. Sensitive receptors in the vicinity of Program activity sites would likely include scattered ranch and farm houses associated with the agricultural uses of the area.

Construction activities would generate emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions. These emissions could expose sensitive receptors to pollutant concentrations. However, impacts to regional air quality would be less than significant (see discussion under b, above) and because emissions would be dispersed throughout the rural agricultural areas of the Program Area, impacts to sensitive receptors would also be less than significant.

e) Construction of some of the Program activities would include potential short-term odor sources, such as diesel equipment operation, which could result in the creation of objectionable odors. Since the Program activities would be temporary, spatially dispersed, and generally take place in rural areas, these activities would not affect a substantial number of people. The Program activities would not create objectionable odors affecting a substantial number of people. Impacts would be less than significant.

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Biological Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
4. BIOLOGICAL RESOURCES–				
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐

Discussion

Affected Environment

The Program is within the Klamath Bioregion,[8] which extends from the Pacific Coast eastward more than halfway across California to the Modoc Plateau and the Sacramento Valley floor. Forest types change from old-growth redwoods, white fir, and Douglas fir along the coast to drier types in the mountain ranges of Siskiyou County, mixed conifer–pine and mixed conifer–fir, then to Ponderosa pine and a variety of shrub communities (e.g., bitterbrush-rabbitbrush and juniper-sagebrush). The region is drained by rivers including the Eel, Trinity, Klamath, and Russian. The Klamath is a major river of the Pacific coast (250 miles long), and two of its tributaries, the Shasta and the Scott, drain arid interior valleys characterized by extensively utilized annual grasslands.

These watersheds are used by listed anadromous fish and a variety of threatened or endangered wildlife and sensitive plants, including California red-legged frog, western yellow-billed cuckoo, Swainson's hawk, and sandhill crane.

a, d) Many "special-status"[9] wildlife and plant species known to occur in the Program Area are associated with riparian habitats or those in closely adjacent uplands: e.g., Pickering's ivesia, bank swallow, and northwestern pond turtle. Many of the Covered Activities involve operating machinery in riparian zones, manipulating habitat, and fencing streambanks. Impacts on these plants and animals are potentially significant.

Coho salmon are among the protected and special status animal species known to occur within the Program Area. Although one of the primary goals of the Program is to protect and restore coho salmon in the Shasta River watershed, the Program has the potential for adversely affecting coho salmon, their habitat, and their movement.

The EIR will evaluate the potential impacts of the Covered Activities in the ITP and MSAA on these species and their habitat, including, most importantly, potential impacts on coho salmon migration, spawning, and rearing.

[8] California bioregions were developed by the Inter-agency Natural Areas Coordinating Committee (California Department of Forestry and Fire Protection, 1992. California Bioregions http://www.frap.cdf.ca.gov/data/frapgisdata/select.asp).

[9] The term "special status species" includes those that are listed and receive specific protection defined in federal or state endangered species legislation, as well as species not formally listed as threatened or endangered, but designated as "rare" or "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations, or policies adopted by local agencies such as counties, cities, and special districts to meet local conservation objectives.

b) Although enhancement of existing riparian habitat is a component of the Program, restoration activities, such as bank stabilization or the removal of migration barriers, may have short-term adverse impacts on riparian habitat along the Shasta River and its tributaries.

The EIR will evaluate the potential impacts of the Covered Activities in the ITP and MSAA on riparian habitats, and identify impacts and mitigation measures on riparian and other sensitive natural communities.[10]

c) Beyond the riparian habitats of the waterways themselves, the valleys support emergent wetlands, wet meadows and ponds, mostly seasonal in nature. All are part of the watershed system and most are under the jurisdiction of the Clean Water Act and are "waters of the state" regulated by the Regional Water Quality Control Board and, in some cases, CDFG. Recovery and compensatory actions prescribed by the ITP and MSAA will involve alteration of, working within, crossing, and/or minor filling of wetlands.

The EIR will evaluate the potential impacts of the Covered Activities in the ITP and MSAA on waters of the U.S. and the state, and prescribe appropriate mitigation measures.

e) The *Conservation Element of the Siskiyou County General Plan* is the principle policy document for natural resource protection and stipulates "maintaining all species of fish and wildlife for their intrinsic and ecological values." The Program would not conflict with any local policies or ordinances protecting biological resources.

f) Subsequent to the listing of coho salmon as a threatened species in the Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU), and as an endangered species in the Central California Coast ESU, the California Fish and Game Commission directed CDFG to develop a Recovery Strategy for coho salmon in California. Planning for coho salmon recovery involves both state and federal actions because it is listed under both the federal ESA and CESA. The Recovery Strategy is the preliminary step toward a state recovery plan.

The Department initiated a multi-stakeholder, statewide Coho Recovery Team (CRT) to make recommendations on components of a plan to recover the species. Additionally, a team was created to focus on agricultural water and land issues in the Shasta and Scott River valleys. This team is known as the Shasta-

[10] Several specific native vegetative communities within California (as distinct from the organisms they support) have been identified as rare and/or sensitive. These natural communities are of special significance because the present rate of loss indicates that acreage reductions or habitat degradation could threaten the viability of dependent plant and wildlife species.

Scott Coho Recovery Team (SSRT). All of these actions constitute a conservation planning effort underway. The Program is an outcome of these planning efforts, and is thus not in conflict.

In 2005, the U.S. Fish and Wildlife Service published a final critical habitat (CH)[11] designation for 22 vernal pool ecosystem units in California and Oregon, including Siskiyou County. However, the CH units within Siskiyou County are well south of the Program Area.

The Shasta River watershed contains federally designated CH for coho salmon. Potential impacts of the Program on these areas will be evaluated in the EIR. The existence and relevance of any other protective plans, policies, and ordinances will also be determined in the EIR.

Cultural Resources

	Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
5.	**CULTURAL RESOURCES— Would the project:**				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b)	Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐

Discussion

a, b, d) The Program would cover a variety of agricultural activities, as well as avoidance, minimization, and mitigation measures, some of which would entail earthmoving, mostly within stream banks and beds and riparian areas. These may have the potential to disturb historical or archeological resources, or human remains. The potential for such impacts will be evaluated in the EIR.

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[11] Critical habitat designation is a component of species recovery planning as defined by the Federal Endangered Species Act.

c) Covered Activities would take place in alluvial valleys of young age, which are unlikely to contain unique paleontological resources or unique geologic features. Therefore, there would be no impact on such resources or features from the Program.

Geology, Soils, and Seismicity

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
6. GEOLOGY, SOILS, AND SEISMICITY— Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Setting

The Program Area comprises the entire Shasta River watershed, which is located in Siskiyou County in central-northern California. The Shasta River watershed (795 square miles) is defined by two geomorphic provinces, the Klamath Mountains to the west and the Cascade Range (Cascades) to the east. Geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform; eleven provinces are distinguished in California (CGS, 2002) with each region displaying unique, defining features based on geology, faults, topographic relief and climate.

Geologically, the Shasta River watershed can be described by three principal features: Shasta Valley (an intermontane, valley floor basin comprised chiefly of debris avalanche deposits and alluvium), the eastern edge of the Klamath Mountains (relatively old metamorphic, sedimentary, and plutonic rocks on the west), and the Cascade Range (relatively young volcanic rocks on the east). The Klamath Mountains on the west are characterized by complexly folded and faulted metamorphic, sedimentary, volcanic, and ultramafic rocks of Paleozoic age, intrusive plutonic rocks of Mesozoic age, and by marine sandstone and conglomerate of Cretaceous age (Mack, 1960; Wagner and Saucedo, 1987). On the east, Shasta Valley is bounded by the Cascade Range, which is dominated by Cenozoic age volcanic rock. The Cascade Range is a broad northward-trending series of giant volcanoes ranging in age from Pliocene to Recent and extending from British Columbia south to Lassen Peak in northern California. The volcanoes of Pliocene age are deeply eroded, whereas the more youthful volcanoes, which were formed by effusion during Pleistocene and Recent time, have been only slightly dissected (Mack, 1960). All of the known historic eruptions in the contiguous United States have been from volcanoes in the Cascade Range. The most prominent volcano of the high Cascades is Mount Shasta.

The Mount Shasta, standing at an elevation of 14,162 feet above mean sea level (amsl) southeast of the valley floor, is the highest point in the Shasta River watershed. Mount Shasta has continued to erupt at least once every 600-800 years for the past 10,000 years. It is possible that the most recent eruption of Mount Shasta was observed from the Pacific Ocean in 1786 although the source of that eruption has not been identified clearly (Christiansen et al., 1977). The youngest major unit erupted from the summit dome is named the Hotlum cone. Preliminary dating of volcanic events probably related to the Hotlum cone indicates that some of its eruptions occurred at least as recently as about 200 years ago (Christiansen et al., 1977). The summit dome still has active fumaroles and a small acid hot spring. An eruption from Mount Shasta could impact the program area, yet the potential for an event with unavoidable adverse impacts is considered low and is no different than for existing conditions.

Shasta Valley is a nearly oval, intermontane basin (Mack, 1960). The western edge and northern end of Shasta Valley is underlain by Quaternary alluvium deposited by the Shasta River and its tributaries. The eastern half of the valley, which is much flatter than the western part, is occupied largely by an extensive flow of basaltic lava recently erupted from the flanks of Mount Shasta (Mack, 1960). The rest of the Shasta Valley (i.e., most of the western half) is underlain by deposits of an exceptionally large debris avalanche of Pleistocene age that extends northward from the western flank of Mount Shasta.

Morphology of the Shasta Valley

The unique morphology of the Shasta Valley floor was shaped primarily by a gigantic debris avalanche [described by Crandell (1989)] that occurred 300,000 to 380,000 years ago (i.e., during the Pleistocene). The debris avalanche probably originated as a rapid succession of huge landslides of water-saturated rock on the northwest flank of ancestral Mount Shasta, each of which cut progressively deeper into the volcano. Two texturally distinct parts characterize the avalanche deposit: the block facies and the matrix facies. The matrix facies consist of an unsorted and unstratified mixture of pebbles, cobbles, and boulders in compact silty sand; texturally it resembles the deposit of a mudflow (Crandell, 1989). The block facies are responsible for the many small hillocks throughout the valley and include individual andesite blocks (many of which are pervasively shattered) ranging in size from tens to hundreds of meters in maximum dimension. In essence, a massive amount of material was entrained in a landslide from the ancestral Mount Shasta and large andesite blocks were scattered down the valley and a finer, more liquid, matrix flowed around them and down the valley. The avalanche deposits cover an area of at least 260 square miles and are overlain on the east by basaltic lava flows and on the south by andesitic lava flows, lahars, and alluvium from Mount Shasta. The morphology of the deposits has changed little since their emplacement; the lack of a well-integrated drainage system and absence of deep and widespread dissection of the deposits are due to the gently sloping surface and to the presence of resistant rock at the head of the Shasta River gorge northwest of Montague (this bedrock threshold is the base level for the upstream part of the Shasta River drainage basin). The Shasta River flows northward along the west side of the block facies as far as a point about 3 kilometers north of Edgewood, then turns and follows a northeastward course between parallel ridges formed by the block facies, as does Parks Creek (Crandell, 1989).

Topography

The Shasta River watershed slopes northward, draining to the Klamath River basin. The valley floor lies between altitudes of 2,400 and 2,800 feet amsl. Mount Shasta (as described above), in the southeast, is the highest point in the watershed. However, the Klamath Mountains on the east have a higher average elevation on the whole, the highest peak being Mount Eddy (9,038 feet amsl) some nine miles southwest of the City of Weed.

Seismicity and Seismic Hazards

There are no known active[12] faults in the Shasta River watershed. The nearest known active fault is the north to north-northwest trending Cedar Mountain-Mahogany fault zone (CM-MFZ) mapped approximately 6 miles east of the headwaters of the Little Shasta

[12] The term *active*, as used herein, refers to a fault for which there is evidence of displacement during Holocene time (i.e., the last 10,000 years) according to information summarized by Jennings (1994).

River. The other nearest significant seismic sources are the Hat Creek-McArthur-Mayfield (HC-M-MFZ) and Big Lagoon-Bald Mountain (BL-BMFZ) fault zones mapped approximately 38 miles (southeast) and 85 miles (southwest) from the Shasta River watershed, respectively. The assigned maximum earthquakes for the CM-MFZ and the HC-M-MFZ are 7.1 and 7.2, respectively (Cao et al., 2003). The BL-BMFZ has an assigned maximum earthquake magnitude of 7.5. Based on a Probabilistic Seismic Hazard Assessment Model by the U.S. Geological Survey (USGS) and the California Geological Survey (CGS) (2002) horizontal ground accelerations due to earthquakes that range from 0.1g (10 percent of the acceleration due to gravity) to 0.2g have a 10 percent probability of exceedance in 50 years in the central Siskiyou County area. This also means that there is a 90 percent probability that these ground accelerations will not be experienced in the next 50 years. The ground accelerations that have 10 percent probability of occurrence in 50 years are usually considered in the seismic design of typical structures. As a comparison, potential ground accelerations that are three to four times higher than those assigned to the central Siskiyou County area, having a similar probability of occurrence, are present in the San Francisco Bay area based on the Probabilistic Seismic Hazard Assessment Model.

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to movement on the fault plane. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults. As described above, because there are no known active faults within the Program Area, the likelihood of surface fault rupture is very low and would not be a design consideration.

Ground Shaking

Ground shaking in the Program area could occur as a result of an earthquake within the greater northern California or southern Oregon region. However, ground motions attenuate with distance from the causative fault and there are no known active faults in the Program area. Generally, Siskiyou County is an area of low seismic activity. There is no record of any death or injury resulting from earthquakes within the region and damage to buildings has been very minor (Siskiyou County, 1976). Accordingly, ground shaking in the Program area can be expected to have low to moderate intensities.

Liquefaction

Liquefaction is a phenomenon in which unconsolidated and/or near saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in the temporary fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 50 feet. Due to the relatively low potential for strong ground motions and lack of structural elements proposed within saturated loose soils, such as alluvium, liquefaction potential is not an issue for the Program.

Volcanic Eruptions

An eruption from Mount Shasta could impact the Program Area. However, implementation of the Program would have no impact on the likelihood of such an event occurring.

Regulatory Context

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zones Act), signed into law in December 1972, requires the delineation of zones along active faults in California. The main purpose of the Alquist-Priolo Act is to prevent the construction of buildings to be used for human occupancy (2,000 person hours or more per year) on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future ground surface displacement (Hart and Bryant, 1997). Surface fault rupture is not necessarily restricted to the area within a Fault Rupture Hazard Zone, as designated under the Alquist-Priolo Act.

California Building Code

The California Building Code (CBC) is another name for the body of regulations found in Part 2 in title 24 of the California Code of Regulations, which is part of the California Building Standards Code (CBSC, 2001). Title 24 is assigned to the California Building Standards Commission which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in title 24 or they are not enforceable. The purpose of the CBC is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. Published by the International Conference of Building Officials, the UBC is a widely-adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary California amendments. These amendments include significant building design criteria that have been tailored for California earthquake conditions (CBSC, 2001). The national model code standards adopted into title 24 apply to all occupancies in California except for modifications adopted by state agencies and local governing bodies.

Local

Siskiyou County General Plan

The Siskiyou County General Plan Land Use Element contains the following policies that could be applicable to the Program:

> *Policy 1.* No development will be allowed in identified and potential landslide area unless certified by a licensed California Geologist, as reasonably safe for the development proposed.
>
> *Policy 7.* Specific mitigation measures will be provided that lessen soil erosion, including contour grading, channelization, revegetation of disturbed slope and soils, and project timing (where feasible) to lessen the effect of seasonal factors (rainfall and wind).

Discussion

The Program does not cover the construction of or modifications to any buildings or habitable structures. Hence, the building code regulations discussed above do not apply to the Program. Further, the structures that may be constructed under the Program (e.g., headgates, boulder weirs, and fish screens) are not among those listed by the Siskiyou County Department of Public Works (DPW) Building Department (2006) as requiring an inspection. Therefore, no structural impacts are anticipated as a result of Program implementation.

a.i) There are no known active faults underlying the Shasta River watershed and, according to the State of California's Alquist-Priolo Earthquake Fault Zoning Map (Hart and Bryant, 1997), fault-rupture hazard zones have not been established for this area. Therefore, the Program would not have an impact related to exposing people or structures to substantial adverse effects stemming from the rupture of a known earthquake fault.

a.ii) Ground shaking in the Program Area could occur as a result of an earthquake within the greater northern California or southern Oregon region. The nearest active fault (the Cedar Mountain-Mahogany Fault Zone) lies outside of the Shasta River watershed. Ground shaking within the Shasta River watershed due to seismic events is expected to have low intensities according to the USGS/CGS Probabilistic Seismic Hazards Assessment Model (2002). Thus, the

Program would not expose people or structures to substantial adverse effects involving strong ground shaking and this potential impact would be less than significant.

a.iii) There are no known active faults in the Shasta River watershed and ground shaking induced by seismic activity is expected to be minimal. Therefore, the Program would not expose people or structures to substantial adverse effects involving seismic-related ground failure and this potential impact would be less than significant.

a.iv) Most Covered Activities would take place within a stream or upon its banks and not upon hillslope areas (i.e., where most landslides occur). Further, Covered Activities in stream bank areas (e.g., riparian restoration, installation of fencing, and bank stabilization) where shallow landslides and slope failures may occur serve to stabilize these areas and would, if anything, result in a beneficial impact. Therefore, proposed structures and construction activities under the Program would not have an effect on landslides nor expose people or structures to potential substantial adverse effects involving landslides.

b) Soil erosion and loss of topsoil could occur as a result of proposed construction activities within and adjacent to stream channels (i.e., on slopes directly connected to stream channels). In this case (i.e., relatively small scale, construction-related impacts), the principal concern with respect to soil erosion is the potential impact to water quality (i.e., increased turbidity) rather than the actual loss of topsoil from the slope. Disturbed surface soils could be entrained by overland runoff and delivered to adjacent streams or other type of water body. Thus, it is *both* processes (surface runoff and soil disturbance) that typically must be managed in these situations. As such, the potential impact of the Program upon soil erosion is discussed and analyzed in the section, *Hydrology and Water Quality.*

c) Destabilization of natural or constructed slopes would not occur as a result of Program implementation. Most Program activities would take place within a stream or upon its banks and not upon hillslope areas (i.e., where most landslides occur). Further, Covered Activities in stream bank areas (e.g., riparian restoration, installation of fencing, and bank stabilization) where shallow landslides and slope failures may occur serve to stabilize these areas and would, if anything, result in a beneficial impact

d) Shrink-swell or expansive soil behavior is a condition whereby a soil reacts to changes in moisture content by expanding or contracting; this activity may cause subsequent damage to buildings or structures with foundations in this type of soil.

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS, 2006) has summarized descriptive and spatial information regarding soils in the central part of Siskiyou County which includes the Program Area. Most of this information was derived from the Soil Survey for Siskiyou County, Central Part, published by the NRCS in 1983. The NRCS has mapped soils within the part of Siskiyou County comprising the Program Area and described the physical properties of the various soil types. Some of the soils have been characterized as having a high[13] shrink-swell potential and some Covered Activities may take place in the vicinity of such soils. However, the structures proposed are relatively minor and locating them within expansive soils would not create a substantial risk to life or property. Therefore, the potential impact concerning the possible location of Program components within expansive soils is considered less than significant.

e) The Program does not include construction of or components related to septic tanks or an alternative wastewater disposal system. Therefore, there would be no impact to soils in the Program Area as a result of wastewater disposal.

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[13] Shrink-swell potential is commonly expressed as the linear extensibility percent (LEP), which is a measure of the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. As used herein, a *high* shrink-swell potential refers to soil types with an LEP greater than 6 percent.

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Hazards and Hazardous Materials

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
7. HAZARDS AND HAZARDOUS MATERIALS– Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☒	☐	☐	☐

Setting

Regulatory Setting

Definitions

Hazardous Materials

Hazardous materials are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories, based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases).[14] Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications, as well as in residential areas to a limited extent.

Hazardous Waste

A hazardous waste is any hazardous material that is discarded, abandoned, or is to be recycled. Hazardous materials and wastes can result in public health hazards if released to the soil, groundwater, or air.

[14] Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3.

Regulatory Framework

Hazardous Materials Management

Numerous local, state, and federal laws and regulations regulate the use, storage, and disposal of hazardous materials, including management of contaminated soils and groundwater. EPA is the federal agency that administers hazardous materials and waste regulations. State agencies include the California Environmental Protection Agency, which includes the Department of Toxic Substances Control, the North Coast RWQCB, the California Air Resources Board, and other offices. A description of agency jurisdiction and involvement in management of hazardous materials is provided below.

United States Environmental Protection Agency. EPA is the federal agency responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. The legislation includes the Resource Conservation and Recovery Act of 1986 (RCRA), the Superfund Amendments and Reauthorization Acts of 1986 (SARA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The federal regulations are primarily codified in title 40 of the Code of Federal Regulations (40 CFR). EPA provides oversight and supervision for site investigations and remediation projects, and has developed land disposal restrictions and treatment standards for the disposal of certain hazardous wastes.

California Department of Toxic Substances Control. DTSC works in conjunction with EPA to enforce and implement specific laws and regulations pertaining to hazardous wastes. California legislation for which DTSC has primary enforcement authority includes the Hazardous Waste Control Act and the Hazardous Substance Account Act. Most state hazardous waste regulations are contained in title 22 of the California Code of Regulations. DTSC generally acts as the lead agency for soil and groundwater clean-up projects, and establishes clean up and action levels for subsurface contamination that are equal to, or more restrictive than, federal levels.

North Coast Regional Water Quality Control Board. The Program Area is within the jurisdiction of the North Coast RWQCB. RWQCBs are authorized by the California Porter-Cologne Water Quality Act of 1969 to implement water quality protection laws. RWQCBs provide oversight for sites where the quality of groundwater or surface waters is threatened, and has the authority to require investigations and remedial actions.

California Air Resources Board (CARB) and the Siskiyou County Air Pollution Control District (SCAPCD). The Program Area is in the Northeast Plateau Air Basin. CARB and SCAPCD have joint responsibility for developing and enforcing regulations to achieve and maintain state and federal ambient air quality standards in the district. CARB is responsible for enforcing the Clean Air Act and the CAAQs. SCAPCD is responsible for regulating air emissions from stationary sources, monitoring air quality, and reviewing air quality issues in environmental documents. The Air Quality section in this initial study further describes the responsibilities of CARB and SCAPCD, air quality conditions in the Northeast Plateau Air Basin, and potential air quality impacts associated with the Program.

Local Hazardous Materials Management. The agency responsible for local enforcement of state and federal laws controlling hazardous materials management in Siskiyou County is the Environmental Health Division of the County Public Health Department. This agency became the Certified Unified Program Agency (CUPA) for the county on January 1, 1997. The CUPA program regulates underground tanks, hazardous materials (including, but not limited to, hazardous substances, hazardous waste, and any material which a handler or the CUPA has reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment), and any unauthorized release of hazardous material. In addition, the CUPA program regulates medical waste and final disposal/transfer activities of solid waste.

Worker Health and Safety. Worker health and safety is regulated at the federal level by the federal Department of Industrial Relations. Worker health and safety in California is regulated by Cal/OSHA. California standards for workers dealing with hazardous materials are contained in title 8 in the California Code of Regulations, and include practices for all industries (known as “General Industry Safety Orders”), and specific practices for construction, and hazardous waste operations and emergency response. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

Discussion

a) Covered Activities would not involve the routine transport, use, or disposal of hazardous materials. Therefore, there would be no impact of this kind.

b) Construction activities and ongoing agricultural operations covered under the Program would involve use of heavy equipment and other machinery that use petroleum-based fuels, lubricants, and other fluids classified as hazardous materials. The routine use of such equipment and machinery carries the risk of leaks and spills due to accident, equipment failure, and routine fueling, lubricating, and maintenance. Because activities covered by the Program are not substantially different or more intensive than ongoing agricultural and construction activities already occurring in the Program Area, there would not be a substantial increase in the risk of leaks or spills.

As stated in the project description in this initial study, ITP General Condition B would require SVRCD and any sub-permittee to immediately stop, contain, and clean-up any fuel, lubricants, or other hazardous materials that leak or spill while engaged in a Covered Activity. This condition further requires SVRCD or the sub-permittee to notify CDFG immediately of any leak or spill of hazardous materials into a stream or in a place where it can pass into a stream, and requires SVRCD and all sub-permittees to store and handle hazardous materials at least 150 feet away from the edge of mean high water elevation.

Because the Program would not substantially increase the use or risk of release of hazardous materials, and because ITP General Condition B would further reduce the risk of any release resulting in harmful contamination of the environment, this impact is considered less than significant.

c) As noted in the previous discussion, the Program would not result in an increase in the use or risk of release of hazardous substances. Some Covered Activities may occur within one quarter mile of a school. However, these activities are indistinguishable from other agricultural operations and construction activities already occurring in the Program Area. In addition, ITP General Condition B, discussed above, would further reduce the risk of any release resulting in harmful contamination of the environment or exposure of people to hazardous substances.

d) Government Code section 65962.5 requires several state agencies to compile and report lists of hazardous materials sites. Collectively, these lists are referred to as the "Cortese List" after the author of the enabling legislation. Included in the Cortese List are a list of releases from leaking underground storage tanks (LUSTs) compiled by the State Water Resources Control Board; a list of current Cease and Desist Orders (CDO) and Clean-Up and Abatement Orders (CAO) issued by the same agency; and a list of Hazardous Wastes and Substances sites compiled by DTSC. Within Siskiyou County, there are 62 actives LUST sites; 32 active CDO and CAO sites; and one Hazardous Waste and Substances site. Several of these are located in the Shasta River watershed, but most of these are within the city limits of Weed or Yreka.

Because of the possibility of some Covered Activities occurring in or near one of the Cortese List sites, this issue will be further investigated in the EIR.

e, f) The Program will not introduce new activities or inhabited structures within two miles of a public airport, public use airport, or private airstrip, and therefore would not pose a safety hazard to people residing or working in the Program Area.

g) The Covered Activities under the Program would not interfere with an adopted emergency response plan or emergency evacuation plan.

h) Most of the Covered Activities will occur in agricultural areas within Shasta Valley, and as such, there will be little risk of wildfire associated with them. Some activities may occur on the urban or wildland fringe, however, and may result in increased risk of wildfire. The potential for such an impact will be further examined in the EIR.

References

California Environmental Protection Agency, *Cortese List.* http://www.calepa.ca.gov/SiteCleanup/CorteseList/. Accessed September 28, 2006

Siskiyou County, *Siskiyou County Public Health Department, Hazardous Materials Management Program.* http://www.co.siskiyou.ca.us/phs/envhealth/wastecupa.htm. Accessed September 28, 2006.

Hydrology and Water Quality

Issues (and Supporting Information Sources):		*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
8.	**HYDROLOGY AND WATER QUALITY— Would the project:**				
a)	Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☒	☐	☐	☐
c)	Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or by other means, in a manner that would result in substantial erosion or siltation on- or off-site?	☒	☐	☐	☐
d)	Substantially alter the existing drainage pattem of a site or area through the alteration of the course of a stream or river or, by other means, substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☒	☐	☐	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Discussion

a) The North Coast RWQCB has included the Shasta River in the *2002 CWA Section 303(d) List of Water Quality Limited Segment* (NCRWQCB, 2002), which is a document listing impaired water bodies and the principal pollutants or stressors causing impairment. The Shasta River is listed as being impaired by organic enrichment/low dissolved oxygen (DO) and temperature (NCRWQCB, 2002). Subsequently, the Water Quality Control Plan for the North Coast Region (North Coast Basin Plan) (NCRWQCB, 2006) includes a list of objectives (qualitative and quantitative) related to the different sources of impairment.

Implementation of the Program may increase sedimentation (which may exacerbate organic enrichment and DO conditions) and water temperatures within the Shasta River. Potential sedimentation impacts would be related to construction activities covered by the Program (e.g., new or modified water diversion structures, fish screens, stream crossings, instream habitat structures, and barrier removal/fish passage projects) and would be temporary in nature. However, Covered Activities could also result in water quality impacts. For example, any new grazing operations covered by the Program could increase hillslope erosion and lead to increased sedimentation and organic enrichment (animal waste) within the Shasta River. New or modified water diversions could reduce instream flows by an amount sufficient to result in higher average water temperatures. Further, Covered Activities that include instream structures (e.g., boulder weirs, constrictors, and placement of woody debris) could pond water at low flows and result in warmer water temperatures, depending on the specific location and nature of installation. These water quality impacts could potentially be significant and will be addressed in further detail in an EIR.

b) Implementation of the Program, specifically the practice of an alternative stock watering system (i.e., using groundwater in place of surface water), could impact local groundwater supplies or recharge. Concerning production or irrigation wells, the severity of this potential impact would depend in great part on the proximity of a given project to other planned or existing wells and the hydrogeologic characteristics of the local aquifer. Further, excessive groundwater extraction could reduce groundwater discharge to nearby streams and significantly lower the magnitude and/or reduce the duration of base flow. These groundwater impacts could potentially be significant and will be addressed in further detail in an EIR.

c) Implementation of the Program could alter an existing stream (e.g., the Shasta River and/or one or more of its tributaries), such that substantial instream erosion or sedimentation would result. Certain instream components the Program covers could significantly affect stream hydraulics and sediment transport; these components include new or modified water diversion structures, boulder weirs, constrictors, bank protection projects, and gravel augmentation projects. Structures that would span all or most of the stream channel width (i.e., diversions and weirs) could decrease local stream gradient, causing sediment accumulation, and/or result in bed scour immediately downstream of the structure. Bank protection projects would serve to deflect the flow stress exerted on stream banks to the bed, which could increase bed scour and erosion. Gravel augmentation projects could decrease stream sediment transport capacity and/or increase the scour potential of large flows. These impacts on stream hydraulics and sediment transport could potentially be significant and will be addressed in further detail in an EIR.

d) Implementation of the Program could alter an existing stream (e.g., the Shasta River and/or one or more of its tributaries), such that increased localized flooding would result. Certain Program components could increase the hydraulic roughness (i.e., boundary resistance to flow) of a stream and subsequently decrease its capacity to convey high flows. Those components include new or modified water diversion structures, boulder weirs or clusters, engineered habitat structures, and placement of large woody debris. For a given flood discharge, if hydraulic roughness is substantially increased (and all other hydraulic parameters remain unchanged) then flow velocity would decrease and the cross-sectional area of the flow would increase. In other words, the flow would have an increased tendency to pool, or back-up, and flood a local area. This consequence would likely only be a concern if a project relevant to this impact was implemented adjacent to an existing road or trail. This impact upon stream channel capacity could potentially be significant and will be addressed in further detail in an EIR.

e) The Program would not create a substantial amount of impervious or altered surfaces, or otherwise create or contribute substantial amounts of additional runoff within the landscape. Therefore, the Program would have no impact upon existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, other than the potential water quality impacts discussed above.

f) The Program would not otherwise degrade water quality, and therefore would not have an impact upon water quality outside of the potential impacts already discussed above.

g) The Program does not propose new housing and therefore would have no impact upon placement of housing within a 100-year flood hazard area.

h) The Federal Emergency Management Agency (FEMA) is responsible for mapping areas subject to flooding during a 100-year flood event (i.e., a flood with a 1 percent chance of occurring in any given year). FEMA (2004) has designated and mapped the 100-year flood hazard zone for the Shasta River watershed and some components of the Program would be implemented within this zone. As discussed above, some instream Program components could impact hydraulic roughness characteristics and stream channel capacity. Those components include new or modified water diversion structures, boulder weirs, constrictors, bank protection projects, and gravel augmentation projects. However, a 100-year flood is often orders of magnitude larger than the annual flood or a flood experienced every few years, on average. Those smaller, more frequent floods are more relevant when considering the scale of the structures proposed as part of the Program; such potential flooding impacts have been discussed above. The structures proposed are not substantial enough to impede or redirect a flow with the magnitude of a 100-year flood event, and therefore this potential impact would be less than significant.

i) The Program would not expose people or structures to a significant risk of loss, injury or death involving flooding and, therefore, would have no impact concerning this criterion.

j) The Program is not located in an area that would be affected by a seiche or tsunami. Parts of the Program Area, particularly the steep uplands, may experience mudflows or be relatively more susceptible to mudflow hazards. . Mount Shasta, in the southeast of the Shasta River watershed, is an active volcano whose latest lava flows are probably not more than a few centuries old according to Mack (1960). In an extreme scenario, an eruption or other catastrophic seismic event on Mount Shasta could trigger a lahar or mudflow-like event capable of filling the entire Shasta Valley. Proposed instream structures could be damaged or even destroyed in the event of a mudflow. However, such events are extremely rare and the potential risk of loss involving a mudflow (or debris avalanche) is not a significant one and, thus, the potential impacts associated with mudflows or debris avalanches would be less than significant.

References

Federal Emergency Management Agency, 2004. Q3 Flood Data, California. Digital database (ArcGIS), Disc 1.

Mack, S., 1960. *Geology and Ground-Water Features of Shasta Valley, Siskiyou County California*. U.S. Geological Survey Water-Supply Paper 1484, 115 p.

North Coast Regional Water Quality Control Board,, 2002. *2002 Clean Water Act Section 303(d) List of Water Quality Limited Segment.* Approved by U.S. Environmental Protection Agency in July, 2003. Available online: http://www.swrcb.ca.gov/tmdl/303d_lists.html

North Coast Regional Water Quality Control Board, 2006. *Water Quality Control Plan for the North Coast Region*. September, 2006. Available online: http://www.waterboards.ca.gov/northcoast/programs/basinplan/bpdocs.html

Land Use and Land Use Planning

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

Discussion

a) The Program would not physically divide an established community. Most or all of the Covered Actvities are located either in or next to a stream channel.

b) As stated under Agricultural Resources above the Program provides take authorization under CESA and coverage under section 1602 for specific "Covered Activities." These include, but are not limited to, water diversions and actions to restore coho salmon habitat (see ITP and MSAA Covered Activities above). The ITP requires specific avoidance; minimization, and mitigation measures to protect coho salmon and to implement key coho salmon recovery tasks (see Conditions of Approval above). Implementation of the Program has the potential to impacts agricultural resources and will be evaluated in the EIR.

c) The Program would not conflict with any applicable habitat conservation plan or natural community conservation plan.

References

Siskiyou County, *Siskiyou County General Plan, Land Use and Circulation Element*, 1980.

Mineral Resources

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

Discussion

a,b) The Program covers only ongoing, legal agricultural activities, and as such would not have an effect on mining or mineral resources.

Noise

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

Setting

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels are rarely persist consistently over a long period of time. In fact, community noise varies continuously with time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. Background noise levels change throughout a typical day, but do so gradually, corresponding with the addition and subtraction of distant noise sources and atmospheric conditions. The addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) makes community noise constantly variable throughout a day.

These successive additions of sound to the community noise environment vary the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{dn}: The energy average of the A-weighted sound levels occurring during a 24-hour period, and which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers at industrial plants often experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individuals past experiences with noise. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the L_{dn} noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the L_{dn} is more likely to around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports.

Noise Attenuation

Point sources of noise, including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate (lessen) at a rate of 6.0 dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (e.g., atmospheric conditions, noise barriers, type of ground surface, etc.). Widely distributed noises such as a large industrial facility spread over many acres or a street with moving vehicles (a "line" source) would typically attenuate at a lower rate of approximately 3.0 to 4.5 dBA per doubling distance from the source (also dependent upon environmental conditions) (Caltrans, 1998).

Existing Ambient Noise Environment

The Program Area encompasses rural residential, agricultural, and open space areas in north-central Siskiyou County. The primary contributors to the noise environment in the Program Area include vehicle traffic on highways and county roads; airplane overflights; sounds associated with agricultural and construction activities including use of heavy equipment and power tools; sounds emanating from residential neighborhoods, including voices, noises from household appliances, and radio and television broadcasts; and naturally occurring sounds such as wind and wind-generated rustling. Additional noise sources may include electrical and industrial devices and other man-made localized sources. Generally, intermittent short-term noises do not significantly contribute to longer-term noise averages.

Ambient natural noise sources also include wind, which is much more common than calm conditions throughout the Program Area, and is expected to generate noise levels in the range of 45 to 50 dBA. Ambient daytime L_{eq} noise levels in the vicinity of residences and in the agricultural areas of the Program Area can be expected to be between 50 and 55 dBA. Measured L_{dn} noise levels near Interstate 5 (I-5) range from 75 dBA at a distance of approximately 180 feet, to 60 dBA at a distance of approximately 460 feet. Measured L_{dn} noise levels near SR 97 range from 75 dBA at a distance of 120 feet from the roadway, to 60 dBA at a distance of 400 feet (CPUC, 2006).

Three general aviation airports (Weed Airport, Montague-Yreka Rohrer Field Airport, and Siskiyou County Airport) are located within the Program Area. Weed Airport is approximately four miles northwest of the City of Weed adjacent to I-5. It has one runway that is 5,000 feet long and 60 feet wide (Siskiyou County, 2006a). Montague-Yreka Rohrer Field Airport is approximately one mile west of the City of Montague. The Montague-Yreka Rohrer Field Airport has two runways; one is 2,080 feet long and 100 feet wide and the other is 3,360 feet long and 50 feet wide (Airport Data, 2006). Siskiyou County Airport is located four miles northeast of the City of Montague. It has a single runway, 7,484 feet long and 150 feet wide and can accommodate most narrow bodied airline jets (Siskiyou County, 2006a). Ambient Ambient noise levels in the vicinity of these airports are elevated.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

The Covered Activities would occur primarily in rural agricultural areas throughout the north-central portion of the County. It is anticipated that some of the Covered Activities would occur in close proximity to rural residential receptors.

Regulatory Context

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

Siskiyou County

The Siskiyou County General Plan Noise Element provides audible noise standards appropriate for the operations of development projects. The General Plan identifies land use compatibility for community noise. According to the General Plan, residences are the most sensitive land use. It sets a noise limit for residential land uses of 60 dBA. For new development within a residential land use area, noise limits range from 60 to 65 dBA with noise abatement features included.

Construction noise sources such as those that would result with implementation of the Program are typically regulated on the local level through enforcement of noise ordinances, implementation of general plan policies, and imposition of conditions of approval for permits. However, Siskiyou County does not have general plan standards or municipal codes that address short-term construction noise (Siskiyou County, 2006).

Discussion

a, d) Covered Activities, such as the installation of water diversion structures, installation of fish screens and boulder weirs, barrier removal projects (e.g., the Grenada Irrigation District Fish Barrier Removal Project), and installation of instream habitat improvement structures may require the use of heavy equipment, such as loaders, backhoes, or excavators and haul trucks. Some of the Covered Activities would also require the operation of stationary pumps within or adjacent to active stream channels. Offsite noise sources would result from commuting workers (anticipated to be less than 10 per day for each Covered Activity during construction) and from heavy truck trips (anticipated to be up to three per day for each Covered Activity during construction).

Covered Activities would occur between July 1 and October 31, pursuant to ITP General Condition G. The majority of the Covered Activities would take place in open agricultural areas, though some construction activities may occur near residences. Sustained construction activities under the Program are expected to last no longer than one to two weeks at each of the activity site.

Noise levels generated by construction activities would vary depending on the particular type and duration of use of various pieces of construction equipment. Typical noise levels of construction equipment that may be used to construct some of the Program activities are listed in Table 11-1.

TABLE 11-1
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, L_{eq} at 50 feet)
Truck	88
Dozer	85
Loader	85
Backhoe	80
Generator (compressor)	81

SOURCE: FTA, 2006.

As shown in Table 11-1, intermittent and continuous use of construction equipment could generate noise levels in excess of 85 dBA at 50 feet. This equates to a noise level of approximately 79 dBA at 100 feet or as high as 73 dBA at 200 feet. The duration of noise impacts would be relatively brief, estimated to be no more than approximately one to two weeks at any one location. Given the short duration of impacts at any one location, construction noise would not be considered significant at affected residences if construction would be limited to daytime hours. A general condition will be considered for inclusion to the ITP and MSAA to insure that the impact of construction noise would be less than significant. If a noise reduction condition is not included as a general condition in the ITP and MSAA, the potential impact will be evaluated in the EIR.

It should be noted that the Covered Activities would cause only minor changes to existing, ongoing, legal water diversions and other in-stream and near-stream activities. Because these activities are considered ongoing and also part of the baseline conditions, there would essentially be no change in ambient conditions as a result of Program implementation.

b) The use of blasting and/or pile drivers that typically generate excessive groundborne vibration or groundborne noise would not be included as part of the Covered Activities. Some of the Covered Activities would involve temporary sources of groundborne vibration and groundborne noise during construction from operation of heavy equipment. During construction, operation of heavy equipment would generate localized groundborne vibration and groundborne noise that could be perceptible at residences or other sensitive uses in the immediate vicinity of a given construction area. However, groundborne vibrations attenuate rapidly from their source, and since the duration of impact at any one location would be very brief (estimated to be from one to two weeks) and since the impact would occur during less sensitive daytime hours (i.e., between 7:00 a.m. and 7:00 p.m.), the impact from construction-related groundborne vibration and groundborne noise would be less than significant.

c) As discussed in (d) above, Covered Activities would cause only minor changes to existing, ongoing, legal water diversions and other in-stream and near-stream activities. Because these activities are considered ongoing and also part of the baseline conditions, there would essentially be no change in ambient conditions as a result of the Program implementation. In addition, Covered Activities would consist of short-term construction projects dispersed throughout the Program Area. Therefore, there would be no long-term noise impacts on ambient noise levels. Impacts would be less than significant.

e) The Program would not involve the development of noise-sensitive land uses, and therefore would not expose people to excessive aircraft noise. No impacts would occur.

f) The Program would not involve the development of noise-sensitive land uses, and thus, would not expose people to excessive aircraft noise. No impacts would occur.

References – Noise

Airport Data. 2006. FAA Information about Montague-Yreka Rohrer Field Airport (105). Accessed website (http://www.airport-data.com/airport/105) on June 8, 2006.

California Department of Transportation. 1998. *Technical Noise Supplement*, 1998.

California Public Utilities Commission (CPUC). 2006. Draft Initial Study/Mitigated Negative Declaration for PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. August.

Federal Transit Administration. 2006. *Transit Noise and Vibration Impact Assessment*, May 2006.

Siskiyou County. 2006a. Accessed the Siskiyou County Airports website (http://www.co.siskiyou.ca.us/dpw/airports.htm) on June 8, 2006.

Siskiyou County. 2006. Personal communication with Pat Matthews of the Siskiyou County Planning Department, July 24, 2006.

Population and Housing

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
12. POPULATION AND HOUSING— Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

a,b,c) The Program is limited to activities that are either part of normal, ongoing agricultural operations or involve riparian and streambed restoration. The Program would not induce substantial population growth, displace substantial numbers of existing housing or people, and therefore would not have an adverse affect on population and housing.

Public Services

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
13. PUBLIC SERVICES— Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☐	☒
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☐	☒

Discussion

a.i, a.ii, a.v) The Program covers specified, lawful activities, including both agricultural water diversions and other agricultural operations, as well as actions to restore or improve coho salmon habitat, and would not generate the need for additional police or fire protection services or other public facilities or services. Short-term construction activities could result in a temporary, minor increase in the need for emergency response in the event of an accident or fire, but would be within the context of normal public service demands within the Shasta River watershed. Because any increase in public service demands would be temporary and short-term in nature, any impact is considered to be less-than-significant.

a.iii) The Program is focused on typical agricultural operations and coho salmon habitat restoration actions within a working agricultural landscape, and would not impact school enrollment numbers, or require provision of additional facilities to maintain acceptable student-teacher ratios.

a.iv) The Program would not result in demand for additional parks or put undue burdens on existing parks. Therefore, there would not be a significant impact related to parks.

Recreation

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
14. RECREATION—Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	☐	☐	☒	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐

Discussion

a, b) The Program primarily applies to projects on private lands, either in or near the stream channel. However, there could be some instances within the watershed where Covered Activities take place in a public recreation area, which may require temporary closures or restricted access to recreational facilities (e.g., recreation areas, parks, or trails) during construction activities. However, given that closures or restrictions would be temporary and short-term in nature, the diversion of recreational users to other areas would not result in substantial deterioration of regional parks and public open space, and any impact would be less than significant.

Transportation and Traffic

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
15. TRANSPORTATION AND TRAFFIC— Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that would result in substantial safety risks?	☐	☐	☐	☒

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☒	☐
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., conflict with policies promoting bus turnouts, bicycle racks, etc.)?	☐	☐	☐	☒

Setting

Covered Activities would primarily occur in the rural, low-density areas of north-central Siskiyou County. Regional and local access to the activity sites would be provided by several state and local roadways, each of which would be used to transport construction materials, equipment, and workers to the various sites. The Program Area and surrounding roadway network are illustrated in Figure 1. The paragraphs below provide descriptions of the regional and local roadway network.

Regional Roadways

Interstate 5 (I-5) is a north-south freeway that extends from the Mexican border to the Canadian border, traversing the states of California, Oregon, and Washington. I-5 is generally a four-lane, limited access freeway that traverses the western side of the Shasta Valley. Traffic volumes along I-5 in the area are highest south of Weed, with an annual average daily traffic (ADT) level of 22,900 vehicles per day (vpd). North of Yreka traffic volumes are lower, with annual ADT levels below 15,000 (Caltrans, 2006).

State Route 97 (SR 97) is a southwest-northeast oriented highway that extends from I-5 in Weed, up through Klamath Falls, Oregon and Yakima, Washington, to the Canadian border. This highway is generally a two-lane route with pull-out lanes on steep inclines and turn lanes at major intersections and crossroads. In the Program Area, SR 97 skirts the southern end of the valley, south of Lake Shastina. Traffic volumes in the Weed area are several times higher near the I-5 interchange compared to several miles northeast of the interchange. For example, immediately northeast of the I-5 interchange, the annual ADT level is 12,300 vpd, while north of Big Springs Road (approximately 4.5 miles northeast of the interchange) the annual ADT is 3,250 vpd (Caltrans, 2006).

State Route 3 (SR 3) is a two-lane highway that extends from the City of Montague in Siskiyou County down to State Route 36 in Trinity County. In the Program Area the highway extends east from Montague to I-5 in Yreka, where SR 3 and I-5 join for several miles until near Sharps Road, where SR 3 separates from I-5 and follows Yreka Creek southwest out of the valley. Traffic volumes along SR 3 in the area range from ADT levels of approximately 3,000 vpd southwest of Yreka and near Montague, to over 14,000 vpd in Yreka (Caltrans, 2006).

Old Highway 99 is a two-lane County road with paved shoulders that generally parallels the west side of I-5 from south of Yreka to Weed. This road experiences a moderate amount of traffic. Old Highway 99 had a recent ADT rate of 2,019 vpd one mile north of the 99-87 Cut Off (County Road A12), as reported in a 2006 traffic count (Siskiyou County, 2006).

99-87 Cutoff (County Road A12) is a two-lane County road with paved shoulders. The road extends from I-5 in Grenada towards the southeast where it terminates at SR-97.

Other County Roads. Other two-lane County roads that provide regional access to the Program Area include Montague Grenada Road, Ager Road, Airport Road, Shasta Road, Little Shasta Road, Harry Cash Road, and others.

Local Roadways

The local roadways that would be used to access the activity sites would primarily be county and private roadways in the rural agricultural areas of north-central Siskiyou County. The majority of the local roads have relatively low to very low traffic volumes, have two-lanes with unimproved shoulders, and may have a dirt or paved surface.

Regulatory Context

The development and regulation of the transportation network in the Program Area primarily involves state and local jurisdictions. All roads within the Program Area are under the jurisdiction of state or local agencies or a private landowner. State jurisdiction includes permitting and regulation of the use of state roads, while local jurisdiction includes implementation of state permitting, policies, and regulations, as well as management and regulation of local roads. It is not anticipated that any construction work that is part of a Covered Activity would occur directly within a public roadway, which would require encroachment permits prior to commencing work in the public ROW from all jurisdictions that manage or maintain the applicable roadway(s). Applicable state and local laws and regulations related to traffic and transportation issues are discussed below.

California Department of Transportation

The California Department of Transportation (Caltrans) manages interregional transportation, including management of construction activities within the California highway system. Caltrans is responsible for permitting and regulating the use of state roadways. Caltrans requires that permits be obtained from its District 2 Office for transportation of oversized loads and certain materials, and for construction-related traffic disturbances in the Program Area. Caltrans permit requirements would apply to the transportation of oversized loads associated with the construction and operation of Covered Activities.

Siskiyou County

The majority of the roads that would provide direct access to activity sites within the Program Area are under the jurisdiction of Siskiyou County. County policies and regulations regarding the design of roadways are contained in the circulation element of the Siskiyou County General Plan. However, because the plan focuses on the design and implementation of circulation system improvements, policies in this element do not directly relate to the Covered Activities.

Similar to Caltrans, the Siskiyou County Public Works Road Department would require Program participants to obtain a Transportation Permit from the county if the Covered Activity required hauling of oversized or heavy loads on county roads. The permit would stipulate which roads would be authorized for use, as well as any other specific conditions or restrictions that would be required.

Transportation and Traffic Issues

a) Covered Activities involving construction would result in short-term increases in traffic volumes (a combination of construction worker vehicles and vehicles carrying material and equipment to and from the various Program activity sites). Traffic levels that would be generated on area roadways would vary depending on the particular type and duration of activity. The most intensive construction activities that would occur under the Program would be associated with building water diversion structures (e.g., boulder weirs, and headgates, and maintenance of sump ponds), installation of fish screens and riparian fencing, barrier removals riparian fencing, barrier removal projects (e.g., the Grenada Irrigation District Fish Barrier Removal Project), and installation of in-stream habitat improvement structures.

   It is anticipated that each activity covered under the Program would require no more than five to ten days of active construction work and would require less than ten commuting worker trips and an average of up to three heavy truck trips to the activity sites each workday. Covered Activities would occur between July 1 and October 31, pursuant to ITP General Condition G.

   Construction generated traffic in the Program Area would be temporary, and therefore would not result in any long-term, ongoing effects on traffic operating conditions. The impact of construction-related traffic would be a temporary and intermittent lessening of the capacities of Program Area streets because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. Most construction truck traffic would be dispersed throughout the day and throughout the Program Area. Thus, the temporary increases would not significantly disrupt traffic flow on any of the roadways in the Program Area. Program participants would need to satisfy both Caltrans and Siskiyou County permit requirements for oversized loads, which would include conditions and other requirements designed to alleviate impacts on the local transportation system.

Given the limited and dispersed nature of Program-generated traffic and that Program participants would be required to obtain transportation permits for oversized truck loads, traffic-related impacts associated with the Program would be less than significant.

b) Level-of-service (LOS) standards established by jurisdictions (local, county, and state) for roadways in those jurisdictions are intended to regulate long-term traffic increases from operation of new development and do not apply to temporary construction projects. As such, Covered Activities (with their temporary and intermittent traffic generation, described in (a) above) would not exceed, either individually or cumulatively, LOS standards established by Siskiyou County or other agencies responsible for area roadways.

c) Implementation of the Program would not change air traffic patterns. No impacts would occur.

d) The Covered Activities would not change the configuration (alignment) of area roadways, and would not introduce types of vehicles that are not already traveling on area roads. However, heavy trucks operating on public roads could increase the risk of accidents through interaction with other vehicles. Potential conflicts could also occur between construction traffic and alternative modes of transportation (e.g., bicyclists and buses). However, because of the limited and dispersed nature of Program-generated traffic and because Program participants would be required to obtain transportation permits for oversized truck loads, which would include route restrictions and safety requirements if applicable, traffic-related incompatible use impacts associated with the Program would be less than significant.

e) Implementation of the Program would not result in inadequate emergency access. Covered Activities would not require work directly within a public road and would not result in any other actions that could block emergency access. No impacts would occur.

f) Construction vehicles associated with Program activities that would transport materials and workers to and from the various construction sites would likely be temporarily parked onsite, at the activity locations. Given the dispersed nature and small size of the anticipated construction workforces, implementation of the Program would not generate a substantial number of parked vehicles; therefore, impacts would be less than significant.

g) The Program would have no long-term impact on demand for alternative transportation or on alternative transportation facilities. No impacts would occur.

References – Transportation and Traffic

California Department of Transportation, 2006. 2005 Traffic Volumes on California State Highways. Accessed the Traffic and Vehicle Data Systems Unit website (http://www.dot.ca.gov/hq/traffops//saferesr/trafdata/index.htm) on September 26, 2006.

Siskiyou County. 2006. Personal communication with Jeremy Lipke, Civil Engineering Assistant with the Siskiyou County Pubic Works, on June 26, 2006.

Utilities and Service Systems

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
16. UTILITIES AND SERVICE SYSTEMS—Would the project:				
a) Conflict with wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Require new or expanded water supply resources or entitlements?	☒	☐	☐	☐
e) Result in a determination by the wastewater treatment provider that would serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

Discussion

a) The Program would not generate wastewater and therefore would not conflict with wastewater treatment requirements of the North Coast RWQCB.

b) The Program would not require the construction of new water or wastewater treatment facilities or the expansion of existing facilities.

c) The Program would not require the construction of new storm water drainage facilities or expansion of existing facilities.

d) The Program would require SVRCD to improve baseline instream flows within critical reaches of the Shasta River and its tributaries and at critical life stages of coho salmon by installing water efficiency improvement projects on sub-permittees' properties or by changing or adding points of diversion to keep flows instream to point of use. Projects that could be implemented to improve instream flows are: 1) the upgrade of agricultural water delivery systems to reduce waste; 2) the upgrade of water application systems; and 3) moving or adding points of diversion downstream near point of use. With these possible baseline instream flow improvements, there may be potential impacts to existing irrigation systems, including those controlled by irrigation districts. This topic requires further evaluation in the EIR.

e) There is not a connection between project implementation and wastewater treatment provision.

f) Covered Activities would not be expected to generate substantial volumes of solid waste, and much of the waste that is generated could be recycled. The Yreka Solid Waste Landfill, the only permitted, operating landfill in Siskiyou County, is owned and operated by the City of Yreka. This landfill has sufficient capacity through approximately 2065 at the projected rate of waste acceptance (CIWMB, 2006).

g) Individual projects under the ITP would be subject to local, state. and federal statutes regarding solid waste.

References

California Integrated Waste Management Board, Solid Waste Information System (database of California landfills and other solid waste facilities), www.ciwmb.ca.gov/SWIS Accessed 9/27/06.

Mandatory Findings of Significance

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
17. MANDATORY FINDINGS OF SIGNIFICANCE— Would the project:				
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Have impacts that would be individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☒	☐	☐	☐
c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Discussion

a) As discussed under Biological Resources above, the Program has the potential to result in take of coho salmon, a listed species. This potential will be investigated in the EIR.

b) The Program would authorize a potentially large number of individual activities, mostly located in and near fish-bearing streams. The EIR will examine the cumulative impacts of the Covered Activities, assuming that a large number of such activities will be implemented following approval of the Program. The cumulative analysis in the EIR will focus on cumulative effects of the Covered Activities, in addition to other past, current, and probable future projects that may affect stream resources, particularly coho salmon and other anadromous salmonids, on hydrology of the affected streams, and cumulative, indirect effects on land use in the Shasta River watershed.

c) The Program would not increase the risk of physical harm to human beings, either directly or indirectly. The potential for the Program to indirectly affect human beings through possible pressures to change land use, notably the potential to induce a shift from agricultural to other uses, will be examined in the EIR.

APPENDIX AQ

Sum of Ems Factor #/hr		Year2007 Pollutant				
Equipment Name	**Hp**	**CO**	**NOx**	**PM10**	**SOx**	**VOC**
Bore/Drill Rigs	50	0.19	0.263	0.021	0.075	0.038
	175	0.688	1.023	0.043	0.294	0.054
	Composite	0.476	1.252	0.048	0.329	0.067
Cement and Mortar Mixers	Composite	0.046	0.076	0.005	0	0.01
Concrete/Industrial Saws	50	0.358	0.323	0.044	0.077	0.087
	175	1.007	2.014	0	0.282	0
	Composite	0.451	0.778	0.071	0.128	0.119
Cranes	50	0.282	0.238	0.03	0.053	0.101
	175	0.454	0.904	0.057	0.167	0.09
	Composite	0.355	1.023	0.052	0.196	0.086
Crawler Tractors	50	0.35	0.28	0.047	0.053	0.155
	175	0.727	1.652	0.102	0.251	0.172
	Composite	0.631	1.521	0.1	0.232	0.161
Crushing/Proc. Equipment	50	0.628	0.5	0.07	0.105	0.229
	175	1.007	2.289	0.141	0.348	0.241
	Composite	0.854	1.748	0.126	0.268	0.221
Dumpers/Tenders	Composite	0.044	0.077	0	0	0
Excavators	50	0.243	0.241	0.028	0.059	0.076
	175	0.597	1.125	0.064	0.233	0.102
	Composite	0.472	1.138	0.06	0.243	0.097
Forklifts	50	0.252	0.173	0.027	0	0.096
	175	0.358	0.766	0.054	0.001	0.089
	Composite	0.259	0.457	0.05	0	0.079
Generator Sets	50	0.306	0.322	0.036	0	0.108
	175	0.758	1.719	0.091	0.002	0.164
	Composite	0.322	0.656	0.048	0.001	0.094
Graders	50	0.309	0.285	0.025	0.073	0.124
	175	0.672	1.377	0.082	0.257	0.134
	Composite	0.546	1.442	0.074	0.276	0.124
Off-Highway Tractors	175	0.771	1.751	0.106	0.27	0.181
	Composite	0.695	1.953	0.095	0.31	0.169
Off-Highway Trucks	175	0.74	1.507	0.1	0.258	0.164
	Composite	0.641	2.731	0.096	0.494	0.187
Other Construction Equipment	50	0.333	0.303	0.037	0.066	0.135
	175	0.599	1.363	0.077	0.22	0.133
	Composite	0.561	1.38	0.065	0.223	0.118
Pavers	50	0.26	0.269	0.03	0.067	0.08
	175	0.668	1.298	0.071	0.266	0.117
	Composite	0.435	0.802	0.058	0.165	0.098

Sum of Ems Factor #/hr		Year2007 Pollutant				
Equipment Name	**Hp**	**CO**	**NOx**	**PM10**	**SOx**	**VOC**
Paving Equipment	50	0.284	0.261	0.033	0.06	0.11
	175	0.57	1.298	0.074	0.21	0.128
	Composite	0.411	0.909	0.066	0.144	0.107
Plate Compactors	Composite	0.026	0.039	0.002	0	0.009
Rollers	50	0.235	0.248	0.027	0.062	0.071
	175	0.558	1.085	0.059	0.224	0.095
	Composite	0.364	0.697	0.051	0.139	0.077
Rough Terrain Forklifts	50	0.355	0.336	0.041	0.081	0.113
	175	0.676	1.312	0.077	0.259	0.124
	Composite	0.446	0.806	0.073	0.15	0.101
Rubber Tired Dozers	175	0.67	1.191	0.037	0.273	0.186
	Composite	1.024	2.817	0.112	0.452	0.211
Rubber Tired Loaders	50	0.343	0.312	0.039	0.074	0.111
	175	0.584	1.133	0.068	0.221	0.109
	Composite	0.425	1.111	0.063	0.221	0.099
Scrapers	175	0.85	1.867	0.117	0.307	0.193
	Composite	0.816	2.839	0.114	0.496	0.207
Signal Boards	50	0.385	0.385	0.048	0.094	0.24
	175	0.857	1.949	0.108	0.322	0.184
	Composite	0.097	0.185	0.013	0.024	0.021
Skid Steer Loaders	50	0.191	0.228	0.022	0.061	0.048
	Composite	0.204	0.287	0.025	0.067	0.045
Surfacing Equipment	50	0.157	0.141	0.016	0.031	0
	175	0.495	1.089	0	0.195	0
	Composite	0.67	1.827	0.062	0.307	0.104
Tractors/Loaders/Backhoes	50	0.472	0.353	0.052	0.072	0.179
	175	0.632	1.433	0.093	0.21	0.154
	Composite	0.419	0.816	0.083	0.115	0.125
Trenchers	50	0.269	0.306	0.032	0.079	0.079
	175	0.727	1.374	0.071	0.299	0.116
	Composite	0.365	0.596	0.05	0.127	0.083
Welders	50	0.316	0.285	0.036	0	0.117
	175	0.572	1.266	0.063	0.001	0.135
	Composite	0.232	0.318	0.034	0	0.079

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					Emission Factor lbs/hour					Annual Emissions lbs				
			Hours/day	days/year	CO	NOx	PM	SOx	VOC	CO	NOx	PM	SOx	VOC
ONSITE EMISSIONS														
Dozer			8.00	84.00	1.024	2.817	0.112	0.452	0.211	688.13	1893.02	75.26	303.74	141.79
Loader			8.00	84.00	0.425	1.111	0.063	0.221	0.099	285.60	746.59	42.34	148.51	66.53
Backhoe			8.00	84.00	0.419	0.816	0.083	0.115	0.125	281.57	548.35	55.78	77.28	84.00
								Onsite Total (lbs/year)		**1255.30**	**3187.97**	**173.38**	**529.54**	**292.32**
								Onsite Total (tons/year)		**0.63**	**1.59**	**0.09**	**0.26**	**0.15**
OFFSITE EMISSIONS														
Running Exhaust Emissions (grams/mile)														
	days/year	trips/day	miles/trip	grams to lbs	CO	Nox	PM	Sox	VOC	CO	Nox	PM	Sox	VOC
Semi-Truck	84	9	80	0.002205	21.193	18.732	0.018	0.017	0.809	2826.26	2498.07	2.40	2.27	107.89
Pick-Up Truck	84	30	20	0.002205	17.893	2.019	0.0194	0.005	0.73	1988.48	224.38	2.16	0.56	81.13
Starting Emissions (grams/trip)														
Semi-Truck	84	9		0.002205	151.358	4.125	0.004	0.004	14.937	252.31	6.88	0.01	0.01	24.90
Pick-Up Truck	84	30		0.002205	5.938	0.519	0.002	0	0.868	33.00	2.88	0.01	0.00	4.82
Tire Wear (grams/mile)														
Semi-Truck	84	9	80	0.002205			0.027			0.00	0.00	3.60	0.00	0.00
Pick-Up Truck	84	30	20	0.002205			0.008			0.00	0.00	0.89	0.00	0.00
Break Wear (grams/mile)														
Semi-Truck	84	9	80	0.002205			0.013			0.00	0.00	1.73	0.00	0.00
Pick-Up Truck	84	30	20	0.002205			0.013			0.00	0.00	1.44	0.00	0.00
								Offsite Total		**5100.06**	**2732.21**	**12.24**	**2.83**	**218.74**
								Offsite Total (tons/year)		**2.55**	**1.37**	**0.01**	**0.00**	**0.11**
FUGITIVE DUST (PM10)														
emission factor (ton/acre-month)	acres	months	(tons/year)					**Fugitive Dust Total (tons/year)**				**3.08**		
0.77	1	4	3.08											
								Project Total (lb/year)		6355.35	5920.17	6345.62	532.37	511.06
								Project Total (tons/year)		**3.18**	**2.96**	**3.17**	**0.27**	**0.26**
					CO	Nox	PM	Sox	VOC					
			Onsite (tons/year)											
			Equipment Exhaust		**0.63**	**1.59**	**0.09**	**0.26**	**0.15**					
			Fugitive Dust (tons/year)				3.08							
			Onsite Total (tons/year)		**0.63**	**1.59**	**3.17**	**0.26**	**0.15**					
			Offsite Total		**2.55**	**1.37**	**0.01**	**0.00**	**0.11**					
			Project Total (tons/year)		**3.18**	**2.96**	**3.17**	**0.27**	**0.26**					

APPENDIX E
Scoping Comments

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Scoping Comment Summary

During October/November 2006, the California Department of Fish and Game (CDFG) received 26 scoping comment cards and letters in reference to the Notice of Preparation for the Shasta River Watershed-wide Permitting Program and the Scott River Watershed-wide Permitting Program. Fourteen of the 26 comment submissions were considered "general" by CDFG, and therefore were considered in preparation of both Environmental Impact Reports (EIRs). There were eight letters specifically addressing concerns in the Scott River watershed, and four letters that applied to the Shasta River watershed.

Scoping Comments that addressed issues in the Shasta River watershed were received from the following:

Federal Agencies

United States Army Corps of Engineers

State Agencies

State Clearinghouse Letter – SCH #2006102093
Quartz Valley Indian Reservation
Yurok Tribe
Native American Heritage Commission
Siskiyou County

Organizations

Ad Hoc Committee – Ann Maurice
Cal Trout – Curtis Knight
Klamath Riverkeeper – Regina Chichizola
North Coast Consumer's Alliance – Ellen Faulkner
Pacific Coast Federation of Fishermen's Associations – Vivian Helliwell

Individuals

Gary Black
Jack Cowley
Monique Dixon
Margaret Draper
Dean Estep
Don Gutleben
Justin Ly
Don Meamber
Danielle Quigley

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
333 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94105-2197

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DEC 27 2006

Regulatory Branch (1145b)

SUBJECT: File Number 400208 (Shasta River) and 400209 (Scott River)

Mr. Bob Wialliams
California Department of Fish and Game
601 Locust Street
Redding, California 96001

Dear Mr. Williams:

This letter responds to a request for comments on the "Notice of Preparation of a Draft Environmental Report" for establishing watershed wide permitting programs on the Scott and Shasta Rivers. Both the Shasta and Scott Rivers and their tributaries are considered waters of the United States. All proposed discharges of dredged or fill material into waters of the United States must be authorized by the Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S.C. Section 1344). Waters of the United States generally include tidal waters, lakes, ponds, rivers, streams (including intermittent streams), and wetlands.

Your proposed work appears to be within our jurisdiction and a permit may be required for your project. The Corps has a number of permitting options available. Permits may be in the form of a Regional General Permit issued to your office as the sponsor or Individual Permits issued for each project site. Application for Corps authorization should be made to this office. An application Form is available upon request. The application must include plans showing the location, extent, and character of the proposed activity. You should note, in planning your project, that upon receipt of a properly completed application and plans, it may be necessary to advertise the proposed work by issuing a Public Notice for a period of 30 days.

Our Nationwide and Regional General Permits have already been issued to authorize certain activities provided specified conditions are met. Your completed application will enable us to confirm that your activity is already authorized. You are advised to refrain from starting your proposed activity until we make a determination that the project is covered by an existing permit. Commencement of work before you receive our notification will be interpreted as a violation of our regulations.

Should you have any questions regarding this matter, please call Michael Shirley of our Regulatory Branch at 707-443-0855. Please address all correspondence to the Regulatory Branch and refer to the File Number at the head of this letter.

Sincerely,

for Kelley Reid

Jane M. Hicks
Chief, Regulatory Branch

Copy Furnished:

CA DFG, Redding, CA
CA RWQCB, Redding, CA

County of Siskiyou Planning Department
P.O. Box 1085
Yreka, California 96097

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean Walsh
Director

Notice of Preparation

October 20, 2006

To: Reviewing Agencies

Re: Shasta River Watershed-Wide Permitting Program
SCH# 2006102093

Attached for your review and comment is the Notice of Preparation (NOP) for the Shasta River Watershed-Wide Permitting Program draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Bob Williams
Department of Fish and Game, Region 1
601 Locust Street
Redding, CA 96001

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

for: Scott Morgan
Senior Planner, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH#	**2006102093**
Project Title	Shasta River Watershed-Wide Permitting Program
Lead Agency	Fish & Game #1

Type	**NOP** Notice of Preparation
Description	The program is designed to implement key coho salmon recovery tasks while facilitating compliance by agriculure operators and those implementing coho salmon restoration projects with the California Endangered Species Act and Fish and Game Code section 1602.

Lead Agency Contact

Name	Bob Williams				
Agency	Department of Fish and Game, Region 1				
Phone	530-225-2365	***Fax***			
email					
Address	601 Locust Street				
City	Redding	***State***	CA	***Zip***	96001

Project Location

County	Siskiyou					
City						
Region						
Cross Streets						
Parcel No.						
Township		***Range***		***Section***		***Base***

Proximity to:

Highways	
Airports	
Railways	
Waterways	Scott River Watershed
Schools	
Land Use	Various

Project Issues	Biological Resources; Agricultural Land; Landuse; Toxic/Hazardous; Water Quality; Public Services; Other Issues

Reviewing Agencies	Resources Agency; Department of Boating and Waterways; Department of Conservation; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Native American Heritage Commission; State Lands Commission; California Highway Patrol; Caltrans, District 2; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 1

Date Received	10/20/2006	***Start of Review***	10/20/2006	***End of Review***	11/20/2006

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: Siskiyou

SCH# 2006102093

Resources Agency

- [x] **Resources Agency**
Nadell Gayou
- [x] **Dept. of Boating & Waterways**
David Johnson
- [ ] **California Coastal Commission**
Elizabeth A. Fuchs
- [ ] **Colorado River Board**
Gerald R. Zimmerman
- [x] **Dept. of Conservation**
Roseanne Taylor
- [ ] **California Energy Commission**
Paul Richins
- [ ] **Dept. of Forestry & Fire Protection**
Allen Robertson
- [x] **Office of Historic Preservation**
Wayne Donaldson
- [x] **Dept of Parks & Recreation**
Environmental Stewardship Section
- [ ] **Reclamation Board**
DeeDee Jones
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
Steve McAdam
- [x] **Dept. of Water Resources**
Resources Agency
Nadell Gayou
- [ ] ______________
Conservancy

Fish and Game

- [ ] **Depart. of Fish & Game**
Scott Flint
Environmental Services Division
- [ ] **Fish & Game Region 1**
Donald Koch
- [ ] **Fish & Game Region 2**
Banky Curtis
- [ ] **Fish & Game Region 3**
Robert Floerke
- [ ] **Fish & Game Region 4**
Julie Vance
- [ ] **Fish & Game Region 5**
Don Chadwick
Habitat Conservation Program
- [ ] **Fish & Game Region 6**
Gabrina Gatchel
Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
Tammy Allen
Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
George Isaac
Marine Region

Other Departments

- [ ] **Food & Agriculture**
Steve Shaffer
Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
Public School Construction
- [ ] **Dept. of General Services**
Robert Sleppy
Environmental Services Section
- [ ] **Dept. of Health Services**
Veronica Malloy
Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
Debby Eddy
- [ ] **Office of Emergency Services**
Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
State Clearinghouse
- [x] **Native American Heritage Comm.**
Debbie Treadway
- [ ] **Public Utilities Commission**
Ken Lewis
- [x] **State Lands Commission**
Jean Sarino
- [ ] **Tahoe Regional Planning Agency (TRPA)**
Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
Sandy Hesnard
- [ ] **Caltrans - Planning**
Terri Pencovic
- [x] **California Highway Patrol**
Shirley Kelly
Office of Special Projects
- [ ] **Housing & Community Development**
Lisa Nichols
Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
Rex Jackman
- [x] **Caltrans, District 2**
Marcelino Gonzalez
- [ ] **Caltrans, District 3**
Jeff Pulverman
- [ ] **Caltrans, District 4**
Tim Sable
- [ ] **Caltrans, District 5**
David Murray
- [ ] **Caltrans, District 6**
Marc Birnbaum
- [ ] **Caltrans, District 7**
Cheryl J. Powell
- [ ] **Caltrans, District 8**
Dan Kopulsky
- [ ] **Caltrans, District 9**
Gayle Rosander
- [ ] **Caltrans, District 10**
Tom Dumas
- [ ] **Caltrans, District 11**
Mario Orso
- [ ] **Caltrans, District 12**
Bob Joseph

Cal EPA

Air Resources Board

- [ ] Airport Projects
Jim Lerner
  - [ ] Transportation Projects
  Ravi Ramalingam
  - [ ] Industrial Projects
  Mike Tollstrup
- [ ] **California Integrated Waste Management Board**
Sue O'Leary
- [ ] **State Water Resources Control Board**
Jim Hockenberry
Division of Financial Assistance
- [ ] **State Water Resources Control Board**
Student Intern, 401 Water Quality Certification Unit
Division of Water Quality
- [ ] **State Water Resouces Control Board**
Steven Herrera
Division of Water Rights
- [x] **Dept. of Toxic Substances Control**
CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**

Regional Water Quality Control Board (RWQCB)

- [x] **RWQCB 1**
Cathleen Hudson
North Coast Region (1)
- [ ] **RWQCB 2**
Environmental Document Coordinator
San Francisco Bay Region (2)
- [ ] **RWQCB 3**
Central Coast Region (3)
- [ ] **RWQCB 4**
Teresa Rodgers
Los Angeles Region (4)
- [ ] **RWQCB 5S**
Central Valley Region (5)
  - [ ] **RWQCB 5F**
  Central Valley Region (5)
  Fresno Branch Office
  - [ ] **RWQCB 5R**
  Central Valley Region (5)
  Redding Branch Office
- [ ] **RWQCB 6**
Lahontan Region (6)
  - [ ] **RWQCB 6V**
  Lahontan Region (6)
  Victorville Branch Office
- [ ] **RWQCB 7**
Colorado River Basin Region (7)
- [ ] **RWQCB 8**
Santa Ana Region (8)
- [ ] **RWQCB 9**
San Diego Region (9)

- [ ] Other ______________

Last Updated on 04/28/06

Quartz Valley Indian Reservation
13601 Quartz Valley Road
Fort Jones, CA 96032
ph: 530-468-5907 fax: 530-468-5908

November 17, 2006

Bob Williams, Staff Environmental Scientist
Conservation Planning
California Department of Fish and Game
Northern California - North Coast Region
601 Locust Street
Redding, California 96001

California Department of Fish and Game,

Please find the enclosed the comments submitted by the Quartz Valley Indian Reservation (QVIR). We would like to thank you for this opportunity to provide comments during the DEIS scoping process on the Shasta and Scott ITP and Environmental Check List.

The Reservation is located in both Scott and Shasta Valley's. The health of the fishery in these two water sheds is critical to the health and survival of the way of life of our native people, within the Shasta and Scott and the entire lower-Klamath basin.

We understand the need to compromise and work together with the agricultural community and their established way of life. However, we feel this document is in no way a compromise of two sides and regret that tribe's have not been involved from the beginning of this process.

We will continue to provide our technical comments in a hope that they are considered when preparing the final EIS. If a true desire to restore the fishery in both the Scott and Shasta Valley's exists, then we would expect a final EIS to include some of the issues we have presented.

Thank you.

Sincerely,

Harold Bennett
Tribal Vice-Chairman
Quartz Valley Indian Reservation

Shasta River Scoping Comments
Technical Memorandum

The California Department of Fish and Game (CDFG) issued a Notice of Preparation (NOP) of a Draft Environmental Impact Statement (DEIS) for a Shasta River Watershed-Wide Coho Salmon Incidental Take Permitting Program on 11 October of this year.

An Incidental Take Permit (ITP) is required by the California Endangered Species Act (CESA) to be obtained by any party planning to engage in any land- or water use which might cause harm to any species listed for protection under the California Endangered Species Act (CESA).

Coho salmon (Oncorhynchus kisutch) were found to require protection as a threatened species, under the terms of the federal ESA, throughout their range in northwestern California and southern Oregon, by the National Marine Fisheries Service more than a decade ago (Weitkamp et al., 1995). The California Department of Fish and Game eventually reached a similar conclusion and moved to list coho under the CESA statutes in 2003 (CDFG, 2002). In response to the State's listing, a *Draft Shasta Valley Resource Conservation District Master Incidental Take Permit Application* was filed with CDFG in April 2005 (SVRCD, 2005).

The comments provided are drawing on both the 2005 *SVRCD Draft ITP* and the recently-released *Environmental Check List and Initial Study* (*Initial Study*) (CDFG, 2006). These documents are intertwined. The *Shasta River Total Maximum Daily Loads (TMDL's) for Temperature and Dissolved Oxygen* (NCRWQCB, 2006) is also referenced here, along with the comments on that document offered last spring by the Quartz Valley Indian Community (QVIC, 2006). The QVIC document is provided as Appendix A to these scoping comments because it provides excellent background information on the factors that limit salmon populations, including their water quality needs, and recommendations for monitoring and restoring cold water fish populations.

Because neither the *SVRVD Draft ITP* nor the CDFG *Initial Study* adequately characterize the status of the coho salmon species in northwestern California; streamflow issues related to that status; the role of groundwater extractions on stream habitat; or anything resembling a best-science approach to coho salmon protection and restoration (see: Bradbury et al., 1994), background discussion on these issues is provided here.

AN OVERVIEW OF CDFG'S INCIDENTAL TAKE PERMITTING PROCESS

A fundamental flaw in CDFG's approach to the proposed permitting of the incidental take of coho salmon in the Shasta River watershed is that it will not succeed in protecting coho salmon and it will not, therefore, satisfy CDFG's CESA authority for issuing such a permit in the first place.

The basic authority for these incidental take permits (California Fish and Game Code Section 2081) states, in part, that

> (c) No permit may be issued pursuant to subdivision (b) if issuance of the permit would jeopardize the continued existence of the species. The department shall make this determination based on the best scientific and other information that is reasonably available, and shall include consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (1) known population trends; (2) known threats to the species; and (3) reasonably foreseeable impacts on the species from other related projects and activities.

The *Initial Study* fails to meet the stated CESA requirements for the use of best available science; it does not properly characterize the true risk of coho salmon extinction; and it does not acknowledge that the continuation of existing land- and water uses in the watershed will, in all likelihood, cause further decline of coho salmon in the Shasta River. Because the ITP does not address issues like the excessive diversion of streamflow and the over-extraction of groundwater, flow-related water quality problems in the Shasta River will not be resolved and coho salmon will likely continue to decline, or will become extinct altogether. The actions that CDFG would permit will, in fact, jeopardize "the continued existence of the species".

CDFG's use of SVRCD Draft ITP submission date as the baseline conditions for the application of CEQA may just meet the minimum requirements of CEQA but it fails altogether to comport with the department's duties under the State and federal endangered species acts and legislative mandates such as the Fisheries Restoration Act of 1985 (CF&G Code Section 2760, et seq.), which contemplates not only the prevention of further salmon population declines in the state, but planning and implementation, by the department, of a doubling of salmon numbers, "primarily through the improvement of stream habitat".

The preponderance of scientific evidence found in 1995 that Shasta River basin coho salmon required the protection of State and federal endangered species acts because dams, land use and water extraction activities had so profoundly changed habitat quality that the species was – and it remains to this day -- on the verge of extinction. Maintaining the Shasta River coho salmon population at its current depleted level will most likely only postpone their extinction until they are overcome by genetic drift or stochastic events (Rieman et al., 1993).

To meet the requirements of CEQA, the DEIS must consider past, current and future environmental effects. By setting baseline conditions as those existing in April 2005, CDFG fails to consider the past activities degrading coho salmon habitat, such as the development and operation of Dwinnell Dam; the over-diversion of surface water, the growing over-extraction of groundwater, and water pollution generated by agricultural activities (NAS, 2003). CDFG's entire DEIS is, to the contrary, limited to assessing the impacts of narrowly-defined ITP-related restoration activities and it skips all mention of those land- and water-use actions which are degrading coho habitat in the Shasta River watershed. By concentrating on narrow restoration measures, and ignoring the adverse impacts of current land- and water uses, the DEIS fails CEQA's test to consider cumulative environmental impacts which, taken together, are significant in their nature.

The *Initial Study* does not recognize the *Shasta TMDL* (NCRWQCB, 2006) and there is no indication that the substantial body of technical information concerning pathways to coho salmon protection and restoration (Kier Associates, 1991; 1999; NAS, 2003) were ever reviewed or used by CDFG. Ideally the Shasta River watershed-wide ITP would work in conjunction with the TMDL because water quality problems are the major reason for coho salmon decline in the basin. Given the present weaknesses the CDFG ITP process, water quality problems issues identified in the State's TMDL will remain unattended and jeopardy to Shasta River coho salmon will continue.

Actions taken under the *SVRCD Draft ITP* and *Initial Study* focus only on coho salmon, which is not the only Pacific salmon species at risk in the Shasta River basin nor, for that matter, the one of greatest economic importance. This single-species "tunnel vision" fails to protect steelhead trout (O. mykiss) and Chinook salmon (O. tshawytscha), as well as coho salmon.

Were CDFG to continue in its present approach to approve the watershed-wide ITP as proposed, it is essentially permitting a number of activities that violate State and federal law, including:

- the failure to release adequate flows from Dwinnell Dam to maintain fish life in the Shasta River, a violation of CFG Code Sections 5937 and 5946.
- The extraction of groundwater that is directly connected to surface water requires a State Water Resources Control Board (SWRCB) water rights permit, yet none was obtained when the flow from Big Springs was first tapped in the late 1980's, destroying essential Shasta River salmon and steelhead refuge habitat (Kier Associates, 1999).
- The listing of the Shasta River as impaired under the Clean Water Act (NCRWQCB, 2005) recognizes the river's impaired polluted condition; mandates the need for a TMDL water quality recovery plan; and mandates the cooperation of agencies of State government beyond those with primary responsibility for water pollution abatement.

The issuance of a watershed-wide ITP as proposed by CDFG will shield activities in the Shasta River watershed which are inimical to coho salmon protection and restoration from effective and necessary legal challenge.

SUMMARY COMMENTS ON THE *SVRCD DRAFT ITP* APPLICATION

The *Initial Study* is written in response to the 2005 submittal of the S*VRCD Draft ITP* but it does not take advantage of the detailed information from it concerning the specific actions to be taken. What follows here is a brief summary of the *SVRCD Draft ITP*. More details concerning its stipulations are, then, included in a later section that reviews the elements of the *Initial Study* itself (which begins on page 6 of these comments).

In general, the *SVRCD Draft ITP* is well written and comprehensive. It provides a frank discussion of factors known to limit coho salmon in the Shasta River, a reach by reach description of stream impairment, and some good suggestions on how to remedy the problems posed by agricultural operations to coho recovery. The schedule for implementation stretches over several years, but some actions to improve conditions for coho, such as excluding cattle from riparian zones, would begin immediately.

The *SVRCD Draft ITP*, however, has some critical short-comings that are likely to confound coho recovery**:** the lack of jurisdiction of the State Watermaster concerning riparian water rights, the inability to quantify and control groundwater extractions, and a lack of solutions related to fish passage and water pollution associated with the operation of Dwinnell Dam. The goals of the ITP appear to be realistic, but at the same time target conditions should meet the needs of coho salmon – which in some cases they do not. The timeframe for the implementation of SVRCD *Draft ITP* actions is variable. Table 1 lists various restoration and planning measures, together with the deadline for their completion.

Table 1. Actions recommended by the Shasta Valley ITP (SVRCD, 2005) and timeframes for their implementation.

Action	**Final Deadline**
Minimum riparian setback of 35 feet	Immediately upon CDFG Approval of ITP
Drought Year Plan	Within 1 yr. of CDFG Approval of ITP
Ramped Diversion Plan	In Place 1/1/2008
Screen All Diversions	Within 2 yrs. of signing on to ITP
Develop Coho Migrant Index	2008
Minimum D.O. of 6 ppm	2008
Coho reaches fenced or fencing in progress	2008
Cease use of gravel diversion dams	2009
Fish passage at major diversion dams	2010
Decrease temperature 5 ^{o} F	2015
Flows never < 20 cfs	2015

COHO POPULATION VIABILITY ISSUES AND TARGETS FOR RECOVERY

The *SVRCD Draft ITP* provides information from the Shasta River Rack counting station fish counts and radio tagging studies that indicate that coho salmon returns likely range from merely dozens in some years to the low hundreds. Minimum viable population levels to retain genetic diversity range from 200 to 500 individuals (Gilpin and Soule, 1986; Riggs, 1990), so it is likely that Shasta River coho are at critically low survival levels.
The CDFG *Initial Study* makes no mention whatsoever of Shasta River coho salmon population status. Data from Shasta River downstream migrant traps show that coho salmon are at very low levels (Figure 1) and there are indications of weak year classes similar to those recognized in the Scott River Basin (QVIC, 2005). Although downstream migrant trapping results show a community dominated by salmonids, catfish out-numbered coho salmon juveniles in the trap. This indicates that water quality is beginning to favor warm water species

and that impoundments within the Shasta River basin are a source of invasive predators that are a threat to juvenile coho.

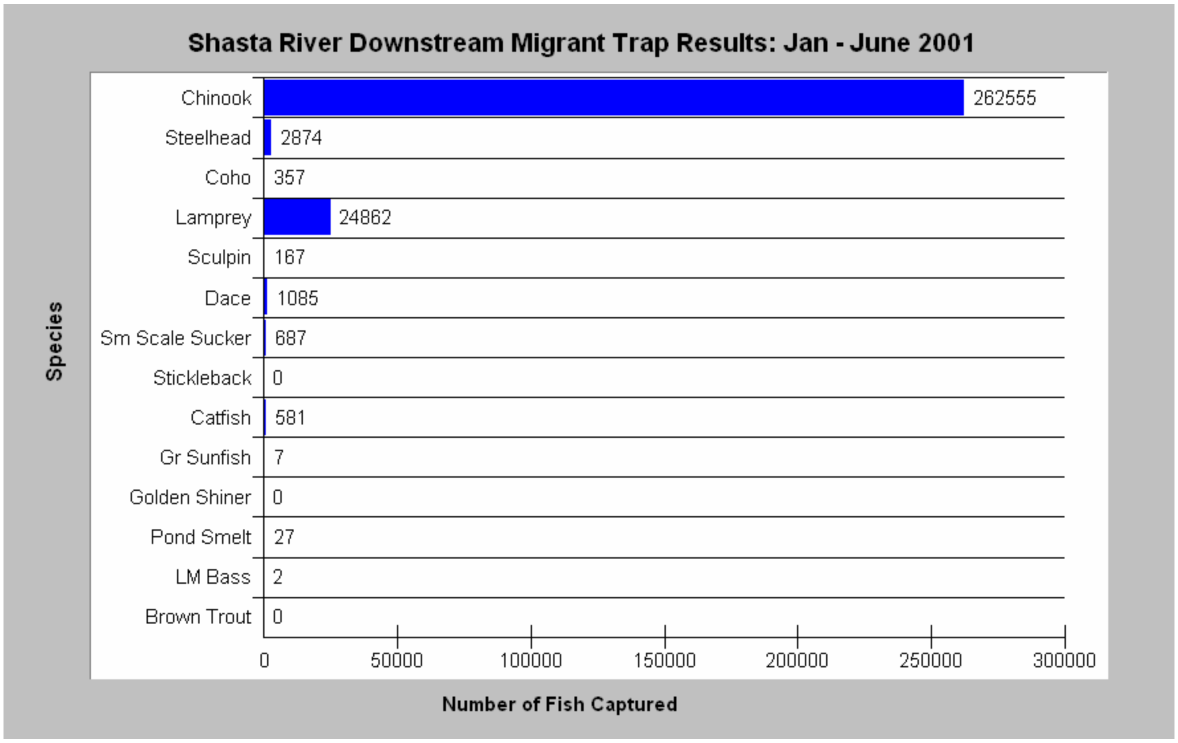

Figure 1. Downstream migrant trapping results from the Shasta River from January to June 2001. Data provided by CDFG (Chesney, 2002) and chart from KRIS V 3.0.

The *SVRCD Draft ITP* correctly assumes that yearling coho juveniles seen moving upstream from the Klamath into the lower Shasta River indicate an interaction with a larger population group or a metapopulation (Rieman et al. 1993). If this plasticity extends, as well, to spawning then interchange between small populations in different tributaries may be helping Shasta River coho maintain their genetic diversity. <u>The CDFG DEIS needs to discuss the overall Klamath Basin coho salmon population condition, metapopulation function, and potential interactions between Shasta River coho salmon stocks and those nearby</u>.

Increased adult coho returns since 2000, when compared to those of the 1980s, are attributed by the *SVRCD Draft ITP* to improvement of Shasta River habitat conditions, but it may well also be associated with improved ocean conditions and wet on-land cycles associated with the Pacific decadal oscillation cycle (Hare et al., 1999; Collison et al., 2003). Ocean conditions off California, Washington and Oregon switched to more favorable conditions in about 1995 and a shift to unfavorable conditions is likely to occur between 2015 and 2025 (Collison et al, 2003). When ocean conditions become unfavorable and a drier on-land climate returns, freshwater habitat conditions will have to have been improved or the risk of Shasta River coho extinction will be substantially increased (see Appendix A for more in depth discussion). <u>The CDFG DEIS needs to discuss how a switch of the PDO in 2015-2025 may impact coho salmon and their on-shore habitat in terms of their prospects for survival</u>.

The *SVRCD Draft ITP* takes the position that habitat conditions in the Shasta River watershed were likely less favorable for coho than were coastal streams. On the contrary, before the development of agriculture in the Shasta, the icy flows from springs likely provided ideal habitat conditions for adult and juvenile salmonids, including coho salmon, year around (NAS, 2003).

Because tributaries of the mid-reaches of the Shasta River often lack surface flow due to almost complete year-round diversion, the *SVRCD Draft ITP* raises questions as to whether these were ever viable coho streams. Groot and Margolis (2001) indicate that coho prefer streams with a gradient of 2% or less. Streams like Julian Creek, Willow Creek, Oregon Slough and the Little Shasta River all have suitable gradient and, therefore, would likely have been inhabited by coho before agricultural development.

The *SVRCD Draft ITP* works under the assumption that coho juveniles entering the mainstem Klamath River as young-of-the-year have almost zero survival, but such an assumption may well not be correct. The Karuk Department of Natural Resources routinely sees coho salmon juveniles using very small tributary streams where they were not spawned and these cold water tributaries may represent important refugia during times when the mainstem Klamath River water quality conditions are poor (Watercourse Engineering, 2005). Were the Klamath Hydroelectric Project dams removed, there would likely be a substantial improvement in water quality (QVIC, 2006b) and a resulting much increased rate of survival of Shasta River coho juveniles during out migration down the Klamath River. <u>This prospect also needs to be addressed in the forthcoming DEIS</u>.

The *SVRCD Draft ITP* suggest that attaining a survival rate of 85 juveniles per adult female spawner will avoid "take" and will meet ESA requirements, based on studies from other West Coast coho studies. Maintaining a population at a very low level engenders much higher risk of population loss. Alternatively, a strategy of opening up spawning areas and expanding access by coho to additional suitable habitat enable expansion of the population to a more sustainable and stable level (Rieman et al., 1993). In order to maintain the viability of the Shasta River coho population into the future, an annual return of at least 500 adults must be attained (Gilpin and Soule, 1990; Higgins et al., 1992). The *Initial Study* fails to address the present status or future viability of the Shasta River coho salmon population. <u>The DEIS must address these critical issues and include tangible measures for species recovery, including monitoring to support adaptive management</u>.

DETAILED COMMENTS ON CDFG'S *INITIAL STUDY*

The CDFG (2006) *Initial Study* for issuance of a Shasta River watershed-wide ITP was reviewed and the following comments refer specifically to passages from that document.

<u>Baseline Conditions</u>: As mentioned above, a flaw in the *Initial Study* (p 6) is setting the environmental baseline conditions as those which existed at the time the *SVRCD Draft ITP* application was filed in 2005. Baseline conditions are typically defined in scientific studies as

those that existed prior to human impacts. NAS (2003) describes historic habitat conditions in the Shasta River prior to European colonization as ideal for all species of Pacific salmon. Cool spring water emerging on the Shasta Valley floor piped by lava tubes from the shoulders of Mt. Shasta provided high summer base flows. Baseline conditions would have included access for spawning and rearing to headwater areas of the Shasta River and tributaries like Eddy Creek above the present site of Dwinnell Dam. Many important tributaries, such as Parks Creek (Figure 2) and the Little Shasta River, had perennial flow and were viable salmonid habitat.

Access for Inspection: The *Initial Study* (p 11) states that non-enforcement personnel must be allowed access to all lands covered under the watershed-wide ITP. The delegation of responsibility to the SVRCD of reporting infractions and the need for advance notice before even non-enforcement personnel make inspections calls into question CDFG's willingness to enforce the ITP. This is especially troubling given that inadequate enforcement by CDFG and others of existing law precipitated the need to list Shasta River coho salmon under the State and federal endangered species acts.

Avoidance and Minimization of Impacts

Stockwater Access: The *Initial Study* (p. 12) stipulates that stock access to the Shasta River and cattle crossing must be restricted after October 31. Fall Chinook salmon historically entered the Shasta River in mid-September and are actively spawning throughout October. Klamath River fall Chinook escapement in recent years shows an alarming downward trend (see Appendix A) and any actions taken under the coho salmon ITP that allow negative impacts to Chinook salmon would be unwise. This is just one example of problems caused by using a single species approach in the ITP process.

Flows: The requirement that all diversions must have flow gauges and that data collected by the California Department of Water Resources (DWR) Watermaster must be shared in a timely manner with CDFG is a step in the right direction. However, as pointed out by NAS (2003):

> "The 1932 adjudication of surface waters in the basin, as currently administered, is insufficient to supply the quantity and quality of water necessary to sustain salmonid populations in the basin."

The fact that riparian water rights below Dwinnell Dam are not part of the adjudication means that the State Watermaster has no authority over them. Riparian land holders may divert water from the stream without regulation, which means that there is no enforcement mechanism for protecting instream flows, even if conservation measures were implemented.

Figure 2. Parks Creek running dry during the summer of 2003 near the point of diversion where most of its flow is diverted into Dwinnell Reservoir. Copyrighted photo used by permission of Michael Hentz.

The DEIS needs to acknowledge that flows in the Shasta River have fallen well below those needed to support salmonids and to maintain water quality. Flows in the lower Shasta River often drop below 20 cubic feet per second (cfs) (Figure 3), which is the target for minimum instream flows in the *SVRCD Draft ITP*. That target is to be met by 2015, but there is no scientific support for that level of flow with regard to restoring cold water fisheries.

Ground water extraction for irrigation and domestic use have significantly decreased surface flows in the Shasta River with major consequences for salmonid carrying capacity (NAS, 2003). Appropriative water rights are required when ground water diversion affects surface flows directly, but no permits have been requested nor issued despite widespread recognition of the problem. The *SVRCD ITP* recommends that "groundwater usage affecting surface flows should be incorporated into water management activities" but offers no specific required action. Uncontrolled ground water extraction has the potential to offset benefits of other ITP efforts. Enforcement action is needed to stop the present illegal diversion of groundwater, and flows from Big Springs must be restored. The *Shasta River TMDL* (NCRWQCB, 2006) recommends an increase in flows at Big Springs to 45 cfs to improve water quality. NAS (2003) stated that "small increases in flow could reduce transit time substantially and thus increase the area of the river that maintains tolerable temperatures." This needs to be pointed out in CDFG's DEIR.

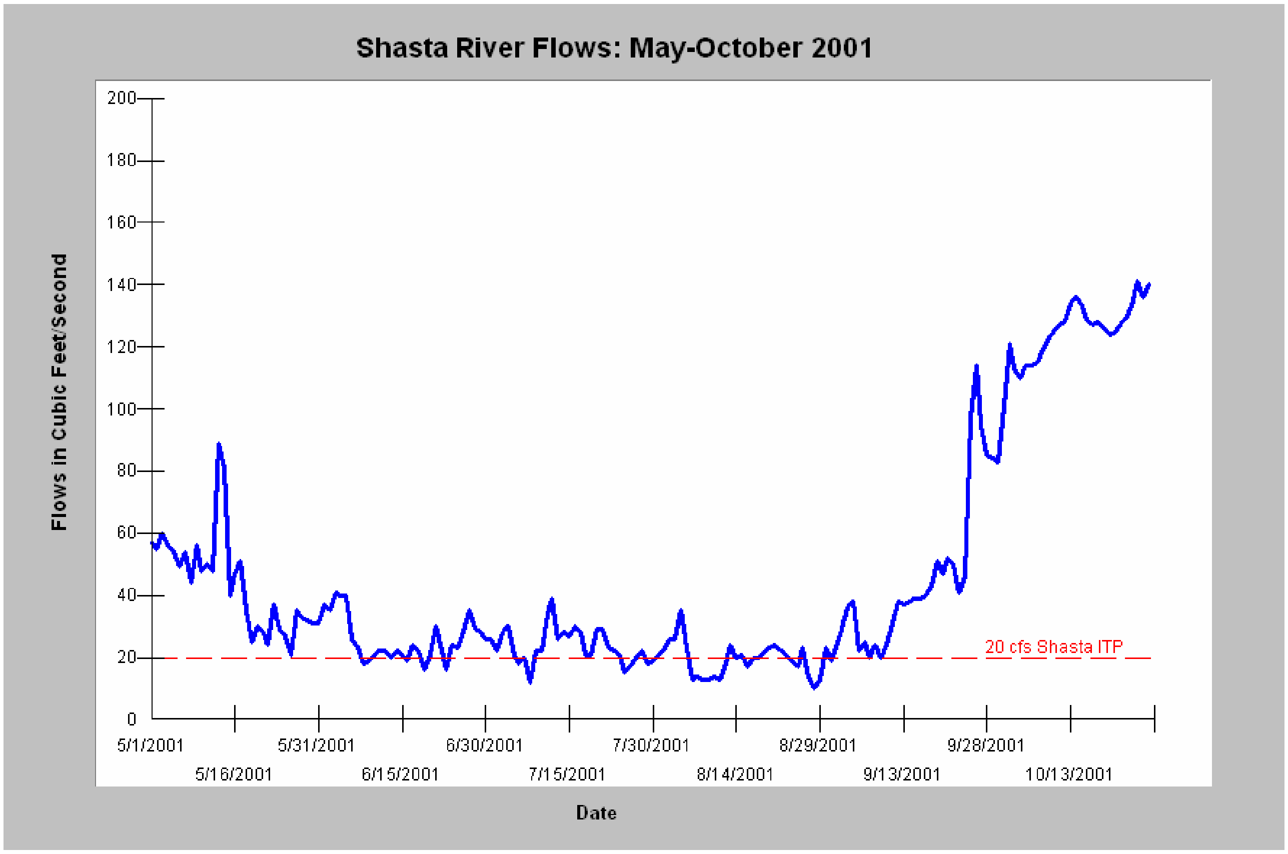

Figure 3. Average daily flow at the USGS Shasta River gauge for May through October 2001 show a pattern of extremely low flows with many days falling below 20 cubic feet per second.

<u>Fish Screens/Fish Passage</u>: The *Initial Study* (p 12) calls for screening of all agricultural water diversions and for the remediation of fish passage problems at diversions, which are positive and necessary steps. <u>Fish passage problems associated with de-watering of lower Parks Creek and the Little Shasta River, however, go unmentioned</u>.

<u>Riparian Restoration:</u> Although the *Initial Study* calls for restoring riparian areas and excluding cattle by constructing fences, the riparian buffer width in *SVRCD Draft ITP* application is only 35 feet, which is insufficient and scientifically insupportable. Poole and Berman (2001) noted the influence of riparian width on water temperature, with wider buffer strips more able to create cooler ambient air temperature over the stream and promote higher relative humidity. Bartholow (1989) showed that mean daily water temperature was most influenced in Western streams by air temperature over the stream, and secondarily by relative humidity, with shade ranking third in influence. Increased buffer widths would also increase the filter capacity for runoff from upland agricultural activity.

<u>Gravel "Push Up" Dams</u>: The *Initial Study* (p 12) calls for a transition from building temporary gravel dams to the use of pumps in most cases, which is a satisfactory approach.

Bank Stabilization: The *Initial Study* states that CDFG would require that all permittees under the watershed-wide ITP use living plant materials for bank stabilization, which is called "bioengineering" (CDFG, 2005). This is an ideal approach to preventing soil loss as fish habitat is maintained or improved.

Tailwater Recovery: Agricultural return flows in the Shasta River often are a source of thermal and nutrient pollution. The *Initial Study* calls for prioritizing agricultural return flows for capture and reuse on the land to decrease thermal and nutrient pollution. While this proposal commendable, implementation even at priority sites could take ten years or more. This measure deserves greater emphasis and urgency in the DEIR.

Dwinnell Dam: The *Initial Study* calls for the screening of the outflow from Dwinnell Reservoir to prevent escapement of warm water fishes and exploring the feasibility of improving flows and/or building a fish ladder over the dam. These proposed measures fall far short of what is necessary and show a lack of understanding of the profound problems caused by this impoundment. Shasta River spring Chinook salmon were likely extirpated by Dwinnell Dam (Kier Associates, 1991).

Figure 4. Dwinnell Dam has blocked upper Shasta River spawning areas since 1928, looses 50% of the water it holds to evaporation and leakage (NAS, 2003) and contributes to water quality problems in the Shasta River.

The NCRWCB and UC Davis (2005) *Lake Shastina Limnology* report shows that Dwinnell Reservoir bears a striking similarity to Iron Gate and Copco reservoirs in the Klamath Hydroelectric Project (QVIR, 2006b). Nitrogen fixing blue-green algae grow at nuisance levels within the Dwinnell Reservoir (Figure 5) and contribute to significant water pollution problems. Temperatures and pH are high and dissolved oxygen may undergo significant depression related to algal photosynthesis and decomposition. The prevalence of warm water fish species in the reservoir is indicative of Dwinell's poor water quality.

The DEIS on the Shasta River watershed-wide ITP needs to recognize that remediation of water quality problems within Dwinnell Reservoir is not possible and that fish passage over the dam is both infeasible and undesirable. See discussions related to Iron Gate Reservoir in *Proposed Terms and Conditions for Relicensing of the Klamath River Hydroelectric Project* (QVIC, 2006b). NAS (2003) stated that the Shasta River has the greatest prospect in the Klamath Basin for salmonid restoration during the upcoming period of global warming and urges consideration of the removal of Dwinnell Dam. The complete lack of flow below Dwinnell Dam is illegal and it should motivate CDFG to advocate for dam removal.

Figure 5. This photo shows Dwinnell Reservoir, also known as Lake Shastina, which has significant blooms of nitrogen fixing algae. Copyrighted photo used with permission of Michael Hentz.

<u>Mitigation Obligations of the SVRCD Under the ITP</u>

<u>Shasta River Water Bank</u>: The *Initial Study* (p 14) would establish an unfavorable precedent of paying farmers and ranchers to leave water in the Shasta River and its tributaries during periods critical for coho salmon survival. Public trust protection is required under California law. Land and water users are obligated to protect common property resources, such as native, cold water fish species. Enforcement action is needed if sufficient stream flows to protect the public trust are not provided. Ironically, the envisioned water purchases or leases to benefit coho would likely not be sufficient to restore Chinook and steelhead. Thus, future negotiations and payments would be needed to improve flows for those species.

Retirement of some water rights through purchase might be a viable strategy, but only if adjudication were revisited and a mechanism put in place to prevent extraction of the conserved fish water by downstream riparian land owners. <u>The *Initial Study* refers to the use of Water Code Section 1707 for securing water dedicated for instream flows, but there is no discussion of tangible measures to acquire such rights nor how they would be enforced</u>.

<u>Improve Instream Flows Through Increased Efficiency of Water Use:</u> The call for improving flows and efficiency of water use in the *SVRCD Draft ITP* and the *Initial Study* are both positive steps. As noted above, however, flow increases would be geared only to coho salmon protection and would not likely benefit Chinook salmon and steelhead. <u>Although the *Initial*</u>

Study references California Water Code Section 1707 that would allow the dedication of water to instream flows for fish, insufficient detail is provided as to how such measures would be pursued, if at all.

Strategy for Dry and Critically Dry Years: According to the *Initial Study*, dry and critically dry years must be identified within one year of ITP approval. The proposed solution to maintain flows in dry and critically dry years is to increase pumping of ground water with payment from the Water Trust for pumping costs. Ground water extraction in the Shasta River basin is already depleting surface flows (Kier Associates, 1999; NAS, 2003), and this strategy is unlikely to succeed.

Coordinating Diversions: Shasta River flows may vary widely within any given day when irrigation is taking place, which may lead to short-term but critical low flow periods that do not show up in average daily flow summaries from USGS. The *Initial Study* calls for coordination of diversions through a Diversion Ramp-Up Management Plan. This is very good and much needed.

Off-stream Stock Water Development: The *Initial Study* (p 15) requires that at least two additional off-stream stock water systems be installed per year during the term of the watershed-wide ITP. The specific target for decreasing the need for stock water from surface water diversions concerns the migration of adult coho after the rains come (November 15). This again ignores critical Chinook salmon needs for additional flow for spawning throughout the month of October.

Spawning Gravel Enhancement: Gravel enhancement in key reaches for coho spawning is recommended in the *Initial Study* (p 16) and is likely needed. Gravel in the Shasta River basin has been depleted by dewatering in winter of streams such as Parks Creek, the construction and operation of Dwinnell Dam, and massive extraction of gravel in the vicinity of Yreka Creek for I-5 construction. A far better solution to replenishing the river's gravel supply, however, would be to restore natural recruitment through the removal of Dwinnell Dam and re-establishing flows in tributaries (See Restoration below).

Habitat Restoration Structures: The *Initial Study* calls for installation of habitat improvement structures in reaches of the Shasta River used by coho salmon. Kier Associates (1999) noted that poor water quality and lack of flow reduced use of habitat improvement projects on Bureau of Land Management (BLM) lands in the lower Shasta River known locally as "Salmon Heaven" (Figure 6). Consequently, investment in instream structures should be contingent on remediating water quality and water flow problems.

Large Diversions Identified as Barriers: To its credit, the *Initial Study* (p 17) specifically identifies three major, long-standing fish passage problems at large diversions and targets them for improvement or replacement.


Figure 6. This photo shows the Shasta River flowing through BLM land in the canyon reach in an area referred to as Salmon Heaven. Boulders were placed to improve fish habitat, but water quality is too poor to support salmonid juveniles during most of summer. Photo from KRIS Version 3.0 (TCRCD, 2003).

Monitoring and Adaptive Management Under the ITP

The responsibility for monitoring under the Shasta River watershed-wide ITP would fall to the SVRCD and DWR, with both having responsibility to report to CDFG. Provision of raw data to CDFG is required, which is a necessity in any science-based activity (Collison et al., 2003). The DEIS prepared by CDFG should include stipulations and descriptions of mechanisms for sharing of raw data with the State Water Boards, the Tribes and the interested public. While both implementation and effectiveness monitoring are called for, no specific monitoring activities are defined. In order to allow trend monitoring and adaptive management, the DEIS needs to require collection of water quality and fisheries data at the same locations and with the same methods already established. Study design for monitoring under the ITP should not be delegated to SVRCD staff nor should specific monitoring requirements be deferred for later action.

Potential Air Quality Impacts of the ITP

The Initial Study (p 26-35) discussion of air quality and potential impacts of ITP related activities extends for nine pages. It correctly concludes that restoration will have no significant impact on air quality. Following a "boiler plate" Environmental Check List in this way leads to dozens of pages of unnecessary narrative on similar subjects.

Biological Resources and Impacts of ITP Implementation

CDFG recognizes that the Shasta River watershed-wide ITP will have potential impacts on other species. We note above that the *Initial Study* considers validating flow levels that target coho only and could incidentally harm Chinook salmon and steelhead, if approved. CDFG notes that riparian bird species could be temporarily displaced by riparian restoration activities. As discussed above, the true impact of continuing agricultural practices under the ITP on coho salmon is unaddressed in this section because of the *Initial Study's* limited focus on the environmental effects of implementing the ITP itself. The DEIS needs to discuss how maintaining current patterns of stream diversion with only minor changes for coho will avoid the risk of jeopardy to Shasta River Chinook salmon and steelhead populations as discussed above.

Geologic Hazards and ITP Implementation

This section in the *Initial Study* (p 39-47) provides some very interesting information on the geology of the Shasta River basin, but it is otherwise a digression from the subject at hand. One conclusion drawn is that "the project will not likely increase the potential for an eruption of Mt Shasta" or to increase earthquake risk. Really.

Potential for Release of Hazardous Materials During ITP Implementation

The *Initial Study* (p 47-52) concludes after a lengthy discussion that the implementation of the Shasta River watershed-wide ITP poses minimal risk of a release of hazardous materials into the environment. The possible "take" through exposure of coho salmon to hazardous materials such as pesticides or herbicides associated with normal agricultural operations is not discussed anywhere.

Hydrologic and Water Quality Impacts of ITP Implementation

Once again, the emphasis of the *Initial Study* on ITP implementation instead of upon the existing impacts to coho salmon makes the lengthy discussion of hydrologic and water quality conditions (p 54-77) of limited value. Major questions regarding water quality remain unanswered. For example, the *SVRCD Draft ITP* proposes improving Shasta River temperatures by lowering the mainstem water temperature by 5° F -- from 80.6° to 75.6° F at Montague-Grenada Road, by 2015. This modest improvement will not support coho salmon rearing and it shows the need to augment flows to attain water temperatures required by salmon as discussed by NAS (2003). U.S. Fish and Wildlife Service data on dissolved oxygen from the lower Shasta River (Figure 7) show that dissolved oxygen levels fall below those optimal for salmonids during summer and even into stressful ranges at night when algae is respiring. The DEIS needs to more fully characterize existing water quality problems as part of baseline discussions.

While the Initial Study states that ITP projects will not increase total impervious area (TIA), it has no recommendation for limits to protect the integrity of urbanizing streams, such as Yreka Creek. Increasing TIA can have substantial impacts on the diversity of fish species and water quality (May et al., 1996)

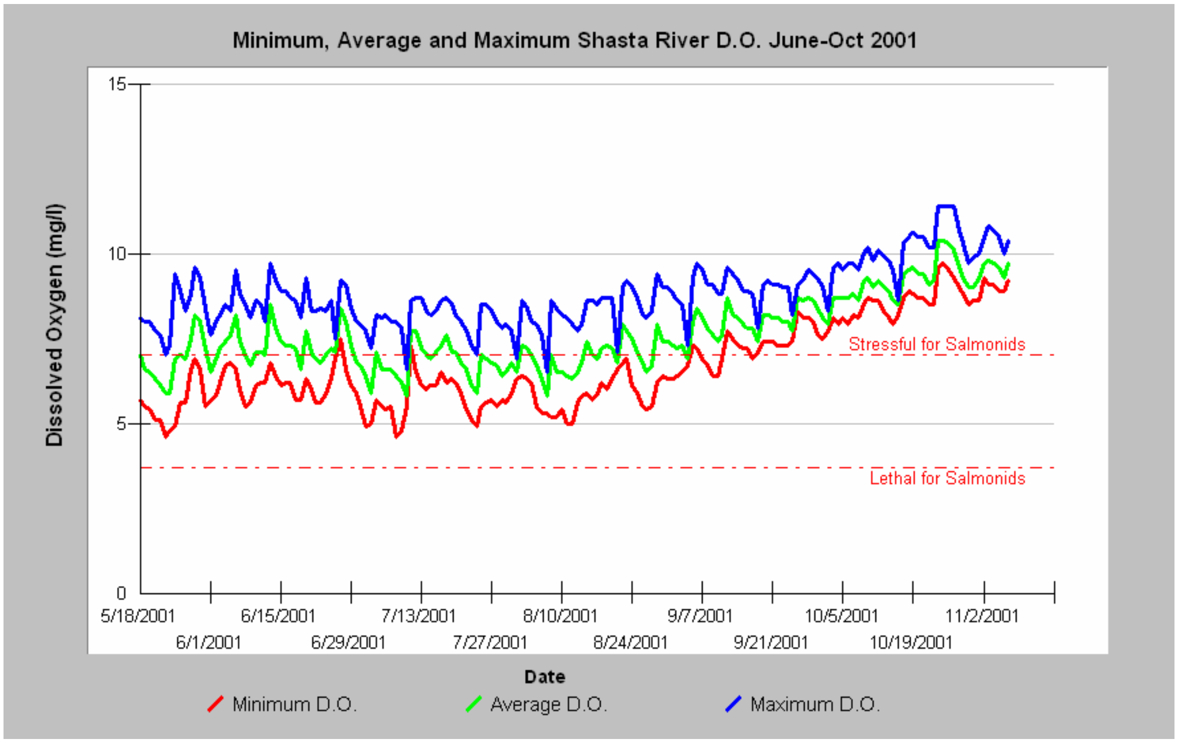

Figure 7. This chart shows the minimum, average and maximum dissolved oxygen of the Shasta River throughout summer in 2001, with highly stressful conditions for salmonids prevailing. Data from USFWS.

<u>To meet with any significant success, the DEIS needs to coordinate actions with those recommended in the *Shasta River TMDL* (NCRWQCB, 2006) and to share responsibility and authority for the oversight of Shasta River water pollution abatement of restoration of cold water fisheries resources. It also needs to honestly address the issue of how flow affects water quality.</u>

ACTIONS NEEDED TO RESTORE SHASTA RIVER ECOSYSTEM AND COHO SALMON

The *SVRCD Draft ITP* pays special attention to the Shasta River reach where Big Springs and Parks Creek converge, correctly characterizing it as refugia that should be a priority for protection and restoration. DWR (1981) noted that Big Springs Creek had the highest amount of Chinook salmon spawning in the Shasta River basin and cold water base flows from the springs sustained temperatures suitable for rearing salmonids throughout summer in the past (NAS, 2003).

Rieman et al. (1993) in their highly useful paper *Consideration of Extinction Risks for Salmonids* state:

> "Maintaining strong populations in the best possible habitats throughout the landscape and preserving the ecological processes characteristic of metapopulations are the best hedges against extinction."

NAS (2003) stated that ground water diversion had caused a major decline in flow in this reach as a result of ground water withdrawals. A midterm review of the State-federal cooperative Klamath Basin Fisheries Restoration Program (Kier Associates, 1999) pointed out that surface water withdrawals had increased as well.

In addition to water withdrawals, increased grazing in riparian zones and excavation with heavy equipment has increased bank erosion and sediment yield to Big Springs Creek and the Shasta River below (Kier Associates, 1999). The lower reaches of Parks Creek have numerous springs and could have been restored to highly suitable coho salmon habitat, but a land trade between a willing private land owner and the U.S. Bureau of Land Management, to enable government acquisition for that purpose, was vetoed by the Siskiyou County Board of Supervisors (Ronald Iverson, personal communication). Instead the riparian zone of lower Parks Creek is still heavily grazed and conditions there are very poor.

The *SVRCD Draft ITP* also recognizes that timber harvest in upper Parks Creek may be a source of fine sediment.

Bradbury et al. (1996) also recognize that the most important step in restoring Pacific salmon populations is to protect refugia. Unfortunately the trend for the most important reach of the Shasta River, which which includes Big Springs Creek and lower Parks Creek, has been toward a more degraded condition over recent years. <u>Some mechanism must be found to limit ground water extraction and to restore some of the cold spring flow back to the Shasta River and its tributaries as recommended in the *SVRCD Draft ITP*</u>.

Stream reaches at higher elevations above the current site of Dwinnell Dam would also likely be suitable for coho salmon, Chinook and steelhead and could serve as expanded habitat and additional refugia, if Dwinnell Dam were removed. Dwinnell Dam operations are not covered by the proposed ITP.

The *Draft Shasta Valley ITP* (SVRCD, 2005) will rely heavily on funding through the Natural Resources Conservation Service (NRCS) from the EQIP program. This source of funds has recently been used for the installation of groundwater pumps in the Scott River that may be hindering – certainly not helping – streamflow and fish habitat in that basin. NRCS policy is to not publicly disclose who receives funds, nor anything about the project, without the express written permission of the landowner. This lack of transparency hampers adaptive management and makes it more likely that money will be spent on things that enhance farm economics while falling short of benefiting fish. The DEIS needs to stipulate that the location of restoration investments from any public agency be made public and that effectiveness monitoring related to such investments be pursued.

Wider riparian buffers may not be considered fully because of practical concerns of farmers and ranchers, i.e., that too much area would be lost to production. <u>The ITP should recommend the use of conservation easements to obtain adequate compensation for farmers and ranchers to establish a sufficiently wide riparian zone</u>. The ITP should commit to experiments to determine if microclimatic benefits and attendant stream cooling can be attained with wider buffers.

CONCLUSION

CDFG should consider taking a more global approach to Shasta River coho salmon conservation and recovery that would benefit all the Pacific salmon species concerned and fully remediate the watershed's water quality problems. The current approach of trying to mitigate current impacts, while maintaining the existing agricultural and water use practices will not likely prevent jeopardy of coho salmon under the proposed ITP, as required under CESA.

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Ph: 530-468-5907 fax: 530-468-5908

April 4, 2006

Catherine Kuhlman, Executive Officer
North Coast Regional Water Quality Control Board
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

Dear Ms. Kuhlman,

The Quartz Valley Indian Community of Quartz Valley Indian Reservation (QVIR), with the assistance of our consultants Kier Associates, have reviewed the public draft version of the North Coast Regional Water Quality Control Board's (RWB) Staff Report for the *Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads* (Shasta TMDL).

The Tribe hopes that the Shasta TMDL will result in measurable and timely improvements in the water quality of the Shasta River watershed. Please realize that QVIR is the only federally recognized, sovereign tribal government in Siskiyou County. The consideration that the Board gives to our comments should be representative of this fact.

We appreciate the efforts of your staff in the creation of this document. The Board and its Staff should be well aware of QVIRs position on the Shasta River TMDL. Please find attached the official comments of the Quartz Valley Indian Reservation regarding the Shasta River TMDL and Implementation Plan.

The QVIR supports the concept of the TMDL. The Tribe would like to see the Shasta River Watershed restored to historical healthy and sustainable conditions. We do have some concerns with the draft document and question some of the implementation approaches, however, we feel overall that the Shasta TMDL is a good place to begin with action towards restoring the historic water quality of the Shasta River Watershed.

We understand the Regional Board has limited staff and funding, therefore we would like to provide assistance by being involved in the implementation of the Shasta TMDL and working on a government to government basis with monitoring and restoration. Additionally, the Tribe would like to be a party in the suggested Memorandums of Understanding between federal agencies and the Regional Board.

I would like to stress the Tribe's sentiment that the state of the Shasta Watershed needs immediate attention and action. We have seen populations of coho, Chinook, steelhead, and lamprey severely decline in the Shasta Watershed. To us, water is life. We are concerned about the future of our lives and call upon the North Coast and State Water Boards to protect and heal this watershed.

Attached, you will find technical comments and recommendations. Please contact myself or my environmental staff at 530-468-5907 for further information or clarification on the issues discussed.

Thank you,

Harold Bennett
Vice Chairman

Quartz Valley Indian Reservation has reviewed the public draft version of the North Coast Regional Water Quality Control Board's (RWB) Staff Report for the *Staff Report for the Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads* (Shasta TMDL).

Following the summary immediately below, detailed comments which correspond to the particular Scott TMDL subjects are provided (some of the comments are applicable to several sections of the TMDL). Where subjects were <u>not</u> addressed by the RWB staff we have inserted discussion where such matters would fit, had they been addressed. Insignificant issues such as typographic/grammar errors are included as Appendix A.

SUMMARY OF COMMENTS

Overall, the technical analysis in the Shasta Dissolved Oxygen (D.O.) and Temperature TMDL uses sound logic, has good supporting graphics, and uses standard models that have been previously used in the basin. The models are transparent and their assumptions are clearly stated and for the most part well supported. The Shasta TMDL recognizes that increasing flows is an important action needed to remediate water temperature problems, which is both scientifically accurate and commendable.

There are several ways in which the technical portion of the TMDL could be improved. First, there is no discussion of pH in the TMDL, despite the fact that pH values in the mainstem often exceed *Basin Plan* objectives (NCRWCB 2001), are high enough to be stressful to salmonids, and have similar causes as the dissolved oxygen issue. Second, the TMDL repeatedly refers to nutrient sources (such as from tailwater returns and Dwinnell Reservoir) as problems because of contributions to nitrogenous biological oxygen demand (NBOD), when NBOD is in fact only a small part of the oxygen demand in the Shasta River. The real problem with those nutrient sources, which the TMDL repeatedly overlooks, is the total amount of nitrogen (in all forms) contained in those nutrients sources and its stimulation of aquatic plant growth. This occurs throughout the Staff Report and the *Basin Plan* amendment language, and should be corrected.

A more holistic watershed focus is another way in which the TMDL could be improved. Partially due to the model-centric focus of the TMDL, the Shasta River is treated as a 40 mile trunk without functional tributaries. Flow data from the *Appropriation of Water Rights in the Shasta Basin* (CADPW, 1932) contained in the TMDL show that all tributaries had surface flow and were functional parts of the Shasta River, but there is no mention of restoring connectivity. Pollution from reaches of streams like upper Parks Creek are not recognize because they are not part of the model, although Parks Creek is connected to the Shasta River during major storms. Water quality issues within Lake Shastina (aka Dwinnell Reservoir) are described, but the benefit of removing the dam for abating temperature and nutrient pollution is not discussed. It should be noted here that NRC (2004) recommends consideration of removal of Dwinnell Dam.

A summary of our comments regarding implementation is included below as Table 1 (patterned after Table 4 of the Basin Plan amendment language). The water quality compliance scenario in temperature TMDL includes a 50% increase in flow from Big Springs Creek. We strongly support that decision; however the TMDL implementation does not lay out a clear path for how such a substantial increase in flow could be achieved. The RWB proposes to take no action to increase flows to improve water quality for five years, which seems like a long wait given the stock status of Klamath River salmon (Kier Associates, 2006); we think two years would be a more reasonable amount of time. Implementation relies heavily on voluntary measures, although adjacent language stressing the Regional Water Board's (RWB) ability to follow up with enforcement is reassuring. The implementation plan proposes good ideas for how to manage tailwater return flows, riparian areas, and rangelands. The discussion of urban and suburban runoff does not contain any language regarding planning or design, an oversight that should be corrected.

The Shasta TMDL does not set a clear monitoring program, leaving it until a year after TMDL approval. It would seem wise to encourage continuation of specific on-going monitoring efforts of relevant parameters before the more comprehensive plan is drafted.

DETAILED COMMENTS

Chapter 1: Introduction

On the whole, the introductory chapter is visually appealing and highly informative.

1.4 Watershed Overview

The Watershed Overview section (1.4) has maps that give the reader excellent geographic reference, but also convey rainfall patterns, geology, vegetation and location of modeling reaches. Hydrology and flow (1.4.5) are also clearly laid out in this section, including powerful summary charts. Discussion of riparian (1.4.7.1) reveals interesting information specific to the Shasta River that is useful for understanding model parameters in later chapters. Sections on historic and current land use (1.4.8) help frame the problem in a longer term continuum.

1.4.10 Anadromous Fish of the Shasta River Watershed

The section on fisheries (1.4.10) is thorough and there are useful charts that summarize data on fall chinook, coho and steelhead trout. Although data on steelhead and coho are sparse, the Shasta TMDL should state explicitly that life history requirements of these species make them more vulnerable to water quality problems. Consequently, coho and steelhead populations are likely to have declined more than fall Chinook salmon, which do not require extended freshwater rearing.

Although the TMDL makes no mention of it, Pacific salmon populations are effected changing ocean productivity and patterns of precipitation. The Pacific Decadal Oscillation (PDO) cycle causes major shifts in ocean productivity and conditions seem to shift from favorable for salmon to unfavorable approximately every 25 years. Good ocean conditions for salmon off the California and Oregon Coast prevailed from 1900-1925 and 1950-1975 and switched to favorable again in 1995 (Hare et al., 1999). The good ocean cycle is usually associated with increased rain and snow fall. Poor ocean cycles from 1925-1950 and 1976-1995 were associated with dry on-land cycles.

The Chinook salmon population of the Shasta River is showing a long term decline (Figure 1) that does not bode well for long term survival. The population is failing to rebound despite recent average and above average rainfall years and mostly favorable ocean conditions. Collison et al. (2003) point out that PDO conditions will switch back to negative ocean and dry on land sometime between 2015 and 2025 and that, if freshwater habitat conditions have not improved by that time, stock losses are likely to occur. Shasta stocks ranged from 533-726 from 1990-1992 during the last dry climatic cycle, a critically low level (Gilpin and Soule, 1990). The final Shasta TMDL should cite the findings of Hare et al. (1999) and use it as a reason for urgency of to move forward on a TMDL Implementation Plan.

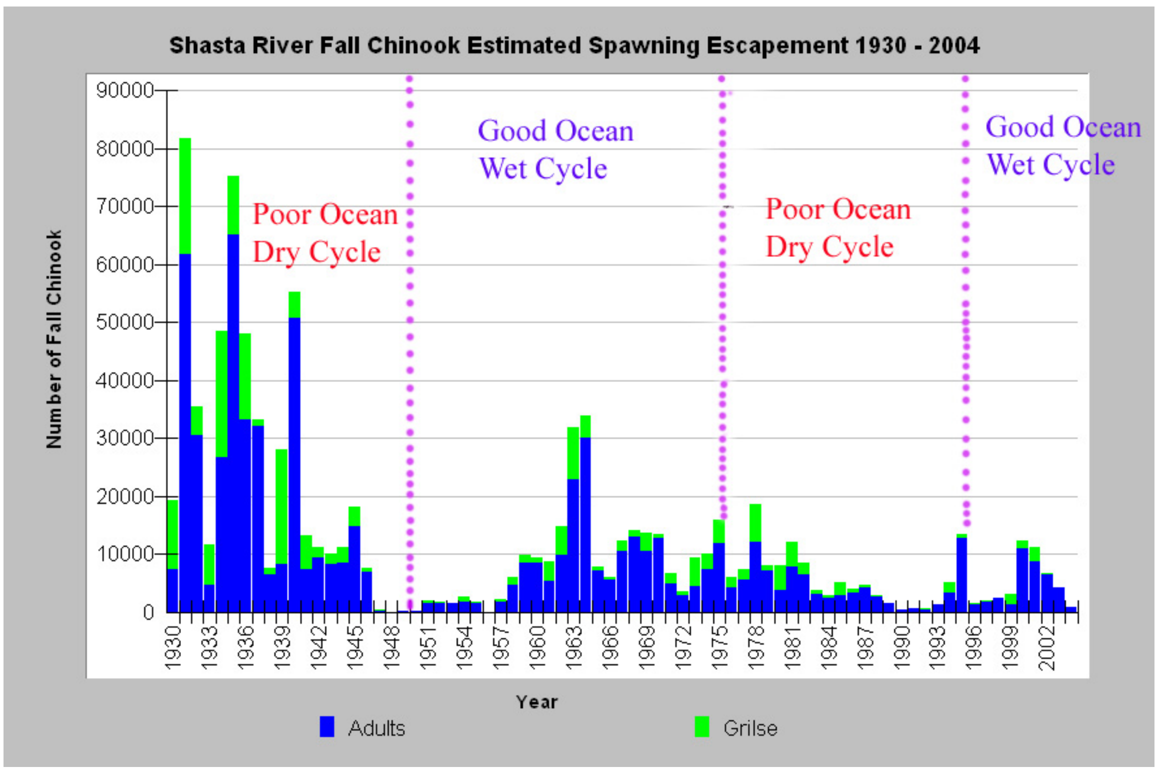

Figure 1. Shasta River Chinook salmon returns from1930 to 2005 are displayed in this chart along with known Pacific Decadal Oscillation cycles (Hare et al., 1999).

The Shasta TMDL does not address the October 1 deadline for shutting off stock water and increasing stream flows for fish passage. Snyder (1931) noted that fall Chinook salmon entered the Shasta River in September. Fish now delay their migration until after October 1 because of lack of sufficient flow and associated warm water temperatures (Figure 2). This delayed pattern of entry into the Shasta River is manifest in both wet and dry years (Figure 3). Fall chinook forced to sit for weeks in stressful Klamath River conditions likely have reduced fecundity. This intensive selection pressure likely selects for later run timing. For discussion of similar impacts caused by Iron Gate Dam on mainstem spawning Klamath River fall chinook, see Kier Associates (2006).

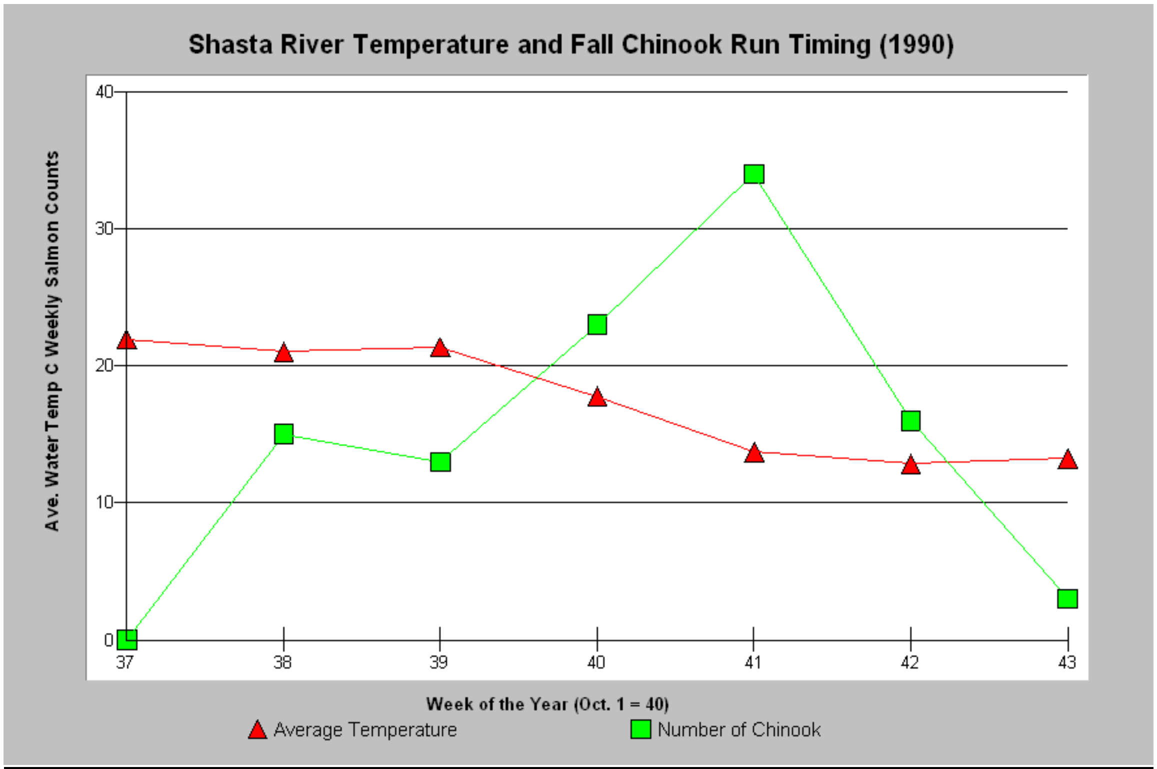

Figure 2. Increased flows with the end of stock water season decreased water temperature and triggered increased fall Chinook salmon migration into the Shasta River.

1.4.10.5 Habitat and Fish Distribution

The distribution map (Figure 1.16) showing very limited range for steelhead likely is conservative, with steelhead very likely occurring in Parks Creek at least during high flow years. A map showing gradient would be useful to judge the former range of coho salmon, spring chinook and steelhead. Expanding habitat toward historical range under TMDL Implementation would substantially improve prospects of long term Pacific salmon species population viability and stability.

The fish distribution map indicates that Big Springs is not currently salmonid habitat yet the California Department of Water Resources (1981) *Klamath and Shasta River Spawning Gravel Enhancement Study* showed a huge concentration of fall chinook spawning Big Springs Creek. This is a tangible indication that Big Springs Creek was a major refugia for Pacific salmon in the early 1980's before reduction of flows due to ground water pumping. Figure 4 shows riparian destruction in lower Big Springs Creek and the adjacent reaches of the Shasta River that would also degrade fish habitat and lead to thermal pollution (Kier Associates, 1999).

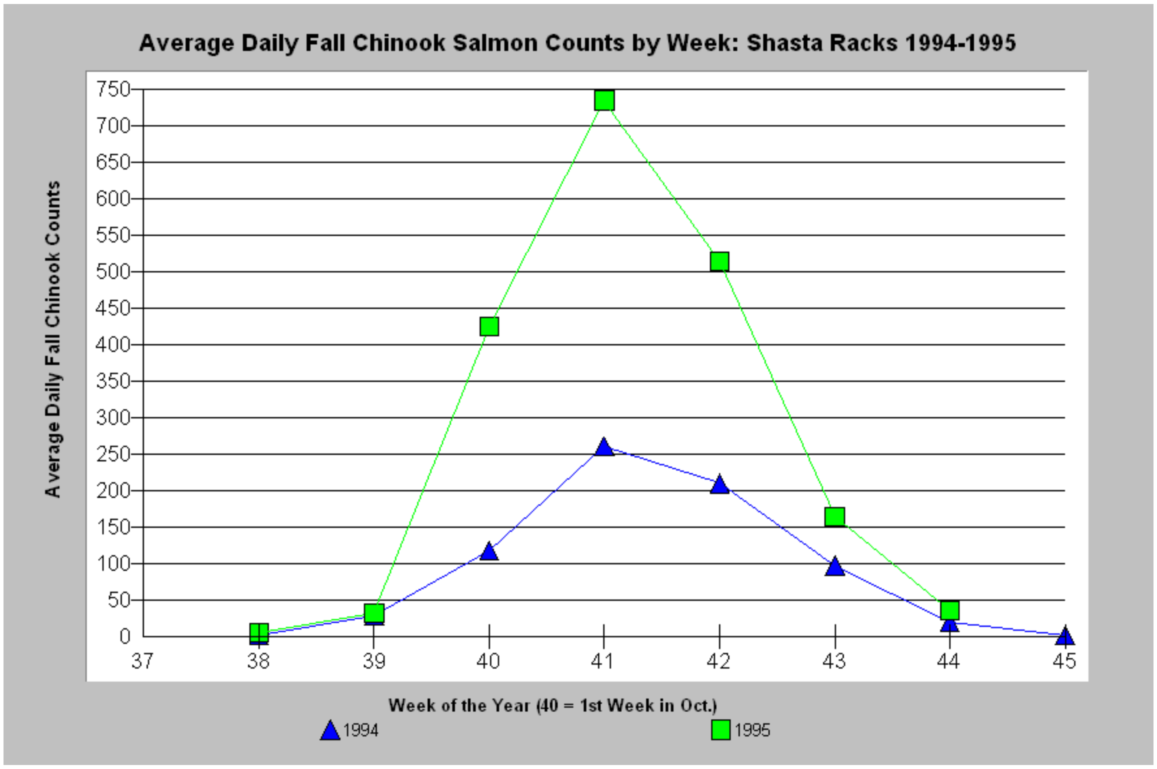

Figure 3. Fall chinook in 1994 and 1995 waited until the first week in October to move into the Shasta River because of increased flows at the end of the stock water season.

Figure 4. This photograph shows heavy equipment and excavation in the riparian zone of the Shasta River above Louie Road just upstream of the convergence with Big Springs Creek in January 1995. From Klamath Resource Information System V 3.0 (TCRCD, 2003).

Chapter 2: Problem Statement

2.2.2 Water Quality Objectives:
Table 2.2 "Narrative and Numeric Water Quality Objectives applicable to the Shasta River basin TMDLs" should also include the *Basin Plan* water quality objectives for pH in the Shasta River. While the Shasta River is not officially listed as pH impaired, summer pH values in mainstem Shasta River are extremely high (>9.5), and are unequivocally related to nutrients and D.O.

The lack of analysis of pH in TMDL is troubling, and deserves correction, for several reasons. First, pH directly affects salmonids, with pH levels above 8.5 being stressful and pH 9.6 being lethal (Wilkie and Wood 1995). For a more complete review of the effects of pH on salmonids, see Kier Associates (2005a). Second, ammonia toxicity increases with pH (U.S. EPA 1999). Third, high maximum pH and high diurnal ranges of pH are often symptomatic of nutrient enrichment and excessive growth of aquatic plants, which makes pH a highly useful index of photosynthesis. As described in Chapter 4, the primary cause of the low dissolved oxygen problems in the Shasta River is excessive respiration by aquatic plants. Analysis of pH data is a valuable tool to help understand the spatial and temporal dynamics of D.O. and nutrient impairment.

The mouth of the Shasta River has been monitored with automated water quality probes since 2000. Data from 2000-2004 show that maximum pH typically exceeds the *Basin Plan* objective of 8.5 for most days from June through September (Figure 5). TMDL Appendices A and C contains continuous pH data from other sites in the Shasta River. Goldman and Horne (1983) note that at pH of over 9.5 that all ammonium ions would be converted to dissolved ammonia, which is highly toxic to salmonids. These pulses of extreme pH occurred in seasons of downstream juvenile migration (June 2002) and during periods when adult Chinook salmon may be holding (September 2001) downstream of the mouth of the Shasta in the Klamath River.

2.3.1 Temperature Requirements of Salmonids
It is our opinion that this section presents the best available science, including from U.S. Environmental Protection Agency (2003).

2.3.2 Temperature Conditions of the Mainstem Shasta River
This section presents colorful and useful graphics (i.e. Figure 2.1) that show the seasonal variability versus life history requirements, duration of stressful conditions and the temperature profile of the river from Dwinnell Dam to the convergence with the Klamath River.

The TMDL states on page 2-12 that "Weekly maximum temperatures exceed the spawning, incubation, and emergence threshold (i.e. MWMT of 13°C) at all Shasta River reaches from April through June, and during the second half of September." An examination of Figure 2.1 shows that to be incorrect because temperatures are above 13°C until mid-October, not September. This should be corrected.

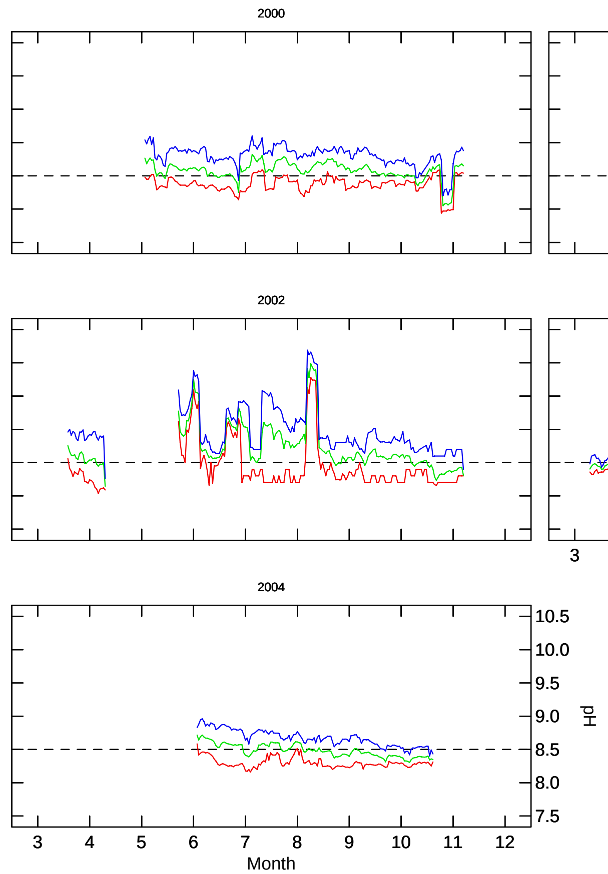

Figure 5. Daily minimum (red), average (green) and maximum (blue) pH for the Shasta River near its mouth (site SH00) for the years 2000-2004 with a reference values showing the NCRWQCB (2001) maximum pH standard of 8.5. Data are from the *Klamath TMDL* database, with data originally collected by the U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, and USGS. [2002 is actually a collection of two datasets].

2.5 Biostimulatory Substances:

pH should also be specifically mentioned in this sentence on page 2-24, "In this context for the Shasta River TMDL, Regional Board staff define nuisance aquatic growth as that which contributes to violation of numeric water quality objectives (particularly dissolved oxygen) or adversely affects beneficial uses."

2.5.1 Nutrient Criteria and Trophic State Thresholds

This section of the TMDL should mention that site-specific data analyses are required to set meaningful nutrient criteria (Tetra Tech, 2004).

We recommend that this section start with this paragraph:

> "Nutrients do not directly affect salmonids, but impact them indirectly by stimulating the growth of algae and aquatic macrophytes to nuisance levels that can adversely impact dissolved oxygen and pH levels in streams. The concentration of nutrients required to cause nuisance levels of periphyton

varies widely from one stream to another. Detailed data analysis is required to determine relationships. U.S. EPA (2000) and Tetra Tech (2004) provide excellent summaries of the literature on these analytical methods and will not be repeated here. Such analyses have not yet been conducted on the Shasta River, so in this section we discuss national (USEPA 1986), regional (USEPA 2002), and international (Dodds et al. 1998) literature."

The Dodds et al. (1998) reference is relied upon far too heavily, perhaps even misapplied, in this section of the TMDL. The trophic categories in Dodds et al. (1998) were derived from looking at the distribution of nutrient concentrations in many streams and then arbitrarily dividing them up into three statistically equal categories; they are not based on any type of ecological functionality.

EPA (2000) provides the following cautionary note about Dodds et al. (1998):

> "It should be stressed that this approach proposes trophic state categories based on the current distribution of algal biomass and nutrient concentrations which may be greatly changed from pre-human settlement levels."

In other words, it is likely that the population of streams used by Dodds et al. (1998) are skewed towards more impaired streams, thus the nutrient concentrations for the trophic boundaries are skewed high. In particular, the 0.7 mg/L total nitrogen value presented by Dodds et al (1998) as the oligotrophic-mesotrophic boundary is highly suspect. Note that USEPA's (2002) recommended ecoregional nutrient criteria for total nitrogen is 0.12 mg/L, more than 5 times lower than the 0.7 mg/L from Dodds et al. (1998). Based on analysis of nutrient, pH, D.O., and periphyton data in the Klamath, Trinity, and Salmon Rivers, Kier Associates (2005a) recommended a total nitrogen criteria of 0.2 mg/L for the lower Klamath River.

As noted above, the nutrient concentration required to cause impairment in a stream varies widely according to many factors, thus the more specific the analysis the better. Thus, we cannot see any justification for the TMDL to use the numbers presented Dodds et al. (1998) derived from across North America and New Zealand, rather than the USEPA (2002) criteria derived from data in Nutrient Ecoregion II (Western Forested Mountains) of the western United States. We recommend that both Dodds et al. (1998) and USEPA (2002) remain in the literature review presented in 2.5.1, but that when analyzing Shasta River nutrient data in section 2.5.2 (Shasta River Watershed Nutrient Conditions), the USEPA (2002) recommended criteria should be used instead.

<u>2.5.2 Shasta River Watershed Nutrient Conditions</u>
<u>2.5.2.1 Total Phosphorus</u>
On page 2-28, the following statement is made:

> "Downstream of the headwaters, Beaughton and Boles Creeks enter the Shasta River from the west and flow through the phosphorus rich volcanic soils flanking Mount Shasta. This is reflected in the high total phosphorous values in these creeks with averages of 0.192 and 0.119 mg/L respectively."

The land use map (Figure 1.12) clearly indicates that the watersheds of Beaughton and Boles Creek contain an urbanized area around Weed that may also be a substantial contributor to phosphorus concentrations. Development is widely recognized to increase nutrient concentrations in streams (U.S. EPA, 2000). While we agree that the high phosphorus concentrations in Beaughton and Boles Creek are likely due in part to natural geology, they are also likely exacerbated by land use, and this should be acknowledged in the TMDL.

2.5.2.2 Total Nitrogen

As noted above in comments on Section 2.5.1, Shasta River nutrient data should not be compared to Dodds et al. (1998), but to USEPA (2002).

In regard to Beaughton and Boles Creek, page 2-29 of the TMDL states "Although total phosphorus levels are high in these tributaries, total nitrogen levels are generally low." We disagree with this assertion; nitrogen concentrations in Boles Creek are high. The TMDL should also recognize that the form of nitrogen is also important (as inorganic forms of nitrogen such as ammonia and nitrate are available to immediately stimulate plant growth). While total nitrogen at Boles does lie slightly below Dodds et al.'s oligotrophic-mesotrophic boundary, nitrate plus nitrite concentrations are very high. We suggest the following revision. Replace "Data from Boles creek generally reflect oligotrophic conditions, with average total nitrogen measuring 0.69 mg/L." with "Data from Boles creek indicate that total nitrogen there are higher than Beaughton Creek, with average total nitrogen measuring 0.69 mg/L, far above USEPA (2002) recommended nutrient criteria of 0.12 mg/L. Additionally, inorganic forms of nitrogen were high, with nitrate plus nitrite nitrogen ranging from 0.360 to 0.560 and an average of 0.493."

The statement "Total nitrogen values in springs are generally within the mesotrophic boundary" (p 2-30) is inconsistent with the rest of the nutrient discussion. The statement should be changed to "Total nitrogen values in springs are several times higher than the USEPA (2002) recommended ecoregional criteria."

Little evidence is provided to support the statement that "Maximum total nitrogen levels in the mainstem Shasta River increase in a downstream direction." Table 2.8 provides total nitrogen data on the Shasta River near the headwaters, Shasta River above Dwinnell, and then lumps all mainstem sites below that as "Shasta River below Dwinnell Dam." To support that statement, the sites below Dwinnell Dam should be analyzed individually. Appendix B of the TMDL contains USGS and RWB data from 2002-2003 indicating that the patterns at sites below Dwinnell Dam are complex and that analysis of the data is confounded due to the use of a laboratory with inadequate detection limits for Kjeldahl nitrogen.

2.6.3 Potential Municipal and Domestic Water Supply and Contact Recreation Impairment

Discussions of Dwinnell Reservoir in Section 2.5.2 note increased nutrients as compared to reaches of the Shasta River above, but do not mention the role of the nitrogen-fixing blue green algae *Anabaena flos-aquae* as one of the sources of nutrient pollution (though it is later in the document in Chapter 4). *Anabaena flos-aquae* is correctly noted in the text to be a producer of anatoxins.

Chapter 3: Temperature Source and Linkage Analysis

3.1.1 Stream Heating Processes
This section presents a good description of how the Shasta River warms.

3.3 Stream Heating Processes Affected by Human Activities in the Shasta River Watershed
3.3.2 Shade
On page 3-6, there is discussion of a reach at river mile 37.3 shown in Figure 3.2 where the riparian vegetation noticeably changes from sparsely vegetated to densely vegetated, coincident with a 4 degree drop in temperature. It seems unlikely that riparian vegetation would rapidly cool temperatures by 4 degrees C. As Dr. Coutant points out in the peer-review (Appendix I) another possibility is that hyporheic exchange cooled the water. For details, see our comments under 3.3.7, a new section that we request be added to the TMDL.

3.3.3 Tailwater Return Flows
The attribution of warming in Big Springs Creek to diversion and agricultural return water is correct, although less than optimally illustrated by the TIR image presented (Figure 3.6). Page 3-8 states that "…Big Springs Creek, where a tailwater return flow was 9.2°C warmer than the creek and caused a plume of hot water that extended for hundreds of meters (Figure 3.6)." We have examined this figure closely, and do not see the effect described. We are unable to determine if the effect does not exist, or if it is problem with image quality.

3.3.4 Flow and Surface Water Diversions
The Shasta TMDL does not present the thermal evidence (Watershed Sciences 2004) that flow depletion is causing stream warming in tributaries Parks Creek and the Little Shasta River. Data and TIR images show temperature oscillations in Parks Creek and the Little Shasta River that indicate these streams warm as their flows are depleted (Figure 6). Kier Associates (2005b) described a similar effect on Shackleford Creek in the Scott River. Diversion also completely dries up reaches that would otherwise be suitable habitat for salmonids (Figure 7). Changing patterns of diversion on lower Parks Creek would provide a cold water reach connected to the mainstem Shasta River that could serve as a refugia for juvenile salmonids.

U.S. EPA (2003) points out the need to protect and restore well distributed refugia when other factors confound meeting temperature requirements of salmonids in mainstem environments. Hydrologic connectivity of Parks Creek is also needed for spawning gravel recruitment in the Shasta River below Dwinnell Dam. Kier Associates (1999) noted that: "Without a change in winter flow regimes to allow increased gravel supply from Parks Creek to enter the Shasta River, long-term depletion of spawning gravels for salmon and steelhead is inevitable."

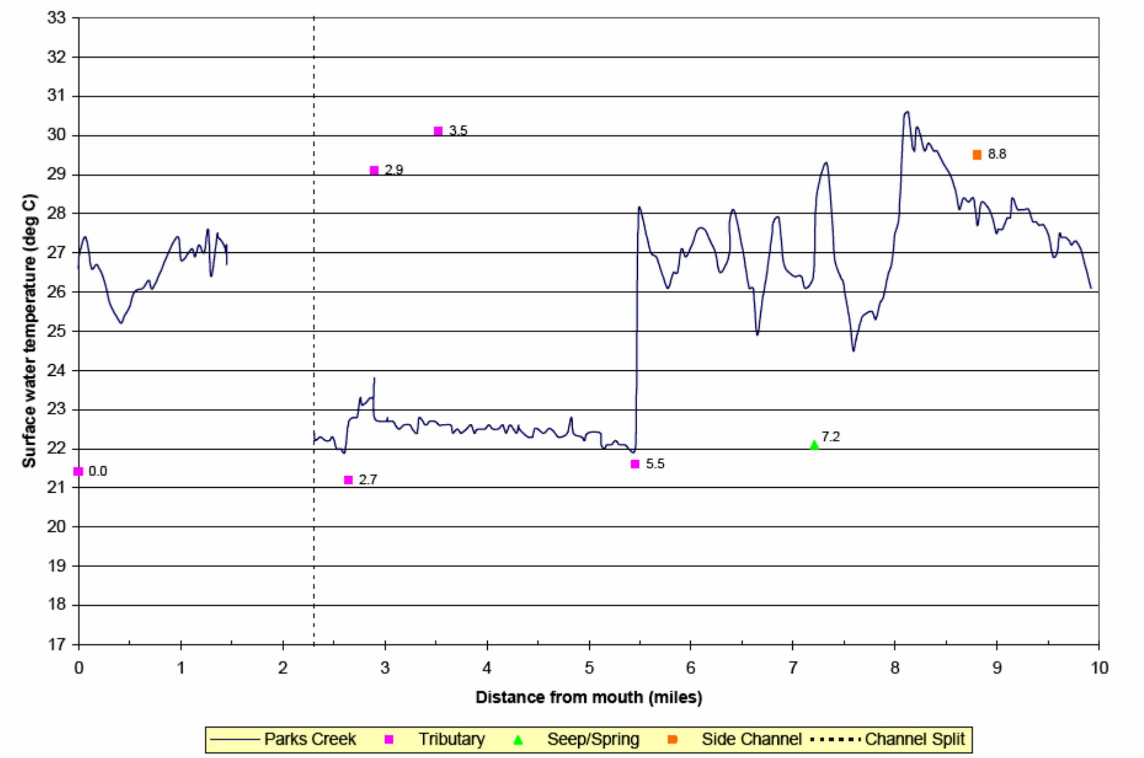

Figure 6. This temperature profile of Parks Creek from Watershed Sciences (2004) shows that at the top of the monitoring reach, water temperatures are already elevated by upstream diversions. Spring flows feed the stream above river mile 5 (RM 5) and cool it, but diversions dry the channel just above river mile 2 (RM 2.3).

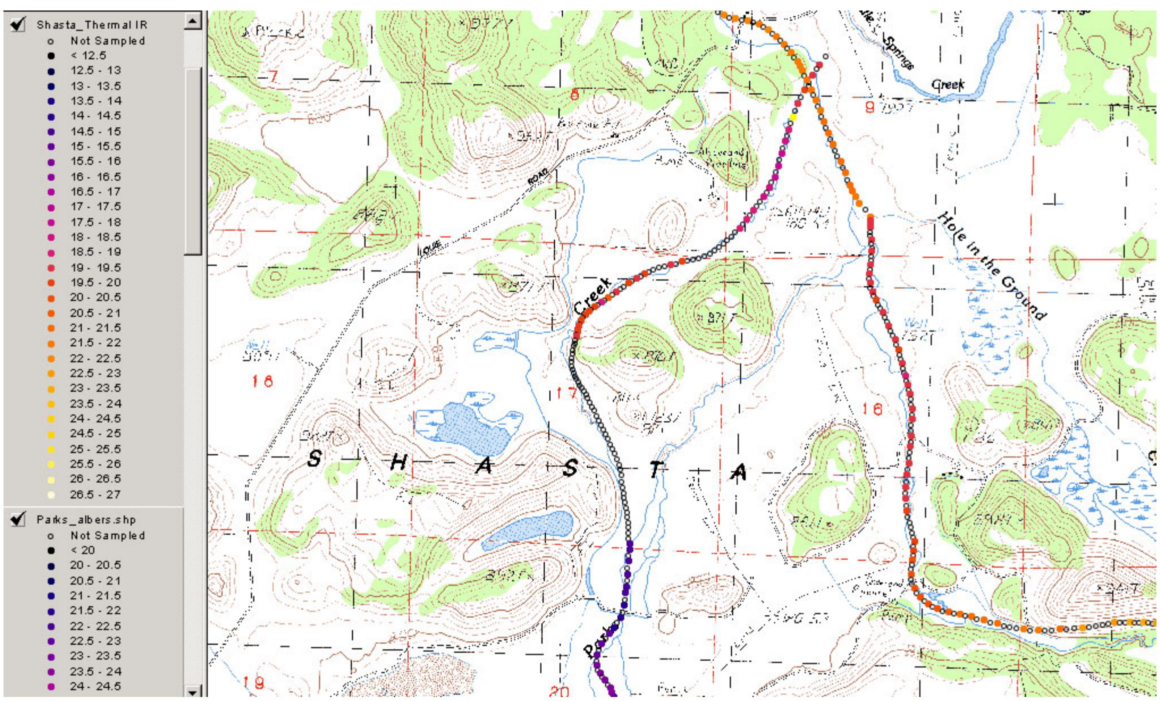

Figure 7. Thermal Infrared radar (Watershed Sciences, 2004) of lower Parks Creek. Stream is cold enough for salmonids but drained by diversion before reaching the Shasta River.

3.3.5 Groundwater Accretion / Spring Inflows

This section of the TMDL contains good discussions of why groundwater accretions and spring inflows are important to water temperatures in the Shasta River; however, it does not note that groundwater accretions and spring inflows are not included in the TMDL's water quality model.

Table 6 in Appendix D shows the "Hydrodynamic input locations and types" (e.g. the locations of types of inflows and outflows included in the models). The only specific inputs included were Parks Creek (rm 34.94), Big Springs (rm 33.71), and Yreka Creek (rm 7.88). Other inflows are included as distributed inflows. As noted in Appendix D, temperatures for "all accretions between GID and Anderson Grade" (that reach covers most of the mainstem Shasta below Dwinnell Dam) were assigned the temperature of the Shasta River at Anderson Grade. In other words, it appears as though all springs and groundwater accretions, such as the spring shown in figure 3.9, were assigned Shasta River water temperatures. This seems problematic as the springs are much cooler than the Shasta River water.

3.3.7 Hyporheic function

We propose that a short section on hyporheic function be added here.

Connection of surface water to these sub-surface waters is recognized as having a potential cooling influence (Poole and Berman, 2001; U.S. EPA 2003). It is important to note that this is a different mechanism than springs or groundwater accretion. It is not "new" cool water that dilutes the warm river water, but rather that warm river water enters the sand/gravels of the hyporheic zone and then re-emerges cooler, with no net effect on the amount of water in the stream. While magnitude and distribution of this effect in the Shasta River is unknown, it may be significant (and likely the cause of the cooling described in section 3.3.2 and shown in Figure 3.2). As Dr. Coutant mentioned in his review, the model could potentially simulate this effect:

> "For hyporheic flow, if you have some idea of the rate of flux in and out of the gravel, you could treat the flux into the gravel as withdrawal from the stream (water of ambient quality) and replace it downstream with distributed inflow representing the flux out of gravel (with water quality of the hyporheic flow)"

As noted by Dr. Coutant, failing to include this mechanism in the model may result in an over-estimation of the effect of shade. We recognize that the Regional Water Board will be reticent to conduct additional modeling work at this stage of TMDL development, but as research in the Shasta River continues this should be conducted in the future.

A major problem in the Shasta River that may have disrupted hyporheic function is the mining of hundreds of thousands of yards of gravel from the Shasta River when highway Interstate 5 was built (Kier Associates 1991). Virtually all alluvium was removed and replenishment is blocked by Dwinnell Dam and by de-watering of tributaries that formerly contributed both water and gravel to the mainstem (Kier Associates, 1999). Restoring connectivity of tributaries with the mainstem could increase spawning gravel supply and ultimately recreate some hyporheic function as well.

3.3.8 Timber harvest

We propose that a short section on timber harvest be added here.

Timber harvest activity in upper Parks Creek (Figure 7) is likely having similar effects as in the Scott River, described by Kier Associates (2005b). Logging in rain-on-snow prone watersheds leads to increased sediment yield and peak discharge that in turn widen stream channels and contribute to increased water temperature. Although the introduction of the *Shasta TMDL* mentions logging as an historic activity, it appears active in upper Parks Creek. Lingering cumulative effects, such as high road densities, skid roads and early seral forests, are likely triggering increase sediment yield, increased flood flows and decreased summer base flows. Kier Associates (2005b) pointed out that dry upland forest sites may require decades for recovery due to slow tree regeneration, causing an extended window of cumulative watershed effects related to flow.

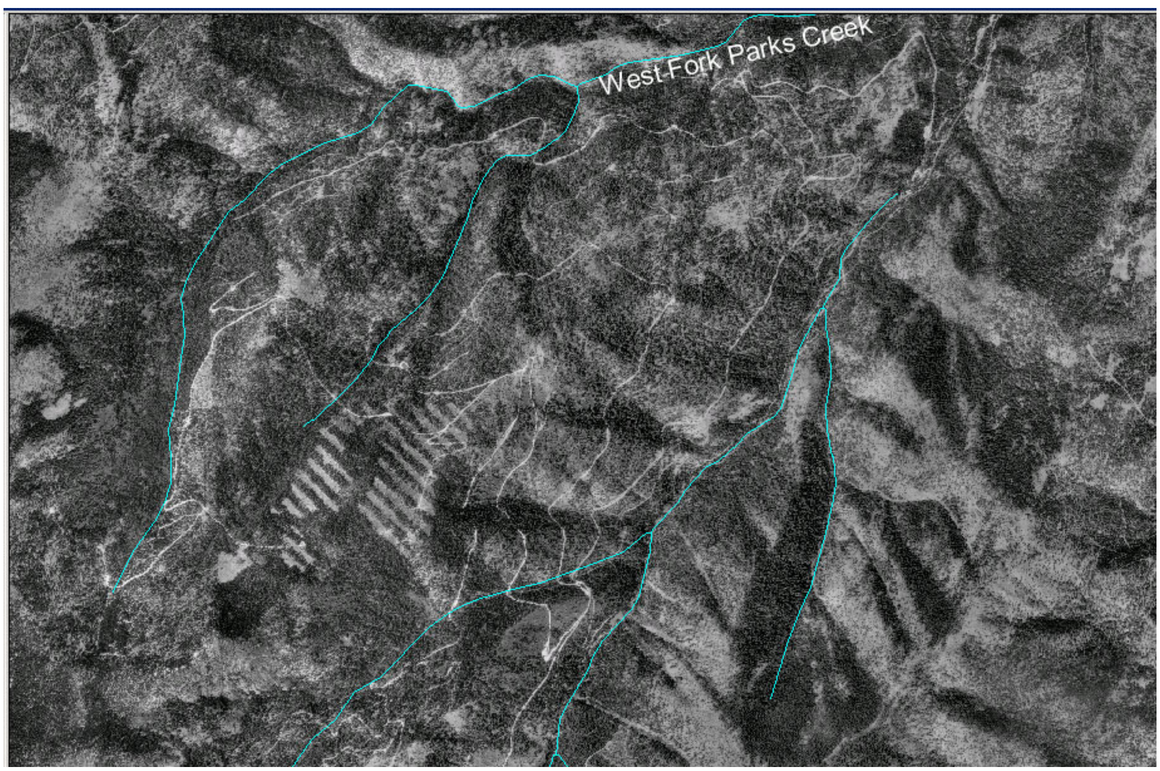

Figure 7. An orthophoto quad image of upper Parks Creek shows high road densities, numerous skid trains and clearcuts.

Chapter 4: Dissolved Oxygen Source and Linkage Analysis

4.3 Processes Affecting Dissolved Oxygen Concentrations in the Shasta River Watershed

The third paragraph of section 4.3 on page 4-3 (beginning with "Though…") should be revised. Characterizing Shasta River biological oxygen demand (BOD_5) as "relatively low" in comparison to raw sewage and hyper-eutrophic Upper Klamath Lake is not at all appropriate. As coldwater salmonid habitat they are much higher than optimal. We do agree that Shasta BOD_5 concentrations are low in the sense that they are not the major factor driving D.O. dynamics in the Shasta River. We suggest that paragraph should be replaced with the following revision:

> "Though the data are limited, BOD_5 concentrations (a measure of carbonaceous deoxygenation in the water column) in the Shasta River indicate that carbonaceous oxygen demand exerted in the water column is only a minor component of the total oxygen demand in the Shasta River. BOD_5 concentrations in the Shasta River range from 1.0 to 15.0 mg/L, with an average of 2.1 mg/L. For comparison, biochemical oxygen demand concentrations in the Klamath River near the outlet of hyper-eutrophic Upper Klamath Lake range from approximately 5 to 25 mg/L. Also for comparison, a typical biochemical oxygen demand concentration of untreated domestic sewage in the United States is 220 mg/L (Chapra 1997, p. 358)."

<u>4.3.3.2 Factors Affecting Aquatic Vegetation Productivity in the Shasta River</u>

Biggs (2000) is the best reference regarding periphyton growth, and should be cited in this section. The following sentence should be added to the end of the first paragraph of this section on page 4-11: "Biggs (2000) provides a comprehensive review of the factors affecting periphyton growth."

Flow and Current Velocity

The statement on page 4-12 "In addition, when a scour-event washes the vegetative material out of the Shasta system, there is a decrease in the oxygen demand exerted on the river" should be followed by a mention of how this might affect the Klamath River. We suggest the following: "However; it should be noted that this material could potentially have negative consequences downstream in the mainstem Klamath River, depending upon the time of year and if it settled out or kept moving out to the Pacific Ocean."

Nutrient Concentrations

The last paragraph in this section (beginning with "Section 2.5 provides an overview of trophic status boundaries associated with nutrients…") contains numerous references to trophic boundaries based (apparently) on the Dodds et al. (1998) reference. As explained above in comments on section 2.5.1s, the trophic boundaries presented in Dodds et al. are arbitrary and do not have much relevance to the Shasta River, so this section should be revised to reference ecoregional criteria from USEPA (2002) instead of Dodds et al.

<u>4.4 Anthropogenic Effects on Shasta River Dissolved Oxygen Conditions</u>

<u>4.4.1 Tailwater Return Flow Quality</u>

The most important mechanism by which tailwater returns affect D.O. is not included in the bullets on page 4-15, an omission which deserves correction. Tailwater returns are increasing nitrogen levels in the Shasta River, which can increase growth of aquatic plants.

As shown in Chapter 7, respiration of aquatic plants, stimulated by high nutrient levels, is by far the largest contributor to dissolved oxygen demand in the Shasta River. While it is worthwhile to mention that tailwater returns do increase nitrogenous oxygen demand of the Shasta River, the most significant effect of tailwater on oxygen demand is to increase total nitrogen levels and stimulate aquatic plant growth. We recommend that a new second bullet be added:

> "The average total nitrogen concentration of tailwater return flows is over two times that of the average Shasta River concentration during the irrigation season (*XX and XX [fill in the appropriate values]* mg/L, respectively). This increase in nitrogen stimulates the growth of aquatic plants, substantially contributing to oxygen demand by increasing respiration."

Also, table 4.3 should also include total nitrogen calculated from individual samples as NO3+NO2 + TKN.

<u>4.4.3 Lake Shastina and Minor Impoundments</u>
This section does not mention two of Lake Shastina's most important effects on oxygen demand in the Shasta River:

> 1. Shastina reduces peak flows, allowing organic matter and fine sediments to accumulate in the channel, contributing to oxygen demand via macrophyte respiration, and
> 2. Shastina increases nitrogen concentrations, stimulating aquatic plant growth and hence contributing to oxygen demand via macrophyte respiration.

We recommend the following text be added in a new paragraph at the bottom of page 4-19 (after "…may occur in the Reservoir"):

> "As discussed above in section 4.3.3.2, Lake Shastina substantially reduces scouring peak flows. This allows organic matter and fine sediments to accumulate in the channel. These are the preferred substrates for aquatic macrophytes, so this effect expands the area of suitable habitat for macrophytes, increasing the amount of macrophyte photosynthesis and respiration in the Shasta River."

We recommend the following text be added in a new paragraph near the bottom of page 4-19 (above "The regular occurrence of algal blooms…"):

> This increase in total nitrogen concentrations fuels the growth of aquatic plants, which in turn contributes to oxygen demand by increasing aquatic plant photosynthesis and respiration.

Also, because not all blue green algae can fix nitrogen (i.e. *Microcystis aeruginosa* cannot), the statement "Blue green algae are capable of sequestering atmospheric nitrogen." should be changed to "Like many blue green algae, *Anabaena flos-aquae* is capable of sequestering atmospheric nitrogen, resulting in the potential for additional nutrient pollution."

4.4.5 Flow
This section does not mention a third important way in which flow affects dissolved oxygen. We recommend that the following text be added to the last sentence in this section (after "…caused by photosynthesis and respiration.") on page 4-21:

> Third, flow can affect dissolved oxygen through its effects on water temperature. For instance, larger volumes of water have a higher thermal mass are more resistant to heating and cooling. So if a large volume of water is cool (i.e. from a spring-fed creek such as Big Springs) it can travel downstream and retain its low temperature. Low temperatures allow water to water hold more dissolved oxygen. Through this mechanism, flow can affect dissolved oxygen.

Chapter 5: Analytical Approach and Methods

5.2 Analytic Approach and Model Selection
For reasons discussed above in our comments on section 4.4.5, the following sentence should have "water temperature, " inserted after "sediment oxygen demand rates, ":

> Further, as outlined in Chapter 4, dissolved oxygen concentrations of the Shasta River depend on photosynthetic and respiration rates of aquatic vegetation, sediment oxygen demand rates, consumption of oxygen via nitrification and biochemical oxygen demand, and flow.

5.6 RMS Sensitivity Analysis
We recommend the following addition to the section (extracted from Appendix D, with some edits):

> With respect to dissolved oxygen, CBOD, and NBOD decay rates were largely insensitive (meaning they had little effect on model outputs), as was the SOD rate. The driving factor for dissolved oxygen was maximum photosynthetic and respiration rate. These values were adjusted during calibration to fit the model to measured data. Reaeration rate, a calculated term within the model, played a pivotal role, particularly in the steep canyon reach where mechanical reaeration would be expected to occur.

Chapter 6: Temperature TMDL

Overall, this chapter appears to be based on sound analyses. We applaud the Regional Water Board for including flow increases from Big Springs in its Water Quality Compliance Scenario, as flow depletion is a long recognized problem in the Shasta River Basin, and good evidence is provided as to how this flow increase would affect water quality.

6.2 Water Quality Compliance Scenario Conditions

6.2.3 Tributary Temperatures

6.2.3.1 Big Springs Creek

The discussion of how 4^{O}C lower than baseline was chosen for the Water Quality Compliance Scenario should be explained more clearly (we cannot make sense of it in its current form).

6.6 Margin of Safety

On page 6-19, the following statement is made:

> Some improvements in stream temperature that may result from reduced sedimentation are not quantified. Reduced sediment loads could lead to increased frequency and depth of pools, independent of changes in solar radiation input. These changes tend to result in lower stream temperatures overall and tends to increase the amount of lower-temperature pool habitat. These expected changes are not directly accounted for in the TMDL.

While it is true that reducing sediment loads would likely decrease stream temperatures (and it should be noted that increased rates of hyporheic exchange are another mechanism by which this would occur), it is not clear what basis the Regional Water Board has for stating that sediment load are going to decrease. If this statement is to remain in the TMDL, it should be specified *why* sediment loads are going to decrease, otherwise this is not a margin of safety, it is theoretical statement.

Chapter 7: Dissolved Oxygen TMDL

7.2 Algae Box Model Application and Results

7.2.2 Summary and Conclusions

We agree with the statement on page 7-4 that "If TIN concentrations in the Shasta River were maintained at levels comparable to those concentrations measured in the headwaters of the Shasta River, aquatic vegetation biomass would likely be reduced."

7.3 RMS Model Application

7.3.2 Photosynthetic and Respiration Rates

On page 7-5, the TMDL states:

> The photosynthetic and respiration rates assigned for the water quality compliance scenario were 50% of those for the existing (baseline) condition, as shown in Table 7.3. These reductions in photosynthetic and respiration rates assume a 50% reduction in aquatic vegetation standing crop during the simulation periods. Regional Water Board staff believe that such reductions in aquatic vegetation standing crop, and associated reductions in photosynthetic and respiration rates, are achievable in the Shasta River.

No reason is stated for why a 50% reduction in photosynthetic and respiration rates was chosen. With no reason provided, the decisions seems arbitrary. The TMDL then states: "In practice, the mechanisms that would result in these reductions include:

• Decreased light availability to aquatic vegetation via increased riparian shade, as outlined in Section 6.2.1;
• Reduced concentrations of biostimulatory nutrients in the Shasta River achieved via controls targeting NBOD reductions from Lake Shastina outflow, irrigation return flows, and Yreka Creek, as outlined in Section 7.3.3;
• Reduced fine sediment inputs from irrigation return flows that can be achieved via controls targeting NBOD reductions, as outlined in Section 7.3.3; and
• Increased flushing flows to scour the channel of accumulated fine sediments that promote the establishment and proliferation of rooted aquatic macrophytes.
• Reduced stream temperatures, as outlined in Chapter 6."

While we agree that these mechanisms would indeed reduce the photosynthetic/respiration rates, it is unknown how much each of these factors would need to change in order to result in a 50% reduction in the photosynthetic/respiration rates. The quantitative relationships between each of these factors and the photosynthetic/respiration rates is not known. This uncertainty should be acknowledged in the text.

Furthermore, as we have stated above several times, <u>it is not NBOD that causes dissolved oxygen problems in the Shasta River, it is total nitrogen</u>. As shown in table 7.7, NBOD is only 7.9% of the oxygen load for the baseline condition; respiration of aquatic plants is 73.9%. Therefore, "NBOD" in the bullet points above should be replaced with "NBOD and total nitrogen"

While it is important to acknowledge scientific uncertainty, we also believe that since the factors causing D.O. problems are known, there is no need to wait until we have 100% certainty on the magnitude of land/water use changes that are required to bring the Shasta River into compliance with the water quality objectives. The best strategy is to continue with restoration efforts, and then evaluate progress along the way.

Chapter 8: Implementation

The RWB has an obligation to make sure that the water quality objectives are met, and beneficial uses restored and protected, particularly because the final *Shasta TMDL Action Plan* will be amended to the *Basin Plan* (NCRWQCB, 2001). If there are multiple ways to meet the objectives, we support giving landowners the flexibility to decide how they want to meet those objectives. For example, <u>if</u> other regulatory and policy processes such as the *Shasta Incidental Take Permit* (SRCD, In Draft), *Coho Recovery Plan* (CDFG, 2004), and Timber Harvest Plans will result in the attainment of water quality objectives, then further regulation by the RWB is not necessary.

Duplicative and overlapping regulation benefits no one. Unfortunately, these other processes often rely on voluntary measures that neither guarantee that water quality problems will be remedied nor that TMDL objectives will be achieved. <u>When other policy</u>

approaches and voluntary landowner actions fail to achieve the TMDL objectives, then the RWB must use its considerable regulatory and enforcement authority to take necessary actions to ensure results.

The implementation actions requested in these comments are summarized below as Table 1 (a revised version of Table 4 from the proposed Shasta TMDL Basin Plan amendment language).

8.1.1 Prioritization of Implementation Actions

Page 8-6 states "Where reaches of the Shasta River and its tributaries are providing suitable freshwater salmonid habitat, protection of these areas should be a priority for restoration efforts." While this is a step in the right direction, it could be improved by specifically mentioning coho salmon, coldwater refugia needs and connectivity.

The Shasta TMDL should follow the approach of Bradbury et al. (1995), which is to identify the most intact habitat patches and to begin restoration by making sure that these areas are protected and enhanced as a top priority. In the Shasta River basin, these would be the stream reaches with coho salmon or those that provide coldwater refugia for other Pacific salmon species. The *Shasta TMDL* needs to add specific reference to lower Parks Creek and the need to restore riparian there and change diversion to provide a refugia and to improve spawning gravel supply to the mainstem Shasta River.

8.3 Tailwater

We recognize that tailwater returns are a substantial contributor to water quality problems, and we support the recommendations in this section.

8.4 Water Use and Flow

The water quality compliance scenario in Chapter 6 includes a 50% increase in flow from Big Springs Creek. We strongly support that decision; however the TMDL implementation does not lay out a clear path for how such a substantial increase in flow could be achieved. To be realistic, it will also have associated cost factors for assisting water conservation to offset the current demand for groundwater. Some language should likely be added to reflect this long term need.

The RWB proposes to take no firm action to increase flows to improve water quality for five years, which seems like a long wait given the stock status of Klamath River salmon (Kier Associates, 2006). We support the RWB in taking action, and think that two years would be a more reasonable amount of time to wait. A quote from the *Long Range Plan for Klamath River Basin Fishery Restoration Program* (Kier Associates, 1991) gives a sense of long term perspective:

> "In the year 2000, if adequate progress towards improving flow conditions for salmonids has not been made …. then investigate the option of reallocation of water rights under the public trust doctrine for protection of fish habitat."

While many of the ideas proposed in the *Coho Recovery Plan* are positive, they are also voluntary. It is important for the Regional Water Board to remember that it has a responsibility to protect public trust resources and ensure results. If voluntary measures work, that would be great, but they are often insufficient and further action is required.

Chapter 8 states that: "Other management measures recommend the leasing, purchasing, or donations of water rights from willing water rights holders in the Shasta River watershed." While purchasing or donations could provide long-term benefits to fish and water quality, leases would be unwise because they provide no long-term benefits. A major hurdle for success, if water rights are acquired, is that riparian water users are likely to exploit any water not used by those contributing water. The original Shasta River adjudication (CDPW, 1932) recognized that problem and it still has not been remedied. today. Before water rights are purchased, restrictions on water withdrawal under riparian rights must be disallowed, which likely requires another adjudication. Legality of some water rights also needs to be explored because ground water diversions that are linked to surface flow depletion require an Appropriative Water Right and diversions from the underflow of Big Springs have not obtained such rights (Kier Associates, 1999). The TMDL should also note that water rights holders may designate temporarily their water right to instream flow under California law SB-301, without penalty of losing that right at a future date (Kier Associates, 1999).

<u>8.5 Irrigation Control Structures and Impoundments</u>
<u>8.5.1 Implementation Actions for Irrigation Control Structures and Minor Impoundments</u>
The reference "(Great Northern Corp. 2001)" should be added after "1996" to the statement "The Shasta CRMP, working with cooperative landowners, has removed one impoundment in 1996, the farthest downstream…"

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<u>8.6 Lake Shastina</u>
This statement on page 8-25 has several problems and needs correction:

> "Additionally, nutrient inflows (Chapter 4) from natural sources to the reservoir appear to be significant, but nutrient loads from the outflow of Shastina exceed inflow loads, on an annual basis, suggesting that Lake Shastina is an additional source capable of generating its own nitrogenous oxygen demanding substances."

First, the TMDL does not contain any data/analysis regarding Lake Shastina nutrients loads (loads are mass per time, e.g. kg/year), only concentrations (e.g. mg/L). The sentence should be corrected by replacing "loads" with "concentration" (or if the Regional Water Board does have information about loads, it should be presented). Second, as we have stated above several times, <u>it is not NBOD that causes dissolved oxygen problems in the Shasta River, it is total nitrogen.</u> Therefore, "nitrogenous oxygen demanding substances" in the sentence above should be replaced with "nitrogen, affecting dissolved oxygen conditions downstream by increasing nitrogenous oxygen demanding substances and stimulating growth of aquatic plants."

The statement on page 8-25 that "10) appropriate actions, based on the investigation's results, to reduce nitrogenous oxygen demand, thereby, increasing dissolved oxygen concentrations in Lake Shastina and, thus, discharges from Dwinnell Dam to the Shasta

River." we recommend that "nitrogenous oxygen demand," should be replaced by "total nitrogen and nitrogenous oxygen demand"

Two other statements on the same page should be similarly revised by replacing "nitrogenous oxygen demand" with "total nitrogen and nitrogenous oxygen demand":

> "Initiate, complete, and submit to the Regional Water Board the results of an investigation characterizing, quantifying, and analyzing the sources of nitrogenous oxygen demanding substances contributing to low dissolved oxygen levels affecting the beneficial uses of water in Lake Shastina and to waters of the Shasta River downstream from Dwinnell Dam.
>
> Based on the results of the investigation, the Regional Water Board shall determine appropriate implementation actions necessary to reduce the nitrogenous oxygen demand that is lowering dissolved oxygen concentrations in Lake Shastina and affected areas downstream from Dwinnell Dam."

Lake Shastina has substantially changed the hydrology of the Shasta River, decreasing peak stormflows and reducing the frequency of high flows that can scour fine sediments and aquatic plants. For this reason, we request that the following language be added to this section "The Regional Water Board shall study the possibility of using pulse flows from Lake Shastina to clean out accumulated organic matter and macrophytes from the Shasta River. The study will also consider the effects of such pulse flows on the Klamath River downstream."

<u>8.8 Urban and Suburban Runoff</u>
This section neglects to mention planning and design as important means to manage urban and suburban runoff. Runoff pollution is much easier to minimize and manage if stormwater is considered during the design phase. We recommended the addition of the following language:

> "New developments should be designed to minimize stormwater runoff and maximum infiltration by minimizing impervious surface area, minimizing hydrologic connection between impervious surfaces and watercourses, and constructing stormwater retention basins. Existing developments should be retrofitted to minimize stormwater runoff."

<u>8.10 United States Bureau of Land Management</u>
This section should specifically reference staff for enforcement. BLM lands in the Shasta River canyon include extremely important Chinook salmon spawning habitat and juvenile salmon and steelhead rearing habitat. Grazing in violation of BLM policies has taken place illegally in the past and may recur if occasional enforcement presence is not in evidence. Illegal residences on BLM land off Hudson Road have not been removed and residents are harvesting firewood from the riparian zone on public land.

Chapter 9: Monitoring

If the RWB staff are not prepared to present a monitoring plan with the *Shasta River TMDL*, they should at least specifically mention on-going monitoring that should be continued for long term trend monitoring. The CRMP gauge at Montague-Grenada Road, USFWS multi-channel data recorder, USGS flow monitoring and annual deployment of automated temperature sensing probes. The TMDL should specifically reference need to store and share data in a way that supports TMDL implementation and adaptive management. The Klamath Resource Information System (TCRCD, 2003) is available for use by the community and the major expense of populating the database has been paid by previous grants. Cooperative efforts between the RWB, Tribes, agencies and stakeholders would not cost much if each partner dedicated a few days of staff time a year.

Conclusion

The Shasta TMDL comes at a time when Klamath River fall Chinook salmon stocks are collapsing, due to water quality problems and consequent disease epidemics (Kier Associates, 2006). Unlike other mountains throughout the West, snowpack on Mt Shasta is increasing with the onset of global warming, making the Shasta River an even more important tributary for Klamath Basin salmonids. NRC (2004) calls for restoring the Shasta River as a necessity in ensuring the salmon survival. The switch in the PDO looms. Speedy implementation is needed.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
Range and Riparian Land Management	• Parties Conducting Grazing Activities. • Parties Responsible for Vegetation that Shades Water Bodies. • Parties Responsible for Bank Stabilization Activities. • Regional Water Board.	Landowners should employ land stewardship practices and activities that minimize, control, and, preferably, prevent discharges of fine sediment, nutrients and other oxygen consuming materials, as well as elevated solar radiation loads from affecting waters of the Shasta River and tributaries. Those that oversee and manage grazing and range land activities in the Shasta River watershed should implement grazing and rangeland management practices listed in Table 8.1 of the TMDL Implementation Plan, and in the Shasta Restoration Plan. The Shasta CRMP should, (1) implement the strategic actions specified in the Strategic Action Plan, and (2) assist landowners in developing and implementing management practices that are adequate and effective at preventing, minimizing, and controlling discharges of nutrients and other oxygen consuming wastes, and elevated water temperatures. The Regional Water Board will work cooperatively with the Shasta CRMP to provide technical support and information to willing individuals, landowners, and community members in the Shasta River watershed, coordinate educational and outreach efforts, and monitor the implementation and effectiveness of the Shasta Watershed Restoration Plan.	Proposed action is sufficient.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		Should voluntary efforts fail to be implemented or effective at preventing, minimizing, and controlling discharges of sediment, nutrients and other dissolved oxygen consuming materials, and increasing solar radiation loads, the Regional Water Board's Executive Officer shall require the appropriate responsible parties to develop, submit, and implement a RRWMP on an as-needed, site-specific basis. Any landowner may be subject to this requirement if livestock grazing activities on their property are discharging, or threatening to discharge oxygen consuming materials and/or elevated solar radiation loads to a water body in the Shasta River watershed. The RRWMP shall describe in detail: Locations discharging and/or with the potential to discharge nutrients and other oxygen consuming materials, and increased solar radiation loads to watercourses which are caused by livestock grazing, How and when those sites are to be controlled and monitored, and management practices that will prevent and reduce, future discharges of nutrient and other oxygen consuming materials, and increases in solar radiation loads. Group and/or individual RRWMPs shall be implemented upon review, comment, and approval	

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Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		by Regional Water Board staff and their Executive Officer for compliance with Regional Board directives, the Basin Plan, and also with the management measures in the Nonpoint Source PCP. The Regional Water Board shall address the removal and suppression of vegetation that provides shade to a water body through its Wetland and Riparian Protection Policy, a comprehensive, region-wide riparian policy that will address the importance of shade on instream water temperatures and will potentially propose riparian setbacks and buffer widths. The Policy will likely propose new rules and regulations, and will therefore take the form of an amendment to the Basin Plan. Other actions under this section may be modified for consistency with this policy, once adopted. With funding already available through a grant from the U.S. EPA, Regional Water Board staff are scheduled to develop this Policy by the end of 2007. Permitting and Enforcement: The Regional Water Board shall take appropriate permitting and enforcement actions if necessary to address the removal and suppression of vegetation that provides shade to a water body in the Shasta River watershed. Such actions may include, but are not limited to, general waste discharge requirements (WDRs) or waivers of WDRs for grazing and rangeland activities, farming activities near water bodies, stream bank stabilization activities, and other	

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		land uses that may remove and/or suppress vegetation that provides shade to a water body. Should prohibitions or general WDRs be developed, they may apply to the entire North Coast Region or just to the Shasta River watershed. If necessary, Regional Water Board staff shall propose to the Board appropriate enforcement actions for human activities that result in the removal or suppression of vegetation that provides shade to a water body in the Shasta River watershed. Such actions may include, but are not limited to, cleanup and abatement orders, cease and desist orders, and administrative civil liabilities (fines) in accordance with California Water Code sections 13304, 13301, and 3350, respectively. Enforcement actions for violations of the California Water Code shall be taken when and where appropriate. Enforcement activities should be consistent with the State Water Board's *Water Quality Enforcement Policy* (SWRCB Resolution No. 2002-0040), adopted February 19, 2002, and as it may be amended from time to time. This enforcement policy promotes a fair, firm, and consistent enforcement approach appropriate to the nature and severity of a violation. Within two years of the date that the TMDL Action Plan takes effect the Regional Water Board's Executive Officer shall report to the Board on the	

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		status of the preparation and development of appropriate permitting actions. Enforcement implementation is ongoing and effective the date that the TMDL Action Plan is adopted.	
Tailwater Return Flows	• Parties Responsible for Tailwater Management and Use • Shasta CRMP • Shasta RCD • CDFG • Regional Water Board	Parties responsible for tailwater discharges from irrigated lands, which may include landowners, lessees, and land managers, should implement the management practices presented in the CDF&G's Coho Recovery Strategy, the Shasta CRMP's Shasta Watershed Restoration Plan and the Shasta RCD's Incidental Take Permit Application. Regional Water Board staff will evaluate the effectiveness of these voluntary actions and develop	Proposed action is sufficient.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		recommendations for the most effective regulatory vehicle to bring tailwater discharges into compliance with the TMDL and the Basin Plan. Information gathered during the evaluation phase will be used to formulate final recommendation(s) to the Regional Water Board. This evaluation phase shall be completed within 12 months after the TMDL is approved by the U.S. EPA. Based on Regional Water Board staff recommendation(s) derived from the evaluation phase for tailwater management, the Regional Water Board shall adopt prohibitions, Waste Discharge Requirements, Waivers of Waste Discharge Requirements, or any combination, thereof, as appropriate. To assure compliance if prohibitions, WDRs, Waivers of WDRs, or any combination of the latter are adopted, a tiered tailwater management program may be instituted for tailwater management that may include various elements such as discharge and receiving water sampling, monitoring, and reassessment. Additional management practices to assure that tailwater discharges to receiving waters comply with the TMDL and the Basin Plan may also be based on results from the tailwater management program.	

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	**Responsible Parties**	**Action Proposed in Public Draft TMDL**	**Recommended Alternative Action**
Water Use and Flow	• Water Rights Holders and other Stakeholders • Shasta Coordinated Resource Management and Planning Committee (Shasta CRMP) • Shasta Valley Resource Conservation District (Shasta RCD) • California Department of Fish and Game (CDFG) • Regional Water Board	Water diverters should participate in the CDFG's Coho Recovery Strategy (CDFG 2004a) and Incidental Take Permit Program (CDFG 2004b). The Regional Board shall work with DFG to establish monitoring and reporting elements of these programs in order to gage their effectiveness. Water diverters should participate in and implement flow-related measures outlined in the Shasta CRMP's Shasta Watershed Restoration Plan. The Regional Board shall work with the Shasta CRMP to establish monitoring and reporting elements in order to gage the Plan's implementation and effectiveness. If after five years, the Regional Board Executive Officer finds that the above-measures have failed to be implemented or are otherwise ineffective, the Regional Board may recommend that the SWRCB consider seeking modifications to the decree, conducting proceedings under the public trust doctrine, and/or conducting proceedings under the waste and unreasonable use provisions of the California Constitution and the California Water Code.	Water diverters should participate in the CDFG's Coho Recovery Strategy (CDFG 2004a) and Incidental Take Permit Program (CDFG 2004b). The Regional Board shall work with DFG to establish monitoring and reporting elements of these programs in order to gage their effectiveness. Water diverters should participate in and implement flow-related measures outlined in the Shasta CRMP's Shasta Watershed Restoration Plan. The Regional Board shall work with the Shasta CRMP to establish monitoring and reporting elements in order to gage the Plan's implementation and effectiveness. **The Regional Water Board shall actively encourage the purchase of water rights for the purpose of maintaining adequate streamflows.** **Recommend revisiting adjudication to stop riparian appropriation of water purchased for instream flows and fish.** If after **two** years, the Regional Board Executive Officer finds that the above-measures have failed to be implemented or are otherwise ineffective, the Regional Board will recommend that the SWRCB consider seeking modifications to the decree, conducting proceedings under the public trust doctrine, and/or conducting proceedings under the waste and unreasonable use provisions of the California Constitution and the California Water

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	**Responsible Parties**	**Action Proposed in Public Draft TMDL**	**Recommended Alternative Action**
			Code.
Irrigation Control Structures, Weirs, Flashboard Dams, and other Minor Impoundments (Collectively referred to as minor impoundments)	• Individual Irrigators • Irrigation districts • Other Stakeholders owning, operating, managing, or anticipating construction of minor impoundments	Irrigations districts, individual irrigators, and other stakeholders that own, operate, manage, or anticipate construction of instream impoundments such as flashboard dams, or other structures capable of blocking, impounding, or otherwise impeding the free flow of water in the Shasta River system shall comply with the following measure: Within one year of TMDL approval by the U.S. EPA, report to the Regional Water Board methods and management practices they shall implement that will reduce sediment oxygen demand rates by 50% from baseline behind all minor impoundments. Options may include, but are not limited to: 1) permanently removing impoundments in the Shasta River mainstem as a mechanism to provide for flushing flows capable of scouring fine sediment from the stream-river channel on which aquatic plants grow; 2) re-engineering existing impoundments to decrease their surface area; and 3) not undertaking the construction of new impoundments unless they can be shown to have positive effects to the beneficial uses of water relative to water quality compliance and the support of beneficial uses, including the salmonid fishery, in the Shasta Valley.	Proposed action is sufficient.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
Lake Shastina	• Montague Water Conservation District (NWCD) • Other Appropriate Stakeholders • Regional Water Board	The Montague Water Conservation District shall take the following actions: Initiate within two years, complete and submit to the Regional Water Board within five years, the results of an investigation characterizing, quantifying, and analyzing the sources of, and ways to reduce, nitrogenous oxygen demanding substances contributing to low dissolved oxygen levels affecting the beneficial uses of water in Lake Shastina and to waters of the Shasta River downstream from Dwinnell Dam. Based on the results of the investigation, the Regional Water Board shall determine appropriate implementation actions necessary to reduce the nitrogenous oxygen demand that is lowering dissolved oxygen concentrations in Lake Shastina and affected areas downstream from Dwinnell Dam.	The Montague Water Conservation District shall take the following actions: Initiate within two years, complete and submit to the Regional Water Board within five years, the results of an investigation characterizing, quantifying, and analyzing the sources of, and ways to reduce, **nutrients and** nitrogenous oxygen demanding substances contributing to low dissolved oxygen levels affecting the beneficial uses of water in Lake Shastina and to waters of the Shasta River downstream from Dwinnell Dam. Based on the results of the investigation, the Regional Water Board shall determine appropriate implementation actions necessary to reduce the **nutrients and** nitrogenous oxygen demand that is lowering dissolved oxygen concentrations in Lake Shastina and affected areas downstream from Dwinnell Dam. **The Regional Water Board shall study the possibility of using pulse flows from Lake Shastina to clean out accumulated organic matter and macrophytes from the Shasta River.**
City of Yreka Wastewater Treatment Facility (Yreka WWTF)	• City of Yreka • Regional Water Board	The Regional Water Board staff shall pursue aggressive compliance with Order No 96-69, and CAO No.R1-2004-0037. To ensure timely submittal of sampling and analytical results from the operators of the Yreka WWTF, the Regional Water Board staff shall also continue vigorous oversight and enforcement of Monitoring and Reporting Program	Proposed action is sufficient.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		No. R1-2003-0047.	
Urban and Suburban Runoff	• Cities of Yreka, Weed, the Lake Shastina Development • Other Stakeholders • Regional Water Board	The cities of Yreka, Weed, the Lake Shastina Development and other stakeholders should identify possible pollutants, their sources, and volumes of polluted runoff from urban and suburban sources within their spheres of influence that may discharge, directly or indirectly, to waters of the Shasta Valley watershed. Cities and other stakeholders responsible for urban and suburban runoff should implement the following measures: Seasonal scheduling of construction activities to prevent unnecessary waste loads in stormwater runoff. Seasonal scheduling for the application to lawns and gardens, municipal facilities, and agricultural areas of fertilizers, pesticides and herbicides, and other oxygen consuming materials that may contribute to dissolved oxygen impairments to watercourses in the Shasta River hydrologic system from cities, towns, developments and other concentrations of urban and suburban populations. When, and if, pollutant sources are identified that discharge, or threaten to discharge, oxygen consuming materials, fine sediment, and other	The cities of Yreka, Weed, the Lake Shastina Development and other stakeholders should identify possible pollutants, their sources, and volumes of polluted runoff from urban and suburban sources within their spheres of influence that may discharge, directly or indirectly, to waters of the Shasta Valley watershed. Cities and other stakeholders responsible for urban and suburban runoff should implement the following measures: Seasonal scheduling of construction activities to prevent unnecessary waste loads in stormwater runoff. Seasonal scheduling for the application to lawns and gardens, municipal facilities, and agricultural areas of fertilizers, pesticides and herbicides, and other oxygen consuming materials that may contribute to dissolved oxygen impairments to watercourses in the Shasta River hydrologic system from cities, towns, developments and other concentrations of urban and suburban populations. **New developments should be designed to minimize stormwater runoff and maximum infiltration by minimizing impervious surface**

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Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		polluting constituents to nearby watercourses from existing runoff control facilities, the Regional Water Board will work cooperatively with responsible parties to ascribe appropriate management measures and reasonable time schedules to control and eliminate said pollutant discharges.	**area, minimizing hydrologic connection between impervious surfaces and watercourses, and constructing stormwater retention basins. Existing developments should be retrofitted to minimize stormwater runoff.** When, and if, pollutant sources are identified that discharge, or threaten to discharge, **nutrients,** oxygen consuming materials, fine sediment, and other polluting constituents to nearby watercourses from existing runoff control facilities, the Regional Water Board will work cooperatively with responsible parties to ascribe appropriate management measures and reasonable time schedules to control and eliminate said pollutant discharges.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
Activities on Federal Lands	• U.S. Forest Service (USFS) • Regional Water Board	The USFS shall consistently implement the best management practices included in *Riparian Area Management 1997* (USDA/USDI 1997), and *Water Quality Management for Forest System Lands in California, Best Management Practices* (USFS 2000). The Regional Water Board staff will continue its involvement with the USFS to periodically reassess the mutually agreed upon goals of the Management Agency Agreement between the SWRCB and the USFS. Additionally, the Regional Water Board shall work with the USFS to draft and finalize a Memorandum of Understanding (MOU). The MOU shall be drafted and ready for consideration by the appropriate decision-making body of the USFS within two years of the date the TMDL Action Plan takes effect. The MOU shall include buffer width requirements and other management practices as detailed in the Implementation chapter of the TMDL.	Proposed action is sufficient.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	**Responsible Parties**	**Action Proposed in Public Draft TMDL**	**Recommended Alternative Action**
	• U.S. Bureau of Land Management • Regional Water Board	BLM shall implement best management grazing strategies that are detailed in a joint management agency document titled: *Riparian Area Management 1997* (USDA/USDI 1997). The Regional Water Board shall work with the BLM to draft and finalize a Memorandum of Understanding (MOU). The MOU shall be drafted and ready for consideration by the appropriate decision-making body of the BLM within two years of the date the Shasta River TMDL Action Plan takes effect. The MOU shall include buffer width requirements and other management practices as detailed in the Implementation chapter of the TMDL.	Proposed action is sufficient.
Timber Harvest Activities on Non-federal Lands	**• California Department of Forestry (CDF)** **• Regional Water Board**	[discussed in chapter 8 but not in Basin Plan amendment language]	**The Regional Water Board shall rely on applicable current regulations, existing permitting and enforcement tools, and other ongoing staff involvement, summarized in the listed below, associated with timber harvest activities. As such, no new regulations or actions are being proposed in association with this TMDL:** **- Z'Berg-Nejedly Forest Practice Act and the California Environmental Quality Act (CEQA)** **-Management Agency Agreement between the CDF and the State Water Resources Control Board to oversee water quality protection on timber operations on non-federal lands in California.** **- Senate Bill 810, enacted in 2003, provides that a**

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Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	**Responsible Parties**	**Action Proposed in Public Draft TMDL**	**Recommended Alternative Action**
			Timber Harvest Plan (THP) may not be approved if the Regional Water Board finds that the proposed timber operations will result in discharges to a water body impaired by sediment and/or is in violation of the Basin Plan. - Regional Water Board Timber Harvest General Waste Discharge Requirements (Order No. R1-2004-0030) and Categorical Waiver of Report of Waste Discharge (Order No. R1- 2004-106) for timber activities on private lands. Both the Categorical Waiver and the General Waste Discharge Requirements programs use the CDF timber harvest, functional equivalent review process for THPs and Non-industrial Timber Management Plans (NTMP) to ensure compliance with the CEQA. - Active and continuous oversight by Regional Water Board staff of the timber harvest review and inspection process. - Habitat Conservation Plans and Sustained Yield Plan review. - U.S. Forest Service activities (discussed in Section 8.1.17) and CDF and Board of Forestry meetings and review.
Caltrans Activities	• California Department of Transportation (Caltrans) • Regional Water Board.	Regional Water Board staff shall complete an initial evaluation of the Caltrans Stormwater Program within two years of the date the TMDL Action Plan takes effect. After the initial two-year evaluation is completed, the Regional Water Board staff shall continue periodic reviews of the Caltrans Storm Water Program to assure ongoing compliance with	Proposed action is sufficient.

Table 1. Proposed TMDL Implementation Actions and Recommended Alternative Actions

Source or Land Use Activity	Responsible Parties	Action Proposed in Public Draft TMDL	Recommended Alternative Action
		the Shasta River TMDL.	

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Appendix A:

Typographic/grammar errors and other less significant comments

General comment
Many of the tables and charts in this document are formatted as images, not text/lines. This makes them harder to read (fuzzy and pixilated) and makes it impossible to copy/paste data from tables into spreadsheets. If possible, the Regional Water Board should try in future TMDLs to properly format the tables and charts.

Page 2-25
This statement is based on a total of 6 data points: "Total phosphorus levels are low in the headwaters of the watershed at the North North Fork Shasta River and Shasta River near the headwaters monitoring locations, with values of 0.025 mg/L"
Hence, a qualifying statement is necessary (also note that the word North is repeated). We suggest the following: "Existing limited data (6 samples) indicate that total phosphorus levels are low in the headwaters of the watershed at the North Fork Shasta River and Shasta River near the headwaters monitoring locations, with values of 0.025 mg/L"

Page 2-28
This statement is based on a total of 6 data points: "Total phosphorus concentrations of the headwaters of the Shasta River are generally oligotrophic, with TP concentrations at levels that do not promote nuisance aquatic growth."
Hence, a qualifying statement is necessary. We suggest the following: "Existing limited data (6 samples) indicate that total phosphorus concentrations of the headwaters of the Shasta River are generally oligotrophic, with TP concentrations at levels that do not promote nuisance aquatic growth."

Page 2-29
This statement is based on a total of 6 data points: "Existing limited data (6 samples) indicate that" to the beginning of "The headwaters of the Shasta River generally have low total nitrogen levels, indicative of conditions that do not promote aquatic plant growth."
Hence, a qualifying statement is necessary. We suggest the following: "Existing limited data (6 samples) indicate that the headwaters of the Shasta River generally have low total nitrogen levels, indicative of conditions that do not promote aquatic plant growth."

Page 3-9
In Figure 3.5, the Y-scale on graph is too large. It would be more legible if scale was from +1 to -4, rather than current scale of +4 to -4. If this would be easy to do, it should be redone.

Page 3-16
There is a bunch of irrelevant words on this page (delete).

Page 4-2
The statement that “The organic matter thus produced then serves as an energy source for bacteria and animals in the reverse process of *respiration*…” should be revised to include the fact that plants also respire (could be fixed by adding “plants, ” before “bacteria”).

Page 4-5
The statement “At this average TKN concentration, approximately 2.3 mg/L of oxygen is consumed, representing a moderate component of the total oxygen demand exerted in the Shasta River.” should be revised to read “At this average TKN concentration, approximately 2.3 mg/L of oxygen would be consumed. This 2.3 mg/L of oxygen consumption occurs spread over an unknown period that is likely at least five days long, thus representing only a moderate component of the total oxygen demand exerted in the Shasta River.”

Page 4-6
This statement on page 4-6 is ambiguous as to whether the conditions occurred in the Shasta River or elsewhere: “USGS reports document cases of supersaturated conditions attributed to aquatic plant growth persisting for several days or more, with saturations as high as 250 percent (Flint et al. 2005, p. 60).” We recommend changing it to:
“USGS reports from Oregon document cases of supersaturated conditions attributed to aquatic plant growth persisting for several days or more, with saturations as high as 250 percent (Flint et al. 2005, p. 60).”

Page 8-7
On this page there are several mentions of the Scott River that should instead be the Shasta River. It appears as though this language was ported over from the Scott TMDL. Also, there is mention of the “Strategic Action Plan”, another relic from the Scott River TMDL.

Page 8-8
Change “timewith” to “time with”

Page 8-9
“Grazing on federal land is addressed separately in sections 8.8 (Forest Service) and 8.9 (BLM) of the Staff Report.” This apparently references an outdated numbering system; it should be sections 8.9 and 8.10.

Page 8-11
This language is contained twice in the same paragraph. One should be deleted.

> “Irrigation water would be applied uniformly based on an accurate measurement of cropwater needs and the volume of irrigation water applied, considering limitations raised by such issues as water rights, pollutant concentrations, water delivery restrictions, salt control, wetland, water supply and frost/freeze temperature management. Additional precautions would apply when chemicals are applied through irrigation.”

Page 8-13

This statement is out of place, and it is unclear what the point is:

> "The Dissolved Oxygen TMDL (Chapter 7), using the water quality compliance scenario of the RMS model, shows that photosynthetic and respiration rates approaches 50% of existing baseline conditions when assuming a 50% reduction in the standing crop of aquatic plants."

This does not make any sense. The photosynthetic/respiration rates are essentially the same things (just different units) as the standing crop.

Page 8-18
Change "dry wet water plan" to "dry year water plan"
Change "dissolver" to "dissolved"

Page 8-34
Change "Contol" to "Control"
Change "Dsicharge" to "Discharge"
Change "nd" to "nd"

YUROK TRIBE

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December 19, 2006

Bob Williams
Staff Environmental Scientists
Conservation Planning
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Re. Scoping comments for the California Department of Fish and Game (CDFG) Draft Environmental Report for the proposed Shasta and Scott River Watershed-Wide Permitting Program

Dear Mr. Williams:

This letter contains the technical comments of the Yurok Tribal Fisheries Program regarding the watershed-wide permitting programs for both the Scott and Shasta Rivers. I would like to thank you for the opportunity to submit these comments beyond the original due date. Our staff has been stretched thin during recent months dealing with a multitude of ongoing important issues related to the health of the Yurok Tribe's fisheries resource.

The Yurok reservation is located along the lower 44 miles of the Klamath River. The fisheries resource of the Klamath Basin is integral to the Yurok way of live; for subsistence, ceremonial, and commercial purposes. The Yurok Tribe is the largest harvester of Klamath Basin fish populations, dependent upon all fish stocks that migrate through the reservation, including coho salmon and other species that are destined for the Scott and Shasta Rivers. These scoping comments are intended to assist the State with development of the watershed-wide permitting programs in a manner that fully protects, conserves and restores fish populations of the Scott and Shasta Rivers; basins that have the potential to once again be primary producers of fish for the sustenance of Yurok People.

It should be noted that it is a challenge to draft meaningful scoping comments regarding a DEIR that will cover an Incidental Take Permit (ITP) and Master Streambed Alteration Agreement (MSAA) when neither of these documents are yet available for review. We look forward to consulting with CDFG regarding these documents when they become available for our review. The comments listed below are in regard to the *Environmental*

Checklist/Initial Study that has been distributed for both the Scott and Shasta Rivers permitting programs.

Scope of Analysis
From the Environmental Checklist/ Initial Study it appears that the ITP is intended to apply to all agricultural activities undertaken by those who sign up and not just stream diversions and restoration projects. If this is the case the EIR must analyze and consider the entire scope of the agricultural activities to be covered, including the cumulative impact of all agricultural activities in each sub-basin currently occurring as well as anticipated activities. The full range of agricultural activities and impacts includes but is not limited to groundwater pumping, length of irrigation season, cropping patterns and systems, grazing systems, summer pasturage and stocking per acre, nutrient production and cycling, nutrient export/delivery to streams. If the word agricultural is defined to include silvicultural activities, then that needs to be clearly stated. If, as appears from the initial study, the analysis only addresses stream diversion and restoration activities, then the ITP must be similarly limited in scope and should not be applied to entire agricultural operations.

Baseline
A primary concern we have with the DEIR is that the baseline being proposed is narrowly defined as existing conditions at the time the ITP application was submitted (spring of 2005); the conditions that led to the listing of coho salmon under the California Endangered Species Act (CESA). This baseline fails to consider the past activities that have led to the degradation of coho habitat, such as the construction of Dwinell Dam in the Shasta River, the over-diversion of stream flow in both basins, the over-pumping of ground water that is hydrologically connected to surface flow, and stream channelization that has occurred to protect farm land. Per the requirements of CEQA, we request that the DEIR conduct a cumulative environmental impacts analysis, and that an assessment be made regarding the impacts to coho salmon from ongoing land and water management activities of these basins.

The environmental baseline for in-stream flows for fish should be the flows ordered in the adjudication at the gauging station. It is assumed that these flows were based on CDFG and USFS input. In fact, additional flows were requested but not granted in the adjudication.

Instream Flow
We are fully supportive of activities that will improve flows in the Scott and Shasta Rivers, as low flow is a primary factor limiting fish production from these basins. However, the success of actions intended to increase instream flow is dependent upon several factors; the "devils in the details" so to speak. Therefore, we recommend that the following assessments be conducted while developing the DEIR.

- Given that the Scott and Shasta Rivers are over-allocated, there should be an assessment of the ability to address increase of flow in an over-allocated system. For example, if California Water Code 1707 or some other mechanism is used to dedicate water rights for instream purposes, what is the likelihood that this water will actually be used for these purposes over the long-term, rather than simply used by another diverter downstream? This analysis should include an assessment of likelihood that legal and/or illegal diversions will divert or pump out of the river the water dedicated for instream purposes.

- An assessment is also needed regarding the likelihood that the abandonment of surface water diversions will not be simply converted to groundwater pumping; pumping of groundwater that is hydrologically connected to surface water. This is especially important given that groundwater pumping is not proposed to be covered under the ITP. The NCWQCB has determined in the case of the Scott that the extent of connection between ground and surface water is not accurately known. Therefore, the extent of impact of conversion from surface to groundwater irrigation is also unknown. In this circumstance, the precautionary principle suggests that the USGS and DWR finding that surface and groundwater are "broadly interconnected" should be the basis of analysis.
- A process needs to be identified that will determine measurable benefits to stream flow above the current base-line. The CEQA process should be used to assess various alternatives for evaluating stream flow benefits from various activities. This analysis should include assessment of increases in cold water flows.
- If piping of irrigation ditches is to be used as a water conservation measure, then an assessment should be conducted regarding the "net" water right vs. the "point of diversion" water right, and the resultant benefit to streamflow from the piping. There should be an assessment to determine whether piping of water in some locations may actually result in less stream flow, because of increased "net" diversion and a decrease of water leaking from ditches and returning to the stream.
- If ground water pumping is exchanged for surface water diversions, what effect will this have on the duration of the irrigation season? Could the irrigation season be extended, thereby delaying the time the stream would be re-watered in the fall? How will this be assessed prior to implementation? Since groundwater is not regulated, how will someone be prevented from pumping more or longer?
- A hydrologic assessment should be conducted regarding the relationship between ground water pumping and surface flows. All groundwater pumping measures should be guided by the results of such an assessment.
- Diversion ditches can be high maintenance, to the point that they are occasionally abandoned. Abandonment can be caused by stream channel migration or simply result from an extended period of poor maintenance. It is natural for diversion ditches to occasionally be abandoned, which is envisioned in state water law; water rights are not forever, but only for as long as they can be used. An assessment should be made in the CEQA process to determine whether piping of some ditches may affect the abandonment of ditches, thereby resulting in long-term increased water diversions. Will there be a process implemented to prevent this from occurring?
- Determinations regarding the appropriate time of year for a stream to lose connectivity should be based upon sound biology and hydrology. An assessment should be made to assess the scientific basis of any such determinations. Where

available, historical information concerning when certain streams naturally dewatered should be used and cited.

- An assessment needs to be conducted regarding whether the ITP will address non-adjudicated water rights, such as riparian and appropriative water rights.

Specificity of Language

An assessment should be conducted of the ITP and MSAA regarding the specificity of language included in the permits. For example, if there is language in regard to the dedication of water to instream flow, such language should be stated as "no less than" rather than "up to" (Scott River Initial Study, section 8.4.1 Flow Enhancement Mitigation 3).

Instream Structures

The CEQP process should include an assessment regarding the extent that instream structures and large-scale rip rap will be covered by the ITP. Will activities be distinguished regarding habitat restoration vs. protection of fields?

Prioritization of Streams for Restoration

The CEQA process should include an analysis of how streams or stream segments will be prioritized for restoration efforts. How will essential life stages be considered spatially and temporally in such a prioritization process?

Installation of Fencing and Riparian Restoration and Revegetation

If riparian planting or fencing are implemented as avoidance, minimization, or mitigation measures, the CEQA process should conduct an analysis regarding the width and resultant effectiveness of the areas to be planted or fenced. This analysis should identify the most important metric for assessing success. For example the length of stream to be restored should be given priority over the acres of trees planted and/or fenced? An analysis of effectiveness monitoring plans should also be conducted – for example, the metric for success should be based upon the densities of trees that survive, not simply the density of trees planted.

In-stream and riparian restoration projects should be required to be consistent with moving the stream toward "properly functioning condition" as defined on a site specific basis by DFG biologists.

Water Diversion Structures

If the ITP or MSAA are to cover activities such as ongoing maintenance of existing flashboard dams, gravel push-up dams and other temporary structures, the CEQA process should conduct an analysis regarding the relationship between these structures and Fish and Game Codes 5901 (states it is unlawful to not allow for fish passage) and 5937 (states that it is mandatory to allow enough water to remain in a stream to keep fish in good condition). The assessment should determine whether these structures would violate these codes. In cases where there is a violation, the environmental impacts should be assessed for providing remedies to the violation. Specifically, there should be an analysis of the Dwinell dam and the benefits of providing fish passage to Coho as required by California law or the benefits to Coho from dam removal.

Stock Water Systems
The Initial Study for the Scott River states that an average of two alternative stock watering systems will be installed per year. The Shasta River Initial Study states that two alternative stock watering systems will be installed per year if this is determined to be beneficial for coho salmon. The CEQA process should conduct an analysis to assess this rate of implementation relative to the goal of providing adequate flow for coho salmon as soon as possible.

Compliance Monitoring
According to the Initial Study, the RCD's within each basin will be responsible for monitoring the sub-permittees' compliance with the terms and conditions of their sub-permits by instituting a comprehensive compliance monitoring program. The CEQA process should conduct a thorough assessment of the accountability of such a program. Will CDFG conduct audits to ensure that the compliance monitoring program is meeting its intended purpose?

Adaptive Management
We support the effectiveness monitoring results being used as the basis for an adaptive management type program, to refine future avoidance, minimization, and mitigation measures. The CEQA process should conduct an analysis of how such an adaptive management program will be implemented. How will such a Program be encouraged? What will be the structure of such a Program? Who will be participants in such a process? Will the Basin's Tribes be allowed participation in such a Program?

Access to Property
The Initial Study states the sub-permittees shall allow "non-enforcement CDFG representatives written consent to access the sub-permittee's property for the purpose of verifying compliance with, or the effectiveness of, required avoidance, minimization, and mitigation measures and/or for the purpose of fish population monitoring, provided CDFG notifies the sub-permittee at least 48 hours in advance." The CEQA process should assess the pros and cons from allowing such access to CDFG law-enforcement personnel as well, especially given their expertise in enforcing regulatory measure.

The CEQA process should also assess whether CDFG has the authority to cede a right to private landowners. There should be a through analysis of all non-waiver enforcement provisions including aerial surveillance and the lost environmental benefits of access and enforcement allowed before the waiver. Since the State Lands Commission and the Siskiyou County Council have declared that the Scott River is navigable, the CDFG may already have the right of access. This should be assessed in the EIR.

Water Master Reporting

The Initial Study states that DWR will report the results of water use information to CDFG on a monthly basis from April to November of each year. The CEQA process should assess how often DWR will be visiting each point of diversion to ensure compliance with the law, as well as assess whether the information DWR reports to CDFG be- available to the public?

Summary

In summary, many of the activities discussed in the Initial Studies have the potential to dramatically improve conditions in the Scott and Shasta Rivers for coho salmon as well as the overall aquatic health of these ecosystems. As mentioned earlier, the success of these activities is dependent upon the details associated with their implementation. Therefore, we request thorough analysis be conducted throughout the environmental review process to ensure that implementation is effective in achieving desired results. In the end, the effectiveness of these permitting Programs should be based on results, both in regard to specific projects as well as the overall Program resulting in increased populations of coho salmon. If you would like to discuss these comments, please don't hesitate to contact me at the address in the letterhead. We look forward to meeting with CDFG staff to discuss the ITP once it becomes available for our review.

Sincerely,

Dave Hillemeier
Yurok Fisheries Program Manager

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

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October 25, 2006

Mr. Bob Williams
California Department of Fish & Game
Region 1
601 Locust Street
Redding, CA 96001

Re: SCH# 2006102093; CEQA Notice of Preparation (NOP) of an Initial Study for the Shasta River Watershed-Wide (Including Tributaries) Permitting Program; Siskiyou County

Dear Mr. Williams:

Thank you for the opportunity to comment on the above-referenced document. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR per CEQA guidelines § 15064.5(b)(c). In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE),' and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:

√ Contact the appropriate California Historic Resources Information Center (CHRIS). The record search will determine:

- If a part or the entire (APE) has been previously surveyed for cultural resources.
- If any known cultural resources have already been recorded in or adjacent to the APE.
- If the probability is low, moderate, or high that cultural resources are located in the APE.
- If a survey is required to determine whether previously unrecorded cultural resources are present.

√ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.
- The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.

√ Contact the Native American Heritage Commission (NAHC) for:

* A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity who may have information on cultural resources in or near the APE. Please provide us site identification as follows: USGS 7.5-minute quadrangle citation with name, township, range and section. This will assist us with the SLF.

- Also, we recommend that you contact the Native American contacts on the attached list to get their input on the effect of potential project (e.g. APE) impact.

√ Lack of surface evidence of archeological resources does not preclude their subsurface existence.

- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.

√ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans.

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* CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this
Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens.

√ Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the CEQA Guidelines mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

<u>√ Lead agencies should consider avoidance, as defined in § 15370 of the CEQA Guidelines, when significant cultural resources are discovered during the course of project planning.</u>

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse
Attachment: List of Native American Contacts

COUNTY OF SISKIYOU
COUNTY ADMINISTRATIVE OFFICE

Barry Shioshita, County Administrator
P.O. Box 750 • 201 Fourth Street, Yreka, CA 96097
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November 20, 2006

Mr. Bob Williams
Staff Environmental Scientist
Conservation Planning (CDFG)
601 Locust Street
Redding, CA 96001

RE: CEQA COMMENT ON THE SHASTA RIVER/SCOTT RIVER WATERSHED PROJECT "INCIDENTAL TAKE PERMIT"

Dear Mr. Williams:

Siskiyou County has long taken a proactive approach to dealing with environmental issues that impact the constituency in our county, and as such, appreciates the opportunity to comment on this "groundbreaking approach to permitting" that can benefit public trust resources, landowners and water users in a synergistic way. This project is the result of the development of a Recovery Strategy for Coho Salmon and the Pilot Program on the Scott and Shasta River valleys for agricultural operations. We have the following comments:

1. It is critical that a very clear and complete description of the "programmatic" or "watershed-wide" nature of this CEQA process be included in the appropriate documents. The ESA Team stated in its workshop sessions that "types of measures" would be evaluated under CEQA, not specific measures or the specifics of measures. We think the manner and method of tiering this EIR to any needed EIRs for specific actions/projects that would be implemented as part of the avoidance, minimization, and mitigation measure process should be specifically stated, described, and analyzed. We feel that some type of Program EIR, Project EIR, Master EIR, or some other CEQA document may be necessary as a template for review and analysis of this "project." It is our understanding that one of the incentive benefits for prospective applicants is that the requirement for an individual CEQA review would be eliminated. Is there a possibility that a sub-permittee would have to do additional CEQA analysis and review under the program as currently outlined?

   We understand that the State and Regional Water Boards may have a template for CEQA analysis and review on a state-wide and region-wide basis regarding waste discharge requirements. Communication with them may have benefits to this CEQA review.

The ESA Team also stated that it would be impossible to quantify the take or the benefits to fish from the measures in the permit. The potential success of this project hinges on the ability of people to actually see that the take of anadramous fish is avoided, minimized, or fully mitigated, and that the 1600 requirements will indeed protect the riverine environment. Therefore, it is critical to fully communicate a complete description of the permitting program and the "project" to be reviewed under CEQA.

2. There is a tremendous advantage for the Department of Fish and Game, public trust resources of the valleys, and the citizens/water users/farmers and ranchers to participate in a watershed-wide, streamlined permitting system. This proposed permitting program institutes actions where those actions are not just tied to an individual applicant's property (as under a standard individual permit), but are focused and prioritized in the watershed where the benefit to the public trust resources, sub-permittees, and permit holders alike is maximized. This unique program will allow prospective applicants an incentive as well as a choice to apply through the "Watershed-wide Permitting Program." This is another reason why it is important to clearly describe and distinguish the "program" from the "project". It is important that the larger benefit from a watershed-wide approach be communicated and analyzed in the CEQA process.

   In order to realize these benefits, potential sub-permittees must see an advantage to working together for the benefit of other sub-permittees under the watershed-wide approach. Any financial burden in terms of potential costs and fees must be spread to all individuals participating considering the factors of equitability and proportionality. This burden needs to be less than the cost of applying for an individual permit. Under the watershed-wide approach, there must be equity and fairness across all resource users. The permit provisions and language must allow the RCDs, as permit holders, to implement the program in the best manner possibie. Such permitting language should allow the RCDs the flexibility to organize and administer the permitting process in order to attract as many sub-permittees as possible. The RCDs must look at an appropriate fee structure, and may also need to specify measures that enable fair and equitable treatment, such as a mitigation banking program.

3. We suggest that this CEQA process prevent and clear up any existing confusion between the Recovery Strategy that is now being voluntarily implemented, and any stipulated permit measures that are currently designated as recovery tasks but which will become requirements under the Watershed-wide Permitting Program.

4. This permitting program must be economically sound. The opportunity to achieve strong resource management, a viable permitting program, and a user-friendly approach will pay dividends as open space in these river valleys continues to serve the needs of both citizens and public trust resources.

5. The manner and method that this project and program can interface with TMDL Action Plans and federal recovery plans should be discussed in the CEQA analysis. It makes sense that the two components, i.e., TMDL Action Plans and the federal recovery strategies should mesh, and this interactive approach will eliminate unnecessary and costly redundancy or conflict in achieving the objectives of both programs.

6. We encourage program paperwork simplification to the extent practical. Let's keep the process as simple as possible, and make it viable and attractive to potential applicants.

7. We encourage an evaluation of the use of hatcheries as replacement of habitat where that would be appropriate.

We think that the alternative of having permit applicants get an individual permit and be responsible for avoidance, minimization, and mitigation measures on that property is not as beneficial to resources and citizens as is the watershed-wide permitting approach currently being analyzed.

Sincerely,

Barry Shioshita
County Administrator

James DePree
Natural Resource Policy Specialist

Ad Hoc Committee

P.O. Box 484
Occidental, CA 95465
707 874-3855

Bob Williams
Department of Fish and Game
601 Locust Street
Redding, CA 96001

12/6/06

re: NOP DEIR Scott and Shasta River Watershed ITP and *Master* Streambed Alteration...

Dear Mr. Williams,

1. This ITP and "Master" streambed alteration agreement and its associated proposed Draft EIR are absolutely inappropriate and to the best of my knowledge and belief *illegal* -- a violation of CEQA and perhaps other California Codes. A "Master" agreement is outrageously wrong for the Scott and Shasta, especially considering the ongoing degradation of the Klamath watershed and the fact that the degradation is being used to justify the destruction of the commercial salmon fishing industry! We need analysis of *specific* projects and *specific* impacts, not a *generalized analysis* of activities *in general.*

The Klamath watershed is "degraded" (EPA assessment *over 10 years ago*). The Shasta has temperatures so high they are *lethal* for salmon. A once highly abundant resource has been reduced to threatened or nearly extinct, due to water diversions. The commercial salmon industry, along with the watershed, reduced to but a fraction of its former productivity and the the Siskiyou Resource Conservation District would consider a so-called "Master" streambed alteration agreement that would allow individual property owners and the RCD *to avoid* a specific analysis of proposed "bulldozing", "additional diversions", "cattle crossings", "flashboard dams", "gravel push-up dams", "pumps", "excavations" without requiring a *specific* EIR on each and every such potentially disastrous project proposal!!??

Such a proposition in the context of the collapse of the commercial salmon industry, *due to degradation of the Klamath,* is appalling. We don't need any additional siltation downstream from any projects -- even those *purporting* to be in the best interest of the coho. The best approach to saving coho and chinook and increasing their abundance, is to get the heavy equipment out of the streams, and *reduce,* not add to the already existing water diversions.

2. Since the MSAA and ITP are still in *draft form,* it is premature to attempt an environmental assessment of them! It is impossible to assess the adequacy of the "checklist" absent the Final MSAA and ITP. Do we evaluate generalities now, only to see the "Draft" changed later?

3. What about *cumulative* impacts? *How many* new diversions, push-up dams, bulldozers, cattle-crossings, etc, would the Master Plan allow? How could an EIR assess cumulative impacts without knowing the sum total of projects and where exactly they are proposed to be located?

4. It might sound positive, on its face, to plant shade plants along the banks, but often the road to disaster is paved with good intentions. We cannot just assume that the best judgment and best risk-benefit assessment will prevail in any given case. Willows have been planted where they do not grow, and bank stabilization projects have caused bank failures. We need to be analyzing and commenting on specific projects as they are proposed, not "agreement" generalities.

5. We believe that the "future studies" in the ITP and MSAA for both Shasta and Scott Rivers are in violation of CEQA per *Sundstrom v Mendocino*. If you proceed with this environmental assessment, specific analysis of any project would happen *in the future*, *after* this generalized, non-specific, environmental review, *outside the scope of public disclosure* and comment, which we believe, is in violation of CEQA.

6. "Future studies" examples:
Page 12, Scott River Environmental checklist (equivalent examples are in the Shasta document):

"...each sub-permittee...*will* implement specified requirements in an effort to eliminate 100% of the fish barriers...." *Future specifications*! We cannot *assume* these "specified requirements" will be adequate just because they will be reviewed by CDFG. Specified requirements need to be prepared for the public and other agency review *during, not after,* the CEQA process!

"...each sub-permittee *will be* required to provide...fish passage...at each diversion.... Where such passage appears to be inadequate, the sub-permittee must submit plans to CDFG for review and approval." More *future* plans and *future* review. Plans must be part of, *not outside* the CEQA process. The *public* and other Agencies have an obligation to review those plans by law (CEQA).

"If engineered drawings are deemed necessary [by CDFG], they *will be* submitted for review and approval prior to implementing the project." More *future* plans and *future* review, *after* this CEQA process. Those specific plans need to be part of CEQA review.

7. In general, we believe that the MSAA and ITP for both Shasta and Scott Rivers are an attempt to remove specific instream projects from public scrutiny contrary to CEQA. This must not be allowed. We say scrap this project. It runs counter to all the positive efforts being made to restore our the watershed. If RCD and CDFG review was adequate to protect the Klamath watershed and its resources from degradation, the Klamath would not be degraded today! There is need for radical departure from past practices and a need for public and other agency ideas *per CEQA*.

Sincerely,

Ann Maurice

Ann Maurice

November 20, 2006

Bob Williams
Staff Environmental Scientist
Conservation Planning
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

RE: Shasta and Scott River Watershed-Wide Permitting Program

Dear Mr. Williams,

California Trout appreciates the opportunity to comment on the California Department of Fish and Game's (CDFG) Shasta-Scott River Watershed-Wide Permitting Program (Program). We understand at this time we have the opportunity to comment on the scope and content of environmental information for the development of a Draft Environmental Impact Report (DEIR).

California Trout is a statewide conservation organization dedicated to protect and restore wild trout and steelhead waters throughout California. California Trout operates a field office in Mt. Shasta and has worked specifically in the Shasta River watershed since 2000. California Trout has served as a member of the statewide Coho Salmon Recovery Team and the Shasta-Scott Recovery Team (SSRT).

We are supportive of the Program to develop a watershed wide permitting process to implement coho salmon recovery tasks and facilitate compliance of agricultural activities and restoration projects with the California Endangered Species Act (CESA). However, for the program to succeed several fundamental issues must be addressed.

- The Program is intended to address Fish and Game Code Section 1602 but should not memorialize or provide any other explicit exemption for landowners to comply with the Fish and Game Code, including but not limited to Section 5937.
- California Trout recommends that these measures not be financed exclusively with public dollars. Diverse funding mechanisms for all

measures should be identified and include the contributions from applicants.

We are confident the above issues can be addressed and believe on the whole the implementation of the Program will facilitate implementation of Coho Recovery Strategy recommendations and improve habitat conditions for coho salmon in the Shasta and Scott Rivers. Below we provide our specific comments on the Initial Study by section and highlight issues in need of additional evaluation in preparing the Draft Environmental Impact Report (DEIR).

8.1 Project Overview

If DFG extends the Master Streambed Alteration Agreement (MSAA) an additional five years as proposed (pg. 2) there should be a public review process for the extension. The DEIR should evaluate the need for a public review process at the end of year five.

We look forward to reviewing and commenting on the specifics of the Incidental Take Permit (ITP) and the MSAA at the appropriate time. Our comments here are in the context of not reviewing the details of these plans because we understand they are still in draft form and not ready for public comment. We also understand these documents will be made available as part of the DEIR and we look forward to commenting then.

8.3 Environmental Baseline

CDFG defines environmental "baseline" conditions (pg. 6) as the date the application for an ITP is submitted. However, baseline conditions are what led to CESA and Federal ESA listings. The DEIR should evaluate the use of baseline conditions that provide a higher threshold than existing conditions.

8.4.1 Covered Activities

ITP and MSAA Covered Activity 1: Water Diversion Pursuant to a Legal Water Right.
All water rights should have mechanisms for verification as specified in the *Coho Recovery Strategy for Coho Salmon,* Table 10-1 recommendations WM-2a-d, pages 10.4 and 10.5. The DEIR should evaluate the potential impacts of the potential for legal water right diversion allocations to exceed available instream flows. The DEIR should identify and evaluate measures to protect coho salmon in these instances.

ITP and MSAA Covered Activity 2: Water Diversion Structures.
Covered Activities include flashboard dams, gravel push-up dams and other temporary structures. Gravel push-up dams "form a flow barrier that seasonally blocks the flow of the stream/river" (pg. 7). The DEIR should evaluate gravel push-up dams and their compliance with Fish and Game Code Sections 5901 and 5937.

8.4.2 Conditions of Approval

ITP General Condition C

This condition requires sub-permittees to provide "non-enforcement CDFG representatives written consent to access the sub-permittee's property….." (p. 11). California Trout requests that all CDFG employees be allowed access to sub-permittees property subject to the written consent and prior notice stipulations. Specifically denying access to CDFG enforcement representatives unnecessarily garners mistrust. Additionally the DEIR should evaluate the need for landowner access agreements for CDFG to inventory and assess fishery populations and habitat conditions in all areas covered by Program.

ITP General Condition D

This condition identifies sub-permittees as being responsible for any costs to implement any avoidance or minimization measures and that that the SVRCD is responsible for costs to implement any mitigation and monitoring measures. CalTrout agrees with this condition and we would also like to highlight the issue of funding these measures. CalTrout recommends that these measures not be financed exclusively with public dollars. Diverse funding mechanisms for all measures should be identified and include the contributions from applicants.

ITP General Condition F

The DEIR should explain and evaluate Condition F (pg. 11) regarding a $100,000 letter of credit for CDFG to draw against if the RCD or sub-permittee fails to comply with measures they are responsible for.

ITP Additional Avoidance and Minimization Obligation C: Fish Passage Improvements

This condition requires that "the SVRCD and each sub-permittee with fish passages issues will implement specific requirements in an effort to eliminate 100% of the fish barriers on a scheduled basis over the term of the ITP" (Initial Study, Page 12). CalTrout supports this measure. However, we note the contradiction of this measure when compared to *ITP Additional Avoidance and Minimization Obligation I: Dwinnell Dam and the Montague Water Conservation District (MWCD).* In regards to fish passage Obligation I requires the MWCD to shall develop a feasibility study to "investigate the *possibility* of providing fish passage at Dwinnell Dam" (Initial Study, Page 14, emphasis added). In the development of a Draft EIR this contradiction should be resolved by clearly identifying and evaluating potential measures to provide fish passage around Dwinnell Dam.

Flow Enhancement Mitigation 2: Improve Baseline Instream Flows Via Water Efficiency Improvements.

This mitigation measure states that "generally" a water transfer will utilize Water Code Section 1707 (p. 14). California Trout believes all transfers should be done under 1707 and request that the DEIR evaluate this water transfer issue.

Flow Enhancement Mitigation 3: Develop and Implement a Contingency Plan for Dry and Critically-Dry Water Years.

Flow Enhancement mitigation 3 (pg. 15) includes pumping groundwater to meet surface flow requirements during Dry and Critically-Dry Water Years. The DEIR should evaluate the potential impacts of pumping groundwater during dry years. Groundwater pumping during dry years has the potential to exacerbate low flow conditions.

Flow Enhancement Mitigation 4: Install Alternative Stock Water Systems.

Flow Enhancement mitigation 4 (pg. 15) also relies on groundwater pumping. As for *Flow Enhancement Mitigation 3* the DEIR should evaluate the potential impacts of groundwater pumping during dry years for stock water purposes. Specifically, connectivity and water right issues should be addressed.

8.5.3 Monitoring and Adaptive Management Program Under the ITP

The DEIR should evaluate the efficacy of allowing the SVRCD to be responsible for monitoring sub-permittees' compliance with the terms. We see the rationale in this arrangement given the SVRCD may be best suited to implement a monitoring program but the DEIR should clearly evaluate the relationship between the SVRCD and the CDFG as the enforcement agency. Our primary concern is that because the SVRCD is an organization representing member landowners and in certain circumstances be reluctant to report violations to CDFG and in some cases this may happen unintentionally. We believe these concerns can be alleviated by a clear evaluation in the DEIR of the role of the SVRCD in compliance and evaluation of the role of CDFG.

California Trout believes one of the most important parts of the Program is effectiveness monitoring. We recommend that the DEIR evaluate an effectiveness monitoring plan. We suggest an evaluation of the Integrated Status and Effectiveness Monitoring Program (ISEMP) currently being implemented in the Columbia River Basin. The ISEMP has been created as a cost effective means of developing protocols and new technologies, novel indicators, sample designs, analytical tools, data management, communication tools and skills, and restoration experiments. The most important and relevant part of the ISEMP is the Intensively Monitored Watershed (IMW) program designed to determine the effectiveness of restoration actions through an experimental management framework. We believe this program could provide an excellent framework for evaluating the success of the Program and California Trout stands ready to assist CDFG, SVRCD and landowners in establishing this program. Further information on the ISEMP program can be found at http://www.nwfsc.noaa.gov/isemp.

Conclusion

California Trout appreciates the opportunity to comment. We are supportive of CDFG, SVRCD and landowners efforts to develop the Program and are confident that a comprehensive Draft Environmental Impact Report will adequately address and evaluate our concerns. Any questions about California Trout's comments can be addressed to

Curtis Knight in our Mt. Shasta Area Office at (530)926-3755 or by email at caknight@jps.net.

Sincerely,

Curtis Knight
Mt. Shasta Area Manager

Received @ Shasta River Scoping meeting 10/24/06

The public is invited to provide comment or concerns related to the Shasta River Watershed Project.

Name: Regina Chichizola - Klamath River Keeper

Address: PO Box 21 ~~8~~

City, State, Zip: Orleans Ca 95556

Telephone: 530 627-3280

E-mail: klamath@riseup.net

Comments may be submitted tonight or mailed to:

Mr. Bob Williams,
Staff Environmental Scientist

Conservation Planning (CDFG)
601 Locust Street
Redding, CA 96001

(530) 225-2365 (phone)
(530) 225-2381 (fax)

COMMENT: The Shasta + Scott Rivers have most of the water diverted and need additional flows. The job of the agencies is to protect the Coho not only to work with water users. Down river communities are effected by the Scott + Shasta.

Additional water needs to be cold. Parks Creek should go it the river and not into Lake Shastina. Waterways should not be bulldozed or grazed + ground water needs to be included in the Scott. I will provide additional comments later. Please have a hearing for

Thank you for your participation: down river communities. We need to try to hard to give inpute. ~~I will do.~~

Thank you, Regina

North Coast Consumer's Alliance
P.O. Box 351
Redwood Valley, CA 95470

To: Bob Williams
Staff Environmental Scientist
Conservation Planning, CDFG
601 Locust St.
Redding, CA 96001
FAX: 530 225-2381

Re: Notice of Preparation of a Draft Environmental Impact Report, Shasta River Watershed-wide Permitting Program.

Dear Mr. Williams,

Thanks for taking a special effort to provide me with the two NOP's on the Shasta and Scott Rivers and for allowing me time to study the documents and to respond. It is very much appreciated.

The covered activities permitted through the watershed-wide program have not been sufficiently described in scope, number or intensity of streambed disruption. New diversions? It doesn't exclude them.

Under the Program, heavy equipment may operate in the streambed every day of every summer for ten years. This is an unacceptable amount of streambed disturbance.

Permitting new wells for stock watering without doing a thorough groundwater/surface water relationship study is unacceptable. Agricultural activity can be economically sustainable over time if it is environmentally sustainable. If you don't know how much water is in the aquifer and if you don't know how that quantity relates to river flow, how can you tell what level of water extraction is sustainable? High temperature/low flow conditions might give you a clue, however, that too much water is being diverted. The NOP considers this condition as merely an opportunity get heavy equipment into the streambed, possibly to create new diversions. This is not acceptable.

Grazing of livestock in the streambed will become a permitted activity, approved by the CDFG. Not acceptable.

The Program will permit the current amount of tailwater returns for several years. Not acceptable.

The Program will allow the continued entraining of fish into the fields for fertilizer for too long. Not acceptable.

The timetable for changing to more fish-friendly diversion techniques and for reducing tailwater returns is so slow that it almost guarantees the demise of the coho.

The hopefully beneficial actions outlined in the NOPs for both the Shasta and the Scott (opening up fish passage barriers, dam removal etc.) have not been adequately described. Each project may require its own EIR to comply with CEQA. Without such, the public may be locked out of the information needed to respond. This Program is already illegal in that it authorizes continued activities that harm Coho. It will be doubly illegal if it thwarts CEQA.

The uncorrected over-extraction of water from the tributaries and continued pollution by animal wastes have contributed to the diminished carrying capacity of the Klamath, which in turn has shut down the commercial salmon fishing industry along the North Coast. The closures are due to concerns about the "weakest stock." The coho in the Shasta and the Chinook in the Klamath are designated as weakest stock. While the CDFG Program is permitting take of Coho in the Shasta and adversely impacting the Chinook, the PFMC is shutting down the commercial salmon fishery due to this take. Any EIR must be widened to include a discussion of this unfortunate set of regulations. Scoping sessions must be conducted near the fishing communities along the coast that are the most deeply impacted economically.

In summary, the Program institutionalizes the horrendous management practices that got the Shasta in the sorry condition it is now. It is a prescription for ongoing mismanagement for the next ten years. In order to comply with CEQA, alternatives must be considered. Instead of twisting CESA and section 1602 to comply with the current mismanagement:

- Give the ag interests a disincentive to continue entraining fish into the fields for fertilizer. Fine them heavily. Stop unscreened diversions now!
- Give them a similar disincentive for creating tailwater returns. Fine them. Let the new regulations stop tailwater returns NOW not ten years from now.
- No new water diversions!
- Encourage the NCWQCB to use its power to cut back on the water rights of the most egregious water wasters.
- Get tough! Use whatever enforcement powers you have to trim the beef industry of wasteful and destructive practices and of unsustainable overproduction.

There is a built-in incentive for producing sustainably farmed beef. The public will pay more for it.

Yours truly,

Ellen Faulkner

Ellen Faulkner

Bob Williams
Staff Environmental Scientist
Department of Fish and Game
601 Locust Street
Redding, California 96001
October 29, 2006

Re: Scott and Shasta Incidental Take Permits for Coho Salmon; Scoping Comments

Dear Mr. Williams,

The Draft Take Permit should be released for review by downstream affected interests. Involvement of downstream fishing communities, tribal governments, Counties, and the public is essential to developing a plan that will achieve recovery goals for listed coho salmon. The Coastal Commission also has an interest, and should be included in the development of the ITP. Agreements between State and Federal agencies for fisheries protections and public funding must also be considered.

Water pollution problems in the Scott and Shasta Rivers are exacerbated by low and no-flow conditions in the rivers and their tributaries at times of year crucial to coho survival. The Draft ITP Applications for the Scott and Shasta Rivers do not contain a goal of achieving minimum flow requirements for coho salmon. Buying water each year from willing sellers does not provide for flows in dry years. Long-term solutions must be found to provide the needed water flows, such as permanent transfer of water dedicated for fish. Since coho salmon live in fresh water for a year before migrating to the ocean, year-round cold water must be provided for them in order to begin recovery.

Dwinnell Dam must be addressed for its contribution to temperature and low dissolved oxygen pollution in the Shasta River, and also because it blocks access to significant spawning habitat upstream. Dwinnell Dam is currently in violation of state laws requiring flow releases. It does not provide any electricity generation.

Cold, oxygen-rich water would also contribute to the ocean fishery for chinook, which is limited in good years by restrictions on coho. The Klamath river system is essential to a viable commercial fishery in the ocean, and hearings should be held in coastal communities. Fishing economies of cities from as far away as Morro Bay in Southern Central California to ports in Northern Oregon are severely affected by the health of fisheries in the Scott and Shasta Rivers. Ninety percent of California ocean commercial salmon permits have been dropped in the last twenty years, largely due to area closures to protect Klamath River fish stocks. Fishing closures began 27 years ago, in 1979, for Klamath stocks, only to have habitat continually degraded in the river. The 2006 ocean season was the most restrictive in history. Scott and Shasta Rivers are major tributaries, and should be producing healthy fish runs. Instead, the rivers are dewatered for months in some years, leading to fish kills and late spawning.

Groundwater pumping must be fully mitigated in order to allow an exemption for groundwater pumping. Much of the agricultural diversion from the Scott River is from wells connected to the river; this must be addressed in the ITP. Compliance with provisions of the ITP must be monitored and enforced by other than irrigators affected by the requirements, who serve on the Resource Conservation District. The RCD has a history of publicly opposing any regulation of their water-use activities, and is not likely to be effective in protecting the interests of the fish. The Department of Fish and Game, whose officials are sworn to uphold laws that prevent dewatering of the rivers, also have a twenty-year history of not enforcing Fish and Game laws related to minimum flows needed for salmonids in the Scott and Shasta Rivers.

The California Endangered Species Act (CESA) and CEQA require specific actions with timelines for recovery of threatened coho salmon. The California Recovery Strategy for coho salmon contains six goals for recovering coho salmon populations, and before de-listing can be achieved:

- Maintain and improve the number of key populations and increase the number of populations and cohorts of Coho salmon.
- Maintain and increase the number of spawning adults.
- Maintain the range, and maintain and increase distribution of Coho salmon.
- Maintain existing habitat essential for Coho salmon.
- Enhance and restore habitat within the range of Coho salmon.
- Reach and maintain Coho salmon population levels to allow for the resumption of Tribal, recreational, and commercial fisheries for Coho salmon.

The de-listing goals should be met before irrigators are exempted for "take."

Minimizing "take" at diversions is a good idea, and a legal requirement with which irrigators have been out of compliance for years. California's Fisheries Restoration Program maintains public confidence in the distribution of public moneys for restoration by requiring that the funds not be used for compliance with existing laws. Preliminary documents of the ITP suggest the intention is to pay for regulatory compliance with public money, reducing opportunities for other effective projects not already required of the landowner. In fact, a large part of ten million dollars of restoration money was recently directed through CDFG to do just that, ostensibly to buy cooperation with the ITP from landowners. Involving a larger body of the interested public would open the process to considering the benefit of all parties, instead of re-creating a 1950's style "smoke-filled rooms," back-scratching situation of mutual self-interest.

Fencing out cattle and planting riparian vegetation will not be effective without cold water flows at critical times for juvenile and adult salmon. Coho salmon populations will not recover without water. Stranding of fish when portions of the stream are dewatered is a direct "take," illegal before CESA listing, but historically un-enforced in the Scott and Shasta Valleys. But stressful and lethal hot water temperatures for fish when they cannot access cold water refuges must also be mitigated for the agricultural exemptions to be mitigated. Acquisition of sources of cold water from springs and enforcement of existing laws such as 5937 would help. Side-channels and backwaters can be good refuges for juvenile fish—very effective examples have been created on the Mattole River. The California Environmental Quality Act, CEQA, requires full mitigation before take can be permitted.

CDFG should fulfill its obligations as an agent of the State of California to benefit all the people of the state, including all interested parties in development of an effective recovery for threatened coho populations that belong to all of us before taking part in any agreements that will further divide communities in the Klamath Basin. All legal obligations to protect and restore threatened coho populations must be met before irrigators are exempted for "take."

Vivian Helliwell
Pacific Coast Federation of Fishermen's Associations
P.O. Box 307
Eureka, CA 95502

The public is invited to provide comment or concerns related to the Shasta River/Scott River Watershed Project.

Name: Gary Black

Address: 5916 Eastside Rd

City, State, Zip: Etna CA 96027

Telephone: 530 467-[illegible]

E-mail: gblack@sisqtel.net

Comments may be submitted tonight or mailed to:

Mr. Bob Williams,
Staff Environmental Scientist

Conservation Planning (CDFC)
601 Locust Street
Redding, CA 96001

(530) 225-2365 (phone)
(530) 225-2381 (fax)

COMMENT: John Menke made comment about specific issues being considered. His example is not specific but has not been addressed. ~~A~~ There are numerous flumes that cross streams which require maintenance, repair, and replacement. ~~In~~ In sections that cover diversions & diversion ~~Struc~~ Structures, flumes or construction of alternatives may need to be included as a ~~State~~ standard.

Thank you for your participation!

Scott Scoping meeting
10/25/06

Received @ Shasta River Scoping Mtg 10/24/06

SHASTA RIVER SCOTT RIVER WATERSHED–WIDE PERMITTING PROGRAMS
ENVIRONMENTAL IMPACT REPORTS

The public is invited to provide comment or concerns related to the Shasta River Watershed Project.

Name: Jack Cowley

Address: 7335 Ball mtn Rd

City, State, Zip: Montague Calif 96064

Telephone: 530 459 5506

E-mail:

Comments may be submitted tonight or mailed to:

Mr. Bob Williams,
Staff Environmental Scientist

Conservation Planning (CDFG)
601 Locust Street
Redding, CA 96001

(530) 225-2365 (phone)
(530) 225-2381 (fax)

COMMENT: The Program has become to Complex, Time Consuming + Expense.
The Fish + game state They are Following The will of The People, There Fore The People (state) should Pay all The Costs. The burden should Not be shoulderd by The Landowners.
The Loss of water for irrigation will Forever destroy Sustainable Agriculture in Shasta Valley.
The only alternative is To destroy Shasta Valley as a Prestige Area of Calif. Forever!
RCDs are Voluntary Thus Too much of a burden is placed on Volunteers.

Thank you for your participation!

Monique

...D-WIDE PERMITTING PROGRAMS
...VIRONMENTAL IMPACT REPORTS

The public is invited to pr...
to the Shasta River/Scott River Watershed Project.

Name: Monique Dixon
Address: 6816 E. Callahan Rd
City, State, Zip: Callahan CA 96014
Telephone: 530-410-2054
E-mail: auntnique@hotmail.com

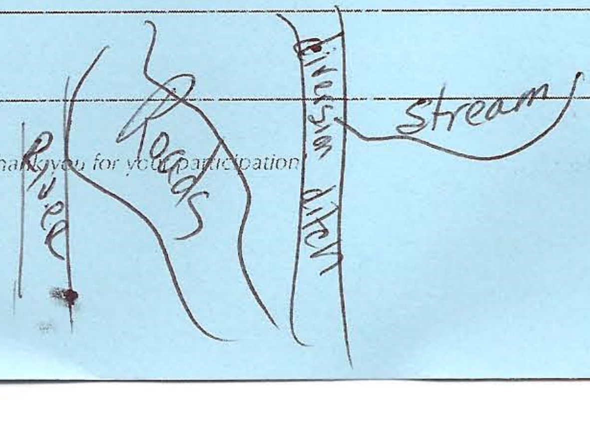
Comments may be submitted tonight or mailed to:

Mr. Bob Williams,
Staff Environmental Scientist

Conservation Planning (CDFG)
601 Locust Street
Redding, CA 96001

(530) 225-2365 (phone)
(530) 225-2381 (fax)

COMMENT: RE: MSAA
Have you considered those streams that may not have access to the river because of blockage, but the water does flow through diversions & eventually end up back in the river.
I realize you aren't considering upslope issues, but the MSAA should be applicable to all streams in the watershed.



Thank you for your participation

Shasta River Program
Scoping meeting 10/25/06

Margaret Draper / Attorney at Law / POB 176 / Bayside / CA 95524

RECEIVED 2006 NOV 14 PM 1 29 DFG - REDDING

November 13, 2006

Bob Williams
Staff Environmental Scientist
Dept. of Fish and Game
601 Locust St.
Redding, CA 96001

Re: TMDL / ITP Shasta and Scott Rivers

Dear Mr. Williams:

I am writing with regard to the Shasta and Scott rivers – significant tributaries to the beleaguered Klamath system. As a prior Shasta Valley Resource Conservation District Director, I can attest to the fact that much was known 20 years ago regarding the high contributions of heat and silt pollution from those two rivers to the Klamath River. Additionally, all the dire events warned of at the time, by tribal groups, independent scientists, fishermen and conservation groups (among others), regarding the viability of downstream fish populations have, sadly, come to pass. Mere warnings have done little to motivate change sufficient to improve fish survival.

The current science on the subject does not appear to show any improvement in the way that landowners and agencies have cooperated to solve the problems of temperature/oxygen content and siltation – let alone chemical pollution. If the "proof is in the pudding," the progress report is dismal.

While I am sympathetic to the needs of landowners and agriculture, destruction of riparian habitat, diversion, and other pollution problems can, and should, be mitigated. Without strict TMDLs this will not occur. Landowners, where pocketbooks are slim, need assistance from agencies to address proper goals – it is an investment government can and should make. Assistance to landowners should not come in the form of easing restrictions, but rather in enabling them to participate in improving water quality. Allowing excessive incidental take permits is not the road public policy should follow in the face of fishery extinction and severe compromising of the Public Trust with regard to the state's waters.

I understand that the North Coast Regional Water Quality Control Board (NCRWQCB) approved the Shasta TMDL on June 29, 2006 and it will be considered for adoption before the State Water Resources Control Board (SWRCB) on November 15, 2006. The Boards website refers to TMDLs as a

> 'pollution budget' designed to restore the health of a polluted body of water. The TMDL process provides a quantitative assessment of water quality

problems, contributing sources of pollution, and the pollutant load reductions or control actions needed to restore and protect the beneficial uses of an individual waterbody impaired from loading of a particular pollutant…

In *Pronsolino et al. vs. Nastri et al (2002) at pp 9 et seq.),* the U.S. Court of Appeals Ninth Circuit provides great insight into the role of TMDLs:

> (The TMDL)… shall be established at a level necessary to implement the applicable water quality standards… Section 303(d)(1)(C)….TMDLs serve as a link in an implementation chain that includes federally regulated point source controls, state or local plans for point and nonpoint source pollution reductions, and assessment of the impact of such measures on water quality, all to the end of attaining water quality goals for the nations waters.

The Clean Water Act thus provides an opportunity to employ TMDLs productively to protect water quality for sensitive and endangered fish species – but only if they are meaningfully applied. Your responsibility is to use the best available science – including use of prior studies and findings – to establish such loads.

In my opinion, the Shasta TMDL model should have included pH because pH values have exceeded Basin Plan objectives for years and are high enough to stress salmonids. This has been known for some time and there is no reason to omit it from the model. It is inconceivable to me that *all* forms of nitrogen were not properly measured and modeled. This has been a significant known problem in the system for decades!

Flood siltation from Parks Creek was an issue raised within the Shasta Valley RCD in the early 80s. I remember letters in the file, written to and probably by the Shasta Valley Resource Conservation District. The fact that such loading was not included in the model is a gross oversight.

While the Shasta TMDL does acknowledge that Dwinell Reservoir is a major contributor to Shasta River problems, there is no mention of considering dam removal. Given the current status of dam removal, it should be on the table for consideration when it comes to water quality protection.

With regard to the Scott River, the TMDLs also appear less than useful. Vague monitoring measures proposed may well to lead to extinction for fisheries, because adaptive management is impossible without sufficient information as conditions change – likely worsen. Decisions regarding Waste Discharge Requirement permits depend on good monitoring.

Assigning groundwater and flow studies to the Siskiyou County, rather than a less biased and less financially challenged office like the SWRCB, almost guarantees such studies will be skewed or incomplete. I speak from experience, having lived and worked in Siskiyou County for more than a decade.

It is again most surprising that the extinction risk of Coho Salmon populations in the basin are not emphasized or noted, and that the decline in the Scotts fall Chinook run is not addressed. Some sort of interim plan to protect these species short term needs inclusion.

Not only is a healthy fish population a good measure of good water quality in itself, but a wonderful benefit. Significantly, the potential importance of the fishery economy has been estimated to exceed the economic value of timber in Northern California since the early 1980s. Certainly, Tribal communities and the public need a healthy fishery.

One of the great frustrations of trying to protect anadromous fish populations in prior years was the fact that the Clean Water Act was not being enforced with regard to non-point source pollution. Now that the Act has been ruled to include such pollution since 2002, agencies and scientists should be actively pursuing goals and standards that actually make a difference in water quality. If "TMDLs serve as a link in an implementation chain," as the court noted above, it is your obligation to improve standards so California can actually ameliorate quality in the Klamath Basin, instead of continuing the frustrating charade that has taken place in the course of my lifetime.

Thanks for your attention to these comments, which I ask be incorporated into the public record at your agency.

Sincerely,

Margaret Draper

Margaret Draper

Cc to: Donald Koch

Dean Estep
P. O. Box 2179
Ft. Bragg, Ca., 95437
707 - 964 - 3700

Bob Williams
Department of Fish and Gme
601 Locust Street
Redding, Ca. 96001

re: Scott and Shaster River Watershed ITP and Master, Streambed Alteration...

Dear Mr. Williams:

I, would start by saying that I, strongly oppose this master streambed alteration.
This agreement is so vague how can there be a honest E.I.R., how could this be in compliance with CEQA.
To suggest incidental take permits and more water deversions is outrages.

The sub-permittee must submit plans to CDFG for review and approval. How can this be in compliance with (CEQA)?
It sounds like you sign and we'll fill in the blanks later. "NO THANK-YOU"

The Shasta and the Scott are part of the Klamath watershed. Which has been used to destroy the commercial salmon industry.
The flow in the Shasta is already to low, with temperatures that are lethal to salmon. I see nothing in your report about chinook salmon, does this mean you don't need a I.T.P. to kill them?

It sounds like you are trying to under mine what the north regional water board is doing.

The idea of bulldozers, backhoes and other heavy equipment in and around the Scott and the Shasta Rivers at any time of the year is adding more degradation to the already troubled Klamath River.!!

If you would like pictures to show the impact this has had on Fort Bragg and the commercial salmon fishermen?

I, would be happy to send them. They just ground up 2 more salmon boats and hauled them off in large dumpsters
to hazard waste dumps.!!

Sincerely,
Dean Estep
Commercial Salmon Fisherman:

Dec 08 06 02:43p Dean Estep 707 9642665 p.1

Scott River Program Workshop

SHASTA RIVER SCOTT RIVER WATERSHED–WIDE PERMITTING PROGRAMS
ENVIRONMENTAL IMPACT REPORTS

The public is invited to provide comment or concerns related to the Shasta River/Scott River Watershed Project.

Name: Don Gutleben

Address:

City, State, Zip:

Telephone:

E-mail:

Comments may be submitted tonight or mailed to:

Mr. Bob Williams,
Staff Environmental Scientist

Conservation Planning (CDFG)
601 Locust Street
Redding, CA 96001

(530) 225-2365 (phone)
(530) 225-2381 (fax)

COMMENT: The fish are going through the screens & getting stuck - they can't get back through. They are living in the ditch & not going back through. Actually those JUNK fish are TROUT!

The "junk fish" are still a valuable food source for other species of animals.

Thank you for your participation!

Scott River Program - Workshop
10/25/06

Received @ Shasta River workshop 10/24/06

SHASTA RIVER SCOTT RIVER WATERSHED–WIDE PERMITTING PROGRAMS
ENVIRONMENTAL IMPACT REPORTS

The public is invited to provide comment or concerns related to the Shasta River Watershed Project.

Name: Justin Ly

Address:

City, State, Zip:

Telephone:

E-mail: justin.ly@ca.usda.gov

Comments may be submitted tonight or mailed to:

Mr. Bob Williams,
Staff Environmental Scientist

Conservation Planning (CDFG)
601 Locust Street
Redding, CA 96001

(530) 225-2365 (phone)
(530) 225-2381 (fax)

COMMENT: Pg. 7 of Initial Study – water diversion is covered if ag operator uses Water for domestic use. Why not cover domestic use (if theres any) regardless of whether the user is an ag operator or not?
Pg. 36 CA red legged frog – I'm not aware of CA red-legged frogs in our area, but it never hurts to check. Will there be surveys done to assess/confirm, ~~at~~ and if so, what avoidance, minimization and/or mitigation measures will be implemented?
Pg. 37 – Coho Recovery Strategy is the recovery plan so the statement that the "Recovery Strategy is the preliminary step toward a state recovery plan" is incorrect.

Thank you for your participation!

>>> DON MEAMBER <dmeamber@sbcglobal.net> 11/4/2006 12:06 PM >>>
Hello Bob,

I am Don Meamber, a rancher, and met you at the Scoping Meeting in Yreka recently. My ranch pumps from the Shasta R. and buys water from Montague Water Conservation District and I am on the Shasta Valley RCD Board. I have a few comments regarding shortages in the Draft ITP. For example on page 19 concerning Fish Screens it states:

"2. Any unscreened diversion in the Program Area operated by a shall have a fish screen installed on or in the diversion no later than four years from the effective date of the Permit...."

Then on page 25 for the Montague Water Conservation District the Draft states:

"In addition, MWCD shall prepare a feasibility study to investigate the design and implementation of fish screens on both the Parks Creek and Little Shasta River diversion."

The MWCD is planning on being a subpermitee and # 2 above says all unscreened diversions will be screened in four years. Sounds like the Draft is meaning: "except for the two diversions of MWCD unless the feasibility study finds those two would be recommended and possible." I am concerned that the petitioners who forced the Coho listing will make an issue of why the Water District is slipping through with a feasibility study, while everyone else must screen in four years.

Another issue of concern to me and the rest of the Board is something the DFG has not addressed in the Draft. The cost of implementing the program, with costs divided among the subpermitees. This is totally unfair. The three big water districts might only pay the same amount as each small user along the River and tributaries. Since the water districts take the lion's share of the water out of the River, they should pay their share of the water, or more properly the entire cost of managing the Permit. The landowners along the streams (two of the districts own no land) will have to bear the entire load of the mitigation projects. Even if grants cover the costs of them, these riparian ranches will have to put up with the work being done and the inspections. The water districts will face little of this.

The DFG should not leave this up to the volunteer Board of the Shasta Valley Resource Conservation District to vote on. CEQA needs to find that DFG must be involved in the decision since the DFG forced the issue of needing an Incidental Take Permit along with the Coho listing. The water districts' water users greatly outnumber the landowners along the streams and will not want to pay for implementation of the Permit, when nearly everything must be done on the riparian owners' properties. The riparian users may end up pulling out of the Permit when they find out how much it will cost them for a problem created largely by the big water districts by dewatering the River. Then the whole Permit will collapse, with law suits to follow.

Hope you can make CEQA recommendations for handling these unresolved issues.

Don Meamber

The public is invited to provide comment or concerns related to the Shasta River/Scott River Watershed Project.

Name: Danielle Quigley
Address: 8937 Horse Range Ln
City, State, Zip: Etna, CA 96027
Telephone: 530 467 3247
E-mail: deerbrush@sisqtel.net

Comments may be submitted tonight or mailed to:

Mr. Bob Williams,
Staff Environmental Scientist

Conservation Planning (CDFG)
601 Locust Street
Redding, CA 96001

(530) 225-2365 (phone)
(530) 225-2381 (fax)

COMMENT: This EIR should focus on currently existing areas of key (A) coho habitat (yokel 2005, Quigley 2005), and identify mitigation to ensure protection of those areas. A particular concern is the use of heavy equipment instream to maintain diversions please ensure that measures are identified to keep them out of stream during key periods (ie identified spawning period Nov 15 - Jan 1) ~~and~~ and critical low flow rearing period ~ eg when key reaches become disconnected. If it is within the scope of the EIR, please identify best possible practices or standards for gravel push-up dams, etc.
[(A) also key areas of Chinook spawning habitat]

Thank you for your participation!

Scott River Program
Scoping meeting 10/25/06