



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OREGON 97232

Refer to NMFS ECO#: WCRO-2020-03651

March 15, 2021

MEMORANDUM FOR: Placer County Habitat Conservation Plan Project File
(Incidental Take Permit #25641)
(ARN: 151422-WCR2021-SA00059)

FROM: Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

SUBJECT: Intra-Service Endangered Species Act section 7 Consultation
(WCR-2020-00XXX) for the Issuance of section 10(a)(1)(B)
Incidental Take Permit for the Placer County Conservation
Program Habitat Conservation Plan authorizing take of California
Central Valley steelhead (*Oncorhynchus mykiss*), Central Valley
fall-run Chinook salmon (*O. tshawytscha*), and Central Valley late
fall-run Chinook salmon (*O. tshawytscha*) and documentation of
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Response

The attached biological opinion and essential fish habitat (EFH) consultation (Attachment 1) represent NOAA's National Marine Fisheries Service (NMFS) West Coast Region, Endangered Species Act sections 7(a)(2) and (a)(4) biological opinion on the Placer County Conservation Program Habitat Conservation Plan (PCCP), dated May 22, 2020. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402; 84 FR 44976, 45016).

The attached also includes a Magnuson-Stevens Fishery Conservation and Management Act EFH consultation for the proposed activities. NMFS assessed the effects of the proposed issuance of an incidental take permit (ITP) to Placer County, which would authorize take of Covered Species for Placer County's Covered Activities, and result in the implementation of the habitat conservation plan (HCP). Implementation of the HCP will minimize and mitigate for adverse effects from Covered Activities on Covered Species to the maximum extent possible. The Covered Species addressed in this opinion are the distinct population segment of California Central Valley (CCV) steelhead, Central Valley (CV) fall-run Chinook salmon evolutionarily significant unit (ESU), and CV late fall-run Chinook salmon ESU.

NMFS has concluded that the proposed issuance of an ITP to Placer County and implementation of the PCCP is not likely to jeopardize the continued existence of CCV steelhead, CV fall-run

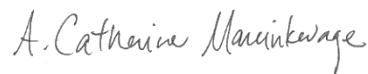


Chinook salmon, or CV late fall-run Chinook salmon nor is it likely to result in the destruction or adverse modification of its designated critical habitat.

NMFS also concludes that the issuance of an ITP to Placer County and implementation of the HCP will result in adverse effects to Pacific salmon EFH. However, these adverse effects will be offset to a degree with the implementation of best management practices and conservation measures in the HCP, such that additional conservation recommendations are not needed or provided.

Please contact Neal McIntosh at the NMFS California Central Valley Office at (916) 930-5647 or via email at neal.mcintosh@noaa.gov, if you have any questions concerning this consultation, or if you require additional information.

Sincerely,



Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

Enclosure

cc: File: 151422-WCR2021-SA00059

Ms. Stephanie Jentsch, USFWS Senior Wildlife Biologist, stephanie_jentsch@fws.gov

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Attachment (1)



UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 West Coast Region
 1201 NE Lloyd Boulevard, Suite 1100
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Endangered Species Act section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Response
 Placer County Conservation Program Habitat Conservation Plan

National Marine Fisheries Service (NMFS) Environmental Consultation Organizer Number:
 WCR-2020-03651

Action Agencies: NMFS, United States Fish and Wildlife Service, United States Army Corps of Engineers

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
California Central Valley steelhead (<i>Oncorhynchus mykiss</i>) Distinct Population Segment	Threatened	Yes	No	Yes	No
Central Valley (CV) fall-run Chinook salmon (<i>O. tshawytscha</i>) evolutionarily significant unit (ESU)	Not listed	Yes	No*	Yes**	No**
CV late fall-run Chinook salmon (<i>O. tshawytscha</i>) ESU	Not listed	Yes	No*	Yes**	No**

* - If this species becomes listed during the permit term.

** - If critical habitat for this species is designated during the permit term.

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	No

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By:

A. Catharine Marcinkevage

Cathy Marcinkevage
 Assistant Regional Administrator for California Central Valley Office

Date: March 15, 2021

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LIST OF ACRONYMS AND ABBREVIATIONS

ARPS – American River Pump Station
BMPs – best management practices
°C – degrees Celsius
CARP – county aquatic resources program
CCV – California Central Valley
CDFG – California Department of Fish and Game
CDFW – California Department of Fish and Wildlife
CEQA – California Environmental Quality Act
CESA – California Endangered Species Act
CFR – Code of Federal Regulations
cfs – cubic feet per second
CRD – conservation and rural development
CRMP – coordinated resource management plan
CV – Central Valley
CWA – Clean Water Act
CWPP – community wildfire protection plan
dB – decibel
DO – dissolved oxygen
DPS – distinct population segment
DQA – Data Quality Act
DWR – California Department of Water Resources
EFH – essential fish habitat
EIR – environmental impact report
EIS – environmental impact statement
EPA – Environmental Protection Agency
ERP – ecosystem restoration plan
ESA – Endangered Species Act
ESU – evolutionarily significant unit
EXR – existing reserves and other protected areas
°F – degrees Fahrenheit
FEIS/R – final environmental impact statement/environmental impact report
FMP – Fishery Management Plan
FR – Federal Register
HAPC – habitat area of particular concern
HCP – habitat conservation plan
HGMP – hatchery and genetic management plans
HUC – hydrologic unit code
ILF – in-lieu fee
ITS – incidental take statement
IWM – instream woody material
LIDS – low impact development standards
LOPs – letters of permission
MSA – Magnuson-Stevens Fishery Conservation and Management Act
NCCP – natural community conservation plan
NEPA – National Environmental Policy Act

NID – Nevada Irrigation District
NMFS – National Marine Fisheries Service
NPDES – national pollutant discharge elimination system
NOAA – National Oceanic and Atmospheric Administration
NTU – nephelometric turbidity units
OHWM – ordinary high water mark
opinion – biological opinion
PAH – polycyclic aromatic hydrocarbon
PBF – physical or biological feature
PCA – Placer Conservation Authority
PCCP – Placer County Conservation Program
PCE – primary constituent element
PCFCWCD – Placer County Flood Control and Water Conservation District
PCWA – Placer County Water Agency
PFG – potential future growth
PG&E – Pacific Gas and Electric
PGP – programmatic general permit
RAA – reserve acquisition area
RGP – regional general permit
RMS – root mean square
RPMs – reasonable and prudent measures
SEL – sound exposure level
SR – state route
SSWD – South Sutter Water District
SWPPP – stormwater pollution prevention plan
USACE – United States Army Corps of Engineers
USC – United States Code
USGS – United States Geological Survey
USFWS – United States Fish and Wildlife Service
VSP – viable salmonid population
WOUS – waters of the United States
WPWMA – Western Placer Waste Management Authority
WRSL – Western Regional Sanitary Landfill
WWPI – Western Wood Preservers Institute
WWTP – wastewater treatment plant

1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into sections 2 and 3, below.

1.1. Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 *et seq.*), and implementing regulations at 50 CFR 402, as amended.

Section 10(a) of the ESA provides exceptions to the section 9 prohibitions on take of Covered Species via two kinds of permits (16 U.S.C. § 1531 *et seq.*). Section 10(a)(1)(A) permits authorize the take of listed species for scientific purposes or to enhance the propagation or survival of listed species. Section 10(a)(1)(B) permits authorize the incidental take of listed species caused by otherwise lawful activities.

Section 10(a)(2)(A) of the ESA, allows an applicant to develop a habitat conservation plan (HCP) that meets specific requirements identified in section 10(a)(2)(A) of the ESA. Any habitat conservation plan must specify: (i) the impact which will likely result from such taking; (ii) what steps the applicant will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps; (iii) what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized; and (iv) such other measures that the Secretary may require as being necessary or appropriate for purposes of the plan.

If these statutory requirements are met, then the applicant can apply to NMFS for an Incidental Take Permit (ITP) pursuant to section 10(a)(1)(B) that would allow for the incidental take of ESA-listed species while carrying out an otherwise lawful activity. Under section 10(a)(1)(B), if the Secretary finds, after opportunity for public comment, with respect to a permit application and the related conservation plan that: (i) the taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the plan will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (v) the measures, if any, required under subparagraph (A)(iv) will be met; and the Secretary has received such other assurances as s/he may require that the plan will be implemented, the Secretary shall issue the permit. As described in the permitting provisions of the ESA, the permit shall contain such terms and conditions as the Secretary deems necessary or appropriate to carry out the purposes of this paragraph, including, but not limited to, such reporting requirements as the Secretary deems necessary for determining whether such terms and conditions are being complied with.

In August 2019, Placer County submitted an incidental take permit (ITP) application with their Placer County Conservation Program Habitat Conservation Plan (PCCP) and Natural Community Conservation Plan (NCCP) for potential future growth and conservation measures to mitigate for that growth for a 50-year permit term. The U.S. Fish and Wildlife Service (USFWS)

is the lead Federal agency on the PCCP, NMFS is a cooperating agency along with the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency. On June 21, 2019, in accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) approved a draft HCP/NCCP and issued a draft joint environmental impact statement/environmental impact report (EIS/EIR) to evaluate the effects of the proposed action of issuing an ITP under section 10(a)(1)(B) of the ESA. USFWS solicited public comments on the draft EIS/EIR until August 20, 2019, and have addressed comments in the final EIS/EIR that was released on May 22, 2020, with a 30-day public comment period.

When considering issuance of an ITP, NMFS must consult internally under section 7 of the ESA to ensure that issuance of the permit, and subsequent implementation of the PCCP, does not appreciably reduce the likelihood of survival and recovery of ESA-listed species. In compliance with section 7(a)(2) of the ESA, in this opinion, NMFS analyzed the effects of the issuance of an ITP for the PCCP, exempting incidental take of ESA-listed California Central Valley (CCV) steelhead for the implementation of Covered Activities.

Central Valley (CV) fall-run and CV late fall-run Chinook salmon are not species listed under the ESA, and no Federal permit is needed to incidentally take them, but there may be a change in listing status during the permit period. If CV fall-run and CV late fall-run Chinook salmon, henceforth referred to as non ESA-listed salmonids, are listed as threatened or endangered in the future, then the ITP, which includes all Covered Species, would become effective immediately for these species.

NMFS also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 *et seq.*) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [<https://repository.library.noaa.gov/welcome>]. A complete record of this consultation is on file at the California Central Valley Office.

1.2. Consultation History

- The applicants began developing the PCCP with assistance from USFWS in 2000.
- NMFS became involved in the PCCP in 2005 as a cooperating agency, due to the inclusion of CCV steelhead, CCV steelhead critical habitat, CV fall-run Chinook salmon, CV late fall-run Chinook salmon, and EFH for Pacific salmon in the plan.
- Between 2008-2012, Placer County paused development of the HCP.

- On June 21, 2019, USFWS published a notice of availability of a draft joint HCP/NCCP and draft EIS/EIR for this project to the Federal Register for public comment and review with a 60-day public comment period.
- USFWS published a final EIS to the Federal Register on May 22, 2020, with a 30-day public comment period.
- On December 2, 2020, USFWS signed their biological opinion for the PCCP. NMFS determined this constituted a complete initiation package, and consultation was initiated for the issuance of an ITP for the PCCP.

1.3. Proposed Federal Action

Under the ESA, “action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02).

Under MSA, Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910).

The proposed action is the issuance of an ESA ITP by NMFS. The ITP would require the implementation of the PCCP, which contains a series of conservation strategies to minimize and mitigate to the maximum extent practicable the effects of the Covered Activities on Covered Species during the duration of the ITP. The term of the proposed ITP is 50 years, unless the permit is terminated before its expiration and pursuant to applicable regulations.

The ITP would exempt incidental take of threatened CCV steelhead. If CV fall-run and late fall-run Chinook salmon are listed as threatened or endangered in the future, then the ITP would become effective immediately for these species. Within the PCCP and for the purposes of this BO, these three species are referred to collectively as the “Covered Species”.

The ITP would allow incidental take of the Covered Species resulting from the following covered actions: (1) activities described in the PCCP during the ITP duration (“Covered Activities”); and (2) activities associated with conservation strategies identified in the PCCP (Placer County 2020b), in accordance with the statutory and regulatory requirements of the ESA.

As a cooperating agency for the PCCP, USACE proposes to issue Clean Water Act (CWA) 404 permits for activities included in the Covered Activities for this HCP.

We considered, under the ESA, whether or not the proposed action would cause any other activities that would have consequences on listed fish species and their designated critical habitat. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. We determined that the proposed action would cause public use of trails and other park facilities. Public uses of trails and parks include hiking, running, biking, horseback riding, fishing, picnicking, wildlife viewing, and photography. The proposed action may also result in off-trail public use of areas within salmonid habitat, such as walking, wading, swimming, and playing with dogs.

1.3.1. Placer County Conservation Program

The PCCP applies to western Placer County and specific areas where conservation activities will take place in neighboring Sutter County. The goal of the PCCP is to provide an effective framework to protect, enhance, and restore the natural resources in specific areas of western Placer County, while streamlining environmental permitting for Covered Activities. Within this framework, the PCCP will achieve conservation goals, comply with State and Federal environmental regulations, accommodate anticipated urban and rural growth, and permit the construction and maintenance of infrastructure needed to serve the county's population.

The PCCP includes three separate, complementary components that support two sets of State and Federal permits:

- Western Placer County Habitat Conservation Plan and NCCP, referred to by Placer County as the HCP/NCCP or “plan” and referred to in this opinion as PCCP. Placer County's plan is a joint HCP and NCCP that will protect fish, wildlife, and their habitats and fulfill the requirements of the Federal ESA and the California Natural Community and Conservation Planning Act (NCCP Act).
- Western Placer County Aquatic Resources Program, referred to by Placer County as the CARP. The CARP will protect streams, wetlands, and other water resources and fulfill the requirements of the Federal Clean Water Act (CWA) and analogous State laws and regulations.
- An in-lieu fee (ILF) program, which will provide wetland mitigation credits that can fulfill compensatory mitigation requirements under section 404 of the CWA by payment of a fee. The ILF will provide compensatory mitigation for impacts to aquatic resources for all projects and activities that are covered under the HCP/NCCP and the CARP.

The PCCP includes a conservation strategy to mitigate effects on Covered Species. The conservation strategy provides for the conservation and management of Covered Species and their habitats. The PCCP will allow issuance of ITPs under the ESA and the NCCP Act by NMFS, USFWS, and CDFW to the local jurisdictions. The permittees will then be able to use those permits for their own operations, maintenance, and capital projects. The permittees will also be able to extend the incidental take exemptions to private entities conducting activities covered by the PCCP and under their jurisdiction.

1.3.2. Permittees and Participating Special Entities

Permittees for the PCCP are:

- Placer County
- City of Lincoln
- South Placer Regional Transportation Authority (SPRTA)
- Placer County Water Agency (PCWA)
- Placer Conservation Authority (PCA), which was created to implement the PCCP and the CARP on behalf of the other permittees

The PCCP allows entities that are not permittees to participate in the PCCP. This process, described in further detail in section 8.9.4 of the PCCP (USFWS and Placer County 2020), allows public agencies or private parties to receive exemptions for incidental take for defined activities by committing to comply with the PCCP and the permits under a binding agreement with the PCA. Public agencies and private entities may seek to become participating special entities over the life of the PCCP. The PCA will determine whether to extend exemptions for incidental take to potential participating special entities on a case-by-case basis, in accordance with the PCCP and its permits. Based on expressed interest the following three public agencies are likely to seek to become participating special entities for the PCCP:

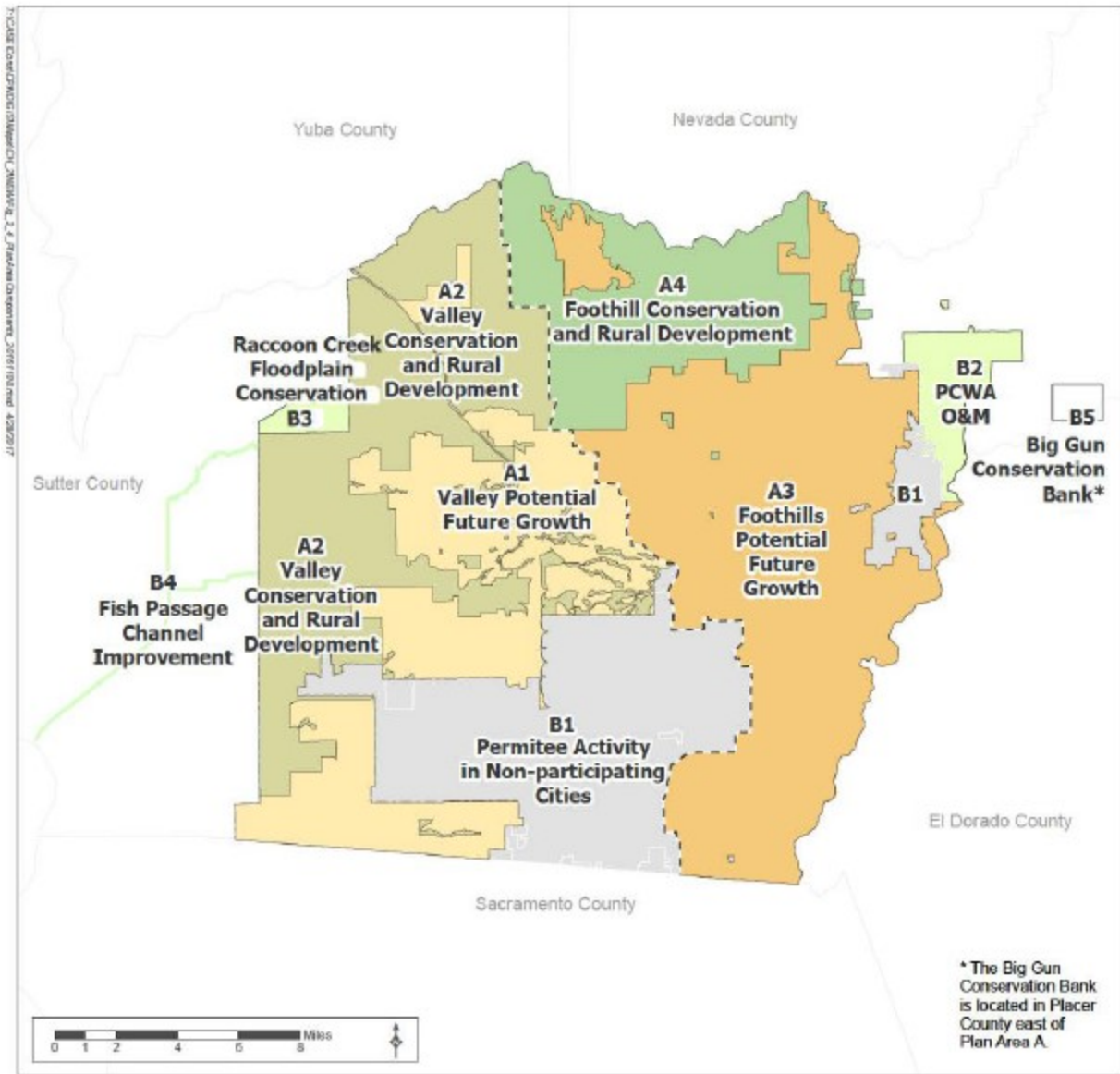
- Western Placer Waste Management Authority (WPWMA), referred to as “Authority” within the PCCP (Placer County 2020b)
- Placer County Flood Control and Water Conservation District (PCFCWCD), referred to as “District” within the PCCP (Placer County 2020b)
- City of Roseville

1.3.3. Covered Activities

Covered Activities include programs or actions that occur repeatedly in one location or throughout the permit area as well as projects, which are well-defined actions that occur once in a discrete location. Covered Activities are based in part on geographical location. The plan area is split into two areas: Plan Area A and Plan Area B. Plan Area A, A1–A4, is the main focus of the PCCP and where all future growth and most of the Covered Activities will take place. Plan Area A will be covered by all of the PCCP permits and all Covered Activities may occur there. Plan Area B, B1–B5, includes several specific additional areas where only specific Covered Activities may occur. The entire plan area and its components are shown in Figure 1.

Covered Activities are split into seven categories by type and by geographical area. The PCCP includes the following categories:

- Valley Potential Future Growth (PFG)
- Valley Conservation and Rural Development (CRD)
- Foothills PFG
- Foothills CRD
- Regional Public Programs
- In-stream Programs
- Conservation Programs



Sources: Placer County, 2014; MND | TPA 2019

Plan Area A

- A1. Valley Potential Future Growth
- A2. Valley Conservation and Rural Development
- A3. Foothills Potential Future Growth
- A4. Foothill Conservation and Rural Development

Plan Area B Components

- B1. Permittee Activity in Non-Participating Cities: Public program or conservation activities undertaken by the Permittees.
- B2. PCWA O&M: PCWA Zone 1: Operations and Maintenance (O&M) for existing facilities east of Auburn plus adjacent Lake Theodore reservoir.
- B3. Raccoon Creek Floodplain Conservation: Watershed protection and stream restoration activities along Raccoon Creek floodplain in a portion of Sutter County.
- B4. Fish Passage Channel Improvement: Fish Passage Channel Improvement: Selective in-stream work on a portion of 33 miles of channels west of Placer County in Sutter County.
- B5. Big Gun Conservation Bank: Conservation actions for California red legged frog in Placer County on the Big Gun mitigation bank east of Auburn.

-- Valley/Foothill Divide

Figure 1. Western Placer County and the PCCP plan area, from figure 2-4 of the PCCP (Placer County 2020b).

1.3.3.1. Valley PFG (A1)

This category includes all ground- or habitat-disturbing projects and activities that occur in component A1, see Figure 1. This category includes public and private activities. It includes rural and urban land uses and the use, construction, demolition, rehabilitation, maintenance, and abandonment of typical public facilities, consistent with the implementation of local general plans, community plans, area plans, specific plans, and local, State, and Federal laws. Acquisition of reserve lands and conservation activities may occur in the Valley PFG, primarily in the PCCP-defined stream system.

Land uses consistent with urban and suburban general plan designations include the following:

- Urban development (*e.g.*, residential, commercial, office/professional, industrial, public/quasi-public);
- Transient lodging (*e.g.*, hotels/motels and recreational vehicle parks);
- Service uses (*e.g.*, banks and financial services, professional offices, medical services, daycare facilities, educational facilities, and business support services);
- Public facilities (*e.g.*, new fire stations, police/sheriff stations and substations, community policing centers, communications facilities (including antennae, towers, and equipment facilities), public administration centers, convention centers, theatres, community centers, concert venues, community gardens, and concession buildings);
- Recreational facilities (*e.g.*, regional parks, neighborhood parks, dog parks, soccer fields, golf courses, indoor and outdoor sports centers, recreational centers, trails, golf courses, racetracks, campgrounds, and associated infrastructure including roads, bridges, parking areas, and restrooms);
- Funeral/interment services (*e.g.*, mortuaries, crematorium, columbaria, mausoleums, and similar services when in conjunction with cemeteries);
- Other urban/suburban uses (*e.g.*, activities consistent with the local general plan and zoning ordinances of Placer County or the City of Lincoln, which are similar in nature to the uses listed above);
- Land use consistent with rural and agricultural general plan designations (*e.g.*, urban and suburban general plan designations also allow land uses listed in the valley CRD section below, also in table 2-7 of the PCCP (Placer County 2020b);
- Public facilities consistent with rural and agricultural general plan designations (*e.g.*, urban and suburban general plan designations also allow public facilities listed in the foothills PFG section below, also in table 2-8 of the PCCP (Placer County 2020b).

Public use of trails and other park facilities is not a Covered Activity of the PCCP, however it is considered in this opinion as an “other activity”, see section 1.3 above, as it would not occur but for the proposed action, and is reasonably certain to occur.

The City of Lincoln and Placer County have developed several planning documents that outline strategies and projects in accordance with current general plans. To the extent that these plans are consistent with the goals of the PCCP, implementation of these planning documents will be covered by the PCCP. Examples of current planning documents in the valley PFG include the following, which can be found at <http://www.ci.lincoln.ca.us/> or <http://www.placer.ca.gov/planning>:

- City of Lincoln General Plan
- Placer County General Plan
- Dry Creek/West Placer Community Plan
- Sunset Industrial Area Plan
- Sheridan Community Plan
- Placer Vineyards Specific Plan
- Regional University Specific Plan
- Riolo Vineyards Specific Plan
- City of Lincoln's Bikeways Master Plan
- 2001 Placer County Regional Bikeway Plan

Additional area plans, community plans, specific plans, and updates to comprehensive general plans will be developed over the course of the permit term. The general plans, specific plans, and implementing zoning may be changed within valley PFG (A1) over the course of the PCCP permit term to accommodate certain growth scenarios by allowing the following:

- Changes in allowed land use type;
- Increased land use intensity;
- Increased residential density.

1.3.3.2. Valley CRD (A2)

This category includes all ground- or habitat-disturbing projects and activities that occur in the valley in the Valley CRD, A2, component of the PCCP area, see Figure 1. This represents the valley reserve acquisition area (RAA) and existing reserves and other protected areas (EXR), but excludes the Valley PFG. Covered Activities here include rural-residential uses and a few types of agriculture-related activities, which are subject to approval by the City of Lincoln or Placer County. The Valley CRD area is where most of the PCCP conservation objectives for the valley will be implemented. PCA acquisition and management of reserve lands in the RAA is a Covered Activity described in section 1.3.3.6, in-stream activities.

As stated in the PCCP (Placer County 2020b), activities in the Valley CRD area must be consistent with designations in the general plans of the City of Lincoln and Placer County. Rural development activities covered by the plan include:

- Rural residential (*e.g.*, single-family homes at a density less than one dwelling per 2.3 acres. This includes privately owned roads, bridges, driveways, emergency access roads, clearing land for a range of rural residential land use activities, and other features commonly associated with rural dwelling units and use of land in rural settings.);
- Public/private recreational facilities (*e.g.*, neighborhood parks, dog parks, soccer fields, golf courses, indoor and outdoor sports centers, recreational centers, open space and passive recreation facilities, trails, golf courses, racetracks, campgrounds, and associated infrastructure including roads, bridges, parking areas, and restrooms as well as maintenance facilities);
- Private facilities of public assembly (*e.g.*, churches, convention centers, theaters, rural recreational uses (*e.g.*, equestrian facilities), community centers, concert venues, community gardens, and concession buildings);
- Transportation facilities (*e.g.*, new capital facility construction, roads, road widening, shoulder improvements, bike lane construction, bridge replacement/widening, culverts, transit facilities, and park and ride facilities);
- Agricultural facilities and uses (*e.g.*, plant nurseries, greenhouses, wine production, wineries, equestrian facilities, farm equipment sales, community centers, and outdoor retail sales. This may include nurseries, Christmas tree farms, ornamental plant nurseries, dairies, and feedlots, if a discretionary permit is required.);
- Food production facilities (*e.g.*, industrial/manufacturing uses associated with food/beverage production and agricultural support services);
- Agricultural uses requiring conditional/minor use permits (*e.g.*, new intensive agriculture that requires a conditional/minor use permit consistent with local general plans, such as commercial equestrian facilities, dairy and swine operations, equestrian event facilities, and wineries);
- Fuel load modifications and treatments (*e.g.*, fuel load modifications and treatments consistent with Placer County Community Wildfire Protection Plan, Placer County Local Hazard Mitigation Plan, Placer County Strategic Plan for Biomass Utilization Program, local ordinances, and Public Resources Code 4291);
- Vegetation management (*e.g.*, fuel reduction (including hand and mechanized removal and controlled burns), tree removal and pruning, grazing activities, invasive vegetation control/removal, hazardous tree work, weed abatement, and algae control in ponds. Permittees may use herbicides and pesticides in accordance with best management practices described in chapter 6 of the PCCP (Placer County 2020b), but shall be responsible for ensuring no take of Covered Species occurs as a result of herbicide and pesticide uses);

- Public facilities (*e.g.*, new fire stations, police/sheriff stations and substations, community policing centers, libraries, public maintenance facilities (park maintenance and transportation corporation yards), public administration centers, and solid waste facilities including transfer stations and recycling centers);
- Non-residential development in rural areas (*e.g.*, telecom facilities and small utility facilities. Solar energy projects in rural areas are covered by the PCCP as long as their effects on Covered Species and natural communities are consistent with the effects evaluation in PCCP Chapter 4, Effects of Covered Activities (Placer County 2020b). Requires approval from Placer County or the City of Lincoln);
- Other rural uses (*e.g.*, other rural uses consistent with the local general plan and zoning ordinances of Placer County or the City of Lincoln, that are similar in nature to the uses listed above. Such proposed uses must share characteristics in common with the uses listed above and are not of greater intensity or density or generate more environmental effects.);
- Conservation activities (*e.g.*, acquisition or operation of land for use as a biological reserve or mitigation bank).

General plans, specific plans, and implementing zoning may be changed over the course of the PCCP permit to allow changes in allowed land use type in A2, Valley CRD, so long as the following terms are met:

- The land use remains rural or agricultural or compatible with rural or agricultural general plan designations,
- Land use intensity is not increased,
- Residential density is not increased.

Activities that do not meet the criteria listed above are not prohibited by the PCCP, but they are not specifically covered by the PCCP. Project proponents who seek approvals or entitlements inconsistent with the above criteria cannot receive take coverage under the PCCP and must apply for take authorization directly from the relevant State or Federal agencies.

1.3.3.3 Foothills PFG (A3)

This category includes all ground- and habitat-disturbing projects and activities that occur in A3, Foothills PFG, see Figure 1. Future growth in the foothills is expected to be lower in magnitude and density than valley future growth. Portions of the Interstate 80 (I-80) corridor and outlying areas around Auburn and along state route (SR) 49 will develop at urban densities with urban land use. Most of the Foothills PFG outside the urban core is zoned for very low-density, rural-residential, and agricultural development. It is expected that most of the land area subject to future growth will be rural residential. Acquisition of reserve lands and conservation activities may occur in the foothills PFG, primarily in the stream system to benefit covered fish.

Urban and suburban use activities that may occur in the Foothills PFG are the same as those listed for Valley PFG (section 1.3.3.1). Covered Activities for Foothills PFG also include ongoing rural and agricultural uses listed in Valley CRD (section 1.3.3.2). Public facilities consistent with rural and agricultural general plan designations include:

- Water supply facilities (*e.g.*, Placer County, PCWA, and city of Lincoln water supply and conveyance facilities and appurtenances to meet the needs of residential, commercial, office/professional, public/quasi-public, and industrial uses);
- Stormwater management facilities (*e.g.*, stormwater conveyance systems, low-impact development facilities, nonpoint source reduction, detention/retention facilities, outfall structures, and other drainage improvements);
- Wastewater management facilities (*e.g.*, sewage-treatment plants, sanitary sewer systems and rehabilitation, force main and effluent line construction and maintenance, effluent discharge and reclaimed water line installation and maintenance, and pump station construction);
- Solid waste management facilities (*e.g.*, landfills, transfer stations, material recovery facilities, small-scale energy production facilities (*i.e.*, landfill gas utilization), and recycling centers);
- Public and private utilities (*e.g.*, transmission lines, telecommunications lines, and gas lines subject to the authority of permittees);
- Other (*e.g.*, other public programs as described below in section 1.3.3.5).

Actions by Pacific Gas and Electric Company (PG&E), Sacramento Municipal Utilities District, and Northern California Power Agency that are not directly subject to the authority of permittees will not be covered under this opinion.

Current plans that apply to the foothills include the following:

- Granite Bay Community Plan
- Horseshoe Bar/Penryn Community Plan
- Ophir General Plan
- Auburn/Bowman Community Plan
- Bickford Ranch Specific Plan
- Placer County General Plan

Additional area plans, community plans, specific plans, and updates to comprehensive general plans will be developed over the course of the permit term of the PCCP. Activities in the Foothills PFG are based on designations in the Placer County General Plan and Community Plans. The general plan, specific plan, and implementing zoning may be changed over the course of the PCCP permit term to allow the following in foothills PFG (A3):

- Changes in allowed land use type,
- Increased land use intensity, and

- Increased residential density.

1.3.3.4 Foothills CRD (A4)

This category includes all ground- or habitat-disturbing projects and activities that occur in the foothills RAA and EXR, collectively termed Foothills CRD (A4), see Figure 1. Most of the area consists of large parcels in woodland and rangeland and is currently zoned for large-parcel minimums. The category includes rural-residential uses and those agricultural activities that are subject to approval by Placer County. The Foothills CRD area is where most of the PCCP conservation objectives for the foothills will be implemented. PCA acquisition and management of reserve lands in the RAA is a Covered Activity described in section 1.3.3.6, in-stream activities.

Covered rural development activities are the same as those listed for Valley CRD (section 1.3.3.2). Covered public agency programs are the same as those listed for the Foothills PFG (section 1.3.3.3).

Covered rural development activities are based on designations in the Placer County General Plan. The general plan and implementing zoning may be changed over the course of the PCCP permit to allow changes in land use type in Foothills CRD (A4), so long as the following terms are met:

- The land remains in rural or agricultural use or is compatible with rural or agricultural general plan designations;
- Land use intensity is not increased; and
- Residential density is not increased.

Activities that do not meet the criteria listed above are not prohibited by the PCCP, but they are not specifically covered by the PCCP. Project proponents who seek approvals or entitlements inconsistent with the above criteria cannot receive exemptions for take under the PCCP and may not begin implementation of a project without obtaining permits from the relevant State or Federal agencies.

1.3.3.5 Regional Public Programs

Regional public programs involve construction of new facilities and operation and maintenance (O&M) of new and existing facilities. These public projects will serve the existing and future Placer County and City of Lincoln residents during the permit term. The programs are typically funded through a variety of sources, and public projects are frequently listed as capital improvement programs in adopted plans or programs. Projects could be carried out by a public agency/utility district or private developer on behalf of a public agency/utility district.

All regional public programs in Plan Area A are covered under the PCCP. Specific activities/projects in permittee activity in non-participating city jurisdiction (B1) and PCWA Zone 1 O&M (B2) are covered, as noted below. Regional public programs are divided into six categories by public facility provider, such that similar activities are grouped together:

- Transportation

- Wastewater
- Water supply (surface and groundwater)
- Solid waste management
- Public parks
- Utilities

All activities will follow the best management practices (BMPs) and avoidance/minimization measures described below.

1.3.3.5.1 Transportation

Transportation programs activities covered under the PCCP may occur anywhere within Plan Area A and as permittee activity in non-participating city jurisdiction (B1). Covered transportation activities include:

- Placer County and City of Lincoln road projects, including new lanes, new connections, extensions, widening, and realignment projects. Projects may include trails for pedestrian and bicycle use.
- Placer County and City of Lincoln roadway safety and operational improvement projects to roads, including shoulder widening and straightening of curves. Modifications to vertical and horizontal alignments. Improvements at intersections and driveway encroachments, including constructing new turning lanes, adding signals, and lengthening existing turning lanes. Also, intersection level-of-service improvements, grade separations, and sound wall installations. Projects may improve access for pedestrians and cyclists.
- Placer County and City of Lincoln maintenance of new and existing transportation facilities, including appurtenant drainage and water quality infrastructure.
- New roads constructed in association with urban or rural development will usually be installed by the developer, and Placer County or the City of Lincoln will assume ownership and maintenance.
- Metropolitan Transportation Plan 2035 and subsequent metropolitan transportation plans (projects that are located in the plan area and under the jurisdiction of the permittees).
- Other, yet undesignated major regional transportation projects.

Two major transportation projects summarized below are already planned to occur within the permit term.

Placer Parkway is a new project for an east-west roadway linking SR 70/SR 99 in Sutter County to SR 65 in Placer County. The Placer Parkway and its interchanges will be covered by the PCCP, both in Plan Area A and within permittee activity in non-participating city jurisdiction (B1). Further details on this project can be found in the PCCP (Placer County 2020b) or at <http://pctpa.net/placerparkway/>.

SPRTA plans improvements to the I-80/SR 65 interchange. The I-80/SR 65 interchange project will be covered under the PCCP in permittee activity in non-participating jurisdiction (B1). A portion of this project has already occurred, was subject to ESA section 7 consultation in 2015 (NMFS 2015), and will not be covered under the PCCP. Further details on this project can be found in the PCCP (Placer County 2020b) or at <http://8065interchange.org/>.

In addition to the two projects above, as part of the general plan, the City of Lincoln anticipates the construction of three interchanges along SR 65 in Plan Area A.

All routine road maintenance activities by permittees that occur within Plan Area A and permittee activity in non-participating city jurisdiction (B1) are covered by the PCCP. Routine road maintenance work means work performed regularly, such as every one to five years, in the plan area. PCWA will also perform routine maintenance on its facilities, including canal maintenance roads and roadway/parking lots associated with its facilities. Routine maintenance work covered under this plan includes, but is not limited to:

- Road signage maintenance or replacement;
- Traffic control device maintenance or replacement;
- Guardrail, fence, or crash cushion inspection, maintenance, or replacement. Median or shoulder barriers will be replaced with structures that are safe for vehicles and, where applicable, wildlife-friendly barriers will be used as specified in chapter 6 of the PCCP (Placer County 2020b);
- Pavement maintenance or resurfacing, including replacement of striping and markers;
- Tree trimming or removal within the road right-of-way for safety;
- Debris collection and removal on roads, trash racks, and shoulders;
- Storm and natural disaster damage repair;
- Vehicle accident repair and cleanup;
- Weed control (the use of herbicides is not covered by the Federal permits and therefore its use cannot result in take of Covered Species);
- Mowing of medians and shoulders for fire hazard reduction;
- Grading of shoulders (up to 20 feet from the edge of paved or unpaved roadways);
- Grading of existing public dirt roadways;
- Repair or replacement of retaining walls;
- Roadside drainage ditch clearing;

- Maintenance of water quality facilities (e.g., oil/grit separators or low-impact development features);
- Curb, gutter, and sidewalk maintenance, repair, retrofit, or replacement.

1.3.3.5.2 Wastewater Programs

Placer County and the City of Lincoln operate and maintain multiple wastewater treatment facilities, lift stations, and a network of collection and distribution pipelines for untreated wastewater, treated effluent for disposal, and reclaimed water for irrigation and other municipal purposes. Placer County is responsible for O&M of the sewer system in the community of Sheridan. Placer County serves areas that include unincorporated portions of North Auburn, Granite Bay, Horseshoe Bar/Folsom Lake, Penryn, Loomis, western Placer County (Dry Creek), Livoti Tract, Sunset Industrial Area, and Sheridan.

The City of Lincoln’s waste management activities are mainly in the established urban area, but will be extended to serve new urban growth, including growth in unincorporated areas covered by the PCCP. The City of Lincoln will also provide treatment of wastewater for the North Auburn, Bowman, Applegate, Christian Valley, and portions of the unincorporated communities in Meadow Vista through the Mid-Western Placer Regional Sewer Project. The Mid-Western Placer Regional Sewer Project will result in the closure of Placer County’s Sewer Maintenance District 1 Wastewater Treatment Plant and conveyance of untreated wastewater to the City of Lincoln’s Wastewater Treatment and Reclamation Facility. The maintenance of this regional pipeline, pump stations, and related infrastructure is considered a Covered Activity.

The PCCP will provide coverage for permittee wastewater projects including:

- Treatment plant construction or expansion, including installation of pipelines;
- O&M;
- Effluent discharge;
- Force main and effluent line construction and maintenance;
- Discharge and reclamation line installation; and
- Pump station construction.

Covered wastewater activities by Placer County may occur anywhere within Plan Area A or within permittee activity in non-participating city jurisdiction (B1). Wastewater projects that are currently planned can be found in table 2-9A of the PCCP (Placer County 2020b) and are incorporated by reference.

Sewer pipeline O&M includes activities within the plan area to prevent deterioration of infrastructure necessary for wastewater conveyance. Routine maintenance work is defined in the PCCP as work performed regularly, every one to five years, to maintain the functional and structural integrity of facilities. Maintenance activities will generally require trenching around existing pipelines and conducting repairs or replacing segments of pipeline. The pipelines are located in both urban and rural areas. Maintenance activities that are proposed for coverage under the PCCP include:

- Mechanical root removal, including the use of a drain snaking rotor with an auger that cuts at the tree root incursion with a rotating blade;
- Rehabilitation, repair, and/or replacement of pipelines and components including, but not limited to, air release valves, piping connections, joints, and appurtenances. Activities may include excavation to access pipelines;
- Sewer pipe sliplining is a trenchless rehabilitation of existing pipelines. Sliplining is used to repair leaks or restore structural stability to an existing pipeline. Sliplining is completed by installing a smaller “carrier pipe” into a larger “host pipe,” grouting the annular space between the two pipes, and sealing the ends;
- Replacement/repair of buried service valves, including valves within creek embankments that may require excavation and minor bank stabilization activities;
- Maintenance of pipeline turnouts, including access to pipelines;
- Replacement/repair of appurtenances, fittings, manholes, and meters;
- Wastewater vault maintenance, which includes minor repairs and debris removal;
- Wastewater meter inspections and repairs;
- Maintenance of pump stations, operation yards, utility yards, and corporation yards;
- Facility access road repairs and maintenance, which is limited to existing roads.

1.3.3.5.3. Water Supply Programs

Permittees PCWA, Placer County (for Sheridan community), and the City of Lincoln will supply present and future water users in the plan area and portions of the non-participating cities. The PCCP covers the collection and conveyance of raw water from surface and groundwater sources to treatment plants or directly to consumers. In most cases, the distribution of treated water does not require incidental take coverage. Two raw water suppliers in Placer County, Nevada Irrigation District (NID) and the South Sutter Irrigation District, are not permittees, but could participate with the PCA in a project and would be covered by the PCCP.

PCWA Covered Activities include O&M of its raw water distribution system, future capital improvement projects within the plan area, and future construction of PCWA water supply facilities to meet the needs of residential, commercial, public facility, and industrial construction within the plan area (*e.g.*, new water supply, treatment and delivery infrastructure, O&M of new water supply, treatment, and delivery infrastructure).

Covered PCWA water supply activities may occur anywhere within Plan Area A and permittee activity in non-participating city jurisdiction (B1). PCWA O&M of existing facilities is covered in PCWA Zone 1 O&M (B2). PCWA planned O&M and planned capital improvement projects are presented in Table 2-9B of the PCCP (Placer County 2020b) and are incorporated by reference.

PCWA uses a variety of canals, pipelines, and other infrastructure to distribute water to its customers throughout Placer County. Most of PCWA's raw water distribution is facilitated by gravity flow through the canal system. PCWA monitors regulating gates and staff gauges throughout the system. PCWA uses collected information to make water purchases and to adjust deliveries according to water demands and weather conditions.

Most of the water supplied by PCWA comes from surface water sources. The majority of water deliveries to PCWA's raw water distribution system depend wholly on PG&E's hydropower operations of the Drum-Spaulding hydroelectric system. PG&E's Drum-Spaulding water supply originates in the upper Yuba River basin, augmented by Bowman Lake and Lake Spaulding on the South Yuba River and Rollins Reservoir on the Bear River. Water is conveyed primarily via the Drum, Bear River, and Upper Boardman canals. PCWA has standing contracts for more than 125,000 acre-feet of water per year delivered at designated points for subsequent conveyance by PCWA to defined service areas.

The American River Pump Station (ARPS) provides an additional source of raw water. ARPS is used to pump water from the north fork of the American River into the Auburn Ravine Tunnel. The Auburn Ravine Tunnel discharges into Auburn Ravine, delivering water to downstream agricultural customers. Water can also be pumped out of the Auburn Ravine Tunnel to supply PCWA's water treatment plants.

The following O&M activities for raw water distribution are included under the PCCP:

- Adjusting or replacing orifices at delivery points;
- Yearly water delivery outages;
- Delivery schedule changes and routine flow adjustments throughout the canal system through use of check boards, temporary weirs, valve controls, and debris removal;
- Seasonal release of excess water at designated outlet locations for flood management during storm events.

PCWA performs scheduled maintenance in the canal system as needed and cleans canals on an annual basis. Maintenance activities associated with canals include clearing debris and sediment, lining leaky canal sections, repairing damaged pipes and/or flumes, and controlling vegetative growth in the canals and on the canal berms. The use of pesticides, including herbicides and rodenticides, is not covered by this opinion or by USFWS' opinion. Canal cleaning is performed during the winter months and is scheduled a month or more in advance. Canal lining is conducted throughout the year.

Other maintenance projects performed on an infrequent basis by PCWA include sediment removal from reservoirs and dams, as well as reservoir and canal berm maintenance related to damage by muskrats, beavers, and otters. The PCWA Natural Resource Management Plan, Appendix E of the PCCP (Placer County 2020c), does not consider these infrequent maintenance projects in its analyses so for this opinion, we assume that they will occur once every ten years. PCWA intends to have staff evaluate potential impacts to environmental resources from these maintenance projects and prepare environmental documents to satisfy CEQA requirements. If

these activities occur more often than once every ten years and impact covered fish species, additional ESA coverage may be required as well.

Occasionally, activities are necessary to ensure that water supplies are maintained and to prevent future problems from occurring. The maintenance activities described below are covered by the PCCP. Water supplies to the plan area come from the Yuba, Bear, and American Rivers. The Clover Valley, Ben Franklin, Caperton, Whitney, McCrary, and Mammoth Reservoirs lie within the plan area. These reservoirs contribute to the streamflows in Clover Valley Creek, Antelope Creek, Secret Ravine, and Miners Ravine. Activities that are covered under the PCCP include:

- Periodic outages for canal cleaning, repair, or sediment removal;
- Repair and replacement of treated and raw water distribution facilities, including pipeline flushing and meter replacement. These facilities include pipelines, flumes, culverts, siphons, outlet structures, flow control structures, customer delivery points, pressure-reducing stations, and appurtenances;
- Perform emergency repairs;
- Canal lining, usually with sprayed-on cementitious mortar, also known as shotcrete or gunite, and piping;
- O&M of water supply, treatment, and delivery infrastructure, including water storage tanks, pump stations, connecting transmission lines, and their appurtenances.

For PCWA emergency repairs, we assume that these will generally be of a similar scope to other repairs. If they exceed the scope of other Covered Activities and impact Covered Species in a manner not considered in this opinion, additional consultation may be required.

PCWA will undertake a number of capital projects for new surface and groundwater supply, treatment, storage, and delivery infrastructure over the term of the PCCP. These include water supply projects, groundwater wells, transmission and distribution pipelines, metering station installations, water treatment and storage facilities, corporation yards, pump stations, and facilities and administration buildings.

The largest of the capital improvement projects will be the West Placer water supply projects. This comprises the construction of water supply infrastructure components, including new or expanded diversions from the Sacramento and American Rivers, and new or expanded water treatment and pumping facilities, storage tanks, and major transmission and distribution pipelines.

The operations of the West Placer water supply projects are not a Covered Activity. However, development projects and associated public infrastructure within the plan area that will use this new water supply are covered. Therefore, the effects in the plan area associated with the West Placer water supply projects, such as effects of expansion of the water supply due to growth within the PCCP plan area, are covered by the PCCP.

O&M of Sheridan’s public water system, construction of a raw water transmission pipeline and related infrastructure, and the diversion of water will be Covered Activities under the PCCP. The Placer County Environmental Engineering and Utilities Division operates and maintains Sheridan’s public water system and provides design support as needed. As the Sheridan community grows, it may be necessary to construct a raw water transmission pipeline from either Bear River or Raccoon Creek to provide surface water for the Nader Road and Sheridan areas. The necessary capacity and resultant diversion from either of these surface water bodies will depend on the feasibility and need of the community in the plan area and will be evaluated as the need arises.

The City of Lincoln has been partnering with NID to develop a water supply system for the provisioning of treated water to future customers within the City of Lincoln General Plan boundaries and the NID service district. The source of water for the proposed project is Lake Combie, with a pipeline proposed to connect at the Combie-Ophir turnout and carry raw water west to a reservoir and treatment plant to be located in the western portion of the NID service district. The Covered Activities from the proposed project would involve the construction of approximately 16.3 miles of pipeline, raw water storage, and a water treatment plant and ongoing O&M of those facilities in Plan Area A.

1.3.3.5.4 Solid Waste Management Facility Programs

Solid waste management facility programs include O&M, expansion of existing facilities, and construction of new facilities. Covered solid waste management facility program activities may occur anywhere within Plan Area A, and transfer stations built or operated by Placer County are covered in permittee activity in non-participating city jurisdiction (B1).

The PCCP will also cover post-closure maintenance activities and the future property use as open space, which may include public recreation (*e.g.*, trails), agriculture, grazing, or other activities compatible with post-closure conditions that might be constructed in the future.

Solid waste management projects that are expected to occur within the PCCP permit term can be found in Table 2-9C of the PCCP (Placer County 2020b) and are incorporated by reference.

WPWMA, who may apply to be a participating special entity, operates the Western Regional Sanitary Landfill (WRSL). The WRSL is currently permitted for waste disposal through 2058. The landfill practices methane gas collection and WPWMA has contracted with Energy 2001 to use most of the gas to generate electricity. When the landfill reaches capacity, it will be capped to prevent liquids from coming into contact with the refuse. Landfill expansion that could take place on two adjacent properties is likely to occur during the PCCP permit term and is a Covered Activity. Solid waste activities that could take place on the existing facility property or either of the two adjacent properties as a result of the expansion include:

- Siting a new landfill;
- Producing energy through landfill gasification;
- Pyrolysis (*i.e.*, decomposition brought about by high temperatures);

- Anaerobic digestion (*i.e.*, breakdown of biodegradable material in the absence of oxygen);
- Other waste-conversion technology;
- Relocating the compost facility, recycling centers, or other drop-off facilities;
- Developing a solar array for on-site electricity demands;
- Creating an alternative fuel and/or electric vehicle fueling station;
- Providing pipeline compressed landfill gas/natural gas to third-party end users in and/or adjacent to the Sunset Industrial Area; or
- Establishing a rail spur to establish off-site transport of recyclables and household hazardous waste.

The materials recovery facility (MRF) is a WPWMA program to help Placer County communities meet California's Assembly Bill 341 mandated recycling goals of diverting at least 75 percent of the waste stream from landfills by 2020. The MRF receives and sorts through municipal and commercial waste to recover recyclable materials including wood, green waste, metals, plastics, glass, paper, junk mail, phonebooks, magazines, scrap paper, paperboard, and cardboard. Yard waste is converted to soil through a composting process. Materials that cannot be composted or recycled and marketed are disposed of at the WRSL. Ongoing operations, relocation, or construction of a new MRF will be a Covered Activity.

The Placer County Department of Public Works owns and operates the Loomis Landfill, a closed unlined Class III landfill. The landfill was closed in 1986. A closure plan was adopted in 1996 and describes how corrective actions, final closure, and post-closure maintenance activities meet the requirements of the California Code of Regulations.

Corrective actions include:

- Installation of a low-permeability cover to reduce infiltration of rainwater;
- Installation of a vegetative layer to protect the low-permeability cover to reduce erosion and minimize cracking of the cover; and
- Installation of an in-fill landfill gas control system to eliminate or reduce migration of landfill gas.

Loomis Landfill was closed in 1998. Post-closure maintenance activities will be implemented for not less than 30 years after final closure (*i.e.*, until at least 2028). Post-closure maintenance activities include:

- Maintenance and monitoring activities for the final landfill cover;
- Drainage systems;

- Vegetative cover;
- Final grading;
- Landfill gas collection system;
- Leachate collection;
- Disposal.

The post-closure land use of Loomis Landfill will be consistent with the surrounding terrain, land uses, and zoning. The site is planned to be maintained as open space, most likely as annual grassland, and may allow for recreation activities.

1.3.3.5.5. Public Recreation-serving Activities

Permittees' recreation-serving activities, including establishing and maintaining public recreation facilities, are Covered Activities, although public use of the facilities is not. Public parks and recreation activities include construction of new parks, adaptation of existing public lands for enhanced recreational access, and O&M of all facilities. Many Placer County and most City of Lincoln parks and trail facilities will be within, or close to, urban areas. Covered public parks and recreation-serving activities may occur anywhere within Plan Area A.

Crossing of streams by trails will be discussed in the in-stream activities section below (section 1.3.3.6). Passive forms of recreation may be allowed on some lands acquired for the reserve system. Construction and maintenance of trail and other recreation facilities on the reserve system will be discussed in the conservation programs section below (section 1.3.3.7).

The construction of new parks is a Covered Activity. Placer County and City of Lincoln parks will include trails, recreation facilities, and other park infrastructure including restrooms, parking areas, maintenance facilities, wildlife observation platform facilities, and education kiosks. To the extent possible, recreational facilities will utilize existing infrastructure, such as existing trails and fire or ranch roads. The Auburn/Bowman, Dry Creek/West Placer, Granite Bay, and Horseshoe Bar/Penryn Community Plans, the Dry Creek Greenway Vision Plan, and the Placer County Regional Bikeway Plans propose trail networks that will be constructed over time. As each of these plans and the Placer County General Plan are updated, trail alignments will be modified as conditions warrant. The existing Placer County fairgrounds within the City of Roseville may relocate within western Placer County. A new fairground will include multiple venues for year-round use.

Placer County and City of Lincoln will maintain and manage park and open space areas as Covered Activities within the PCCP. This includes:

- Trail and road maintenance (*e.g.*, grading, clearing, brushing, erosion control, paving, re-paving and trail restoration);
- Installation of fencing;

- Facility maintenance;
- Prescribed burns;
- Pond maintenance (including draining and dredging); and
- Invasive vegetation management (including removal of invasive species, planting of native vegetation, and livestock grazing).

If a park is to be included as part of the reserve system, details for maintenance will be provided within the reserve management plan, as described in section 5.3.2.1 of the PCCP (Placer County 2020b).

Hidden Falls Regional Park is a 1,200-acre park located between north Auburn and the City of Lincoln. Expansion of park facilities will be included as a Covered Activity under the PCCP and will include additional roads, trails, staging and parking areas, maintenance and caretaker buildings, and a nature education center. Trail connections to Placer Land Trust and Bear Yuba Land Trust properties are anticipated and will also be a Covered Activity. Public uses of the parks are not covered. Public uses of the park include hiking, running, biking, horseback riding, fishing, picnicking, wildlife viewing, and photography. Park amenities currently include a paved access road, 50-space paved parking lot, equestrian staging area, utilities, restrooms, a 60-foot emergency access bridge over Deadman Creek, and a similar bridge over Raccoon Creek.

1.3.3.5.6. Utility Line Construction and Facility Maintenance

Numerous pipelines and cables in the plan area are maintained by the permittees or by public or private utilities, natural gas companies, petroleum companies, or telecommunications companies acting under permittee authority, including franchise and encroachment within permittee-owned roadway or other rights-of-way. These private companies also operate and maintain electric substations, gas valve stations, radio broadcasting towers, and cellular telephone towers, among other facilities. Covered utility line construction and facility maintenance activities may occur anywhere within Plan Area A (Plan Areas A and B are defined in section 2.3, Action Area).

Public and private utility actions that are directly subject to the authority of a permittee are Covered Activities. Public and private utility activities that are regulated by or subject to the authority of another entity, such as the California Public Utilities Commission, are not covered by the PCCP. Some energy or water utilities may already have their own endangered species permits for their activities (*e.g.*, PG&E is developing its own HCP for O&M activities) and will therefore not require coverage under the PCCP. A utility may request coverage under the PCCP for routine maintenance and repair of existing utilities within the plan area as a participating special entity.

Maintenance or repair of linear facilities may involve vegetation clearing (*e.g.*, mowing, disking, herbicide spraying, tree trimming) or excavation of underground utility lines for inspection, maintenance, or replacement. The routine maintenance of utility lines in the plan area is a Covered Activity under the PCCP, except for the use of pesticides, which is not covered by the federal permits. Coverage for utility line or facility maintenance that takes place in the reserve

system will be decided on a case-by-case basis and the permittee may need to consult with the resource agencies as needed.

1.3.3.6 In-stream Activities

This category addresses projects that occur within streams and may result in effects on a stream, reservoir, or on-stream pond. This category includes O&M activities in the stream channel, along the streambank, and on adjacent lands at top-of-bank within the riparian corridor. Covered in-stream activities may occur anywhere within Plan Area A.

In-stream activities covered under the PCCP include:

- Urban and rural development and public program activities described above under sections 1.3.3.1 to 1.3.3.5, valley PFG through regional public programs, that overlap with the stream system and the adjacent riparian corridor, including transportation, water supply, waste management, and stormwater management;
- Bridge construction, replacement, and repair, including vehicular, train, and pedestrian bridges;
- Flood control and stormwater management, including water retention/detention facilities construction, streambed and channel debris and vegetative control and removal, channel lining of canals, canal realignment, maintenance of access roads, beaver dam removal, stormwater conveyance facilities and outfall structures, erosion/sediment control, bank stabilization, and floodplain enhancement;
- Maintenance of existing flood protection and stormwater facilities, such as drainage improvements, existing dams, armored creeks, bypass channels, and stormwater ponds. Maintenance includes trail repair, trash removal, installation of fences, accumulated sediment removal (primarily in reservoirs), road, culvert, and minor bridge repair;
- Natural resource protection, such as bank stabilization projects, restoration to reduce erosion, and fish passage enhancements;
- Erosion control projects or storm damage prevention projects that do not create new permanent structures or hardscape on the creek bank or channel. This category includes temporary flood-fighting activities to prevent storm damage (*e.g.*, sandbagging and earth-fill levees);
- Vegetation management for invasive species removal and native vegetation plantings, including the use of livestock grazing and prescribed burns;
- Reservoir fluctuations including drawdown and filling for maintenance or operational purposes (*i.e.*, not associated with a capital project);
- In-stream gauge station monitoring (installation and maintenance);
- O&M of water system facilities that are located in-stream;

- Implementation of resource management plans;
- Water utility/water supply O&M activities associated with habitat enhancement and restoration that will be conducted inside and outside the reserve system are identified in section 1.3.3.7 conservation programs;
- Implementation of the riverine and riparian conservation and management strategies of the PCCP, including cleaning/removing sediment from gravel beds and augmenting gravel to streambeds, among other in-stream conservation activities.

Some in-stream projects are intended to mitigate, enhance, or restore stream and riparian functions. Since 2013, a number of restoration activities have been undertaken in the plan area and more are expected in the future.

1.3.3.6.1. Bridge Construction and Replacement/Rehabilitation

Placer County and the City of Lincoln operate and maintain bridges within the plan area and have permit authority over privately constructed and maintained stream crossings. The existing distribution of stream crossings is shown in figure 2-10 of the PCCP (Placer County 2020b).

The lifespan of a typical bridge is approximately 50 years. Most of the bridges within the plan area will be replaced or rehabilitated during the PCCP's permit term. Additionally, as development within rural and urban areas progresses, new bridges will need to be constructed. It is estimated that there will be construction of up to 75 new bridges over the 50-year permit term. New and rehabilitated bridges will be designed and constructed consistent with Federal and State guidelines. Bridge construction and replacement/rehabilitation activities covered by the PCCP may occur anywhere within Plan Area A and permittee activity in non-participating city jurisdiction (B1).

New construction, repair, and replacement, including expansion, for all existing bridges conducted by permittees within Plan Area A and Plan Area B1 are Covered Activities. Figure 2-10 of the PCCP (Placer County 2020b) shows the location of several planned major bridge projects. Other yet-unplanned stream crossings will be associated with future growth, mainly in the PFG areas where the density of stream crossings will increase, similar to the density of crossings in the built-up portion of non-participating cities, as shown in figure 2-10 of the PCCP (Placer County 2020b).

In most cases, replacement bridges will be wider than the bridges they replace, in compliance with changing regulations. Some roads may be widened to accommodate growth in vehicular traffic, bicycles, and pedestrians. Road widening will require adding imported borrow and new asphalt, concrete, and aggregate base for pavement.

Where free-span bridges are not feasible, bridges will be built on pile foundation, cast-in-drilled-hole pile, or spread-footing foundations. Excavation for foundations may be required. Where multiple span bridges are necessary, consideration will be made to locate the piers and foundations outside of the low-flow stream channel or away from other resources when feasible. Bridge repair and rehabilitation may be similar to bridge replacement in scope, often requiring roadway widening, new deck support structures, and seismic retrofitting.

Additional detail on the estimated extent of bridge and culvert work is provided in chapter 4 of the PCCP (Placer County 2020b).

1.3.3.6.2. Flood Protection Projects

The PCFCWCD was established in 1984 by the state legislature as a special district, separate from County government, to address flood control issues arising with growth. The PCFCWCD boundaries are the same as Placer County boundaries. Covered flood protection activities may occur anywhere within Plan Area A and permittee activity in non-participating city jurisdiction (B1). It is expected that PCFCWCD will become a participating special entity and, thus, will have activities covered under the PCCP.

PCFCWCD has several projects planned to address flood protection. These projects have been identified through various programs that provide different funding mechanisms and guiding principles of how projects will be planned and designed. Table 1 provides a list of flood control projects, including flood protection capital projects, anticipated to occur within the PCCP permit term.

Table 1. Flood control projects anticipated to occur within the PCCP permit term.

Activity	Description
Scilacci Farms Regional Retention Project	Stormwater retention project with wetlands and agricultural conservation easements located north and south of Raccoon Creek immediately east of the Sutter County line. Refer to section 2.6.6.2.1 of the PCCP (Placer County 2020b) for more details, which are incorporated by reference.
Regional Retention Projects within Cross Canal Watershed	Stormwater retention projects with wetlands and agricultural conservation easements within floodplain areas of stream within the general Cross Canal watershed, including Pleasant Grove Creek, Curry Creek, Auburn Ravine, Markham Ravine, and Raccoon Creek.
Dry Creek Watershed Flood Control Plan – Regional Detention Projects	Both on- and off-channel stormwater detention projects located throughout the Dry Creek watershed. Refer to section 2.6.6.2.3 of the PCCP (Placer County 2020b) for more details, which are incorporated by reference.
Dry Creek Watershed Flood Control Plan – Regional Floodplain Restoration Projects	Floodplain restoration/reconnection projects located throughout the Dry Creek watershed. Refer to section 2.6.6.2.3 of the PCCP (Placer County 2020b) for more details, which are incorporated by reference.
Dry Creek Watershed Flood Control Plan – Bridge/Culvert Replacement Projects	Bridge and culvert improvement projects throughout the Dry Creek watershed.
ALERT Flood Warning System of Precipitation and Stream Level Gages	Installation, monitoring, and maintenance of remote stream data sensors throughout Dry Creek and Cross Canal watersheds.
Dry Creek Watershed Stream Channel Maintenance Program	Stream channel clearing and conveyance maintenance activities throughout flood-prone locations within Dry Creek watershed.
Operations, Monitoring, and Maintenance Activities at PCFCWCD’s Miners Ravine Off-channel Detention Basin Facility	Routine annual maintenance and monitoring as well as non-routine maintenance and operation activities at PCFCWCD’s facility located in Roseville, California.

Flood control O&M activities that may occur throughout the plan area streams include, but are not limited to, installation, monitoring, and maintenance of remote stream data sensors; stream channel clearing; vegetation and debris removal; and conveyance maintenance activities.

Many of the planned flood control capital improvements incorporate design elements that provide on-site avoidance, minimization, and mitigation for both in-stream and riparian habitat. Enhancement and creation of riparian habitat will be coupled with the removal of invasive species and planting of native species. In-stream design elements could include fish passage improvement through the removal of fish barriers, placement of fish ladders, and other in-stream habitat enhancements. Additional design elements may be incorporated to protect in-stream water quality by reducing erosion, sedimentation, and turbidity, as well as removing unauthorized storm drain outfalls. The plans summarized below have been prepared to prioritize projects within the watersheds.

Changes in agricultural practices on the Scilacci Farms property are proposed to relieve flood pressures along levees in the Cross Canal. The 456-acre Scilacci Farms property currently consists of about 330 acres in rice production, 55 acres in wheat production, a remnant 39-acre riparian valley-oak and cottonwood-willow riparian forest, a 22-acre fallow rice field restorable to riparian forest, seven acres of wetlands, and other miscellaneous agriculturally managed areas. The property provides habitat for a variety of wildlife species, including amphibians, reptiles, birds, and mammals. The proposed project will be to place the property under a conservation/flood control easement and manage the land for agricultural production, ecological function, and flood protection. In addition to these goals, the project will allow for the realization of important restoration goals on the property. Both oak woodland enhancement and riparian restoration will be part of this project. The easement and restoration work intends to provide ecological benefits including flood protection, erosion control, and water quality enhancements. The Scilacci Farms project will utilize several of the strategies recommended in the ecosystem restoration plan (ERP) for the Raccoon Creek watershed.

The Lakeview Farms volumetric mitigation facility is a capital flood control project within the unincorporated portion of Placer County that will be constructed by the City of Lincoln. This project will help ensure the protection of life and property from flooding as the City of Lincoln and Placer County grow. The City of Lincoln has purchased 456 acres north of Waltz Road in the unincorporated portion of Placer County to construct an off-channel (off Raccoon Creek) retention facility for flood control purposes. The project is being constructed in phases to passively capture flood water during a 100-year event. Phase one of the project will be developed on 160 acres retaining an additional 1,570 acre-feet of water. The site will function as a retention basin only in extreme (100-year or greater) storm events during the rainy season of October through April and will remain in rice production from approximately March through September. Raccoon Creek's peak flows can range from several hundred cubic feet per second (cfs) to more than 22,000 cfs in a 100-year event. Because the stream channel is generally shallowly incised and meandering, high-flow events are not contained within the channel and extensive overland flow occurs. It is common for flood waters of one to two feet to occur on the Lakeview Farm property. Raccoon Creek includes 33.3 river miles of channel between the Cross Canal and Dry Creek Dam. The flood reduction benefits of the planned improvements are difficult to quantify without hydrologic modeling. The Raccoon Creek ERP found that stormwater runoff from developed areas is a major source of water quality degradation in Raccoon Creek. By protecting this property from future development, stormwater runoff from the site will not be degraded due to urbanization.

The Dry Creek Watershed Flood Control Plan (Placer County 2011) is to provide PCFCWCD and other governmental agencies in both Placer and Sacramento Counties with the information and policies necessary to manage flood waters within the Dry Creek watershed, which includes Miners Ravine, Linda Creek, Secret Ravine, Antelope Creek, Cirby Creek, Clover Valley Creek, and mainstem Dry Creek. The plan evaluates existing flooding problems and identifies flood management options, as well as a funding mechanism to achieve plan recommendations. Capital project elements within this plan include on- and off-channel stormwater detention projects located throughout the watershed, floodplain restoration and reconnections, bridge and culvert improvement projects, and improvements to underground conduits and artificial and natural channels.

The Cross Canal Watershed Flood Control Plan (Auburn Ravine, Coon, and Pleasant Grove Creeks Flood Mitigation) (CH2M Hill 1993) provides PCFCWCD and other governmental agencies in Placer, Sutter, and Sacramento Counties with the information and policies necessary to manage floodwaters within the Cross Canal watershed, which includes Pleasant Grove, Curry Creek, Auburn Ravine, Markham Ravine, and Raccoon Creek. Activities associated with this plan will be covered under the PCCP, including the following:

- Flood management;
- Stormwater retention projects;
- Conservation easements over existing agricultural and wetland areas, compatible with periodic flooding, that fall in Placer County.

The plan evaluates existing flooding problems and identifies flood management options, as well as a funding mechanism to achieve plan recommendations. State and Federal grant funding, will support PCFCWCD and its co-sponsors' efforts to acquire flood and habitat conservation easements to manage and improve the floodplain and associated natural communities within this watershed. PCFCWCD's pursuit of flood and conservation easements on rice production lands will complement efforts on nearby agricultural lands, including a site protected by the California Department of Water Resources (DWR) that also provides improved floodplain and riparian protection. These nearby properties include the 138-acre Lakeview Farms Conservation project, as well as the Lakeview Farms Natural Resources Conservation Service conservation easements that are part of a larger restoration effort within the Raccoon Creek watershed. Wetlands will be reconstructed to benefit waterfowl and migratory birds that are found in the area. Acquisition of flood and conservation easements in these areas will conserve agricultural lands adjacent to Auburn Ravine and Raccoon Creek in an area of increasing development pressure. The goals of the Cross Canal Watershed Flood Control Plan are as follows:

- Quickly and efficiently provide increased volumetric storage (retention) within the existing floodplain during a 100-year flood event;
- Preserve and maintain wetlands;
- Preserve open space, providing linkages with surrounding preserve areas;
- Benefit migratory birds and wildlife;

- Maintain habitat and connectivity for State and Federal species of concern;
- Provide flood control benefits quickly and at relatively low cost per acre-foot of storage.

1.3.3.6.3. Streamside Trails and Crossings

Placer County and the City of Lincoln, as well as other non-profit entities (e.g., Placer Land Trust), lead or participate in programs to construct passive recreational trails in parks, as identified above in section 1.3.3.5.5., public recreation-serving activities. New trails are sited outside of the in-stream area to the extent possible to avoid effects on riparian vegetation and streams. However, some trails will need to cross streams and will require installation of bridges or other types of crossings. Trails may also be implemented as a component of other types of projects, such as flood protection projects or levee reconstruction. In such cases, trails will generally be sited along maintenance roads or in other disturbed areas and will not result in additional effects beyond those attributed to the main project. Streamside trail projects will be a Covered Activity under the PCCP. For more details on trail projects as a Covered Activity, see section 1.3.3.5.5., public recreation-serving activities, or section 2.6.5.5 in the PCCP (Placer County 2020b).

1.3.3.7 Conservation Programs

1.3.3.7.1. PCCP Management Activities

In addition to the projects and activities described above, the PCCP provides coverage for activities associated with the implementation of the conservation strategy. The management activities that will be used on the reserve system are described in detail in chapter 5 of the PCCP (Placer County 2020b), conservation strategy. Implementation of the conservation strategy may occur anywhere in the plan area, but most of these activities will take place within the reserve system assembled in Plan Area A. Some conservation activities may also occur outside of the reserve system, specifically as associated with in-stream conservation measures discussed above in section 1.3.3.6, in-stream activities, and in Plan Area B, Big Gun Conservation Bank (B5), for California red-legged frog.

1.3.3.7.1.1. Habitat Enhancement, Restoration, Creation, Translocation, and Reserve Management

This category includes all management measures, including habitat restoration and creation, required by the PCCP or other measures that might be necessary to achieve PCCP biological goals and objectives, summarized below in section 1.3.4 and in PCCP chapter 5 (Placer County 2020b). The PCCP's conservation strategy sets forth requirements for habitat enhancement, restoration, and creation. Enhancement and management actions that will be used within the reserve system are described in detail in chapter 5 of the PCCP, conservation strategy (Placer County 2020b), which is incorporated by reference.

The PCCP includes a stay-ahead provision, detailed in PCCP section 8.4.3, which will minimize temporal loss of habitat. This will be demonstrated by showing that, at any given time, the cumulative conservation expressed as a percentage of the protection commitment is greater than the cumulative impact expressed as a percentage of the maximum extent of effects as proposed

in the PCCP. When PCCP implementation begins, the PCA will be establishing its structure, collecting implementation fees, and pursuing land acquisitions. To allow time for these start-up tasks to occur, the stay-ahead provision will not apply during the first 2 years of implementation (*i.e.*, during the first 2 years after implementation begins). After this time, the PCA will demonstrate compliance with the stay-ahead requirement. At the end of each calendar year, the PCA will show that the amount of each natural community and constituent habitat protected, restored, or created by the PCA is equal to or greater than the impacts on that community and constituent habitat for all Covered Activities (see section 8.4.3.2 of the PCCP, measure of compliance).

Restoration and creation are important components of the conservation strategy. Restoring and creating new wetlands will permanently affect existing, pre-restoration/creation habitat by converting that habitat, generally agricultural land, grasslands, or disturbed land cover, to wetlands and other natural communities (*e.g.*, valley oak woodland). Habitat restoration and creation activities will generally be disruptive only in the short term. These activities may include soil disturbance, removal of undesirable plants, and limited grading. All habitat restoration and creation is expected to result in a net long-term benefit for Covered Species and natural communities. These activities may have temporary or short-term adverse effects to Covered Species. All habitat enhancement, restoration, and creation activities may also be conducted outside the reserve system. If such activities occur and are consistent with the PCCP, they are covered by the ITP. Examples of such activities include restoration projects conducted as mitigation that require additional coverage beyond the self-mitigating aspects inherent to most restoration projects. Examples of habitat enhancement, restoration, creation, and reserve management activities include, but are not limited to:

- Management measures identified in PCCP chapter 5, conservation strategies (Placer County 2020b), intended to maintain, enhance, restore, and create habitat for Covered Species;
- Vegetation management, including management of invasive plants, using livestock grazing, mowing, manual labor, and/or prescribed burning. Pesticide use is permitted under the PCCP only to achieve biological goals and objectives (*e.g.*, invasive plant or invasive animal control), in accordance with label instructions, and in compliance with State and local laws. Pesticide use is only covered under the NCCP, not the ESA. Implementation of integrated pest management programs established by the local jurisdictions is only a Covered Activity if pesticides are used to achieve invasive plant or invasive animal control. Any pesticide use must comply with the U.S. Environmental Protection Agency's (EPA's) Endangered Species Protection Program;
- Relocation of Covered Species from affected sites and within the reserve system where effects are unavoidable and relocation has a high likelihood of success. This is expected to occur in very limited circumstances subject to NMFS review and approval;
- Demolition or removal of structures, roads, or man-made livestock ponds to increase public safety or to restore habitat;

- Control of introduced predators (*e.g.*, feral cats, feral dogs, pigs, non-native fish, bullfrogs);
- Surveys and monitoring for mitigation and restoration/habitat enhancement projects;
- Use of motorized vehicles for patrolling, maintenance, and resource management activities in the reserve system;
- Use of mechanized equipment for construction, maintenance, and resource management activities in the reserve system;
- Installation of wells, canals, irrigation lines, and other water conveyance facilities, the water from which will be used to fill stock ponds, troughs, and other storage facilities for cattle;
- Travel through the reserve system by habitat managers or wildlife agency personnel. Off-trail travel will be kept to the minimum amount necessary to perform maintenance, management, or patrol activities;
- Fire management including prescribed burning, mowing, and fuel-break establishment and maintenance;
- Repair of existing facilities damaged by floods, landslide, or fire;
- Restoration and enhancement projects in streams, riparian areas, wetlands, and uplands;
- Fish passage enhancements including removal of fish barriers, such as low-flow crossings, and development of fish screens, described further in section 1.3.3.7.2.1.

1.3.3.7.1.2. Monitoring and Research

Biologists will conduct surveys for all Covered Species, natural communities, and other resources within the reserve system on a regular basis throughout the permit term for monitoring, research, and adaptive management purposes (see section 1.3.3.7.1.3.). Surveys will help to track the conservation goals of the PCCP and will contribute to the adaptive management process. These surveys may require physical capture and inspection of specimens to determine, identify, and mark individuals, or measure physical features, all of which may adversely affect Covered Species. Surveys for Covered Species will also be conducted on private land being considered for acquisition for the PCCP. Surveys for all Covered Species will be conducted by qualified biologists. All such survey activity associated with the PCCP will be covered by the ITP.

Research conducted by biologists on PCCP reserves associated with the PCCP is covered by the ITP, as long as the research projects have been determined by the PCA and/or the interagency working group (described below) to have minimal effects on populations of Covered Species. Research on PCCP reserves unrelated to the PCCP is not covered by the ITP because the nature and effects of these future research projects cannot be predicted at this time. Such researchers will be granted access to reserve system properties on a case-by-case basis and such access will be conditioned on compliance with the terms of the PCCP.

Plan Area streams within the reserve system in the Bear River, Raccoon Creek, Auburn Ravine, and Dry Creek watersheds supporting covered fish species will be surveyed to document the status of CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon. Ongoing efforts and existing plans in plan area watersheds (*e.g.*, monitoring by Dry Creek Conservancy, Auburn Ravine/Raccoon Creek Ecosystem Restoration Plan) can provide a framework for elements of the PCCP's survey approach. Status will be documented by quantifying the number of spawners returning to streams. Some plan area streams are currently surveyed periodically for CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon by CDFW, Dry Creek Conservancy, and other partners. The PCA will report acquisition of spawning and migration habitat and riparian and oak woodland habitat (stream miles, acres, and location) for covered fish.

The PCA will collaborate with the wildlife agencies (NMFS, USFWS, and CDFW), the Dry Creek Conservancy, and other partners to continue monitoring and documenting covered fish in these stream systems and expand monitoring efforts to key stream reaches within acquired PCCP reserves. The PCA will coordinate its activities with existing salmonid monitoring programs to ensure that efforts are not duplicated and are complementary.

Visual surveys may be used along key or targeted stream reaches to count live adults, carcasses, and/or redds, if appropriate. Visual surveys can be difficult for CCV steelhead and other winter spawners, due to increased turbidity and high flows. Surveys will be conducted before, during, and after the spawning season for each species (generally fall and winter months). Monitoring protocols will be adopted as feasible to ensure consistency with these local and regional monitoring efforts.

Surveys in acquired parcels will assess habitat condition, if necessary, to better understand the status of species. This habitat assessment may consist of the following components:

- Assess the habitat quality of streams that support covered fish. Habitat features that may be used to characterize habitat quality include, but are not limited to:
 - Water conditions (*e.g.*, temperature, flow, depth)
 - Presence, quantity, and condition of gravel substrate suitable for spawning and egg/alevin incubation for each species
 - Percent of fine sediment in spawning gravel
 - Percent of stream length with riffles, runs, and pools
 - Quantity of instream cover (*e.g.*, large woody material and cut-banks)
 - Percent overhanging vegetation
 - Miles of available off-channel and floodplain habitat
 - Pool attributes, such as frequency (riffle:pool ratio), area, and depth

- Channel width, configuration, and channelization features, including quantity of hardened (*e.g.*, rip-rapped) banks
- Barriers to movement (*e.g.*, beaver dams, waterfalls, and manmade dams)
- Assess condition of riparian habitat. Habitat features that may be used to characterize riparian habitat related to fish include, but are not limited to:
 - Off-channel/side channel habitat availability
 - Connectivity of stream to floodplain (*e.g.*, degree to which stream channel is incised)
 - Condition of streambanks
 - Percent canopy cover
 - Structural diversity

A number of biological goals and objectives were developed for fish, see section 5.2.7.9 of the PCCP, including several at the landscape, section 5.2.5 of the PCCP, and community level, see PCCP sections 5.2.6.2 and 5.2.6.3 (Placer County 2020b). The PCA will track compliance with these biological goals and objectives, including restoration of riverine/riparian habitat (especially migration and spawning habitat), removal or modification of fish barriers, and screening of water diversions.

The PCA will monitor the response of covered fish species to riparian restoration actions in target areas, including specific fish barrier removal sites and other selected in-channel enhancements, some of which are landscape or natural community goals and objectives. To do so, relative abundance of each species can be monitored before and after the action in or near the target reach and, as appropriate, compared to a nearby reference (control) site. The results of fish surveys before and after restoration will be compared. Responses by spawners can be measured as the total number of individual live fish, carcasses, and/or redds using visual counts. Responses by juveniles can be measured as the total number of individuals or catch per unit effort using snorkel surveys, nets, or other standard juvenile fish sampling techniques, depending on site-specific conditions. Restoration efforts will be focused on Raccoon Creek, Doty Ravine, and Auburn Ravine.

Many of the stream conservation measures involve removing or modifying barriers to increase connectivity for fishes and other species within riverine corridors. While barriers often restrict native species from moving within a riverine corridor, they can also restrict non-native species from invading otherwise pristine reaches. When barriers are removed within stream corridors that support native fish populations, the non-native competitor and predator fish populations will be monitored to determine how the barrier removal affects community dynamics and ultimately the relative abundances of covered fish species.

The Friends of Auburn Ravine, Dry Creek Conservancy, and others already have ongoing research/monitoring studies. PCA anticipates that through this ongoing work and additional

relationships, that PCA will work collectively and with the fish and wildlife agencies to design and implement studies in and around the West Placer salmonid streams. In terms of existing and ongoing studies, Placer County developed the Raccoon Creek Watershed Assessment (CBEC Inc. 2017), which identified several data gaps and study needs. As a result, Placer County has helped to fund and is tracking the progress of an eDNA study on Raccoon Creek and Doty Ravine. The second phase of that project will potentially utilize rotary screw traps. Placer County will work with William Jessup University, ECORP Consulting (study sponsors), and the wildlife agencies to potentially cover the study with the PCCP ITP to the extent it meets a fundamental PCCP study need. Otherwise ESA section 7 consultation with NMFS and other environmental permits will be necessary. The PCA intends to work with the fish and wildlife agencies to identify and implement additional research, monitoring, and grant funding opportunities.

Monitoring requirements for covered fish species include:

- Document presence of covered fish in the reserve system and at restoration and enhancement sites outside the reserve system.
- Report (acres and location) acquisition of spawning and migration habitat for covered fish.
- Report (acres and location) acquisition of oak woodlands for covered fish as part of compliance under the PCCP.
- Report (acres and location) actions to enhance habitat for covered fish that occur within and outside the reserve system.
- Track compliance with fish-specific management actions.
- Evaluate salmonid response to riparian enhancement.
- Monitor threats to covered fish.

1.3.3.7.1.3. Adaptive Management

Adaptive management is a decision-making process that will be used during PCCP implementation to adjust future management actions based on new information. Adaptive management is based on a flexible approach whereby actions can be adjusted as uncertainties become better understood or as conditions change (see PCCP figure 7-1). Integrating adaptive management and monitoring is critical to the successful implementation of the PCCP conservation strategy. Monitoring is the foundation of an adaptive approach, and adaptive management actions are developed, in part, from the results of monitoring. See PCCP section 7.1.2, Adaptive Management for more details about how adaptive management will be conducted. PCCP section 7.6, Adaptive Management Program Implementation describes the elements and structure of the adaptive management program and lists the PCA's responsibilities for executing the program.

Adaptive management by the PCA will be advised by four groups: the wildlife agencies, science advisors, land managers, and the public. Wildlife agencies will provide feedback to the PCA

regarding proposed changes to PCCP implementation based on the results of monitoring and provide guidance on the biology and conservation of Covered Species. The primary forum in which these discussions will occur is the Interagency Working Group, which will include representatives from USFWS, NMFS, and CDFW, described in PCCP section 8.2.6.4, Interagency Working Group. The science advisors are an independent group of scientists retained by Placer County (see PCCP section 1.4.5, Science Advisors) that will be consulted by the PCA regularly regarding PCCP implementation. The PCA will share information with other land management agencies (*e.g.*, county parks, state parks) regarding resources and management across reserve boundaries and on a regional scale. Members of the public will be able to provide input to the PCA regarding adaptive management during periodic (at least annual) public hearings and regular meetings of the public advisory committee, which will be open to the public.

1.3.3.7.1.4. Fuel Management

Each reserve system unit will have a fire management component included within the PCCP reserve management plans. The fire management component will describe site-specific conditions and actions required to:

- Reduce existing fuel loads;
- If permissible, re-introduce fire as a natural process of the ecosystem;
- Minimize environmental effects and protect sensitive resources; and
- Enhance and/or restore natural community characteristics.

Preservation of reserve lands in perpetuity will require that they be managed to reduce their susceptibility to catastrophic wildfire as well as to meet the ecological objectives of the PCCP.

Reduction of fuels has three main purposes:

- Reduce fire severity within reserves;
- Reduce the ability for a fire to spread from a reserve to adjacent lands; and
- Reduce the ability for a fire to spread from adjacent lands to a reserve.

Wildfire presents a significant threat to the sustainability of current and future conservation reserves. Wildfires that may start on conservation reserves pose a threat to adjacent properties.

Fuel treatments will be aimed at preventing or at least impairing the spread of fire and reducing fire severity. Fuel treatment zones include property boundaries, public roads, and the interior of reserve parcels. In oak woodlands, shaded fuel breaks may be used along roads, at property boundaries, and within parcels to impair fire spread. Fuel breaks can be used at the periphery of vernal pool grasslands. Fuel treatments in riparian woodlands should focus on the interface between the upland and riparian vegetation.

Within the reserve system, oak woodlands have the highest inherent wildfire risk. Overly dense riparian woodlands are second in degree of risk. Vernal pool grasslands have a relatively lower wildfire risk.

Several approaches will be used to reduce fuels. The choice of approach is affected by environmental constraints, costs, and other social and ecological considerations. The highest priority in the reserve system is to protect natural and semi-natural communities and Covered Species and their habitats. Any fuel treatment must meet this requirement. BMPs will be included in fuel treatments to prevent or minimize impacts on streams, cultural resources, wetlands, soils, wildlife, and PCCP Covered Species or other special-status species, see chapter 6 of the PCCP for more details (Placer County 2020b). The strategy should emphasize avoidance of effects to Covered Species and habitat.

1.3.3.7.1.5. Recreation Facilities and Trails

The PCCP will develop limited recreation opportunities within the reserve system according to the requirements in the PCCP (Placer County 2020b), refer to section 5.3.2.2.1, Content of Reserve Unit Management Plans, and chapter 6, Program Participation and Conditions on Covered Activities, reserve management conditions 1 through 3, for further details. These activities are expected to be minimal, but may include trails and associated infrastructure. The PCCP limits future reserves, not including jump-start lands, to 70 miles of trails, with an average width of six feet, 50 acres total. All trails and recreation facilities will be constructed to minimize effects on Covered Species and vegetation communities and in compliance with the guidelines in the PCCP (Placer County 2020b), refer to section 5.3.2.1, Reserve Management Plans, for further details.

Recreational uses will only be allowed within the reserve system if the PCA determines that they are consistent with the biological goals and objectives of the PCCP and are consistent with a reserve unit management plan approved by the wildlife agencies. Allowed uses will be specified in the reserve unit management plan and may include hiking, non-motorized bicycle riding, walking, horseback riding, fishing, hunting, wildlife observation, photography, and environmental education and interpretation on designated trails at appropriate sites or other similar low-intensity activities.

1.3.3.7.1.6. Reserve System Infrastructure

This category also includes construction, maintenance, and use of facilities needed to manage the reserve system including, but not limited to, reserve field offices, maintenance yards, maintenance sheds, workshops, storage space (*e.g.*, for machinery or vehicles), carports, driveways, roads, bridges, fences, gates, wells, stock tanks, stock ponds, and a native plant nursery to support restoration and enhancement projects. All reserve system management structures will be constructed to minimize effects on Covered Species and vegetation communities and in compliance with the guidelines in the PCCP (Placer County 2020b). Refer to section 5.3.2.1, Reserve Management Plans, and conditions on Covered Activities described in chapter 6, Program Participation and Conditions on Covered Activities for further details.

1.3.3.7.1.7. Emergency Activities

An emergency is a situation involving disasters, casualties, national defense, or security emergencies and includes response activities that must be taken to prevent imminent loss of human life or property (USFWS and NMFS 1998). Responses to changed circumstances within PCCP reserves that may affect populations of Covered Species are covered under the PCCP. Foreseeable emergency activities include, but are not limited to:

- Firefighting of small wildfires or structure fires;
- Evacuation of injured persons or livestock;
- Minor hazardous materials remediation, including remediation and cleanup of illegal dumping prior to acquisition;
- Repair of existing facilities damaged by floods or fire;
- Use of motorized vehicles for conducting activities.

Emergency responses that exceed ecological surrogates, see section 2.9.1. below, or are outside the scope of other Covered Activities may require additional consultation with NMFS and/or other wildlife agencies.

1.3.3.7.2. PCCP In-stream Conservation Activities

The PCCP provides coverage for projects and activities associated with implementation of the conservation strategy. In-stream conservation activities are covered anywhere they may occur in Plan Area A or permittee activity in non-participating jurisdiction (B1), Raccoon Creek floodplain (B3), or fish passage channel improvement (B4). Components B3 and B4 are located in Sutter County, just west of Placer County (see Figure 1 above). According to the PCCP (Placer County 2020b), Raccoon Creek in Placer County and those Sutter County plan components are currently under study to identify the effect of hydrology, water quality, channel geomorphology, and riparian vegetation on salmonids.

PCCP in-stream conservation activities may occur on private and public lands outside the reserve system. These actions will require agreements to be reached with landowners to allow the installation and maintenance of conservation measures. Measures that are implemented outside the reserve system will occur primarily along stream and riparian areas.

In-stream conservation activities include:

- Stream barrier removal or modification;
- Vegetation management, including mechanical removal of invasive weeds in streams;
- Installation of woody debris or rocks to enhance aquatic habitat in streams;
- Gravel augmentation and gravel cleaning conducted to enhance or restore spawning sites for Covered Species;

- Actions to address invasive animal species or invasive plant species control beyond vegetation management;
- Restoration of in-stream and riparian habitats;
- Surveys and monitoring for mitigation and restoration/habitat enhancement projects;
- Monitoring of Covered Species (*i.e.*, salmonids, California red-legged frog, foothill yellow-legged frog, western pond turtle) and natural communities;
- Landowner outreach and education programs that target landowners along streams. Willing landowners may receive technical assistance from the PCA to reduce erosion and sedimentation into nearby streams.

Note that there is some overlap between in-stream conservation measures and those that will occur outside of the stream in the surrounding stream system.

1.3.3.7.2.1. Stream Barrier Modification Projects

The PCCP conservation strategy provides for the removal of fish passage barriers and other projects that improve fish passage. These projects are based on recommendations from the Anadromous Fish Screening and Passage Opportunities in Western Placer County and Southern Sutter County report (Bailey and Buell 2005) and will include removal or modification of the following passage impediments:

- Hemphill Dam, including the construction of a fish ladder and/or removal of the dam and restoration of the riparian zone, owned by NID;
- Cottonwood Dam, including riparian restoration, privately owned;
- Culvert at Doty Ravine on Garden Bar Road, county owned;
- Nelson Lane Dam;
- Raccoon Creek and Waltz Road dam near the Sutter County line.

The removal or modification of these passage impediments will require the cooperation of private entities or public agencies that are not currently permittees of the PCCP. In the event these facilities cannot be modified or removed because they are not under the control of the permittees, alternative fish passage improvements will be recommended to the wildlife agencies for Doty Ravine, Raccoon Creek, Auburn Ravine, or salmonid streams in the Dry Creek watershed.

Other dams and diversion structures that could be removed or modified include the Lincoln Ranch Duck Club Dam, Coppin Dam, Davis Dam, New Moore Dam, Tom Glenn Dam, and Aitken Ranch Dam. The PCA may work with NID to improve fish passage at its facilities, including the NID Doty Ravine south diversion structure, Camp Far West Canal, and Goldhill Dam.

1.3.3.7.2.2. In-channel Habitat Improvement

When opportunities exist, the PCA will remove or modify in-channel features within and outside of the reserve system to restore in-stream habitat. Potential restoration measures include removal of fish passage barriers; removal of features, such as riprap, dikes, and levees; setting back and/or stabilization of creek banks; and the re-establishment of historical stream morphology.

In-channel conservation measures may include the removal of anthropogenic features (*e.g.*, concrete, earthen, or otherwise engineered channels) as well as measures that modify specific elements of in-channel habitat. Methods to improve in-channel habitat include removing non-native vegetation and revegetating with native plants to influence physical processes; installing large woody debris and other in-stream structural elements, such as rocks and boulders, to improve channel complexity and to promote woody debris recruitment and enhance rearing habitat; and augmenting gravel within potential spawning grounds.

Channel restoration may entail reconstruction of a channel or incremental process restoration, installation of a natural structural feature to induce change in a channel. Channel restoration can also be used to restore bank stability and reduce bank erosion, thereby improving aquatic habitat and water quality.

Together, these enhancement and restoration techniques can serve to slow the movement of floodwaters, allow the deposition of sediment to improve channel and bank formation processes, reduce sediment loading in river and stream systems, and improve habitat for Covered Species, including the restoration of complex rearing habitat.

The reduction of fine sediment input to streams is a high priority in Auburn Ravine, Raccoon Creek, Doty Ravine, Miners Ravine, Secret Ravine, and the main stem of Dry Creek and a medium priority in Bear River, Pleasant Grove Creek, and Curry Creek (Placer County 2002, Placer and Sacramento Counties 2003, Foothill Associates 2006). The PCA will focus gravel cleaning and replenishment in high- and medium-priority streams. The PCA will identify specific stream reaches with degraded spawning habitat where cleaning or replenishment of gravels is the only feasible means to enhance habitat. These measures are not anticipated to occur regularly under the PCCP and would only be used as a temporary action to maintain habitat until the reach can be restored.

Gravel cleaning can be used to enhance and restore gravel beds that are already impaired due to excess fine sediment load. Gravel replenishment can be used in streams deficient in spawning gravel due to dams or other artificial structures that prevent gravel recruitment or transport. The use of gravel cleaning or replenishment measures will likely result in additional maintenance requirements because natural processes will not maintain post-cleaning conditions.

Gravel cleaning and replenishment can be effective where the cause and source of excessive fines, including upland sources, such as unpaved roads and land grading activities, have been controlled or remedied.

The PCA will employ invasive animal control measures for in-stream invasive species (*e.g.*, carp, bullhead, and bullfrog) on an as-needed basis. The need to control invasive species and methods to be used will be site-specific and evaluated within a monitoring and adaptive

management framework. The PCA will develop an invasive species control plan for the reserve system, and each reserve management plan will include a section on management of invasive plant and animal species.

Methods of invasive control will depend on site-specific conditions, including type of waterway and time of year, and will be done in close coordination with fish and wildlife agencies to avoid harm to non-target species.

1.3.3.7.2.3. Riparian Restoration

The PCA will restore 330 acres of riparian habitat and an estimated additional 876 acres of riparian habitat to reestablish, reconnect, and expand existing riparian woodland; slow the movement of floodwaters; allow the deposition of sediment to improve channel and bank formation processes; and reduce sediment loading in river and stream systems. Details of the site selection process and methods can be found in section 5.3.1.5.4 of the PCCP (Placer County 2020b).

1.3.3.7.3. Other Placer County Conservation Activities

Placer County administers ongoing conservation and resource management programs (*e.g.*, management of wildfire fuel) that are separate from but complementary to the PCCP. The actions conducted by Placer County to implement the Placer Legacy Program and the Auburn Ravine/Raccoon Creek ERP, Dry Creek coordinated resource management plan (CRMP), Pleasant Grove/Curry Creek ERP, and Dry Creek Greenway Vision Plan are similar to many of those that will be conducted by the PCA to implement the PCCP conservation strategy. These actions will occur primarily outside the reserve system.

1.3.3.7.3.1. Placer Legacy Program and Resource Management Plans

Placer County implements the Placer Legacy Program and CRMPs, which are complementary to the PCCP. The resource management plans focus on in-stream and riparian management and are discussed in section 1.3.3.6, In-stream Activities.

Placer County, in coordination with its public and private partners, will implement the goals and objectives of the Placer Legacy Program throughout the 50-year term of the PCCP's permits.

The Placer Legacy Program uses four main strategies to obtain its goals and objectives: land preservation, stewardship programs, public education, and restoration and enhancement. Conservation of agricultural lands is primarily accomplished through fee title acquisition, conservation easements, and Williamson Act agreements. Stewardship programs focus on agricultural product marketing, tax/estate planning assistance, sustainable practices education, and financial incentives. In addition, Placer County promotes stewardship by providing a long-term planning framework that is scientifically and geographically based, as well as by assisting public and private landowners with Federal and State agency permit application and consultations.

The act of acquiring land or promoting stewardship does not have direct, on-the-ground consequences that require coverage by the PCCP. Such actions have complemented and will

continue to complement the implementation of biological goals and objectives of the PCCP. However, the Placer Legacy Program's restoration and enhancement actions will have environmental effects that are covered by the PCCP.

Many Placer Legacy Program activities will be conducted in concert with PCA implementation of the PCCP. The Placer Legacy Program may, however, carry out activities independent of the PCCP that generally fall under the following categories:

- Introduction of recreation, such as hiking, bicycling, and horseback riding to previously inaccessible natural areas that support grassland, oak woodland, and riparian habitats;
- Creation of urban trails and trail connections as well as the building of interpretive nature and cultural appreciation centers;
- Restoration of riparian and in-stream habitats to benefit salmonid spawning, rearing, and migration life stages in the Raccoon Creek, Auburn Ravine, and Dry Creek watersheds;
- Protection and enhancement of floodplains to maximize water and sediment detention and restore natural stream morphology, including levee pull-backs, floodplain restoration, protection of floodplains from incompatible encroachment, bank stabilization, and other activities that protect existing natural floodplains or restore natural conditions to floodplains that have been modified (typically for agricultural production);
- Establishment of buffers and management of fuel loads to reduce wildfire potential;
- Restoration and enhancement of degraded forests in oak woodland and riparian habitats;
- Development of on-site water management storage features, such as ponds and swales to promote water conservation and improve water quality;
- Coordination of water delivery agencies to ensure the adequacy of future water deliveries for agriculture and native species habitat;
- Encouragement of the use of rice decomposition water to improve waterfowl habitat;
- Acquisition of property for scenic, historical, or agricultural conservation values.

1.3.3.7.3.2. Community Wildfire Protection Plan

The Placer County Community Wildfire Protection Plan (CWPP) (Placer County 2012) provides a comprehensive analysis of wildfire-related hazards and recommendations designed to reduce the threat of wildfire-related damages to values at risk. The CWPP (Placer County 2012) provides a comprehensive analysis of wildfire-related hazards and risks in the wildland-urban interface areas covered by the greater Auburn area, Foresthill/Iowa Hill, Lincoln, and Placer Sierra fire safe councils. The wildland-urban interface is the area where human development and activity meets and intermixes with undeveloped vegetation. The PCCP defines specific fire hazards in designated areas, assesses the values at risk, and identifies and prioritizes specific projects to protect local communities.

Any fuel management activities, which include the creation of fire breaks, and fuel treatment and restoration, conducted by Placer County on private or public lands would be considered a Covered Activity. This activity would be consistent with the CWPP (Placer County 2012).

Note that private landowners clearing fuel on their own property is not a Covered Activity.

1.3.3.7.4. Resource Management Plans

The PCCP integrates three watershed plans, including the Dry Creek CRMP (Placer and Sacramento Counties 2003), the Auburn Ravine/Markham Ravine/Raccoon Creek ERP (Placer County 2002), and the Pleasant Grove/Curry Creek ERP (Foothill Associates 2006), into the conservation strategy. These watershed management plans were designed to help control pollution, manage stormwater, and restore and enhance stream system habitats and uplands that surround them. The watershed plans are comprehensive, ecosystem-based plans for the restoration and enhancement of riparian and in-stream habitats in western Placer County watersheds. The watershed plans were created in coordination with public and private stakeholders, including Placer County, water districts, non-profit conservation interests, agencies, and landowners. The watershed plans provide guidance for riparian and stream restoration and enhancement actions outlined in the Placer Legacy Program.

The PCA will use these restoration and management plans to help guide stream and riparian acquisition, enhancement, and restoration actions. The Placer Legacy Program's restoration and enhancement activities implemented by Placer County will occur on lands within and outside of the reserve system. Although these plans pre-date the preparation of the PCCP conservation strategy, they provide a watershed-level focus that is valuable; they represent stakeholder interests that are consistent with the spirit of State and Federal guidance on the preparation of HCPs and NCCPs. These plans have informed the development of the PCCP conservation strategy and monitoring and adaptive management program and will be used by the PCA to help guide PCCP acquisition, enhancement, and restoration actions for riverine and riparian systems. In no case will these plans supersede the conservation strategy of the PCCP. Their implementation is intended to inform and be covered by the PCCP and will supplement the conservation actions carried out by the PCCP.

The primary goal of these resource management plans is to improve riparian and aquatic habitat quality and connectivity for native biota. The main objectives of these plans are to protect, restore, and enhance riparian habitat; improve salmonid spawning and rearing habitat; restore the natural hydrography and morphology when and where possible; remove and/or modify in-stream barriers to salmonid migration; and improve water quality.

Those projects that are implemented as a result of the watershed planning process will be covered by the PCCP. Construction or restoration activities associated with implementation of the watershed plans may have temporary effects, but overall these projects will provide a net benefit to Covered Species and natural and semi-natural communities by improving ecosystem integrity, resiliency, and connectivity. The general types of projects that are expected to be implemented include the following:

- Control and/or removal of non-native, invasive riparian plant species;

- Creation, expansion, and enhancement of riparian forest and willow scrub natural communities to maximize ecosystem functions, such as shade and bank stabilization;
- Management of the riparian natural community adjacent to grazing areas to reduce sedimentation and fecal contamination;
- Enhancement of floodplain structure to reflect natural stream morphology and improve flood control;
- Control of invasive and/or nuisance animal species, such as bullfrogs, beavers, and bass, to minimize adverse effects on threatened and endangered species;
- Removal or modification of barriers to salmonid migration between spawning habitat and the American and Sacramento Rivers;
- Modification of water diversion structures to minimize juvenile salmonid entrapment;
- Improvement of salmonid spawning and rearing habitat by increasing or encouraging the formation of runs, riffles, and pools and reducing the concentration of finely sized sediment;
- Public education programs and partnerships with wastewater treatment plants to help reduce pollutant loads to streams and increase the use of biofiltering techniques, such as vegetated buffers and off-channel storage ponds in existing and future streamside development and agriculture;
- Management of upland activities to reduce peak runoff flows and sediment and contamination loads;
- Utilization and enforcement of BMPs and smart growth principles to improve water quality and minimize surface runoff discharge.

1.3.4. PCCP Conservation Strategy

Chapter 5 of the PCCP (Placer County 2020b) contains the conservation strategy for the PCCP. For this opinion, the parts of the conservation strategy that explicitly address stream habitat or salmonids are included in the following subsections. All other portions of the conservation strategy and the rest of chapter 5 of the PCCP (Placer County 2020b) are incorporated here by reference.

1.3.4.1. Conservation Strategy Components

The PCCP's conservation strategy will be implemented by the PCA in partnership with the permittees and the wildlife agencies. The strategy has four main components:

- (1) Reserve system. The PCCP proposes to progressively establish a large system of interconnected blocks of land. Over the PCCP 50-year permit term, the PCA will acquire approximately 47,300 acres for natural and semi-natural community protection

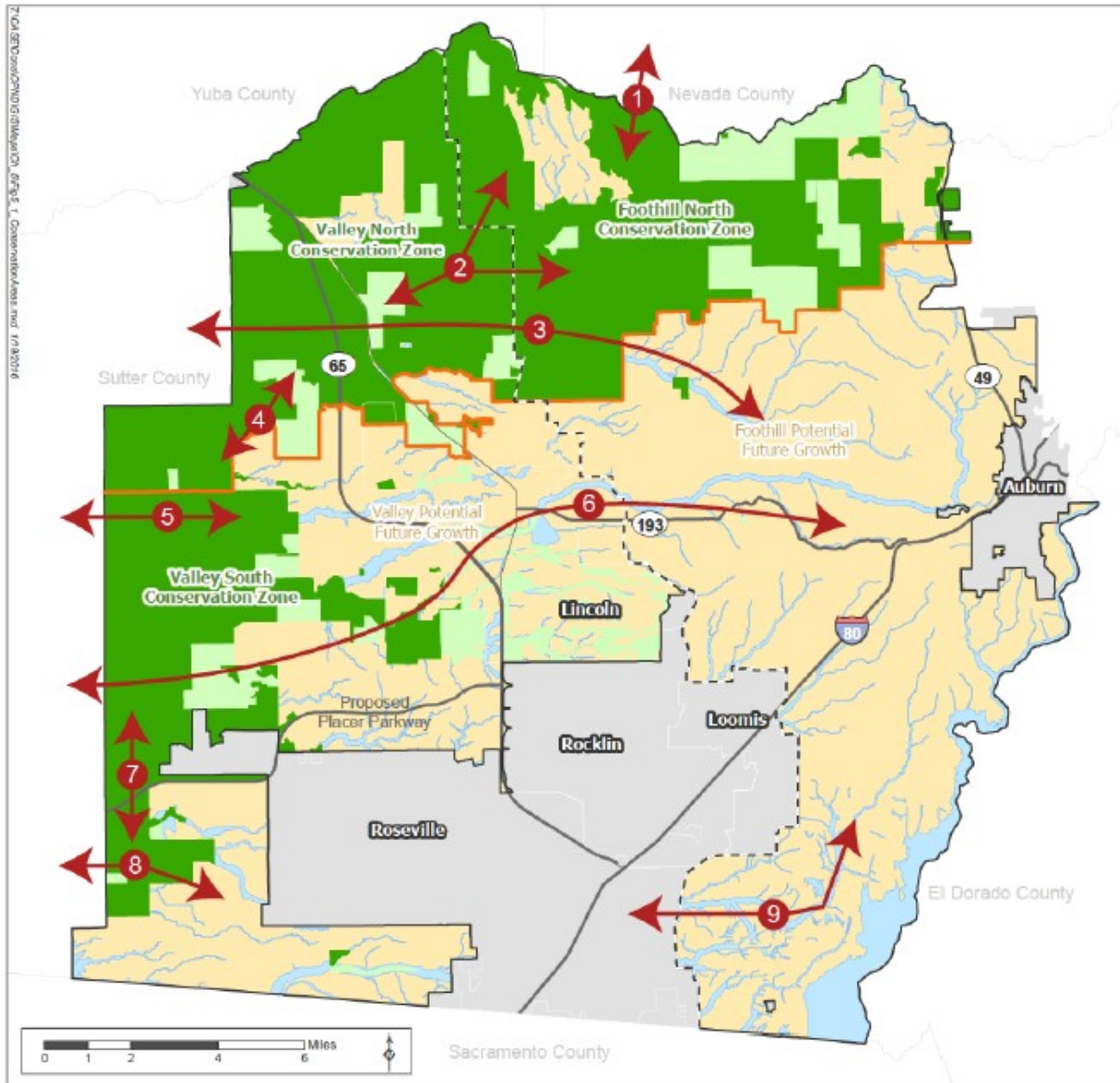
and restoration irrespective of impacts to species and/or habitat from Covered Activities. Within that land, the PCA will restore at least 4,405 acres of natural communities independent of mitigation for effects from Covered Activities, and 6,220 acres of natural communities if all allowable impacts to species and/or habitat from Covered Activities proposed under the PCCP occurs. These protected and restored lands will augment the approximately 16,000 acres of EXR. Cumulatively, 38 percent of the present natural and semi-natural landscape in Plan Area A will ultimately be subject to conservation management.

The reserve system will provide a means for protecting, managing, enhancing, and restoring or creating the natural and semi-natural communities and habitats that support the Covered Species. The reserve system will mainly be located in the western and northern valley and in the northern foothills, regionally separated from future urban and suburban growth. The geographic aspect of the conservation strategy is shown in Figure 2 and in PCCP figure 5-1 (Placer County 2020b).

- (2) Stream protection, enhancement, and avoidance. The conservation strategy protects the stream system everywhere in Plan Area A. Conservation measures in and avoidance of the stream system contribute both to Covered Species' habitats and connectivity in the reserve system. In-stream enhancement actions will occur inside and outside of the reserve system, in Plan Areas A and B. Such actions include, but are not limited to, removal and/or modification of barriers to fish passage, screening unscreened water diversions, improvement of in-channel features, and non-native animal species control.
- (3) Wetland conservation and no overall net loss of wetland functions and services. The PCCP provides for protection, enhancement, restoration, and creation of wetlands through the conservation measures for the vernal pool complex, riverine/riparian complex, and aquatic/wetland complex natural communities. The conservation strategy provides for the protection of surrounding upland necessary to sustain the hydrological function of protected, restored, and created wetlands.

The PCCP anticipates loss of wetlands, including vernal pool wetlands. Restoration and creation of wetlands will specifically provide in-kind compensatory habitat in the RAA or stream system in order to achieve conservation of the Covered Species and no overall net loss of wetland habitat through the 50-year permit term.

- (4) Avoidance and minimization. Covered Activities will avoid or minimize adverse effects by complying with specific conditions that apply to certain communities and species. See section 1.3.5 below and/or chapter 6 of the PCCP (Placer County 2020b) for more details. The PCCP proposes that: (1) conservation measures will take place on lands set aside for conservation purposes, (2) implementation of the conservation strategy will accomplish avoidance and minimization on a cumulative regional scale, and (3) avoidance and minimization in the PFG areas will be focused only on specific resources.



Source: Placer County, 2015; CDFW 2010; CalTrans 2010; MFG | ZPA 2016

- Existing Protected Area
- Reserve Acquisition Area
- Potential Future Growth Area
- Non-Participating City
- Valley/Foothill Divide
- North/South Conservation Zone Divide
- Stream System
- Major Road

Linkage (Orientation)

1. **Bear River Watershed** (N-S) Connect PCCP oak woodland reserves to oak woodlands in Nevada County throughout the Bear River watershed.
2. **Yankee Slough - Raccoon Creek Watershed** (E-W) Connect Valley reserves to Foothill reserves.
3. **Raccoon Creek - Doty Creek corridor** (E-W) Connect existing protected areas and reinforce riparian protection for salmonids.
4. **Lower Raccoon Creek** Maintain connectivity between PCCP northern and southern conservation areas and linkage along lower Raccoon Creek in the Sutter County
5. **Markham Ravine** (E-W) Connect PCCP reserves with scattered existing protected areas to the east; may play a role in giant garter snake dispersal.

6. **Auburn Ravine** (E-W) Connect PCCP reserves with scattered existing protected areas to the east; important for salmonids.
7. **Cross Placer Parkway** (N-S) Remediate barrier created by the proposed Placer Parkway. Connect Pleasant Grove Creek watershed to Curry Creek watershed; may play a role in giant garter snake dispersal.
8. **Curry Creek** (E-W) Connect PCCP reserve lands to Sutter County on the west and avoided stream systems to the east; may play a role in giant garter snake dispersal.
9. **Miners Ravine** (E-W) Connect Stream System reserve opportunities in Miners Ravine to tributaries of Dry Creek; important for salmonids.

Figure 2. PCCP Conservation Zones and Key Linkages, from figure 5-1 of the PCCP (Placer County 2020b).

1.3.4.2. PCCP Conservation Goals, Objectives, and Measures that Address Stream Habitat or Salmonids

1.3.4.2.1. PCCP Landscape-level Goal L-3

Ecological processes and conditions that sustain and reestablish natural communities and native species.

- Objective L-3.1. Implement low impact development standards (LIDS) for Covered Activities in the plan area.
 - Rapidly moving stormwater erodes stream banks and scours stream channels, degrading or removing habitat for fish and other aquatic life. Using LIDS reduces the amount of stormwater reaching a surface water system and helps to maintain natural stream channel functions and habitat. This objective will be met through implementation of measures outside the reserve system where Covered Activities take place. The goal of LIDS is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source (Placer County 2020b).
- Objective L-3.2. Reduce invasive non-native species and increase native species.
 - This is intended to increase native species diversity, which improves natural community resilience and resistance to disturbances, such as drought and flooding, by increasing the likelihood that species or strains with attributes to withstand these disturbances are present on the landscape. Additionally, vegetation biodiversity in riparian and other natural communities provides the structural diversity necessary to provide suitable habitat for many wildlife species. Increasing the relative cover of native plant species also potentially increases resistance to invasion by non-native plants and reduces the potential negative effects of non-native plants. This objective also intends to minimize the introduction and spread of invasive non-native species as described. The PCCP does not intend to control non-native species that are naturalized and are not adversely affecting native species in the plan area.

1.3.4.2.2. PCCP Goal Riverine and Riparian (RAR) 1

Functional riverine and riparian communities that benefit Covered Species and promote native biodiversity in the plan area.

Several landscape-level goals will contribute to this goal. See section 5.2.6.3 of the PCCP for more details (Placer County 2020b).

- Objective RAR-1.1. Protect riverine/riparian complex. Protect 2,200 acres of riverine/riparian complex natural community, which will include at least 1,410 acres of

riparian constituent habitat (960 acres in the valley and 451 in the foothills). This portion of the reserve system will include 88.6 linear miles of streams/riverine habitat.

- Objective RAR-1.2. Protect riverine constituent habitat. Protect at least 88.6 linear stream miles of riverine within the riverine/riparian complex natural community.
 - The assembly of the reserve system will substantially increase the amount of protected riverine and riparian constituent habitats in the plan area. The riverine and riparian protection commitments are large enough, with objective RAR 1.3, to protect corridors for movement from the valley floor to the foothills.
 - The protection commitments for the riverine and riparian constituent habitats are intended to be large enough to protect, along with enhancement and restoration from objectives RAR 1.3, 1.4, 1.5, 1.6, and 1.7, functioning hydrologic systems that provide habitat value for native biota while continuing to meet urban requirements for flood control, drinking water, agriculture, and recreation. For western Placer County streams, this generally means providing the channel width and depth to convey most flood flows while maintaining both aquatic and terrestrial habitat complexity necessary to ensure water quality and suitable streambed conditions for all life stages of aquatic Covered Species.
 - The riverine and riparian commitment is intended to be large enough to ensure that extensive amounts of high quality spawning, rearing, and migrating habitat are protected for the covered salmonids within the Raccoon Creek, Doty Ravine, Auburn Ravine, and Dry Creek watersheds, consistent with the Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead (hereafter, recovery plan) (NMFS 2014b).
 - After restoration is successfully completed, at least 2,232 acres, and up to 3,625 acres if the proposed maximum allowable loss of riverine/riparian complex community occurs from Covered Activities, of riverine/riparian communities will be protected and restored on the reserve system. These protection and restoration commitments provide for the conservation and recovery of Covered Species in the plan area, in addition to mitigating consequences of the actions to 490 acres of the riverine/riparian complex natural community.
 - The protection of 88.6 miles of streams in Plan Areas A and B and restoration of fish passage both upstream and downstream of existing barriers (objective RAR 1.5), will provide for the conservation and recovery of riverine Covered Species in the plan area, in addition to mitigating consequences of the actions on 551 miles of streams in the plan area. The protection of these streams will overlap the riverine/riparian complex community protected.
- Objective RAR-1.3. Restore riverine/riparian complex. A minimum of 32 acres of riparian constituent habitat will be restored, independent of effects. In addition, impacts

on riverine/riparian constituent habitat and the stream system will be mitigated by restoration of riverine and riparian constituent habitat at a ratio of 1.52:1. If the proposed maximum allowable effects on riverine/riparian complex and the stream system occur (490 acres and 426 acres, respectively, for a total of 916 acres), up to an additional 1,425 acres of riverine/riparian complex will be restored. Of the 1,425 acres of riverine and riparian constituent habitat restoration, 1,250 acres must be restored as riparian constituent habitat. Effects on salmonid habitat (*i.e.*, spawning or migrating) will be mitigated in kind. Other natural communities interspersed within riverine/riparian complex may be restored as part of riverine/riparian upland complex (*e.g.*, valley oak woodland, fresh emergent wetlands).

- Riparian restoration will be focused on expanding and connecting existing fragments of riparian communities to restore corridors for movement in the plan area.
 - Achieving this objective will improve riparian-related ecosystem functions, such as providing shade that moderates water temperature in adjacent streams, slowing water velocities during flood events, reducing inputs of nutrients (*e.g.*, nitrogen) and pollutants into streams, providing habitat for terrestrial and aquatic invertebrates, prey species for covered salmonids and native biota, and stabilizing banks against erosion.
- Objective RAR-1.4. Enhance riparian vegetation. Enhance the cover, structural diversity, and native species diversity of the riparian constituent habitat in the reserve system.
 - Objective RAR-1.5. Remove or modify fish barriers. Initiate partnerships with managing agencies and remove or modify two high-priority fish passage barriers, including the barrier at Doty Ravine at Garden Bar Road and one other barrier identified in PCCP table 3-5 (Placer County 2020b) and adapted below in Table 2. When partnerships allow, remove or modify up to three more of the fish passage barriers identified in Table 2.

Table 2. Summary of Fish Passage Barriers Considered in PCCP, adapted from PCCP Table 3-5.

Fish Passage Barrier	Watershed	Type/ Features	Assessment	Recommended Action	Location
Hemphill Dam	Auburn Ravine	Seasonal flashboard dam; elevated sill, sloped apron; unscreened diversion	Significant barrier/ impediment; diversion needs screen	Dam: replace apron with pool-and-chute fishway; diversions: screen with vertical or oblique screen on bank	On Auburn Ravine within the Turkey Creek Golf Course approximately 1.5 miles upstream of the SR 193 crossing

Fish Passage Barrier	Watershed	Type/ Features	Assessment	Recommended Action	Location
Cottonwood Dam	Dry Creek; Miners Ravine	Dam has a rectangular notched weir but remains a barrier to fish passage	Significant barrier/ impediment	Remove dam and restore riverine and riparian habitat	Hidden Valley subdivision, Granite Bay
Doty Ravine at Garden Bar Road	Doty Ravine; Raccoon Creek	Perched 12-foot culvert	Significant impediment	Replace with natural bottom culvert with grade control or open-span bridge with fish passage baffles	Garden Bar Road crossing of Doty Ravine in the Raccoon Creek watershed
Nelson Lane Dam	Auburn Ravine	Seasonal flashboard dam	Minor impediment	Dam: concentrate flow; diversions: screen if needed	On Auburn Ravine approximately ¼ mile downstream of the Nelson Lane crossing
Gaging Station at Raccoon Creek at Waltz Road near Sutter County	Raccoon Creek	Additional study needed	Likely a minor impediment during low flows – additional study needed	Additional study needed	Raccoon Creek near Waltz Road close to the Placer-Sutter County line
Lincoln Ranch Duck Club Dam	Auburn Ravine	Seasonal flashboard dam	Seasonal barrier/ impediment; unscreened diversion	Dam: excavate sump; extend pump; vortex weirs; diversions: screen if needed	On Auburn Ravine approximately 1 mile upstream of the Brewer Road crossing

Fish Passage Barrier	Watershed	Type/ Features	Assessment	Recommended Action	Location
Coppin Dam	Auburn Ravine; Raccoon Creek	Seasonal flashboard dam and unscreened diversion	Seasonal barrier/ impediment	Screen diversion; possibly remove or provide fish passage	On the Cross Canal near the downstream end of the engineered portions of Auburn Ravine in Sutter County
Davis Dam	Auburn Ravine	Seasonal flashboard dam	Minor barrier; seasonal operation	Possibly remove or provide fish passage	On Auburn Ravine between the Pleasant Grove Road crossing and the Union Pacific Railroad tracks in Sutter county
Tom Glenn Dam	Auburn Ravine	Seasonal flashboard dam	Minor barrier; seasonal operation	Possibly remove or provide fish passage	On Auburn Ravine just east of Pleasant Grove Road in Sutter County
Ophir Tunnel Cataract	Auburn Ravine	Natural cataract	Significant impediment	Backwater lower portion with concrete sill series	Upstream of Lozanos Road on Auburn Ravine. Above NID 1 Dam, an impassable impediment
NID Doty Ravine south diversion structure	Doty Ravine	Concrete dam	Seasonal barrier	Screen diversion and add fish passage ladder	On Doty Ravine approximately ¼ to ½ mile downstream of Crosby Herold Road

Fish Passage Barrier	Watershed	Type/ Features	Assessment	Recommended Action	Location
Camp Far West Canal Dam	Raccoon Creek	Concrete dam with headgate	Significant barrier/ impediment	Fish ladder construction; screen intake	Approximately 1 mile downstream of the confluence of Orr and Dry Creek, which combine to form Raccoon Creek. The waterfall on Raccoon Creek is an impassable barrier such that salmonids may never access this dam
NID 1 Dam	Auburn Ravine	12 foot	Additional study needed	Additional study needed	2 miles upstream from Gold Hill Road

- Objective RAR-1.6. Modify unscreened water diversions. Screen, consolidate, relocate, remove, or otherwise modify all unscreened water diversions on salmonid streams in the reserve system.
 - Screening water diversions will reduce entrainment in plan area streams and improve survival of juvenile salmonids. The PCA expects to take over an unknown number of unscreened diversions as lands are acquired in fee title or conservation easement for the reserve system. As these unscreened diversions are brought into the reserve system they will be screened, removed, or otherwise modified to meet this objective and provide for the conservation of covered salmonids. Some unscreened diversions outside of the reserve system (*i.e.*, not protected through fee title or conservation easement) may be screened or removed as part of the fish barrier removal or modification projects, see objective RAR-1.5.
- Objective RAR-1.7. Enhance streams. Enhance stream reaches within the plan area to promote habitat complexity and function (*e.g.*, diversity of in-stream habitat, shaded riverine habitat, floodplain inundation). The PCA will improve in-channel features of plan area streams sufficient to meet a 1.5:1 ratio of enhanced to affected. In-channel enhancement measures will be located in the same watershed and salmonid habitat type

(e.g., spawning, migrating) in which the effects occur. The enhancement measures may be implemented in streams on the reserve system and elsewhere within Plan Area A, Plan Area B3, Raccoon Creek floodplain conservation, and Plan Area B4, fish passage channel improvement.

- This objective intends to improve habitat complexity and function for Covered Species and native biota in Plan Area A and B streams. Increasing channel complexity contributes to biological diversity, richness, and sustainability of the aquatic ecosystem, and benefits salmonid rearing habitat. Increasing channel complexity will provide in-stream refuge cover for covered salmonids, amphibians, and native species. This will provide for more suitable natural conditions for fish and other aquatic species while moderating water temperatures, providing in-stream cover for fish and other aquatic species, and helping to create food sources for covered fish species. This will also facilitate the movement of animals and plants (e.g., dispersal of seeds of riparian species) along riverine and riparian corridors that traverse the plan area.

1.3.4.2.3. PCCP Goal FISH-1

Increased spawning, rearing, and migratory success of covered salmonids in the Auburn Ravine, Raccoon Creek, and Dry Creek watersheds.

Several landscape- and community-level biological objectives will contribute to this goal, see PCCP section 5.2.7.9 for details (Placer County 2020b).

- Objective FISH-1.1. Protect salmonid spawning and migrating habitat. Of the 88.6 stream miles protected in the reserve system, objective RAR-1.2, protect 25 stream miles of salmonid spawning habitat and 10 miles of salmonid migrating habitat primarily on stream reaches along Raccoon Creek, Doty Ravine (a major tributary to Raccoon Creek), and Auburn Ravine.
- Objective FISH-1.2. Protect riparian habitat for fish. Of the riparian natural community protected in the reserve system (objective RAR-1.1), protect 558 acres of riparian habitat along salmonid spawning stream reaches and 342 acres of riparian habitat along salmonid migrating reaches, primarily along Raccoon Creek, Doty Ravine, and Auburn Ravine.
- Objective FISH-1.3. Protect oak woodlands for fish. Of the 12,490 acres of oak woodland and grassland protected in the foothills, protect 9,869 acres in the Raccoon Creek watershed to protect and improve water quality and watershed integrity in the Raccoon Creek watershed, the primary salmonid stream system within the RAA.
 - The Raccoon Creek watershed is the most intact, least fragmented watershed among the salmonid bearing watersheds in the plan area, particularly in the foothills, where spawning habitat is located. This objective intends to enhance watershed resiliency in Raccoon Creek by protecting and restoring large blocks of intact, high-quality oak woodlands, and foothills grasslands. Protecting the integrity of the upper Raccoon Creek watershed will help to improve in-stream

conditions downstream in the valley RAA through enhanced water quality and maintenance of necessary flows for salmonids.

1.3.4.2.4. PCCP Conservation Measures that Address Stream Habitat or Salmonids

1.3.4.2.4.1. PCCP Stream Systems

Protection of the stream system, which includes riparian communities, aquatic habitat, and other aquatic resources, is vital for ensuring the long-term viability of Covered Species. Figure 3 and figure 3-10 in the PCCP (Placer County 2020b) depict the location of the stream system. Only those areas protected as described in the PCCP goals and objectives will contribute toward the protection commitments in the biological goals and objectives.

In addition to protecting the stream system within the reserve system, Covered Activities will avoid or minimize effects within the stream system. Covered Activities that affect natural communities within the stream system boundary must contribute to restoration of the stream system at a ratio of 1.52:1 by paying a stream system fee. Covered Activities throughout the plan area must also implement LIDS.

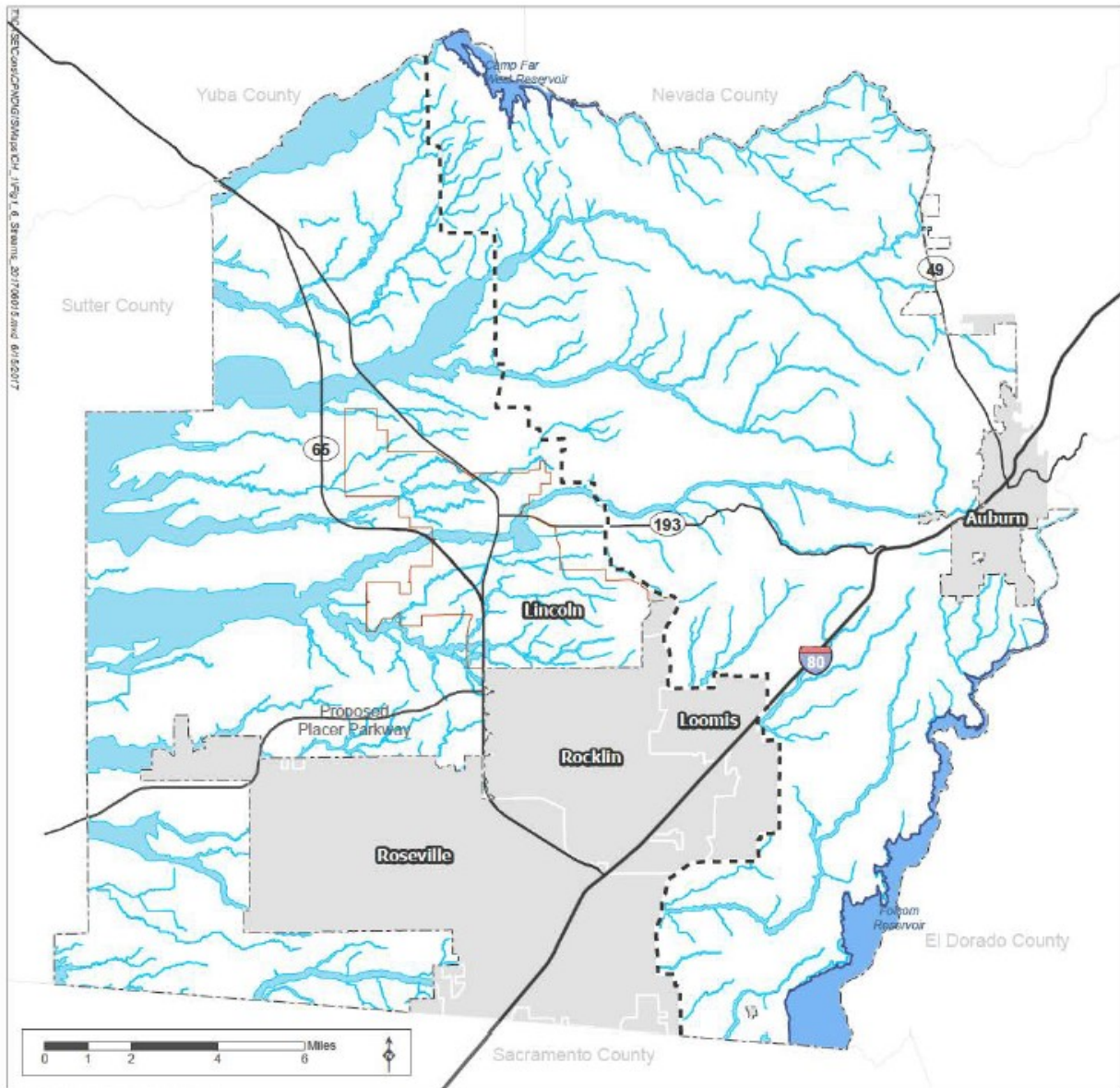


Figure 3. PCCP Stream System, from PCCP figure 3-10 (Placer County 2020b)

1.3.4.2.4.2. Aquatic and Wetland Buffers

Where aquatic and wetland constituent habitats are present in the reserve system, buffers are necessary to avoid the indirect effects from new development that may occur adjacent to the reserve system. The width of the buffers will be as specified in PCCP sections 6.3.2.1.2 and 6.3.2.2.1 (Placer County 2020b). Aquatic and wetland constituent habitats that do not have a sufficient buffer between the aquatic or wetland constituent habitat and new development will

not count toward meeting protection commitments because their proximity to development can greatly reduce their habitat value. Aquatic and wetland constituent habitats that do not have a sufficient buffer between the aquatic or wetland constituent habitat and existing development will count toward meeting the protection commitments. Except for areas subject to intensive fuel management, these aquatic and wetland buffer zones may count toward terrestrial (including riparian) community protection commitments.

1.3.4.2.4.3. Conservation in Plan Area B

It is intended that the majority of the reserve system will be established within Plan Area A. Conservation activities may occur in portions of Plan Area B to achieve biological goals and objectives. Cooperative conservation measures in these areas could also benefit the reserve system by expanding the resources available for a reserve, increasing contiguous reserve size, or improving connectivity. Conservation opportunities could occur in Plan Areas B3 and B4. Lands that may meet these needs for stream habitat or salmonids throughout Plan Area B are:

- Raccoon Creek floodplain conservation (B3). Conservation activities in this area may focus on watershed protection, including acquisition, and stream restoration along the Raccoon Creek floodplain within Sutter County.
- Fish passage channel improvement (B4). Conservation activities in this area may focus on activities to improve fish passage and habitat enhancement within channels west of Placer County in Sutter County. These activities will primarily be one-time actions (*e.g.*, vegetation management, plantings); they do not include land acquisition.

Conservation measures performed by the permittees, including land acquisition, land management, and monitoring activities, within Plan Area B will count toward applicable PCCP commitments. These actions will be covered by the State and Federal permits.

1.3.4.2.4.4. Conservation Zones that Address Stream Habitat or Salmonids

The PCCP consists of five conservation zones. More detail on these zones and their contribution to the overall PCCP conservation strategy can be found in section 5.3.1.3.2 of the PCCP, Conservation Zones (Placer County 2020b). The following includes how these zones address stream habitat or salmonids:

- (1) Valley north conservation zone. Includes the Bear River and Raccoon Creek watersheds and will provide the majority of valley aquatic/wetland complex. Riverine/riparian protection benefits covered salmonids. Reserves here will contribute to linkages with the foothills along the Bear River and Raccoon Creek, maintain connectivity between the valley north and valley south conservation zones, and protect linkages along lower Raccoon Creek in Sutter County.
- (2) Valley south conservation zone. Reserves in valley south will contribute to linkages along Auburn Ravine and Markham Ravine, which is important for salmonid habitat. Reserves in the southern portion of valley south will maintain or restore connectivity across the barrier, which will result from the Placer Parkway and will connect the Pleasant Grove Creek and Curry Creek watersheds.

- (3) Valley PFG. Includes approximately 2,350 acres of natural communities mapped in the stream system. These lands along Auburn Ravine and Dry Creek have direct biological values for salmonids and add to connectivity.
- (4) Foothills north conservation zone. This zone primarily protects oak woodland and the Bear River and Raccoon Creek stream systems.
- (5) Foothills PFG. Includes 3,614 acres of communities mapped in the stream system. These lands along Auburn Ravine and in the upper Doty Creek and Dry Creek watersheds provide spawning habitat for salmonids and provide east-west connectivity from the valley to the foothills.

The PCA will prioritize acquisitions that contribute to protection of the following linkages:

- Bear River Watershed. Connect oak woodland reserves to oak woodlands in Nevada and Yuba Counties throughout the Bear River watershed.
- Yankee Slough – Raccoon Creek watershed. Connect valley reserves to foothill reserves.
- Raccoon Creek – Doty Creek Corridor. Connect existing protected areas and reinforce riparian protection for salmonids.
- Lower Raccoon Creek. Maintain connectivity between the valley north and valley south conservation zones and provide a linkage along lower Raccoon Creek in Sutter County.
- Markham Ravine. Connect reserves with EXR to the east.
- Auburn Ravine. Connect reserves with EXR to the east; important for salmonids.
- Cross Placer Parkway. Remediate barrier created by the proposed Placer Parkway. Connect Pleasant Grove Creek watershed to Curry Creek watershed.
- Curry Creek. Connect reserve lands to Sutter County on the west and avoided stream systems to the east.
- Miners Ravine. Connect stream system reserve opportunities in Miners Ravine to tributaries of Dry Creek; important for salmonids.

1.3.5. Program Participation and Conditions on Covered Activities

1.3.5.1. Categories of Conditions

The PCCP groups conditions according to their purpose as follows.

- (1) General conditions. General conditions (1) apply to all/most Covered Activities and include the assessment of fees for land conversion and other effects and application of BMPs to reduce potential effects on Covered Species and natural communities.

- (2) Natural community conditions. Specific avoidance and minimization measures on Covered Activities in certain natural communities may apply.
- (3) Stream system conditions. Conditions to avoid and minimize effects on the stream system.
- (4) Rural public project conditions. Conditions that address public projects undertaken outside the Sacramento Valley portion of the plan area (valley PFG).
- (5) Species conditions. Where activities may affect Covered Species or where the potential for take can be avoided or reduced through specific actions, such as appropriate species surveys, application of BMPs, seasonal restrictions, or protective buffers.
- (6) Reserve management conditions. Conditions that apply to the management of reserve lands.

1.3.5.2. Regional Approach

The PCCP will follow a regional approach. The PCCP will systematically implement conditions to avoid and minimize effects and, where avoidance is not feasible, will require mitigation for the loss of Covered Species habitat, including aquatic resources, on a regional scale. The PCCP aims to ensure a comprehensive approach to conservation of Covered Species and natural communities by avoiding and minimizing impacts and concentrating protection where it has the greatest long-term value. By protecting and restoring wetland, vernal pools, oak woodlands, and riparian and other high-quality habitats, and restricting Covered Activities from areas of higher biological value, such as in stream systems, regional avoidance and minimization goals are supported.

Regional-scale avoidance and minimization reduces the need for individual projects to avoid and minimize effects at the project scale and allows streamlining of regulatory requirements. The PCCP assumes take will result from Covered Activities and mitigates the aggregate effects through the implementation of the conservation strategy described in chapter 5 of the PCCP (Placer County 2020b).

On-site avoidance and minimization are given a lower priority within the PFG, other than the stream system, where existing urban areas occur and where future development and infrastructure will be concentrated. However, natural community and species surveys may still be required in these areas to ensure that effects on sensitive resources, such as streams and wetlands, are avoided and minimized and to ensure compliance with other species regulations.

1.3.5.3. Conditions on Covered Activities

The PCCP contains many conditions on Covered Activities. For this opinion, those conditions that address stream habitat or salmonids are included in the following subsections. All other conditions in section 6.3 of the PCCP (Placer County 2020b) are incorporated by reference.

1.3.5.3.1. General Conditions that Address Stream Habitat and/or Salmonids

1.3.5.3.1.1. PCCP General Condition 1, Watershed Hydrology and Water Quality

All Covered Activities shall comply with the State of California General Construction Permit, including requirements to develop a project-based stormwater pollution prevention plan (SWPPP), and applicable national pollutant discharge elimination system (NPDES) program requirements as implemented by Placer County and the City of Lincoln.

The site design requirements, source control measures, and BMPs required by this condition will cumulatively benefit Covered Species by:

- Minimizing the potential impacts on Covered Species that are most likely to be affected by changes in hydrology and water quality,
- Reducing stream pollution by removing pollutants from surface runoff before it reaches local streams,
- Minimizing degradation of streams and maintaining or improving the hydrograph to maintain populations of Covered Species and enhance recovery,
- Reducing the potential for scour at stormwater outlets to streams by controlling the rate of flow into the streams.

The following BMPs are related to water quality objectives contained in the NPDES programs, but are more targeted to avoidance and minimization of effects on Covered Species and go beyond the typical requirements of an SWPPP. These BMPs apply to all Covered Activities:

- When possible, vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas. When temporary vehicle parking areas are to be established, the site will be recovered to pre-project or ecologically improved conditions within one year of the start of groundbreaking to ensure effects are temporary.
- Trash generated by Covered Activities will be promptly and properly removed from the site.
- Appropriate erosion control measures (*e.g.*, fiber rolls, filter fences, vegetative buffer strips) will be used on site to reduce siltation and runoff of contaminants into avoided wetlands, ponds, streams, or riparian vegetation.
 - Erosion control measures will be of material that will not entrap wildlife (*i.e.*, no plastic monofilament). Erosion control blankets will be used as a last resort because they tend to biodegrade slowly and trap reptiles and amphibians.
 - Erosion control measures will be placed between the area of disturbance and any avoided aquatic feature, within an area identified with highly visible markers (*e.g.*, construction and erosion-control fencing, flagging, silt barriers) prior to commencement of construction activities. Such identification will be properly maintained until construction is completed and the soils have been stabilized.

- Fiber rolls used for erosion control will be certified as weed free by the California Department of Food and Agriculture, or any agency that is a successor or receives delegated authority during the permit term.
 - Seed mixtures applied for erosion control will not contain California Invasive Plant Council designated invasive species (California Invasive Plant Council 2021) but will be composed of native species appropriate for the site or sterile non-native species. If sterile non-native species are used for temporary erosion control, native seed mixtures must be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive non-natives.
- If the runoff from the development will flow within 100 feet of a wetland or pond, vegetated stormwater filtration features, such as rain gardens, grass swales, tree box filters, infiltration basins, or similar LID features to capture and treat flows, shall be installed consistent with local programs and ordinances.

For more details on this condition, see section 6.3.1.1. of the PCCP (Placer County 2020b).

1.3.5.3.1.2. PCCP General Condition 5, Conduct Worker Training

If project-specific conditions for avoidance or minimization apply during construction, all project construction personnel will participate in a worker environmental training program that will educate workers regarding the Covered Species and their habitats, the need to avoid impacts, State and Federal protection, and the legal implications of violating environmental laws and regulations.

This condition applies to projects where compliance with the conditions described in chapter 6 of the PCCP (Placer County 2020b) would result in one or more avoidance or minimization requirements applied during construction (*e.g.*, maintenance of an avoidance buffer, placement of exclusion fencing). At a minimum, this training may be accomplished through “tailgate” presentations at the project site and the distribution of information brochures, with descriptions of sensitive biological resources and regulatory protections, to construction personnel prior to initiation of construction work.

1.3.5.3.2. Community Conditions that Address Stream Habitat and/or Salmonids

1.3.5.3.2.1 PCCP Community Condition 2.1, Riverine and Riparian Avoidance

Covered Activities that avoid effects on the riparian constituent habitat by excluding construction or other ground disturbance from existing riparian vegetation are not subject to special habitat fees.

Effects to riparian habitat can be credited as avoided if the project does not modify any area within a buffer that extends 50 feet outward from the outermost bounds of the riparian vegetation. The riparian buffer does not include patches of invasive, non-native vegetation that extends beyond the riparian vegetation.

If a project cannot avoid effects on riparian vegetation and surrounding buffer, PCCP community condition 2.2 will apply. An avoidance buffer is not required for streams not otherwise addressed through the stream system conditions, PCCP section 6.3.3 (Placer County 2020b), however, all other community condition 2 requirements apply.

1.3.5.3.2.2 PCCP Community Condition 2.2, Minimize Riparian and Riverine Effects

Project applicants are incentivized to avoid riverine and riparian constituent habitat, see PCCP sections 2.1 and 2.3 for more details (Placer County 2020b). Some Covered Activities will still occur within riverine and riparian constituent habitat. Therefore, projects will adhere to avoidance and minimization measures, as applicable.

The design requirements, avoidance and minimization measures (AMMs), and construction BMPs identified below reflect current and forthcoming regulations and guidance for in-stream project design. These BMPs will be updated as new information is available. Updated BMPs shall be at least as restrictive for protection of the species as those described here, and wildlife agencies will approve proposed changes to BMPs before they are applied to Covered Activities.

BMPs will apply to all Covered Activities in the stream system in the plan area, as well as to open canals, except for PCWA canals, which are addressed in PCCP section 2.4 (Placer County 2020b).

In-stream and stream system BMPs, as provided in the PCCP (Placer County 2020b) are as follows.

Project planning and design AMMs and BMPs:

- All Covered Activities shall minimize the area of disturbance in the stream system to the maximum extent practicable;
- Prior to final project design, site characteristics will be evaluated to determine if non-traditional designs, such as bioengineered bank treatments that incorporate live vegetation or other engineered habitat improvements, can be successfully utilized while meeting the requirements of the project;
- If structural changes to the channel bed are necessary as part of the project design, provisions for fish passage will be incorporated into the project design;
- To minimize the impact of new construction, existing access routes and levee roads shall be used;
- Removal of riparian vegetation shall be minimized, so the amount cleared will only be the amount necessary to accomplish the required activity and comply with public health and safety directives. Where riparian vegetation requires removal, removal will first be targeted in areas dominated by invasive vegetation;

- Maintenance of natural stream characteristics, such as riffle-pool sequences, riparian canopy, sinuosity, floodplain, woody debris, and a natural channel bed, will be incorporated into the project design;
- Stream bank repair design will first consider only use of compacted soil and will be re-seeded with native grasses or sterile non-native hybrids and stabilized with natural erosion control fabric. If compacted soil is not sufficient to stabilize the slope, bioengineering techniques must be used. No hardscape (*e.g.*, concrete or any sort of bare riprap) or rock gabions may be utilized in streams not managed for flood control (*i.e.*, streams where channel clearing, vegetation removal, debris removal, and conveyance maintenance activities are conducted), except in cases where infrastructure or human safety is threatened (*e.g.*, undercutting of existing roads);
- Rock riprap may only be used to stabilize channels experiencing extreme erosion or posing a threat to public safety. When used, rock riprap must be large enough, installed to withstand a 100-year flow event, and planted with native riparian species suitable for planting in such a manner;
- Limit removal of instream woody material (IWM) and vegetation in channels, on stream banks, and along levees and maintenance roads to only that necessary to meet the objective of the Covered Activity, or to meet regulatory requirements or guidelines;
- In streams not managed for flood control purposes (*i.e.*, streams where channel clearing, vegetation and debris removal, and conveyance maintenance activities are conducted), woody material (including live leaning trees, dead trees, tree trunks, large limbs, and stumps) will be retained unless it is threatening a structure, impeded reasonable access, or is causing bank failure and sediment loading to the stream;
- If debris blockages threaten bank stability and may increase sedimentation of downstream reaches, debris will be removed. When clearing natural debris blockages (*e.g.*, branches, fallen trees, soil from landslides) from the channel, only remove the minimum amount of debris necessary to maintain flow conveyance (*i.e.*, prevent significant backwatering or pooling). Non-natural debris (*e.g.*, trash, shopping carts) will be fully removed from the channel.
- To minimize the effect of increased local erosion due to in-channel vegetation removal, the top of the bank shall be protected by leaving vegetation in place to the maximum extent possible;
- Avoid access routes on slopes of greater than 20 percent used to access upland areas adjacent to streams and riparian areas. Any upland access across sloped areas shall be examined for evidence of instability and either revegetated or filled to prevent future landslide or erosion;
- Avoid activities in the active (*i.e.*, flowing) channel to the maximum extent practicable, especially during the migration, spawning, and egg incubation season for covered fish species, or before amphibians have undergone metamorphosis. If activities must be

conducted in the active channel, limit the use of equipment for in-water work to hand tools to the extent practicable;

- Bank stabilization site design shall evaluate hydrological effects immediately upstream and downstream of the work area to minimize downstream erosion caused by changes in water velocity. Design of bank stabilization projects shall incorporate similar roughness and characteristics of the bank surrounding the project area;
- Trails will be sited and designed with the smallest footprint necessary to cross through the stream system. Trail crossings of streams will be aligned perpendicular to the channel and be designed to avoid any potential for future erosion;
- Trail crossings of freshwater systems and drainages will adhere to the BMP above regarding the preference of bridges, or other over-water structures, to minimize disturbance. Culverts may also be used if that is the least environmentally damaging design;
- Trail design shall minimize the need for drainage structures, At the outfalls of drainage structures, erosion control measures shall be taken to prevent erosion;
- Whenever possible, the span of bridges will also allow for upland habitat beneath the bridge to provide undercrossing areas for wildlife species that will not enter the creek. Native plantings, natural debris, or scattered rocks will be installed under bridges to provide wildlife cover and encourage the use of crossings.

Dewatering AMMs and BMPs:

- While in-stream work is performed, the entire streamflow shall be diverted around the work area by a barrier, except where it has been determined by a qualified biologist that the least environmentally disruptive approach is to work in a flowing stream and fish and amphibian passage is not a concern at that time. Where feasible, water diversion techniques shall allow stream flows to gravity flow around or through the work site;
- Cofferdams for isolating in-channel activities shall be installed both upstream and downstream not more than 100 feet from the extent of the work areas to prevent seepage into or from the work area when dewatering of the entire channel is necessary. Otherwise, cofferdams shall affect no more of the stream channel than is necessary to support completion of the work. All water shall be discharged in a non-erosive manner (*e.g.*, through gravel or vegetated bars, or hay bales, on plastic, on concrete, or in storm drains when equipped with filtering devices) provided that it first has been properly treated to eliminate contaminants, including raw concrete. Treated water discharged to the channel shall be consistent with ambient conditions, including temperature and pH. Turbid water or water contaminated with other pollutants pumped out of cofferdams shall be discharged to upland areas (*e.g.*, grassy field) providing overland flow and infiltration and not allowed to re-enter the channel, or pumped to containers (*e.g.*, baker tanks) for disposal;

- In channels with low flows, small in-channel berms constructed of imported, non-erosive materials (*e.g.*, washed, rounded, spawning-sized gravel between 0.4 and 4.0 inches [10 to 100 millimeters] in diameter) or other temporary structures (gravel-filled sandbags, inflatable rubber cofferdams) that deflect water to one side of the channel during project implementation may be built. Following berm removal, the channel shall be restored to its original condition; gravel in contact with flowing water shall be left in place and allowed to disperse naturally by high winter flows;
- Sumps or basins may be used to collect water, where appropriate (*e.g.*, in channels with low flows). If pumps are used, a fish screen must be installed to prevent entrapment of small fish;
- To prevent increases in temperature and decreases in dissolved oxygen (DO), properly sized bypass pipes shall be used (*i.e.*, larger diameter pipes to better pass the flows). Creation of a low-flow channel or other methods to isolate the work area may be used to avoid the use of bypass pipes;
- Diversions shall not diminish the quantity or degrade the quality of discharged water, and shall maintain ambient stream flows below the diversion. When the work is completed, all de-watering materials placed in the channel shall be removed and normal flows shall be restored to the affected stream as soon as it is feasible and safe. To the extent, feasible, all temporary diversion structures and the supportive material shall be removed no more than 48 hours after work is completed; clean gravel in contact with flowing water shall be left in place and allowed to disperse naturally by high winter flows.

Construction AMMs and BMPs:

- The applicant shall maintain a copy of project conditions, as determined by the local jurisdiction and/or PCA, at the site. Site supervisors shall be familiar with all project conditions;
- A qualified biologist will train all personnel working within or adjacent to the stream system (*i.e.*, those people operating ground-disturbing equipment) regarding these avoidance and minimization measures and the permit obligations of project applicants working under the PCCP;
- Personnel shall utilize equipment that minimizes the area and degree of disturbance, such as appropriately-tired vehicles (either tracked or wheeled, depending on the situation), or avoidance of vehicles if possible;
- No vehicles other than necessary construction equipment shall be allowed within the stream system;
- All wetlands, other waters, and stream systems that are adjacent to a Covered Activity project site and that will be avoided shall be marked with bright construction fencing. Temporary fencing shall be removed upon completion of the project;

- Deep pools located outside and adjacent to the construction footprint shall be fenced or blocked with barriers to prevent encroachment of equipment and personnel from affecting deep-pool habitats, which are used as refuges for fish and wildlife;
- When practicable, avoid maintenance and construction activities at night. When night work cannot be avoided:
 - Minimize the use of temporary lighting,
 - Shield and focus lights on work areas,
 - Use the lowest intensity lighting necessary to complete the work;
- Wildlife entering the construction site shall be allowed to leave the area unharmed, or shall be flushed or herded humanely in a safe direction from the site;
- All utility pipe sections shall be capped or inspected for wildlife before being placed in a trench. Pipes within a trench shall be capped at the end of each day to prevent entry by wildlife;
- At the end of each workday all open trenches will be provided with a ramp of dirt or wood to allow trapped animals to escape;
- Staging and storage areas for equipment, stockpiled materials, fuels, lubricants, and solvents shall be located outside of the stream system. If site conditions prevent locating staging areas outside the stream system, at a minimum they shall be located outside the top of the bank, ideally on an existing disturbed area (*e.g.*, access road) or other area that can be readily returned to pre-project conditions at the conclusion of the activity;
- Handle and disposal of invasive plant species removed during Covered Activity implementation will be conducted in such a manner as to prevent further spread of the invasive species;
- To minimize the spread of pathogens, all staff working in aquatic systems (*i.e.*, streams, ponds, and wetlands), including site monitors, construction crews, and surveyors, will adhere to the most current guidance for equipment decontamination provided by the wildlife agencies at the time of activity implementation;
- Only herbicides registered with the California Department of Pesticide Regulation shall be used in streams, ponds, and lakes, and shall be applied in accordance with label instructions. A list of all pesticides that may be used in the project area shall be submitted to the PCA before use. The USFWS and NMFS do not issue incidental take permits for herbicide, pesticide, and rodenticide use; pesticide and rodenticide use, and resultant take of Covered Species, are not covered under the PCCP for the Federal permits;
- Avoid or minimize the amount of fertilizer used during hydroseeding to minimize introducing these materials into waterways.

Post-construction AMMs and BMPs:

- Temporary fills, such as for access ramps, diversion structures, or cofferdams, shall be completely removed upon finishing the work;
- The stream bed will be returned to as close to pre-project condition; considering such characteristics as elevations, profile, and gradient; as appropriate. Ecologically improved conditions shall be incorporated into project design when appropriate;
- Any disturbed soils will be revegetated with native plants; non-invasive species; or non-reproductive plants (*i.e.*, sterile hybrids) suitable for the altered soil conditions;
- Projects that cross beneath streams must provide a post-construction summary of any unanticipated effects (*e.g.*, stream channel disturbance due to a frac-out, where drilling mud is released through fractured bedrock) resulting from implementation of the project. Additional fees may be owed, based on the actual effects of the project;

Operations and maintenance AMMs and BMPs:

- For stream maintenance activities, only in-stream work that is necessary to maintain the channel consistent with designated management purposes (*e.g.*, flood control, groundwater recharge) will be conducted;
- When conducting vegetation management, retain as much understory brush and as many trees as feasible, emphasizing shade producing and bank stabilizing vegetation;
- Vegetation thinning and removal in streams managed for flood control will be phased to ensure that some riparian habitat remains at all times. Projects will be planned so that the least amount of riparian vegetation will be removed while still meeting the desired flood control needs;
- If a project alters the stream bed during stream maintenance, the stream low-flow channel shall be returned to its approximate prior location with appropriate depth for fish passage without creating a potential future bank erosion problem;
- Sediment removal in the stream channel shall use the approach with the least impact, such as phasing of removal activities or only removing sediment along one half of the channel bed, allowing the other half to remain relatively undisturbed;
- Maintenance and operation of pumps and generators placed in-stream will minimize impacts to water quality and aquatic species;
- Temporary crossings shall be installed no earlier than April 15 and shall be removed no later than October 15. This work window could be modified at the discretion of Placer County, the City of Lincoln, and/or the wildlife agencies;
- The following will be implemented to minimize noise effects on fish and wildlife during pile driving:

- Vibratory pile drivers, or other wildlife agency-approved methods, shall be used to drive piles, to the maximum extent practicable;
 - Where feasible, the use of impact hammers to drive piles will be limited to areas outside of the stream channel or in dry cofferdams;
 - Bubble curtains will be used to attenuate sound when it is necessary to drive piles with an impact hammer in water;
 - The smallest pile driver and the minimum force necessary to complete the work will be used;
 - All types of pile driving will be limited to daylight hours only to provide fish and wildlife with extended quiet periods;
 - Prior to initiating pile driving with an impact hammer, an acoustic analysis using the most recent interagency standards and guidelines will be conducted to predict impacts of pile-driving noise on covered fish species;
 - A hydroacoustic monitoring plan will be developed and implemented and underwater noise levels will be monitored during all impact pile driving on land, in dry cofferdams, and in water (using bubble curtains) to ensure that the peak and cumulative sound exposure levels do not exceed predicted values;
- Wood treated with oil-type preservatives (*e.g.*, creosote, pentachlorophenol) shall not be used in waterways. Wood treated with waterborne preservative chemicals shall be used instead, provided that the preservative being used has been approved by the Western Wood Preservers Institute (WWPI), and WWPI guidelines and BMPs to minimize effects on aquatic environments during implementation are followed (WWPI 2021);

Utility line installation AMMs and BMPs:

- Utility lines that cross waterways shall be attached to bridges when feasible;
- When it is necessary to bury utility lines beneath stream channels, a frac-out plan will be prepared and will include a plan for response and containment. In addition, the following factors shall be considered as part of project design:
 - Utility lines shall be buried below the maximum extent of channel bed scour and aligned as perpendicular as possible to the stream channel;
 - Avoid siting crossings at meander bends, braided stream segments, alluvial fans, active floodplains, other inherently unstable reaches, areas of groundwater upwelling, or locations with documented spawning habitat;
 - Trenching through stream banks and channels shall be avoided in favor of trenchless construction methods (*e.g.*, jack and bore, directional drilling), to the maximum extent practicable;

- If trenching is required:
 - Trench widths should be as narrow as feasible to accommodate the pipeline/utility line;
 - Trench excavation shall be conducted in the dry or in areas isolated from flowing water (*e.g.*, cofferdams, stream diversions) and other AMMs associated with cofferdams and water diversions described in this list shall be implemented;
- The amount of disturbance shall be kept to the minimum necessary to complete the work;
- Disturbed areas shall be returned to pre-project conditions prior to returning flow to the stream;
- If directional drilling is required:
 - Drill paths shall be designed at an appropriate depth below the stream channel to minimize the risk of frac-out where drilling mud is released through fractured bedrock;
 - Drill entry and exit points shall be located away from channel banks to minimize impact on the stream system and channel;
- Overland trenches shall be required to be backfilled with the native soils originally excavated from that area, as opposed to imported engineered fills, to the maximum extent feasible. Additionally, where technically feasible, topsoil shall be required to be stripped, stockpiled, and reapplied to original depth in all areas disturbed by construction over and adjacent to overland trenches.

1.3.5.3.2.3. PCCP Community Condition 2.3, Riverine and Riparian Restoration

Covered Activities that affect riverine or riparian constituent habitat must contribute to restoration to compensate for loss of riverine or riparian constituent habitat.

Riverine restoration measures will be located in the same watershed and salmonid habitat type (*e.g.*, spawning or migrating) in which the effects occur.

Generally, restoration and replacement actions will be undertaken by the PCA and funded by additional fees imposed on projects. Riverine and riparian restoration to offset project effects may be implemented on-site to replace the functions of the riparian woodland degraded or lost to the Covered Activity. Riparian restoration implemented on-site will be credited to PCCP restoration targets, if the restoration helps to meet the biological goals and objectives of the PCCP. When it is deemed infeasible to implement restoration at the project site, in-kind restoration will be required at an off-site location or through the payment of fees to the PCA. Stream enhancement will be implemented in concert with PCCP community condition 2.2 (Placer County 2020b).

1.3.5.3.2.4. PCCP Community Condition 2.4, PCWA Operations and Maintenance BMPs

PCWA will apply operations and maintenance BMPs in addition to any other applicable community and species conditions.

PCWA operates an extensive raw water distribution system that includes canals, ditches, flumes, and several small reservoirs.

When PCWA needs to conduct maintenance activities, it will follow pre-implementation BMPs to reduce potential adverse effects of PCWA O&M activities on natural resources in the plan area. These BMPs will be applied at facilities as maintenance needs arise, and will not be applied unless otherwise conducting ground-disturbing activities.

Pre-implementation BMPs:

- Improve canal bank stability and install sediment traps at canal outlets by:
 - Installing velocity dissipation devices at canal outlets;
 - Lining banks at canal outlets;
 - Installing erosion control blankets in areas of soil disturbance;
 - Installing temporary fiber rolls in areas of soil disturbance; and/or
 - Applying spray-on soil binders in areas of soil disturbance.
- Avoid potential wet-weather effects to natural resources in the plan area, such as erosion, by:
 - Patrolling canals and removing potential obstructions to prevent erosion;
 - Minimizing the amount of water purchased from water purveyors during periods of high precipitation;
 - Distributing flood releases from the canal system by releasing flows at numerous intermediate outlets;
 - Planning and designing projects to minimize land disturbance;
 - Installing erosion and sedimentation control measures prior to land-disturbing activities;
 - Identifying areas that are susceptible to erosion for future canal lining activities; and/or
 - Choosing canal crossing sites where erosion potential is low.

In order to prevent degraded water from entering streams after PCWA O&M activities are performed, the following ongoing or post-implementation BMPs will be applied, if applicable:

- Modifying canal operations to gradually restore reservoir releases to canals at a slower rate;
- Applying sediment traps at storm drains for dewatering before canal lining;
- Treating first-flush flows and other flushing to reduce downstream water quality effects, including minimizing sediment releases during the breeding seasons for covered amphibians and fish.

1.3.5.3.3. Conditions to Avoid, Minimize, and Mitigate Effects on the Stream System

The primary objective of stream system conditions is protection of watershed integrity, health and hydrology, by defining the stream system and providing incentive, via fee, for the project applicant to avoid land conversion within the stream system boundary. Projects where effects on riparian and riverine constituent habitat are unavoidable must also comply with community condition 2, riverine and riparian avoidance minimization.

A definition for the stream system boundary is provided in section 3.2.7 of the PCCP (Placer County 2020b). The stream system boundary is different from the watercourse structural setback requirements of local zoning codes.

The stream system boundary will be determined by a qualified biologist and approved by the permittee with jurisdiction over the Covered Activity.

1.3.5.3.3.1. Stream System Condition 1, Stream System Avoidance and Minimization

Design and implement Covered Activities in such a way as to avoid and minimize adverse effects on the stream system.

This condition allows applicants to avoid portions of the stream system and therefore avoid paying fees, as described in stream system condition 2, stream system mitigation: restoration.

1.3.5.3.3.2. Stream System Condition 2, Stream System Mitigation: Restoration

Where Covered Activities result in the permanent or temporary impacts on the stream system, regardless of the community or constituent habitat type affected, effects shall be mitigated by appropriate restoration or enhancement.

This measure works in concert with community condition 2.3, riverine and riparian restoration.

Projects that occur in the stream system, but do not avoid permanent effects, will pay the stream system fee. Projects in the stream system with only temporary effects do not pay the stream system fee. This will apply to all areas of the project that occur in the stream system boundary that is not otherwise assessed a special habitat fee, including affected upland communities within the stream system. See section 9.4.1.4 of the PCCP (Placer County 2020b) for more details.

Some Covered Activities are required to occur in the stream system and, as such, cannot meet the avoidance criteria described in stream system condition 1, stream system avoidance and minimization. Existing structures, uses, and activities; including legal non-conforming structures, uses, and activities; are exempt from the stream system fee unless subject to future modification that would require approval by a permittee. Maintenance activities may also be exempt pending approval of the permittee.

1.3.5.3.4. Regional Public Programs Conditions that Address Stream Habitat or Salmonids

The PCCP contains many conditions on regional public programs all of which are incorporated here by reference. The following subsections highlight some that will serve as AMMs or BMPs for covered fish species or covered fish habitat. Please refer to section 6.3.4 of the PCCP (Placer County 2020b) for more details and design guidance measures.

1.3.5.3.4.1. Transportation and Other Infrastructure Projects

Design requirements:

- Enhance existing undercrossings;
- Implement minimum sizing of culverts;
- Install grating over tunnels/culverts for penetration of light;

Construction BMPs:

- For construction of new gravel roads, disconnect and disperse runoff flow paths, including roadside ditches, which might otherwise deliver fine sediment to stream channels;
- For construction of new gravel roads, prevent gullies by dispersing runoff from road surfaces, ditches, and construction sites by correctly designing, installing, and maintaining drainage structures (*e.g.*, road shape, rolling dips, out-sloped roads, culverts) and keeping streams in their natural channels. No single point of discharge from a road or other disturbed area should carry a flow that would be capable of creating gullies. If gullies continue to develop, additional drainage structures will be needed to disperse the runoff.
- When constructing or reconstructing a ditch, utilize designs for the outlet such that runoff is first filtered and/or spread to improve water quality and reduce flow velocity prior to the runoff entering surface waters, when practical. If not practical, implement sediment management BMPs to trap sediment before it reaches a stream. BMPs described in general condition 1, watershed hydrology and water quality, and community condition 2.2, minimize riverine and riparian effects, will be applied as appropriate;
- When designing or redesigning roads, evaluate, and where appropriate, implement, opportunities to restore natural drainage patterns. Install culverts or rolling dips to retain water in its drainage of origin, which will decrease the potential for erosion downstream.

On problem roads, evaluate, and where appropriate, implement, opportunities to reconstruct the road segment in order to improve and maintain natural drainage patterns; for example, add rolling dips, emergency water bars, and additional cross drains;

- Equipment storage, fueling, and staging areas will be sited on disturbed areas or on non-sensitive, non-native grassland land-cover types, when these sites are available, to minimize the risk of direct discharge into riparian areas or other sensitive land-cover types. When such sites are not available, staging will occur on the road used to access the site. BMPs must be utilized;
- No erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels, on adjacent banks, or where it may enter into any river, stream, or lake;
- Silt fencing or other sediment trapping methods will be installed below the grade of new road construction or road widening activities to minimize the transport of sediment off the site;
- Temporary barriers will be constructed to keep wildlife out of construction sites, as appropriate;
- On-site monitoring will be conducted by a qualified biologist throughout the construction period to ensure that disturbance limits, BMPs, and PCCP conditions/restrictions are being implemented properly;
- Active construction areas will apply standard dust control measures to minimize the effects of dust on adjacent vegetation and wildlife habitats, if warranted;
- Portions of the project that occur in streams (*e.g.*, bridge or culvert construction) will comply with community condition 2.2, minimize riverine and riparian effects;
- Following construction, the areas beyond road shoulders and inside the right-of-way will be returned to a natural state or pre-project conditions when a natural state is not achievable within one year of project groundbreaking. These actions will most likely be applied differently to each road project and will decrease the potential for the spread of invasive species;
- Invasive plants within the project area and any construction staging areas will be removed to prevent the spread of these species into nearby or adjacent reserves;
- Cut-and-fill slopes will be revegetated with native plants, if possible, or with non-invasive plants suitable for the altered soil conditions.
 - All temporarily disturbed areas, such as staging areas, will be returned to pre-project conditions or improved with native plants within one year of project groundbreaking;

- Vegetation and debris will be managed in and near culverts and under and near bridges to ensure that entryways remain open and visible to wildlife and that the passage through the culvert or under the bridge remains clear;
- Permittee shall conduct project activities in a manner that prevents the introduction, transfer, and spread of invasive species including plants, animals, and microbes (*e.g.*, algae, fungi, parasites, bacteria), from one project site and/or waterbody to another. Prevention BMPs and guidelines for invasive plants can be found on the California Invasive Plant Council's website at <http://www.cal-ipc.org/ip/prevention/index.php> (California Invasive Plant Council 2020) and for invasive mussels and aquatic species can be found at the Stop Aquatic Hitchhikers website at <http://www.protectyourwaters.net/> (Aquatic Nuisance Species Task Force 2017);
- Permittee shall inspect all vehicles, watercraft, tools, waders, boots, and other project-related equipment and remove all visible soil, mud, plant materials, and animal remnants prior to entering and exiting the project site and/or between each use in different waterbodies;
- Decontamination of project equipment;
- Decontamination of vehicles and watercraft;

Operation and maintenance BMPs:

- Projects occurring in streams or the stream system will also comply with stream system condition 1, stream system avoidance and minimization, and stream system condition 2, stream system mitigation: restoration, as appropriate;
- Silt fencing or other sediment control devices will be installed down-slope from maintenance activities that disturb soil to minimize the transport of sediment off site;
- In the course of rural road maintenance, no erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels, including roadside drainage ditches, or on adjacent banks where it could be washed into the channel or drainage ditch;
- Alternatives, such as mechanical control, shall be considered to substantially lessen any significant effect on the environment before using pesticides. Integrated pest management BMPs shall be used for all vegetation control;
- Regularly scheduled visual inspection of all roads shall be conducted to identify sites where erosion is contributing sediment to local streams and stabilize eroding areas;
- Annual clearing of flow lines (*e.g.*, culverts and ditches) shall be conducted such that flow lines are maintained free of debris;
- Existing roads shall be used for access and disturbed areas for staging as site constraints allow. Off-road travel will avoid sensitive communities.

1.3.5.3.5. Conditions to Minimize Effects on Covered Species that Address Salmonids

Species condition 7 addresses CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon. This condition applies stream avoidance and minimization BMPs specific for salmonid habitat in the plan area.

Habitat for CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon will be protected, managed, and restored in the reserve system. See chapter 5 of the PCCP for more details (Placer County 2020b).

1.3.5.3.5.1. Guidelines for Salmonid Passage at Stream Crossings

All Covered Activities within salmonid habitat will adhere to the NMFS Guidelines for Passage at Stream Crossings (NMFS 2001) or most current NMFS guidance, where feasible, unless noted in this section. In addition, the California Salmonid Stream Habitat Restoration Manual (California Department of Fish and Game 2011) will be consulted for specific in-stream design features and protocols to enhance habitat for salmonids.

- For stream crossings, the following structure types will be considered, listed in descending order of preference:
 - Free-span bridges that fully span, from top-of-bank to top-of-bank, the stream and allow for long-term dynamic channel stability;
 - Streambed simulation approaches, including a bottomless arch, embedded culvert design, or ford that maintains that natural streambed. The structure shall be sufficiently large and embedded deep enough into the channel to allow the natural movement of bedload and formation of a stable bed inside the culvert or structure. There should not be an excessive drop at the outlet or too high water velocity through the passage structure;
 - Non-embedded culvert, often referred to as a hydrological design, for use in low-gradient areas, that allows fish passage;
 - Baffled culvert, creases in the culvert create a series of short high-velocity runs and low-velocity backwater areas that allow the fish to swim in short bursts and then rest, for use in high-gradient areas, that allows fish passage.
- If the project's site is in an active salmonid spawning area, only free-span bridges or streambed simulations, culverts with a bed that simulates the natural streambed, are acceptable.
- Most stream crossings, regardless of the design (*i.e.*, bridge or culvert) or material used, will be designed to accommodate the 100-year peak floodflow with appropriate clearance to prevent structural damage to the crossing, where feasible. In the valley, the 100-year floodplain can be thousands of feet wide on some stream systems, so it may not be feasible to build stream crossings to accommodate the 100-year peak floodflow. Unless culverts are intentionally designed to be undersized for stormwater detention or retention,

culverts must, at a minimum, accommodate the 100-year flood without causing any adjacent flooding around the crossing that could result in mass erosion of the bank or the structural support of the crossing. This requirement will reduce the risk of channel degradation, stream diversion, and failure that may lead to adverse effects on salmonids over the lifespan of the crossing (NMFS 2001). Some State or local requirements may deem that the 200-year floodplain be considered for stream crossings, the conditions in this section do not supersede those requirements.

- For in-stream culvert installation or replacement projects that may affect stream hydrology, the project must be designed so that the elevations of surface waters in the stream reach exhibit gradual flow transitions, both upstream and downstream. Abrupt changes in water surface and velocities must be avoided, with no hydrologic jumps, turbulence, or drawdown at the entrance. Hydrologic controls may be necessary to provide resting pools, concentrate low flows, prevent erosion of streambed or banks, and allow passage of bedload material (NMFS 2001).
- If a free-span bridge is not feasible, bridge piers and footings will be designed to have minimum impact on the stream. This applies in all stream systems, not just active salmonid spawning areas. A hydrological analysis must be prepared that shows piers or footings will not cause significant scour or channel erosion. Whenever possible, the span of bridges will also allow for upland habitat beneath the bridge to provide undercrossing areas for wildlife species that will not enter the creek. Native plantings, natural debris, or large rocks (not riprap) will be installed under bridges to provide wildlife cover and encourage the use of crossings.
- All in-stream structures will be aligned with the stream, with no abrupt changes in flow direction upstream or downstream of the crossing. This requirement can often be accommodated by changes in road alignment or slight elongation of the culvert. Where elongation would be excessive, such a solution must be weighed against a better crossing alignment and/or modified transition sections upstream and downstream of the crossing. Project components that may result in disruption of stream hydrology and alterations to the natural streambed will be anticipated and mitigated in the project design (NMFS 2001).
- If structural changes to the channel bed are necessary as part of project design, provisions for fish passage will be incorporated into the project design. If the project applicant has the opportunity to incorporate new fish passage into the project design in an area where fish passage is currently lacking, the project applicant will work with the PCA to determine if new fish passage would support recovery of Covered Species.

1.3.5.3.5.2. Applicable Measures

Salmonid 1. Fish passage design. Streamflow through new and replacement culverts, bridges, and over stream gradient control structures must meet the velocity, depth, and other passage criteria for salmonid streams as described by NMFS and CDFW guidelines or as developed in cooperation with NMFS and CDFW to accommodate site-specific conditions (NMFS 2001).

Salmonid 2. Fish passage during construction. Fish passage through dewatered channel sections shall be maintained at all times during the adult and juvenile migration season on streams with Covered Species to allow for unimpeded passage of migrating adults and juveniles. In addition, fish passage shall be maintained during summer on streams supporting summer rearing of Covered Species to allow for seasonal movement of resident fish when the natural channel segment within the vicinity of work areas also supports the movement of resident fish.

- To allow for fish passage, diversions shall:
 - Maintain continuous flows through a low-flow channel in the channel bed or an adjacent artificial open channel;
 - Present no vertical drops exceeding six inches and follow the natural grade of the site;
 - Maintain water velocities that shall not exceed 1.5 feet per second and provide velocity refugia, as necessary;
 - Maintain adequate water depths consistent with normal conditions in the project reach;
 - Be lined with cobble/gravel to simulate stream bottom conditions;
 - Be checked daily to prevent accumulation of debris at diversion inlet and outlet;
- A closed conduit pipe shall not be used for fish passage. Pipes may be used to divert flow through dewatered channel segments on streams that do not support migratory species, or during low-flow conditions when the channel segment within the vicinity of the work areas at the time of construction does not support the movement of fish.

Salmonid 3. Pre-construction relocation. Prior to the start of work or during the installation of water diversion structures, if covered fish species are present and it is determined that they could be injured or killed by construction activities, a qualified biologist will first attempt to gently herd covered fish species away from work areas and exclude them from work areas with nets, if practicable. If herding is not practicable or effective, a qualified biologist shall capture covered fish species and transfer them to another appropriate reach. In considering the relocation, the qualified biologist will determine whether relocation is ecologically appropriate using a number of factors including site conditions, system carrying capacity for potential relocated fish, and flow regimes if flows are managed. If covered fish species are will be relocated, the following factors will be considered when selecting release sites:

- Similar water temperature, within 3.6°F or 2°C, as capture location. In addition, fish must be held in water that is at the same temperature as release sites at time of release. If raising or lowering of water temperature in holding apparatus is required, water temperatures in holding apparatus with fish should not be changed at a rate that exceeds 1.8°F (1°C) every two minutes, and should not exceed 9°F (5°C) per hour;
- Ample habitat availability prior to release of captured individuals;

- Presence of others of the same species so that relocation of new individuals will not upset the existing prey/predation function;
- Carrying capacity of the relocation location;
- Potential for relocated individuals to transport disease;
- Low likelihood of fish reentering work site or becoming impinged on exclusion net or screen.

Capture and relocation of covered fish species is not required by the PCCP at individual project sites, as determined by the PCA and/or the interagency working group, when site conditions preclude reasonably effective operation of capture gear and equipment, or when the safety of the biologist conducting the capture may be compromised.

Salmonid 4. Spawning gravel cleaning. Spawning gravel cleaning and replacement activities should be timed to occur during the dry season and after fry have emerged from the gravel (generally July 1 through October 1). Applicants may submit requests for extension of this work window to the PCA for review by CDFW and NMFS. In streams that receive summer irrigation flows, spawning gravel cleaning and replacement activities should be timed to occur after the irrigation season has ended and stream flows are at a minimum to minimize the need for site dewatering and to minimize the potential for downstream turbidity and sedimentation effects. If dewatering is needed, other applicable AMMs shall be implemented prior to commencing spawning gravel cleaning and replacement activities. Gravel to be placed in streams shall be washed to remove fines, rounded (*i.e.*, non-angular), and spawning-sized, between 0.4 and 4.0 inches (10 to 100 millimeters) in diameter. For gravel augmentation projects, gravels should be placed such that high flows naturally sort and distribute the material.

Salmonid 5. Use of riprap when necessary. When riprap is required to be placed below the OHWM, it shall have a cleanliness value of no less than 85 percent and shall be covered with clean, uncrushed rock consistent with NMFS spawning gravel size requirements. Current standards are 98 to 100 percent of the clean, uncrushed rock must pass through a 4-inch sieve, and 60 to 80 percent must pass through a 2-inch sieve. Of the total volume of rock placed, 50 percent shall consist of clean, uncrushed rock. This measure may be updated with more current standards.

1.3.5.3.5.3. Salmonid Stream Fees

Projects affecting riverine constituent habitat in a salmonid stream will be assessed a special habitat fee based on linear feet of impact. This will apply to both permanent and temporary impacts.

1.3.6. Activities Not Covered by the PCCP

The PCCP strives to cover a broad range of present and future activities over the permit term. Certain other activities are not appropriate for coverage under the PCCP, because of a lack of information, the speculative nature of the project, existing permits, acquisition of permits under a

separate program, or the risk that the project or activity is incompatible with the PCCP's conservation strategy. Categories of activities not covered by the PCCP are listed below.

- (1) Non-participating cities. Any ground-disturbing activities within the jurisdictions of Auburn, Loomis, Rocklin, and Roseville that are not specifically undertaken by a plan permittee are not covered.
- (2) Pesticide/herbicide/rodenticide application for the Federal permits. Pesticide, herbicide, and rodenticide uses are not activities permitted by USFWS or NMFS and will not be covered under the PCCP for Federal permits. All applicable injunctions stipulated during PCCP implementation will be adhered to until formal consultation between EPA, USFWS, and NMFS regarding the effects of pesticides on Covered Species is concluded. This activity is covered under the State permit.
- (3) Routine and ongoing agricultural activities. Routine agricultural activities are defined broadly as activities that occur in the normal course of existing farming or ranching operations, including crop planting, crop harvesting, livestock management, and pesticide application. These activities are not covered by the PCCP. Routine and ongoing agricultural activities that do not go through a county or city permitting process (*e.g.*, grading and/or building permit) would not be subject to local approval and therefore cannot be covered by the PCCP. New intensive agricultural activities, such as cut-flower nurseries, Christmas tree farms, ornamental plant nurseries, dairies, and feedlots, are not covered by the PCCP unless these activities receive permits from Placer County and the City of Lincoln.
- (4) Expansion of cultivated agriculture into natural lands. The expansion of cultivated agriculture into natural lands is not covered by the PCCP unless it is associated with an approved rural development project that is covered by the PCCP (*e.g.*, the expansion requires a grading permit). This category typically applies to new large-scale agricultural operations, such as row crops, vineyards, orchards, disking for winter grains, or pastures. If such agricultural projects do not require grading permits, they would typically not require local approvals by the permittees and, therefore, cannot be covered by the PCCP.
- (5) Timber harvest operations. Most timber harvesting occurs within the Sierra east of the plan area and is rare in western Placer County. Timber harvest plans are regulated through State and Federal agencies and are not included as a Covered Activity.
- (6) Quarries and other mining. Quarries and other mining were considered for inclusion in the PCCP. At the time of PCCP development, no specific projects were proposed for inclusion. Because of the potentially extensive effects associated with quarries and mining and the lack of understanding about what future projects might be proposed, the mining of sand or other aggregate material, or the mining of precious metals or other minerals is not covered by the PCCP.
- (7) Municipal power generation. PG&E, PCWA power generation on behalf of the Middle Fork Project Finance Authority, Roseville Electric, Northern California Power Agency

(generating power for multiple agencies), and Sacramento Municipal Utility District activities for power generation and transmission, including municipal wind and large-scale solar.

- (8) Present projects with their own ESA and CESA permits. Several development or infrastructure projects in the plan area in development during the preparation of the PCCP have obtained their own permits under the ESA and/or CESA. These projects will be bound by the terms of their separate permits, not by the PCCP, and will obtain incidental take coverage from those projects and not from the PCCP.
- (9) Land use intensification in the valley or foothills conservation and rural development components of Plan Area A. Placer County and City of Lincoln general plans, specific plans, and implementing zoning may be changed over the course of the PCCP's permit term to allow changes in allowed land use type so long as the land use remains rural or agricultural or is compatible with rural or agricultural general plan designations, land use intensity is not increased, and residential density is not increased. Activities that do not meet these criteria are not prohibited by the PCCP, but are not specifically covered by the PCCP. Applicants who seek entitlements in valley CRD (A2) or foothills CRD (A4) that are inconsistent with these criteria must apply for take authorization outside of the coverage provided by the PCCP.
- (10) Any private development that otherwise complies with CESA or ESA. The PCA, as the implementing entity, can determine that a proponent of a project under the jurisdiction of a permittee will not be required to comply with the conditions in chapter 6 of the PCCP, Program Participation and Conditions on Covered Activities (Placer County 2020b), or pay any fees if the proponent of the activity provides written confirmation to the PCA that CDFW and USFWS and/or NMFS have determined that the activity is not subject to the CESA and ESA, has already achieved the necessary take authorizations under the CESA and ESA, or has otherwise complied with the CESA and ESA. Under these circumstances, an activity will be deemed to be in compliance with the CESA and ESA by the PCA and thus be exempt from conditions in chapter 6 of the PCCP (Placer County 2020b) and fees if the proponent provides the following:
 - a. Letters from USFWS, NMFS, and/or CDFW that specifically refer to the activity and state that the activity is not likely to result in take of any federally or state-listed species individually or cumulatively, will not preclude successful implementation of the conservation strategy for all Covered Species, and the results for full protocol surveys, approved by CDFW, for state-listed species with the potential to occur on the site showing that no such species or habitat occurs on the site; or
 - b. A copy of an incidental take permit issued by CDFW for the activity and copies of incidental take statements or incidental take permits issued by USFWS and/or NMFS that authorize the proposed Covered Activity; or

- c. A combination of the letters as described above and/or incidental take authorizations from all wildlife agencies with jurisdiction.
- (11) Minor activities. Certain minor projects and activities are not subject to PCCP requirements and are not covered by the PCCP or the permits, because they are not expected to have adverse effects on Covered Species.
- a. Activities that do not require a construction permit. Private development that does not require a development permit, grading permit, building permit, or other construction permit. For purposes of this section, construction permits do not include: ministerial permits for activities that will cause less than 500 square feet of ground disturbance, setback verification permits, sign permits, plumbing/mechanical/electrical building permits, private/public well permits, septic system permits, underground storage tank permits, tree permits, administrative approvals of antennas, temporary outdoor event permits where no ground disturbance occurs, permits for building remodel additions under 500 square feet, or permits for design review remodels under 500 square feet.
 - b. Activities on existing non-natural lands. Activities entirely within managed water or urban land cover types (see sections 3.4.1.1, 3.4.1.3, and 6.2.4.3 of the PCCP for more information (Placer County 2020b)).
 - c. Activities on existing small parcels. Private activities on existing small parcels equal to or less than 20,000 square feet existing at the time of PCCP adoption.
 - d. Small additions to improved properties. Private development improvements of less than 5,000 square feet of new impervious surface to existing improved sites, regardless of parcel size. Includes new structural improvements and installation of roads, sidewalks, hardscape, and other impervious surfaces.

1.3.7. USACE Proposed Action

The Sacramento District of the USACE is proposing to approve and implement the PCCP CWA 404 permit strategy, summarized below. For a comprehensive description of the proposed PCCP CWA 404 permit strategy, see Appendix C of the Placer County Conservation Program Final Environmental Impact Statement/Environmental Impact Report (PCCP FEIS/R) circulated for public review on May 22, 2020 (USFWS and Placer County 2020). The PCCP CWA 404 permit strategy includes USACE's proposed issuance of a programmatic general permit (PGP), two regional general permits (RGPs), and the establishment of abbreviated processes for issuing letters of permission (LOPs) and standard permits (these permits are described in more detail below).

The PCCP CWA 404 permit strategy provides an approach to authorizing the placement of dredged or fill material into waters of the United States (WOUS). within the plan area (see section 2.3 below for a description of the plan area), pursuant to section 404 of the CWA for Covered Activities as defined in the PCCP (see section 1.3.3 above below for a description of Covered Activities) that involve a discharge of dredged or fill material into WOUS. The PCCP CWA 404 permit strategy relies on the conservation strategy in the HCP/NCCP. For a

description of the conservation strategy, see section 1.3.4 above or chapter 5 of the PCCP (Placer County 2020b). This is mirrored in the CARP (Placer County 2020a) developed by the county as a basis for CWA 404 permitting. The CARP describes measures to avoid and minimize impacts to aquatic resources and to address compensatory mitigation requirements for Covered Activities with unavoidable impacts to aquatic resources, consistent with requirements of the HCP/NCCP.

The procedures and associated requirements for the CWA 404 permits will integrate with those contained in the Western Placer County HCP/NCCP, resulting in consistent implementation of the HCP/NCCP and CWA 404 permitting under the PCCP CWA 404 permit strategy.

Implementation of compensatory mitigation projects will be located on HCP/NCCP reserve lands and will be consistent with the plan's conservation strategy, including plan requirements regarding the re-establishment and establishment of aquatic resources. An ILF program will provide compensatory mitigation for impacts from Covered Activities. Payment of Western Placer HCP/NCCP fees into the ILF program to purchase credits will fulfill compensatory mitigation required for Covered Activities under the PCCP CWA 404 permit strategy.

The proposed RGP and PGP are valid for 5 years from the date of issuance (or reissuance). The LOP procedure and the abbreviated standard permit process will be applied to specific activities that do not qualify for inclusion in the RGP or PGP, and may be used throughout the HCP/NCCP permit term of 50 years. Because activities authorized through the CWA 404 permit strategy are a subset of Covered Activities of the Western Placer HCP/NCCP that are analyzed in this opinion, NMFS will consider this opinion valid for fifty years, unless new information reveals effects of USACE's proposed action may result in adverse effects to Covered Species or adverse modification of designated critical habitat in a manner not identified to date, or if a new species is listed that may be affected by the USACE's proposed action.

The PCCP CWA 404 permit strategy includes the following, see appendix C of the PCCP FEIS/R for complete drafts of the proposed permits (USFWS and Placer County 2020):

- A PGP founded on the CARP to be implemented via local ordinance, and designed to reduce duplication with that program, for activities with minimal individual and cumulative effects on the aquatic environment;
- An RGP for minimal impact activities conducted by PCWA under the Western Placer County HCP/NCCP;
- A procedure for issuing LOPs for activities with more than minimal but less than significant effects on the human environment, including aquatic resources;
- An abbreviated process for issuing standard permits for other activities consistent with the PCCP that may have a significant impact on the human environment, and require the preparation of an EIS under NEPA; and
- An RGP for minimal impact activities conducted under the PCCP ILF program.

1.3.8. Cost and Funding

Chapter 9 of the PCCP describes how costs were estimated, budgets and funding sources, methods used to determine fee amounts, and how fee amounts will be adjusted over the permit term in order to ensure adequate funding (see PCCP section 9.2, Cost to Implement the Habitat Conservation Plan/Natural Community Conservation Plan, PCCP section 9.3, Cost Estimate Methodology and Assumptions, and PCCP section 9.4, Funding Sources and Assurances). Methods for calculating fees based on project impacts are described in PCCP section 9.4.1, Habitat Conservation Plan/Natural Community Conservation Plan Development Fees.

PCCP table 9-1, Summary of Capital and Total Cumulative Operating Costs through 50-year Permit Term shows anticipated costs of each cost category considered in developing cost estimates; PCCP appendix L, Cost Model and Assumptions provides additional detail. PCCP table 9-4, Funding Plan summarizes the expected revenues and their sources over the 50-year permit term. The funding plan fully funds the estimated cost of the PCCP. PCCP table 9-5, Chart of Effects and Development Fees provides a summary of the rationale for each of the development fees, the areas subject to each fee, and a description of how the fees will be used and tracked. PCCP tables 9-6, Land Conversion Fee Schedule and 9-7, Special Habitats Fee Schedule provide the fee amount for each development fee. Two mechanisms will be used to adjust fee levels over the permit term to ensure adequate PCCP funding: annual automatic adjustments based on indices (see PCCP table 9-8, Development Fee Adjustment indices), and periodic assessments conducted every five years. PCCP section 9.4.0.7, Adjustment of Development Fees provides the methods and specific timing for conducting these adjustments.

PCCP funding will come from sources in the following three categories: plan development fees, local funding, and State and Federal funding.

PCCP development fees include a land conversion fee for permanent effects, special habitat fees for effects specific to wetlands, streams, and other sensitive habitats, and temporary impact fees for temporary effects. These development fees and how they were derived are described in PCCP section 9.4.1, Habitat Conservation Plan/Natural Community Conservation Plan Development Fees.

PCCP section 9.4.1.9, Private Applicant Options to Pay Fees with Special Tax or Assessment District and PCCP section 9.4.1.10, Land Provided in Lieu of Development Fees describe alternatives to the payment of development fees and conditions that must be met in order to allow the use of these alternatives in place of paying all or a portion of fees. Also, see section 2.4.11 above and section 8.4.13, Land Dedication in Lieu of Land Conversion Fee for additional details.

Local funding will include other development funding for open space (*i.e.*, open space related fees separate from PCCP development fees), credit for dedication of existing open space, investment and interest income, and leases on rice land. Depending on the source, funding will be allocated to either mitigation or conservation actions. Local funding sources are described in PCCP section 9.4.2, Local Funding.

State and Federal funding will include federal and state grant programs. Most State and Federal funding can only be used to provide for conservation actions in the Plan Area and cannot be used for the mitigation share of PCCP costs. Potential State and Federal funding sources and restrictions on their use are described in section 9.4.3, State and Federal Funding. State and Federal funding will fund the acquisition of a maximum of 13,905 acres of the reserve system (this is the share of the reserve system that provides for the conservation, not mitigation, of Covered Species). State and Federal contributions can also provide funds for restoration and enhancement of wetland habitats that are independent of effects to Covered Species. PCCP section 9.4.3.3, Mitigation and Conservation Components provide guidance for delineating conservation versus mitigation under the PCCP.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provide an opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an incidental take statement (ITS) that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of “jeopardize the continued existence of” a listed species, which is “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species” (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion relies on the definition of “destruction or adverse modification,” which “means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species” (50 CFR 402.02).

The designation of critical habitat for CCV steelhead uses the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a “destruction or adverse modification” analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The 2019 regulations define effects of the action using the term “consequences” (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44976), that definition does not change the scope of our analysis and in this opinion we use the terms “effects” and “consequences” interchangeably.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species, or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action (Table 3). The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents, such as recovery plans, status reviews, and listing decisions. This informs the description of the species’ likelihood of both survival and recovery. The species status section also helps to inform the description of the species’ “reproduction, numbers, or distribution” as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the PBFs that are essential for the conservation of the species.

Table 3. Description of species, current ESA listing classifications, and summary of species status

Species	Listing Classification and Federal Register Notice	Status Summary
CCV steelhead DPS	Threatened, 71 FR 834; January 5, 2006	According to the NMFS 5-year species status review (NMFS 2016), the status of CCV steelhead appears to have remained unchanged since the 2011 status review that concluded that the DPS was in danger of becoming endangered. Most natural-origin CCV populations are very small, are not monitored, and may lack the resiliency to persist for protracted periods, if subjected to additional stressors, particularly widespread stressors, such as climate change. The genetic diversity of CCV steelhead has likely been impacted by low population sizes and high numbers of hatchery fish relative to natural-origin fish. The life-history diversity of the DPS is mostly unknown, as very few studies have been published on traits, such as age structure, size at age, or growth rates in CCV steelhead.
CV Fall-run Chinook salmon evolutionarily significant unit (ESU)	Listing was found not warranted and the species were designated as a candidate species in 1999 (64 FR 50394). In 2004, the CV fall-/late fall-run Chinook salmon ESU was re-classified as a species of concern (69 FR 19975) due to specific risk factors.	According to CDFW's GrandTab (CDFW 2020) compilation of escapement for estimates for CV fall-run Chinook in the Sacramento and San Joaquin watersheds seems to decline and rebound based on water year types. Recent trends for the Sacramento River populations show a decline in recent years as a result of drought years (<i>i.e.</i> , 2014 -2015). The past five years have seen a declining trend for escapement in the Sacramento River watershed (excluding hatchery escapement abundances). In the San Joaquin River watershed, CV fall-run Chinook salmon escapement estimates have remained relatively stable, and general trends show an increase in escapement estimates into the San Joaquin tributaries (excluding hatchery escapement).
CV Late fall-run Chinook salmon ESU	Listing was found not warranted and the species were designated as a candidate species in 1999 (64 FR 50394). In 2004, the CV fall-/late fall-run Chinook salmon ESU was re-classified as a species of concern (69 FR	CDFW's GrandTab (CDFW 2020) compilation of escapement estimates for CV late fall-run Chinook salmon in the Sacramento River watershed generally indicates a declining trend. There are no escapement or population estimates for CV late fall-run Chinook salmon in the San Joaquin watershed.

Species	Listing Classification and Federal Register Notice	Status Summary
	19975) due to specific risk factors.	

Table 4. Description of critical habitat, listing, and status summary.

Critical Habitat	Designation Date and Federal Register Notice	Description
CCV steelhead DPS	September 2, 2005; 70 FR 52488	<p>Critical habitat for CCV steelhead includes stream reaches of the Feather, Yuba, and American Rivers, Big Chico, Butte, Deer, Mill, Battle, Antelope, and Clear Creeks, the Sacramento River, as well as portions of the northern Delta. Critical habitat includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high-water line. In areas where the ordinary high-water line has not been defined, the lateral extent will be defined by the bankfull elevation.</p> <p>PBFs considered essential to the conservation of the species include: spawning habitat, freshwater rearing habitat, freshwater migration corridors, and estuarine areas.</p> <p>Although the current conditions of PBFs for CCV steelhead critical habitat in the Central Valley are significantly limited and degraded, the habitat remaining is considered highly valuable.</p>

2.2.1. Recovery Plan

In July 2014, NMFS released a final recovery plan for Sacramento River winter-run Chinook salmon, CV spring-run Chinook salmon, and CCV steelhead (NMFS 2014b). The recovery plan outlines actions to restore habitat, access, and improve water quality and quantity conditions in the Central Valley to promote the recovery of listed salmonids. Key actions for the recovery plan include conducting landscape-scale restoration throughout the Delta, incorporating ecosystem restoration into Central Valley flood control plans, that includes breaching and setting back levees, and restoring flows throughout the Sacramento and San Joaquin River basins and the Delta. Within the action area, recovery actions that have overlap with planned activities of the PCCP include removing fish passage barriers, consolidating and screening diversions, increasing floodplain connectivity, permanently protecting riparian habitat through easements and/or land acquisition, restoring riparian habitat, controlling non-native predators, providing gravel, and improving instream refuge cover for salmonids to minimize predation.

2.2.2. Global Climate Change

One major factor affecting the rangewide status of the threatened and endangered anadromous fish in the Central Valley and aquatic habitat at large is climate change. Warmer temperatures associated with climate change reduce snowpack and alter the seasonality and volume of seasonal hydrograph patterns (Cohen *et al.* 2000). Central California has shown trends toward warmer winters since the 1940s (Dettinger and Cayan 1995).

Projected warming is expected to affect Central Valley Chinook salmon. Because the runs are restricted to low elevations as a result of impassable rim dams, if climate warms by 5°C (9°F), it is questionable whether any Central Valley Chinook salmon populations can persist (Williams 2006).

Although CCV steelhead will experience similar effects of climate change to Chinook salmon, as they are also blocked from the vast majority of their historic spawning and rearing habitat, the effects may be even greater in some cases, as juvenile steelhead need to rear in the stream for one to two summers prior to emigrating as smolts. In the Central Valley, summer and fall temperatures below the dams in many streams already exceed the recommended temperatures for optimal growth of juvenile steelhead, which range from 14°C to 19°C (57°F to 66°F).

In summary, observed and predicted climate change effects are generally detrimental to the species (McClure 2011, Wade *et al.* 2013), so unless offset by improvements in other factors, the status of the species and critical habitat is likely to decline over time. The climate change projections referenced above cover the time period between the present and approximately 2100. While there is uncertainty associated with projections, which increases over time, the direction of change is relatively certain (McClure *et al.* 2013).

2.3. Action Area

“Action area” means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The PCCP plan area is the area within which Covered Activities will be implemented (see Figure 1, above). Placer County, California covers a total area of 1,500 square miles (962,000 acres) and stretches from the Sacramento Valley east to the Sierra Nevada mountains and the California-Nevada state line. The plan area includes two main parts and associated subcomponents:

- Plan Area A is the main focus of the PCCP and where all future growth and most of the Covered Activities will take place. Plan Area A is the City of Lincoln plus all incorporated lands within western Placer County. Plan Area A is divided into the valley, which is 100,698 acres, and the foothills, which is 109,134 acres, for a total of 209,832 acres.
- Plan Area B comprises several specific additional areas in Placer County and adjacent Sutter County where only specific Covered Activities may occur, see section 1.3.3 above or section 2.5.2 of the PCCP (Placer County 2020b) for more details.
 - B1, permittee activity in non-participating city jurisdiction, 50,636 acres

- B2, PCWA zone 1 operations and maintenance, 6,315 acres
- B3, Raccoon Creek floodplain conservation, 1,724 acres in Sutter County
- B4, fish passage channel improvement, 33 miles of channels in Sutter County
- B5, Big Gun Conservation Bank, 52 acres, not shown in figures

Nearly all of the plan area, approximately 95 percent, is in private ownership.

The PCCP plan area is primarily located in western Placer County, California with an incursion of 1,724 acres for floodplain restoration and 33 stream miles for fish passage improvements into Sutter County, California. As each year, the location, timing, and size of projects to be covered by the PCCP is unknown, it is difficult to determine the extent of all areas affected. Instead, the action area is determined by the PCCP plan area and it includes all streams, rivers, riparian areas, and hydrologically linked upslope areas within the PCCP plan area (see Figure 4, below). To account for water quality and acoustic effects that extend outward from Covered Activities, the action area includes an additional 1,000 feet upstream and downstream from all the PCCP plan area boundaries.

Western Placer County falls within four sub-basins at the U.S. Geological Survey (USGS) hydrologic unit code (HUC) level 8: upper Bear River, Raccoon Creek/Auburn Ravine (including Raccoon Creek, Markham Ravine, Auburn Ravine, and Pleasant Grove Creek), lower American River (which includes Dry Creek in the action area), and upper American River. Note that Raccoon Creek was previously known as Coon Creek and is referenced as such in supporting documents and maps including the NMFS recovery plan (NMFS 2014b), the PCCP updated their language for this creek and we have also updated the language in this opinion to Raccoon Creek anywhere that Coon Creek would have been referenced. Because Nimbus Dam blocks anadromy further downstream, the upper American River no longer supports salmonids and is outside of the action area. If the removal of dams or other fish passage barriers provides an increase in anadromous habitat, those areas will then be included in the action area. The action area includes, either in whole or in part, the following USGS quadrangles (quads): Wheatland, Camp Far West, Wolf, Lake Combie, Nicolaus, Sheridan, Lincoln, Gold Hill, Auburn, Verona, Pleasant Grove, Roseville, Rocklin, Pilot Hill, Rio Linda, Citrus Heights, Folsom, Clarksville.

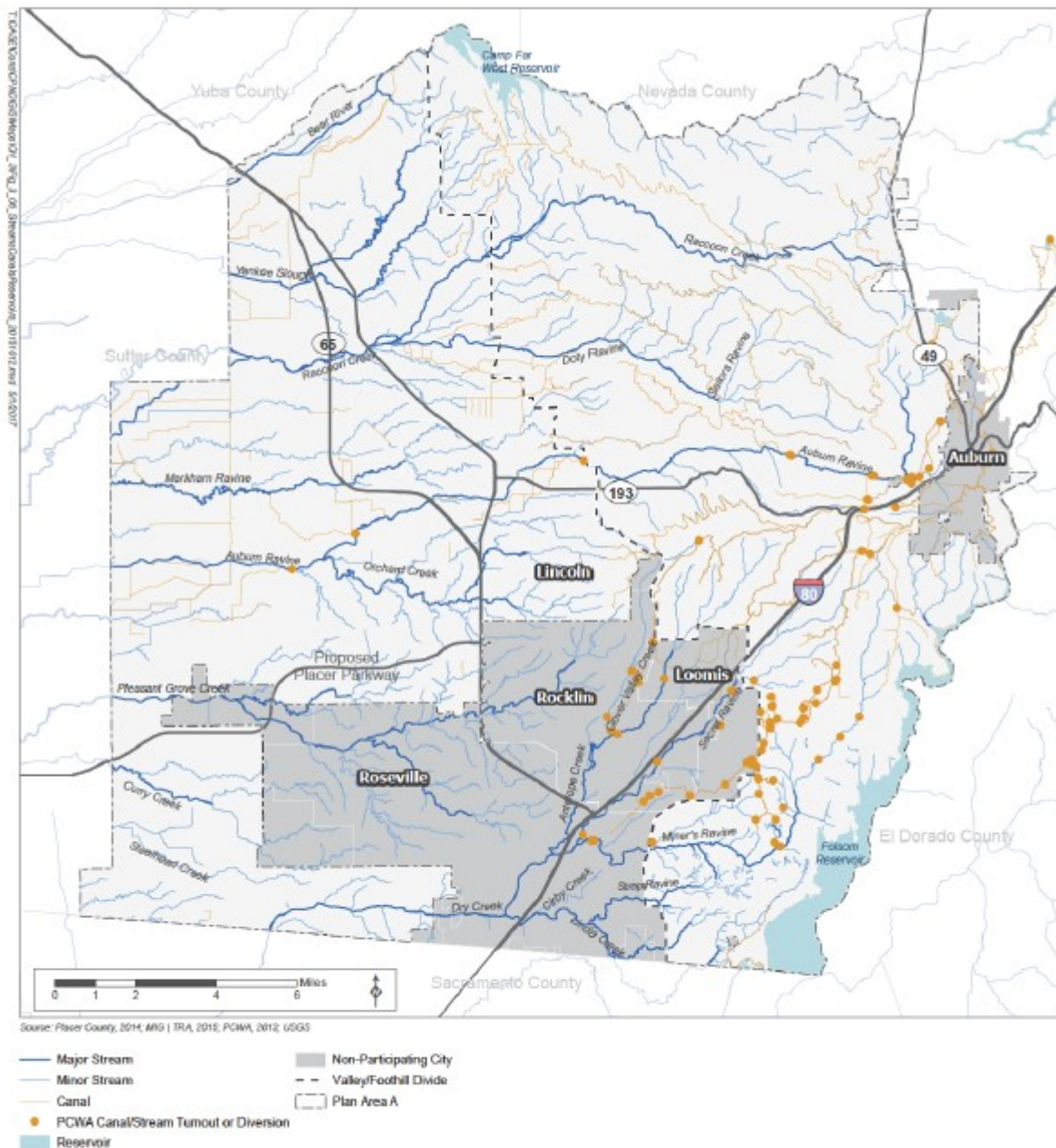


Figure 4. Streams, canals, and reservoirs in the PCCP plan area, from PCCP figure 1-6 (Placer County 2020b).

2.4. Environmental Baseline

The “environmental baseline” refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present

impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions, which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency’s discretion to modify are part of the environmental baseline (50 CFR 402.02).

2.4.1. Status of the Covered Species and Critical Habitat in the Action Area

The action area serves as habitat for anadromous CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon. CCV steelhead is federally listed as a threatened species, while CV fall-run Chinook salmon and CV late fall-run Chinook salmon are considered species of concern by NMFS. All are considered Covered Species for the PCCP. Designated critical habitat for CCV steelhead occurs within the action area.

Western Placer County has 738 miles of streams and 303 miles of irrigation supply and drainage canals mapped. Chinook salmon and CCV steelhead use 122 miles, or roughly 60 percent, of all major streams in western Placer County (Placer County 2020b). These species occur in the Bear River, Auburn Ravine, and Dry Creek and their tributaries (Table 5).

Table 5. CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon habitat types across watersheds in western Placer County. Adapted from species maps 9 and 10 from PCCP Appendix D (Placer County 2020c)

Watershed	River/Stream	CCV Steelhead Habitat	CV Late Fall-run/CV Fall-run Chinook Habitat
Bear River	Bear River	Spawning, rearing, and migration	Spawning, rearing, and migration
Auburn Ravine/Raccoon Creek	Raccoon Creek	Spawning, rearing, and migration – independent population	Spawning, rearing, and migration
	Doty Creek	Spawning, rearing, and migration	Spawning, rearing, and migration
	Auburn Ravine (upper)	Spawning, rearing, and migration – independent population	Spawning, rearing, and migration

Watershed	River/Stream	CCV Steelhead Habitat	CV Late Fall-run/CV Fall-run Chinook Habitat
	Auburn Ravine (lower)	Rearing and migration – independent population	Rearing and migration
Dry Creek	Clover Valley Creek	Spawning, rearing, and migration – other sources	Spawning, rearing, and migration – other sources
	Antelope Creek	Spawning, rearing, and migration – other sources	Spawning, rearing, and migration – other sources
	Secret Ravine	Spawning, rearing, and migration	Spawning, rearing, and migration
	Miners Ravine	Spawning, rearing, and migration	Spawning, rearing, and migration
	Linda Creek	Spawning, rearing, and migration – other sources	Spawning, rearing, and migration – other sources
	Cirby Creek	Spawning, rearing, and migration – other sources	Spawning, rearing, and migration – other sources
	Dry Creek	Rearing and migration	Rearing and migration

The Auburn Ravine watershed includes Auburn Ravine, Raccoon Creek, Doty Ravine, Sailor’s Ravine, Markham Ravine, and Pleasant Grove Creek. The Dry Creek watershed spans Placer and Sacramento Counties, draining approximately 101 square miles (Placer and Sacramento Counties 2003). The watershed contains four sub-watersheds: Cirby/Linda Creeks (including Strap Ravine), Antelope Creek (including Clover Valley Creek), Secret Ravine, and Miners Ravine. The main tributaries of the Bear River include Steephollow and Greenhorn Creeks above Rollins Lake, and Wolf and Little Wolf Creeks between Lake Combie and Camp Far West Reservoir (Placer County 2020c).

2.4.1.1. CCV Steelhead

The watersheds mentioned above function as spawning, rearing, and migratory habitat for CCV steelhead. Spawning adults, holding post-spawn adults, and rearing juveniles may utilize the area on their way to the estuary. Due to the life history timing of CCV steelhead, it is possible for one or more of the following life stages to be present within the action area throughout the year, including adult migrants, holding and spawning adults, eggs, rearing juveniles, or emigrating juveniles. CCV steelhead are known to be present in the plan area in Bear River, Coon Creek (including the Doty Ravine tributary), Auburn Ravine, and Dry Creek (including Secret Ravine and Miners Ravine tributaries) (Bailey 2003, NMFS 2014b, Placer County 2009).

CCV steelhead enter fresh water from August through April and hold until flows are high enough in tributaries to enter for spawning (Moyle 2002). Steelhead adults typically spawn from December through April, with peaks from January through March in small streams and tributaries where cool, well-oxygenated water is available year-round (Hallock *et al.* 1961, McEwan 2001). Hallock *et al.* (1961) found that juvenile steelhead in the Sacramento River basin migrate downstream during most months of the year, but the peak emigration period occurred in the spring, with a much smaller peak in the fall.

The recovery plan (NMFS 2014b) provides watershed profiles for Auburn Ravine, Dry Creek, and Bear River. The recovery plan identifies these watersheds within the action area as core 2 and core 3 watersheds within the Northern Sierra Nevada diversity group (Table 6).

Table 6. Population presence, risk of extinction, and classification of watersheds for those watersheds containing CCV steelhead designated critical habitat within the action area.

River/Creek	Historic Population	Current Population	Population Extinction Risk (Lindley <i>et al.</i> 2007, Williams <i>et al.</i> 2011)	Classification*
Auburn Ravine	No	Yes	Uncertain	Core 2
Dry Creek	Yes	Yes	Uncertain	Core 3
Bear River	Yes	Yes	Uncertain	Core 3

*Classification of watersheds as identified in the recovery plan (NMFS 2014b).

Populations identified in the recovery plan as core 1 are those that possess the known ability or potential to support a viable population. Core 2 populations meet, or have the potential to meet, the biological recovery standard for moderate risk of extinction. These watersheds have lower potential to support viable populations than core 1 populations, due to lower abundance, or amount and quality of habitat. These populations provide increased life history diversity to the DPS and are likely to provide a buffering effect against local catastrophic occurrences that could affect other nearby populations, especially in geographic areas where the number of core 1

populations is lowest. Core 3 watersheds have populations that are present on an intermittent basis and require straying from other nearby populations for their existence. These populations likely do not have the potential to meet the abundance criteria for moderate risk of extinction, but are important because, like core 2 populations, core 3 populations aid in recovery of the species by providing genetic diversity and dispersal connectivity to the greater DPS.

2.4.1.1.1. Auburn Ravine Watershed

The streams within the Auburn Ravine watershed provide spawning, rearing, and migratory habitat for CCV steelhead. The upper reaches of Auburn Ravine serve as spawning habitat, while downstream areas are suitable for rearing and migration. California Department of Fish and Game found steelhead to be, on average, the most abundant fish species during both the winter 2004 and spring 2005 fish community survey sampling efforts in Auburn Ravine (Navicky 2008). Enough steelhead data were collected to estimate an average of 2,163 juvenile CCV steelhead present per river mile between the McBean Park and Wise Road sampling locations (Placer County 2020c). CDFW survey results indicate that Auburn Ravine may constitute a probable steelhead spawning area given the presence of very small juveniles during spring (NMFS 2014c). Auburn Ravine may represent a year-round rearing area for juvenile CCV steelhead, given the presence of both young-of-year and larger juveniles during November, December, and April. Data indicate that winter and spring water temperatures are suitable for successful anadromous fish spawning and juvenile rearing (Placer County 2020b).

Raccoon Creek contains good migration corridors for adult salmonids, patchy spawning habitat and good juvenile rearing habitat in the lower reaches, and good spawning habitat and juvenile rearing habitat in the upper reach (Placer County 2020b). Data indicate that winter and spring water temperatures in Raccoon Creek upstream of Gladding Road are suitable for anadromous fish spawning and rearing on an annual basis. CDFW sampling found juvenile steelhead in Raccoon Creek, although far fewer than in Auburn Ravine (Navicky 2008).

Doty Ravine, a tributary to Raccoon Creek, contains spawning habitat, good migration corridors, and juvenile rearing habitat; however, the quality of migration habitat has been reduced by barriers to upstream passage of adult and juvenile salmonids (Placer County 2020b).

2.4.1.1.2. Dry Creek Watershed

CCV steelhead utilize the mainstem Dry Creek as only a migratory corridor, while tributaries, such as Miners Ravine and Secret Ravine, provide spawning and rearing habitat. Current estimates of steelhead in the Dry Creek watershed number a few hundred fish, with most occurring in Miners and Secret Ravines (Placer and Sacramento Counties 2003). Juvenile steelhead have been collected in rotary screw traps immediately downstream of the confluence of Secret and Miners Ravines, as well as captured in Secret Ravine as recently as 2005 (Placer County 2020b). Limited spawning sites have been identified in Miners Ravine, and temperatures are sufficient for summer rearing of juvenile CCV steelhead (Placer County 2020b). Secret Ravine has the highest quality habitat within the Dry Creek watershed, providing spawning and rearing habitat for steelhead (Placer and Sacramento Counties 2003). Electrofishing and screw trap sampling conducted between the winter of 1998 and the summer of 2000 in Miners and Secret Ravine documented the presence of CCV steelhead in both Dry Creek tributaries (Bailey

2003). In addition, several steelhead smolts were caught in the spring of 1999 and 2000 just downstream of the confluence of Secret and Miners Ravine, suggesting the presence of a naturally spawning population. Linda Creek has two sites that might be suitable for spawning and rearing. Antelope Creek provides minimal habitat for CCV steelhead for the purposes of spawning and rearing.

The Dry Creek watershed has a potential to support a viable population of CCV steelhead despite the limited amount of suitable spawning habitat and year-round rearing habitats. Although habitat conditions within the action area are degraded, the importance of this area for the conservation of CCV steelhead is considered to be high. This is mainly because there is very little suitable CCV steelhead habitat remaining in the Central Valley and any habitat that is currently available is essential for sustaining the DPS.

2.4.1.1.3. Bear River Watershed

During periods of high flows, CCV steelhead are known to utilize the river for limited spawning (Jones & Stokes 2004). Because environmental conditions do not support a self-sustaining population of steelhead in the Bear River, those CCV steelhead that do spawn during high flow years have likely originated from the Feather River Fish Hatchery. The lower reach of the Bear River is narrow and incised, and downstream gravel recruitment is limited. In addition, the Camp Far West Reservoir may not provide releases of water temperatures suitable for salmonids downstream.

2.4.1.1.4. Viability

The recovery plan states that presently, no viable independent steelhead populations have been identified and all are at high risk of extinction (NMFS 2014b). The 2016 5-year status review states that the viability of CCV steelhead has changed little since the 2011 status review, and concerns raised in the previous status review remain (NMFS 2016). The 2016 viability assessment stated there has been no change in extinction risk since 2010 viability assessments and the CCV steelhead DPS continues to be at a high risk of extinction (Williams *et al.* 2016).

2.4.1.2. CV Fall-run Chinook Salmon and CV Late Fall-run Chinook Salmon

CV fall-run Chinook salmon and CV late fall-run Chinook salmon spawn and rear in western Placer County streams, including Bear River, Raccoon Creek, Doty Ravine, Auburn Ravine, Dry Creek, Antelope Creek, Clover Valley Creek, Secret Ravine, and Miners Ravine (Jones & Stokes 2005). Bailey (2003) summarized data from multiple sources that found native and hatchery-origin fall-run Chinook to be present in the Raccoon Creek, Auburn Ravine, and Dry Creek watersheds, but they were absent from the Pleasant Grove and Curry Creek watersheds, likely due to their intermittent flow character. The Placer County populations are part of the State's most abundant fall-/late fall-run of Chinook salmon (PCCP appendix D).

CV fall-run Chinook salmon migrate from the Pacific Ocean to Central Valley rivers from approximately July to December. Within western Placer County stream, migration is dependent on adequate flows and suitable water temperatures, which usually occur following storm events in October or November (Jones & Stokes 2005). Fall-run Chinook salmon spawn from late September to December, with peak spawning during late October and November (Moyle 2002).

Egg incubation for fall-run Chinook salmon begins in September and can extend to March (Vogel and Marine 1991). Within western Placer County streams, juvenile CV fall-run Chinook salmon tend to migrate from February through June, with peak migration occurring from March to May (Placer and Sacramento Counties 2003).

Adult CV late fall-run Chinook salmon migrate from the Pacific Ocean to Central Valley rivers from approximately mid-October through mid-April. Late fall-run Chinook spawn from December to April, with peak spawning during February and March. Egg incubation for late fall-run Chinook salmon occurs from January through June (Vogel and Marine 1991). Juvenile rearing and migration occur from April to December.

Due to this life history timing, one or more life stages of CV fall-run Chinook salmon or CV late fall-run Chinook salmon may be present within the action area throughout the year.

CV fall-run Chinook salmon and CV late fall-run Chinook salmon do not have a recovery plan; however, recovery actions identified in the recovery plan (NMFS 2014b) would likely also apply to the recovery of CV fall-run Chinook salmon and CV late fall-run Chinook salmon. Stressors to Chinook salmon in the plan area include passage impediments/barriers affecting adult migration and spawning, low-flow conditions, limited instream gravel supply, water temperature and water quality issues from agricultural and urban runoff, loss of riparian habitat and instream cover, and predation (NMFS 2014b). Numerous hydropower, water storage, and flood-control projects have been built that block access to large areas that were historically used by salmon. This loss of habitat is widely recognized as a major factor in the decline of salmon populations throughout their range.

2.4.1.2.1. Auburn Ravine Watershed

The oldest known record from Auburn Ravine was a CDFG report summarized by Bailey (2003), which estimated that the stream had a run of approximately 300 Chinook salmon. Raccoon Creek and Doty Creek also had historic Chinook salmon runs (Bailey 2003, Placer County 2013). A 2004 – 2005 fish community survey performed by the California Department of Fish and Game in Auburn Ravine and Raccoon Creek documented one juvenile Chinook salmon in Auburn Ravine and 25 juvenile Chinook salmon in Raccoon Creek (Navicky 2008, Placer County 2020c). Additionally, three adult Chinook salmon were observed spawning at the Gladding Road site in December 2004 (Navicky 2008, Placer County 2020c). Juvenile, fall-run Chinook originating from the Feather River and Nimbus hatcheries are known to occur in the Raccoon Creek and Auburn Ravine watersheds (Bailey 2003). Chinook salmon were also found at the Hidden Falls Park after new gravel was placed as part of the construction of a new bridge over Raccoon Creek (Placer County 2013). Additional fall-run sized Chinook salmon were observed in Raccoon Creek near McCourtney Road in May 2015 (Placer County 2020c).

As part of the Placer County Legacy Program, the NID gaging station in the City of Lincoln impeding salmon movement in the Auburn Ravine watershed was modified to allow fish passage (Placer County 2013). Following the modification of the NID gaging station, nearly 300 Chinook salmon ascended the structure in November and December 2012 (Placer County 2013).

2.4.1.2.2. Dry Creek Watershed

The Dry Creek watershed supports annual runs of CV fall-run Chinook salmon and CV late fall-run Chinook salmon. CDFW conducted periodic Chinook salmon spawning escapement surveys in the Dry Creek watershed as far back as 1963, mostly upstream of the confluences with Miners and Secret Ravines (Placer and Sacramento Counties 2003). In 1964, the estimated Chinook salmon population was over 1,000 fish, with the majority of spawning occurring in Secret and Miners Ravines (Jones & Stokes 2005). Recent spawning surveys conducted by the Dry Creek Conservancy during winter months have documented fall-/late-fall run Chinook salmon spawning. Dry Creek is known to support a few hundred fish; however, most occur in Secret and Miners Ravines (Placer County 2020b).

The mainstem of Dry Creek is not suitable spawning or rearing habitat for anadromous fish, but is considered a migration corridor to the spawning and rearing habitat in upstream tributaries, despite degradation of habitat and lack of habitat complexity in channel. Riparian cover in upstream portions of the creek are intact. Throughout the creek, reaches have been altered, resulting in degraded habitat and water quality issues. Dry Creek is heavily influenced by urban development and runoff as well as fish passage barriers, such as Hayder Dam and a rubble dam just downstream of Watt Avenue.

Miners Ravine supports Chinook salmon, and limited spawning sites have been identified. Fall and winter temperatures are sufficient in Miners Ravine to support adult spawning and rearing of juvenile fall-run Chinook salmon. Salmon have been observed spawning in Miners Ravine in 2012 (Placer County 2020b).

Habitat in Secret Ravine has the highest probability of supporting salmonid populations within the watershed. Water temperatures appear to be suitable for Chinook salmon spawning and rearing throughout Secret Ravine. Since the late 1990s, adult Chinook salmon populations in Secret Ravine have averaged about 160 fish per year (Placer and Sacramento Counties 2003). From 1997 to 2002, outmigrating juvenile accounts from Secret Ravine averaged approximately 15,000 per year (Ayres *et al.* 2003).

Antelope Creek provides minimal habitat for Chinook salmon, which is highly degraded due to fish passage barriers, poor water quality, high sediment loads, and sediment size too small for spawning (Placer County 2020b). There are limited gravel areas within Antelope Creek that may be suitable for spawning. Water temperatures in Antelope Creek are suitable for fall-run Chinook salmon spawning and rearing; however, warm summer water temperatures may limit suitable habitat for salmon rearing. Fall-run Chinook salmon continue to be documented in Antelope Creek during the annual one-day salmon count coordinated by the Dry Creek Conservancy (Placer County 2020c). In 2003, 44 live Chinook salmon and 7 carcasses were observed in Antelope Creek (Placer County 2020c). Fall-run Chinook salmon have been documented spawning in Antelope Creek over the last 40 years; therefore, fall-run Chinook are believed to persist in the creek (Bailey 2003).

Salmonids have been observed in Linda Creek, which provides spawning and rearing habitat (Placer County 2020b). Data from 1999–2004 counted a total of 251 live salmon and 226 salmon carcasses observed in Linda Creek. Most of the habitat is degraded with steep eroding banks and high summer water temperatures. The PCCP (Placer County 2020b) specifies that two sites may be suitable for spawning and rearing: one upstream of Cherry Avenue and the other was near the

Old Auburn Road crossing of Linda Creek (Placer and Sacramento Counties 2003). Cirby Creek is heavily urbanized and likely no longer supports salmonids.

Counts of Chinook adults and redds performed by the Dry Creek Conservancy (2009) indicate a negative trend in all Dry Creek watershed tributaries surveyed (Miners Ravine, Secret Ravine, Antelope Creek, Linda/Cirby Creek, and the main stem of Dry Creek), with fewer adults and redds observed from 2003 to 2008 (Dry Creek Conservancy 2009, Placer County 2020c). Factors contributing to the decline of Chinook salmon include increased sediment, altered flow regimes, reduced access to habitat, and toxicity (Ayres *et al.* 2003).

2.4.1.2.3. Bear River Watershed

The Bear River watershed comprises a small portion of northeastern Placer County, and is the second largest tributary to the Feather River. The Bear River historically hosted a “substantial” Chinook run (Reynolds *et al.* 1993). Currently, the Bear River supports an occasional run of adult fall-run Chinook salmon in years when flows are sufficient to provide passage (Yoshiyama *et al.* 1996, Placer County 2013).

2.4.1.3. Status of Critical Habitat

Critical habitat for CCV steelhead is designated within the action area. CV fall-run Chinook salmon and CV late fall-run Chinook salmon are not currently federally listed, and, therefore, do not have designated critical habitat. Habitat features essential for survival and conservation of these salmon runs are similar to those for CCV steelhead and those described for spring-run Chinook salmon in the recovery plan (NMFS 2014b).

Within the action area, locations on Raccoon Creek, Doty Ravine, Auburn Ravine, Cross Canal, Dry Creek, Miners Ravine, Secret Ravine, and Bear River are located in designated critical habitat for CCV steelhead. Many other creeks within the action area do not contain designated critical habitat, but CCV steelhead may still be present. CCV steelhead may be present in Cirby Creek, Linda Creek, Clover Valley Creek, Antelope Creek, and Strap Ravine, despite non-designated critical habitat.

The PBFs of CCV steelhead designated critical habitat within the action area include freshwater spawning habitat, freshwater rearing habitat, and freshwater migration corridors. The essential features of these PBFs include: water quality and forage, water quantity and floodplain connectivity, water temperature, riparian habitat, natural cover, migration corridors free of obstruction and excessive predation, and water quantity and quality conditions and substrate supporting spawning, incubation, and larval development. However, the condition and function of this habitat have been severely impaired through several factors, including mining, agriculture, urbanization, and removal of riparian vegetation. Such activities throughout these watersheds have resulted in degradation of these PBFs across the entire region. Although the current conditions of PBFs are significantly limited and degraded, the habitat remaining is considered highly valuable to the conservation of the species.

2.4.1.3.1. Auburn Ravine Watershed

The headwaters of Auburn Ravine are characterized by high gradient, steep banks, large boulder and cobble substrates, and abundant riparian vegetation. In the middle reaches, the gradient and substrate size decrease and bank erosion increases, but there is still riparian vegetation and large woody debris. The gradient of Auburn Ravine is very low as it flows through the city of Lincoln, and it is dominated by sandy substrates and a relatively open tree canopy (Placer County 2020b). Further downstream, ranches and farms border the stream. Levees, grazing, and channel maintenance restrict riparian vegetation. High sediment loads, discharge from wastewater treatment plants, and a lack of riparian buffer in the downstream reaches of Auburn Ravine elevate water temperature and diminish habitat quality (Placer County 2020b). In the winter, flows in Auburn Ravine are dominated by runoff and effluent from the City of Auburn WWTP, which contributes discharge year-round (Placer County 2020b). Summer flows are high relative to natural conditions due to water imports from the Bear, Yuba, and American Rivers by NID, PCWA, and PG&E (Placer County 2020b).

The NID Lincoln Gaging Station below has been modified to provide fish passage, and it successfully provides passage, if water conditions are right. Chinook salmon have been observed ascending the structure in 2012 (Placer County 2013). Hemphill Dam currently presents a seasonal barrier to salmonid movement and has not been modified for year-round fish passage.

2.4.1.3.2. Dry Creek Watershed

Historical land uses within the Dry Creek watershed include placer mining, quarry development, agricultural development, and urbanization. Throughout Dry Creek, reaches have been straightened, floodplain areas reduced, reaches dredged, and riparian vegetation removed. This has resulted in eroding banks, sediment deposition, lack of cover, lack of pools and riffles, lack of sediment deposition, and barriers to anadromous fish movement. Sewer and water line crossings create low-flow migration barriers. Hayder Dam and a rubble dam just downstream of Watt Avenue create a partial barrier to anadromous fish migration (PCCP appendix D).

Tributaries within the Dry Creek watershed are known to support anadromous salmonids and other areas likely historically supported anadromous salmonids, but now either have passage barriers or severely degraded habitat. Dry Creek supports a relatively healthy riparian corridor upstream of Folsom Road to the confluence with Miners and Secret Ravines (Placer and Sacramento Counties 2003). Below the confluence with Secret and Miners Ravines, aquatic habitat is characterized by low gradient, slow moving water, dominated by sand/silt substrate. Available fish habitat is limited to undercut banks, overhanging vegetation, and some instream woody material. The mainstem of Dry Creek is not ideal fish habitat, but is considered to be a migratory corridor.

Data from the 2004/2005 surveys conducted by CDFW are consistent with previous studies and anecdotal information suggesting that Dry Creek is utilized as a migratory corridor for anadromous salmonid passage to spawning and rearing habitat in the upstream tributaries (Secret Ravine and Miners Ravine) (NMFS 2014c). Habitat is much more complex in Secret Ravine, with an abundance of pool habitat, large woody material, and suitable spawning habitat. All spawning habitat and accounts of spawning anadromous salmonids have been reported to be located upstream of the Dry Creek Wastewater Treatment Plant.

Miners Ravine still supports salmonids, however, many reaches are heavily degraded. Limited spawning sites have been identified in Miners Ravine, but Miners Ravine would likely support more CCV steelhead and CV fall and late fall-run Chinook salmon if fish passage to spawning sites was improved. Throughout Miners Ravine, reaches have been straightened, floodplain areas reduced, reaches dredged, and riparian vegetation removed resulting in eroding banks, sediment deposition, lack of cover, lack of pools and riffles, lack of sediment deposition, and barrier to anadromous fish movement (Placer County 2020b). High sediment loads and poor water quality limit distribution and success of salmonids. Miners Ravine has a history of placer mining, the mining of stream bed (alluvial) deposits for minerals, which accelerated stream incision down to the bedrock in the upper reaches.

Secret Ravine also still supports salmonids and has the highest quality fisheries habitat in the Dry Creek watershed (Placer and Sacramento Counties 2003). Habitat is complex in Secret Ravine with an abundance of pool habitat, large woody debris, and suitable spawning habitat. Water temperature data from Secret Ravine shows that only the upper portion of the watershed may have suitable conditions for summer rearing of steelhead, but water temperatures are suitable for Chinook salmon spawning and rearing throughout Secret Ravine. Utility pipeline crossings present obstacles to migration.

Linda Creek has two sites that might be suitable for spawning and rearing; however, most of the habitat is generally degraded with steep eroding banks, sedimented streambed, and high summer water temperatures. Cirby Creek is heavily urbanized and likely no longer supports salmonids (Placer and Sacramento Counties 2003).

Antelope Creek provides minimal habitat for the purposes of spawning and rearing. It has limited areas that may be suitable for spawning. Rock dams act as barriers to fish passage in Antelope Creek, degrading migratory habitat, although a few fish have been found in this tributary. Although much of Antelope Creek is degraded and characterized by low water levels, high temperatures, and fine sediment, these factors do not preclude its use for CCV steelhead juvenile rearing. The PCCP (Placer County 2020b) identifies the Antelope Creek stream channel as having the potential for good habitat with some restoration. Clover Valley Creek, a tributary of Antelope Creek, is similarly degraded, with high sediment loads, poor water quality, and rock dam barriers (Placer County 2020b).

2.4.1.3.3. Bear River Watershed

The Bear River watershed contains spawning and migration habitat, and salmonids continue to be found in the Bear River below Camp Far West Dam (Placer County 2020b). The upstream limit of anadromous fish access in the Bear River is the South Sutter Irrigation District's diversion dam, approximately 15 miles above the confluence with the lower Feather River (USFWS 1995). The lower Bear River continues to support remnant and/or “stray” wild and/or hatchery-sustained salmon, and in the past it supported both steelhead and sturgeon as well (Placer County 2020c). Inadequate streamflow in the Bear River prevents the establishment of a self-sustaining steelhead population (Jones & Stokes 2004).

2.4.2. Factors Affecting Covered Species and Critical Habitat in the Action Area

Key stressors identified in the recovery plan (NMFS 2014b) for CCV steelhead and critical habitat in the Auburn Ravine (1), Dry Creek (2), and Bear River (3) are listed below, with numbers corresponding to the watersheds for which they were identified as stressors. These factors also affect the other non-listed salmonids that may migrate, spawn, and rear in these watersheds.

- Passage impediments/barriers (1, 2)
- Flow conditions (*i.e.*, low flows, flow fluctuations) associated with attraction and migratory cues affecting adult immigration spawning, embryo incubation, and/or juvenile rearing and outmigration (1, 2, 3)
- Physical habitat alteration associated with limited supplies of instream gravel, habitat suitability and spawning habitat availability affecting adult spawning (1, 2, 3)
- Flow-dependent habitat availability affecting juvenile rearing and outmigration (1, 2, 3)
- Water temperature and water quality (*e.g.*, agricultural and urban runoff) affecting adult immigration and holding, spawning and embryo incubation, and/or juvenile rearing and outmigration (1, 2, 3)
- Entrainment at individual diversions affecting juvenile rearing and outmigration (1, 3)
- Loss of natural morphology, riparian habitat, floodplain habitat, and instream cover affecting juvenile rearing and outmigration (1, 2, 3)
- Predation associated with non-site-specific and structure-related habitats affecting juvenile rearing and outmigration (1)

These stressors also affect other anadromous species, including CV late fall-run Chinook salmon and CV fall-run Chinook salmon. Watersheds within western Placer County have been degraded from their historic condition and many anthropogenic and naturally occurring factors have led to the decline of anadromous fish in the surrounding ecosystems.

2.4.2.1. Fish Passage Barriers

Impassable dams block access to most of the historical headwater spawning and rearing habitat of CCV steelhead. Table 2 (section 1.3.4.2.2) describes many of the barriers to fish passage within western Placer County, including several dams and diversions. Dams and other passage barriers altered flows and temperatures from their natural and historic regimes. In addition, dams impede movement of aquatic organisms. Affected water quality results in long-term changes to downstream channels, riparian zones, and floodplains (Nilsson and Dynesius 1994, California Department of Water Resources 2002). The availability of steelhead habitat in the Central Valley has been reduced by as much as 95% or more by barriers to movement (*i.e.*, dams). Entrainment of emigrating juvenile salmonids results from unscreened or poorly screened water intakes on

irrigation pumps or hydroelectric generators, and it can be partially mitigated by proper screening.

To facilitate Auburn Ravine water deliveries to users, there are approximately 10 small seasonal diversion dams installed throughout Auburn Ravine. Most of the dams are less than 10 feet high, and they pond water for diversion into agricultural areas. Larger dams also divert water into major canals. Installation of the seasonal dams during the spring and removal during the fall reportedly can affect the upstream migration of some fish species (*e.g.*, CCV steelhead and CV fall-run Chinook salmon) (NMFS 2014c). Despite plans for retrofitting, Hemphill Dam has not been modified for fish passage. There are currently several proposed alternatives to allow for fish passage.

Tributaries within the Dry Creek watershed are known to support salmonids or have historically supported anadromous fish, but many have passage barriers or contain habitat that has been so degraded that they no longer support fish. Migratory access for adult salmonids through Dry Creek and its main tributaries, Antelope Creek, Secret Ravine, and Miners Ravine may be restricted by infrastructure in combination with low flow in the fall (Jones & Stokes 2005). Due to the construction of Cottonwood Dam, as well as various other barriers to passage, flows and temperatures within Miners Ravine have been altered from their natural and historic regimes. Dams convert riverine habitat into pools, which alters downstream flow rates for water and sediment. In addition, dams impede movement of aquatic organisms. The migratory corridor along Antelope Creek has been reduced for adult and juvenile fish by barriers to upstream passage (Jones & Stokes 2005). The percentage of stream flows removed by diversions along Dry or Antelope Creeks have not been documented. However, there are three dams on Dry Creek and the associated diversions are probably active and unscreened (Jones & Stokes 2005). Additionally, there is a dam on Antelope Creek whose associated diversions may be active.

The Bear River Watershed has also been heavily influenced by water management.

Though beavers and their dams are sometimes characterized as nuisances, beavers are native to California (Fountain 2014). Beavers and salmonids co-existed in the same rivers and streams for thousands of years. The impact of beaver dams on salmonids can be complex, with both positive and negative effects depending on conditions (Bouwes *et al.* 2016). Beaver dams may act as potential barriers to fish movement. However, beaver dams have very different hydraulics from man-made structures, so typical fish passage criteria (*e.g.*, height guidelines) may not be appropriate (Pollock *et al.* 2019). Pollock *et al.* (2019) demonstrated that juvenile steelhead are capable of passing beaver dams. However, beaver dams may not be passable by all life stages under all flow conditions. Taylor *et al.* (2010) provides an example of how, in a low flow year, beaver dams can block spawning habitat. Beaver dams generally have greater impact in narrow channels and under low flows, and they are more likely to significantly impact fish in heavily urbanized and engineered channels (Kemp *et al.* 2012). Conversely, beaver activity can increase habitat complexity and produce pools in otherwise dry areas, providing a benefit to juvenile salmonids including some protection from drought conditions (Pollock *et al.* 2019, Wathen *et al.* 2019). Beaver dam analogs have even been implemented as habitat restoration, including in Pacific Northwest steelhead habitat, with observed benefits to salmonids (Bouwes *et al.* 2016, Lautz *et al.* 2019). Beaver dams have been documented in multiple streams within the action area

(Jones & Stokes 2005). However, the effects on fish, including the extent to which these dams may constitute passage barriers for particular life stages or under certain flows, is unknown.

2.4.2.2. Unscreened Water Diversions

Water diversions for irrigated agriculture, municipal and industrial use, and managed wetlands are found within the action area. Depending on the size, location, and season of operation, these unscreened diversions entrain and kill many life stages of aquatic species, including juvenile listed anadromous species (Mussen *et al.* 2013, Mussen *et al.* 2014). Table 2 (section 1.3.4.2.2) notes some of the unscreened diversions within the action area.

There are ongoing efforts to improve fish passage throughout the salmonid watersheds in Placer County. For example, in 2015, the South Sutter Water District (SSWD) installed two cone fish screens on the 80 cfs gravity diversion at the entrance of the Pleasant Grove Canal along Auburn Ravine. The installation of fish screens helps prevent fish species in Auburn Ravine from being diverted into the Pleasant Grove Canal, which is used to provide irrigation water to SSWD customers. Presence of unscreened diversions is a risk to Covered Species, particularly rearing juveniles; however, screening diversions decreases the risk of entrainment.

2.4.2.3. Flow Conditions

Inter-basin transfers artificially augment streamflow in most western Placer County watersheds (Placer County 2020b). Water is delivered to the various watersheds for agriculture, domestic, and commercial use. The main entities involved in the delivery of water in western Placer County include the SSWD, NID, PG&E, and the PCWA.

The present system of dams, diversions, and augmented flows results in abnormal flow fluctuations, in contrast to historical natural seasonal flow variations. Altered flow regimes can influence migratory cues, water quality (including contaminants, dissolved oxygen, and nutrients for primary productivity), sedimentation, and water temperature. Low flows limit habitat area and adversely affect water quality by elevating water temperatures and depressing dissolved oxygen, which stress incubating eggs and rearing juvenile steelhead. Low flows may affect migration of juvenile and adult steelhead by inhibiting adult passage and impeding the downstream movement of juveniles. Low flows in combination with diversions may result in higher entrainment losses (NMFS 2014c). Low flows can confuse or detain migrating juveniles, resulting in higher entrainment at diversions. Reynolds *et al.* (1993) noted that declines in CCV steelhead stocks are due mostly to water development resulting in inadequate flows, flow fluctuations, blockages, and entrainment into diversions. Flows dictate water depth, which must be sufficient to cover spawning fish. Flow volume is also important in maintaining suitable water temperature, a critical variable in successful reproduction, rearing, and survival.

Auburn Ravine receives water imports from the Bear, Yuba, and American Rivers and is used by PG&E, NID, and PCWA as a conveyance feature (Placer County 2020b). In Raccoon Creek, most of the streamflow present during the late spring through early fall consists of imported water en route to downstream agricultural diversions (Placer County 2002). The creek currently receives a daily discharge of around 2 cfs from the Placer County Sewer Maintenance District #1 Wastewater Treatment Plant (WWTP) (Placer County 2020b). Flow in Raccoon Creek is

controlled by releases from Orr Creek Reservoir, operated by NID (Placer County 2020b). Doty Ravine also receives water from deliveries by NID.

Several historically intermittent drainages within the Dry Creek watershed (*e.g.*, Strap Ravine, upper portions of many tributaries) are currently perennial drainages due to nuisance flows (*e.g.*, flows from artificial outfalls, irrigation runoff, and irrigation drainage). These flows may contribute to water quality degradation through associated pollutants and higher water temperatures. A major facility discharging into the Dry Creek mainstem is the Roseville WWTP. Discharges from the Roseville WWTP have minimal impacts to Dry Creek during wet months, however, they can compose a high proportion of flows during dry months (*i.e.*, greater than 50% of total flow at the Vernon Street Bridge) (Placer County 2020b). As development continues to expand within this region, treated effluent discharges will likely increase. Summer stream flows are generally composed of flow from springs and urban runoff, and irrigation drainage and effluent from wastewater treatment systems.

Flows in Bear River are currently largely controlled by the NID system and PG&E (Placer County 2020c). In the 1960s, when growth in the foothills area increased, some of the original water and hydropower infrastructure was replaced or expanded while several new dams, powerhouses, and conveyance works were added. Throughout this period, the Bear River became the region's hydraulic workhorse, conveying water for consumption and energy generation from the upper Yuba, upper American, and its own headwaters and tributaries into the middle and lower Bear, the lower American, and the associated foothill creek-ravine region (Placer County 2020c). Habitat for Chinook salmon and steelhead is limited in Bear River by inadequate streamflow and the high incidence of fine sediment. Inadequate streamflow in the Bear River prevents the establishment of a self-sustaining steelhead population.

2.4.2.4. Limited Suitable Spawning Habitat

Dams, diversions, and dewatering from irrigation limit the access to spawning habitat for salmonids in the Central Valley. Salmonids require specific size gravel for spawning substrate. Sand and silt substrate, as well as boulder-sized riprap, are not suitable for spawning. Proper substrate conditions depend largely on conditions in the upper watershed; sedimentation resulting from logging, development, agriculture, or other activities degrades spawning areas (Placer County 2020c).

The limiting factor for steelhead in the Auburn Ravine system is suitable spawning habitat. Due to the current out-of-basin water imports and related flow regimes, these streams provide spawning and rearing habitats that would otherwise be limited or absent. Rainbow trout (non-anadromous *O. mykiss*) are known to spawn here; however, steelhead spawning has not been confirmed. If suitable spawning habitat were to be established, it is possible that there would be more active use of this creek by CCV steelhead.

Dry Creek substrates are generally composed of a high percentage of fine sediment and spawning habitat appears to be limited (Placer and Sacramento Counties 2003). Dry Creek was not included in the spawning gravel surveys conducted by Jones & Stokes (2005), as CCV steelhead spawn primarily in its tributaries (Placer and Sacramento Counties 2003). However, the percentage of fine sediment in Antelope Creek would likely result in relatively high mortality

of eggs and larvae in all tributary streams. Antelope Creek has two potential CCV steelhead spawning areas and one good resting pool near Antelope Creek's confluence with Dry Creek (Placer and Sacramento Counties 2003), but further concludes these areas are degraded. The PCCP (Placer County 2020b) identifies the Antelope Creek stream channel as having the potential for good habitat with some restoration. Urban development and public access to Antelope Creek, especially in spawning habitat and at potential barriers, translates to a relatively high potential for harassment of spawning adults resulting in reduced fecundity (Jones & Stokes 2005).

2.4.2.5. Water Temperatures

Elevated water temperatures can impact multiple life stages of CCV steelhead, CV fall-run Chinook, and CV late fall-run Chinook salmon. Egg survival is reduced when elevated water temperatures reduce oxygen availability in the gravel. Elevated water temperatures and low dissolved oxygen are a hazard for eggs, fry, and juveniles (Rombough 1988). Increased temperatures also result in increased predation by non-native fish species, reduced growth rates of juveniles (Cech and Myrick 1999, Myrick and Cech 2005, Zillig *et al.* 2018), and cause smoltification to fail (Adams *et al.* 1975) for steelhead. Water temperatures can also prevent migration (Keefer *et al.* 2009). Temperatures that rise to unsuitable levels may limit rearing success and overall survival (Myrick and Cech 2004). Sub-lethal effects on salmonids from high water temperature include increased stress and altered feeding behavior, which leads to decreased fitness and survival.

From June through September in Dry Creek, water temperatures recorded above and below the effluent outfall for the Roseville WWTP have exceeded the water quality standards established for the effluent. In October through December, water temperatures warm downstream of the outfall and exceed the required water quality standards (Placer and Sacramento Counties 2003). Levels of shade in the areas of the watershed are minimal or nonexistent, resulting in higher and potentially harmful water temperatures (Jones & Stokes 2005).

Camp Far West Reservoir may not be able to provide releases or through-flows when needed (*i.e.*, during late summer and early fall) at water temperatures that are suitable to salmonids downstream; the result will depend upon the particular reservoir storage and mixing, as well as the volume, timing, source, and temperature of any upstream flow improvements (Placer County 2020c).

2.4.2.6. Water Quality

Pollutants, in the form of organic material from livestock, fertilizers and pesticides from agriculture, and heavy metals, pesticides, and other toxins from municipal and industrial wastes, impact CCV steelhead and CV fall-/late fall-run Chinook salmon. Due to construction of dams and other passage barriers, flows and temperatures have been altered from their natural and historic regimes. Altered flow regimes can influence water quality, including contaminants, dissolved oxygen, and nutrients for primary productivity. Affected water quality results in long-term changes to downstream channels, riparian zones, and floodplains (Nilsson and Dynesius 1994, California Department of Water Resources 2002).

One of the results of urbanization within Placer County is an increase in wastewater discharge into the streams, which has contributed to the decline of water quality (Placer County 2021a). In particular, Dry Creek receives effluent from the Roseville WWTP and Dry Creek WWTP, as well as inflow from a sewage disposal pond near Rio Linda Central Park and a sewage disposal area near Midtown Park. In addition, it also receives substantial urban runoff. Because this area is being rapidly developed, there is an anticipated increase over time of effluent discharge released to the stream. There is evidence that excessive nutrient loads are due to the WWTP and urban and agricultural runoff (Placer and Sacramento Counties 2003). Unnaturally elevated nutrient inputs can alter biotic communities, result in heavy infestations of invasive species, and present a threat to species' biochemical and hydrologic requirements. Available data on the benthic macroinvertebrate community of Antelope Creek collected by the Dry Creek Conservancy during 2000 and 2001 are consistent with the expectation that contaminants are adversely affecting the aquatic ecosystem. In these samples, the dominant organisms catalogued in the benthic macroinvertebrate community were pollutant-tolerant forms (Bailey 2003).

Continued high levels of mercury in present day Bear River sediments indicate that the majority of the estimated 2.5 million pounds of heavy metals that were discharged into the Bear River watershed during 32 years of hydraulic mining are still present, trapped in the 1.5 billion cubic yards of sediment stripped from hillsides (Placer County 2020c). Mercury can affect the immune, respiratory and cardiovascular systems, reproductive organs, nervous systems, digestive systems, and the blood in fish (Morcillo et al. 2017).

2.4.2.7. Physical Habitat Modification

The loss and degradation of habitat is a major threat to steelhead and Chinook salmon. Human activities, in particular mining and water development activities, have resulted in a loss of salmonid habitat (Reynolds *et al.* 1993). Habitat problems include lack of access to spawning areas, changes in stream conditions, and loss of floodplain rearing habitat.

Throughout these watersheds, there have been numerous activities with negative outcomes for fish: reaches have been straightened, floodplain area reduced, reaches dredged, and riparian vegetation removed, resulting in eroding banks, sediment deposition, lack of cover, lack of pools and riffles, lack of riparian vegetation, and barriers to fish passage. The streams have been largely confined to narrow channels and the riparian plant community reduced to a narrow band along the banks. Stream channels have been converted to irrigation/flood canals, with some riparian vegetation within a generally open grassy levee system. Numerous canals, aqueducts, siphons, reservoirs, ponds, dams, pipelines, and other natural and non-natural water features significantly influence local hydrology within the watersheds. Modification of the watershed's hydrology is compounded by modification of the instream configuration by channelization, levees, dredging, and reduced floodplain area. These modifications also result in altered stream flow where flow is faster in some areas (*i.e.*, channelized conveyances), contributing to erosion and faster peak flow timing, but slower in other areas (*i.e.*, behind dams and other impeding structures), contributing to flooding and sediment deposition. Bank modification (*i.e.*, construction embankments and bank armoring) has changed the geomorphic processes and the success of riparian vegetation.

Riparian vegetation and habitat throughout these watersheds have been removed or degraded. Trees have been removed for firewood, construction materials, and to facilitate grazing and farming (Placer County 2002). Riparian vegetation provides a large host of ecosystem services and its removal has diminished habitat value within the action area. Riparian vegetation plays a key role in the conservation value of rearing habitat for all salmonid life stages. It provides shading to lower stream temperatures and provides overhanging cover for rearing fish; increases the recruitment of large woody material into the river, increasing habitat complexity; provides shelter from predators and; enhances the productivity of terrestrial and aquatic invertebrates, which contribute to the fish food base (Anderson and Sedell 1979, Pusey and Arthington 2003). It has also been shown to directly influence channel morphology and may be directly correlated with improved water quality in aquatic systems (Schlosser and Karr 1981, Dosskey *et al.* 2010). The result of these changes has been the reduction in quantity and quality of several essential features of migration and rearing habitat required by CCV steelhead and Chinook salmon to grow and survive.

2.4.2.8. Predation

Predation on juvenile salmon by non-native fish has been identified as an important threat to fall- and late fall-run Chinook salmon in areas with high densities of non-native predators (Lindley and Mohr 2003). Predation on steelhead parr and smolts by both native and non-native predators is highly likely both in their natal rivers and during their migration through the lower rivers in the Delta. Warm water temperatures cause stress, suppress growth, and increase susceptibility to pathogens and parasites, all of which increase vulnerability to predators. Moreover, non-native fish are adapted to warmer water temperatures; their predatory efficiency is increased by the same condition that heightens the vulnerability of juvenile steelhead (PCCP appendix D). Low flows can be caused by drought conditions, but they are more likely to result from dams and diversions that restrict and regulate streamflow. Loss of riparian vegetation results from clearing riparian areas for agriculture or flood control. Dam removal and water management for a more natural flow regime and riparian restoration can help mitigate these problems.

In Dry Creek, spotted bass (*Micropterus punctulatus*) and Sacramento pikeminnow (*Ptychocheilus grandis*), both of which prey on juvenile salmonids, are commonly found (Placer and Sacramento Counties 2003). Bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), and smallmouth bass (*Micropterus dolomieu*) have also been observed in Dry Creek, and these species also prey on juvenile salmonids (Bailey 2003). Species that have been observed in Antelope Creek include black bullhead catfish (*Ameiurus melas*), brown bullhead catfish (*A. nebulosus*), common carp (*Cyprinus carpio*), and green sunfish (Bailey 2003). HDR snorkel surveys in 2015 also revealed the presence of bullfrogs (*Lithobates catesbeianus*) and crayfish (*Cambarus* spp.) along the creek. All of these species except Sacramento pikeminnow are non-native species, and all could potentially prey on juvenile salmonids.

2.4.2.9. Agriculture Operations

Agricultural and ranch land within Placer County are used for fruit and nut crops, irrigated field crops (such as rice), nursery stock, non-irrigated pasture, and livestock, including approximately 11,900 head of cattle and 9,000 sheep. Agricultural use has altered the watershed and can have adverse effects. The dominant land use in the portion of the watersheds west of Lincoln is rice

farming. This land use drives the current water management practices and the timing and flow volumes of water that is delivered during the spring, summer, and early fall (Placer County 2002). Lower elevations within the Auburn Ravine watershed, which were once dominated by marshlands, have been largely converted to irrigated agriculture, resulting in a loss of these wetland habitats. Historic vernal pool grasslands have been largely replaced by farmland. Upstream, streams flow through non-native grassland (often grazed) and agricultural fields, with a thin margin of mixed native and non-native riparian species along the creeks (Placer County 2002). Adverse effects of agricultural operations also include bank destruction from livestock compaction and decline in water quality due to agricultural and fertilizer runoff.

2.4.2.10. Hydraulic Mining Impacts

Portions of Auburn Ravine, Dutch Ravine, Doty Ravine, and Raccoon Creek were placer mined—mining the stream bed for minerals—in the mid-to-late 1800s (Placer County 2002). This activity resulted in removal of riparian vegetation, excavation of soil, and redeposition of tailings. Hydraulic mining is a form of placer mining using a powerful jet of water to dislodge minerals. Large quantities of sediment generated by hydraulic mining were washed into stream channels and most of this sediment was deposited on the valley floor. The Dry Creek watershed also has a history of riparian and streambed augmentation due to mining. Placer mining in Secret, Strap, and Miners Ravines accelerated stream incision down to the bedrock in the upper reaches.

The Bear River was far more heavily impacted by hydraulic mining than the Yuba or American Rivers and contains a large volume of mining sediment stored in its main channel, which is subjected to continual erosion. The Bear River contains an estimated 125 million cubic meters (160 million cubic yards) of mining sediment, which, in combination with restricting levees, has caused the lower Bear River to change from wide and shallow to deeply incised (Placer County 2020c). In addition, mercury imported from the Coastal Ranges is found in sediments within the historic gold mining areas downstream of Spaulding Reservoir on both the Yuba and Bear Rivers (May *et al.* 2000).

2.4.2.11. Urban and Suburban Development

Watersheds in Placer County have undergone significant urbanization. Streams receive surface runoff from adjacent developed areas via culverts and sheet flow from residential areas. Construction of impervious hardscape cover within a 100-foot buffer of the streams can result in loss of in-stream cover, bank stability, and affect percent of silt, sand, and fine gravel in the watershed. These changes can also result in higher water temperatures. Some bridges within the action area have in-channel abutments within critical habitat, reducing quality and quantity of habitat. Impervious cover (in this case, a proxy for urban development) is a source of aquatic life impairment in urbanized watersheds, which can result in reduction of habitat quality and quantity for CCV steelhead and Chinook salmon.

Many homes have landscaped backyards that come to the edges of streams. The run-off from landscaped yards may contain chemicals from fertilizers, animal waste, and other contaminants that have a detrimental effect on water quality, which could affect all life stages of salmonids (California Department of Water Resources 2002). These residential influences also affect the

natural process of erosion, which, in turn, decreases the recruitment of gravel back into the system. Creek banks near homes are typically buffered with riprap, which allows only fine sediment to enter the creek (California Department of Water Resources 2002).

Auburn Ravine flows through the middle of the city of Auburn, where it is channelized and passes through a variety of culverts. The land adjacent to this portion of the watershed is highly urbanized. Immediately west of Auburn, the character of the channel changes, adjacent land uses change, and water from various sources is discharged into the channel (Placer County 2002). The primary ecological and land use concern in the Auburn Ravine and Raccoon Creek watersheds is the conversion of existing land uses from agriculture to urban and suburban development. Stream and riparian zone areas will face further ecological stress due to the conversion of adjacent upland habitats to urban and suburban development. Additionally, it is anticipated that water quality will decline with urbanization of the surrounding watersheds. Urbanization can contribute to declines in water quality due to increased sedimentation, fertilizer and pesticide use, automobile chemical leakage and tire wear, and increased runoff from impermeable surfaces carrying pollutants (Katz *et al.* 2013, NMFS 2014b, Tian *et al.* 2021).

Auburn Ravine is experiencing the greatest pressures from urban encroachment with the expansion of housing tracts in the Lincoln area. Development could be a major constraint on fishery restoration as most land in the watershed is in private ownership and has no permanent protection (Placer County 2020c). Due to large parcel sizes, particularly along Raccoon Creek upstream of Gladding Road, blue oak woodlands are relatively intact and unfragmented, thus providing large patch sizes for terrestrial species. The Auburn Ravine upper watershed is more fragmented with smaller land parcels under a single owner.

Dramatic levels of urbanization have occurred in the Dry Creek watershed since the 1950s, particularly in the Roseville and Rocklin areas. Many roads traverse the stream valleys, modifying floodplain areas and channels where bridges and culverts have been installed for crossings. Streams have been channelized, moved or straightened to fit floodplain developments, and riparian vegetation has been removed mechanically or by use of herbicides, resulting in bank instability and erosion (Placer and Sacramento Counties 2003). Generally, the middle portion of the Dry Creek watershed has been subject to extreme development pressure by relatively recent growth, primarily within the cities of Roseville and Rocklin. The upper and lower portions of the watershed are anticipated to experience similar growth in the coming years. Such development generally has been perceived to have exacerbated normal historical flooding conditions lower in the watershed, particularly in Sacramento County, by contributing greater and faster flood flows during storm events. In addition, water quality concerns have arisen, due to the perceived increase in sedimentation and potential contamination from non-point sources.

Within the Dry Creek watershed, much of the native vegetation has been removed and either replaced with non-native species (*e.g.*, landscaping, agriculture), developed, or left bare. The reduction in native vegetation has contributed to significant degradation of the watershed water resources. Reduction of riparian habitat and/or replacement with non-native species (*e.g.*, ornamentals) occurs within all tributaries of the watershed. Historically, livestock compaction and off-road recreational vehicle activities have contributed to bank destruction. This has contributed to bank destabilization and erosion, higher water temperatures, and reduction in suitable habitat for aquatic life. In many areas, channels have been deepened, straightened,

and/or relocated to accommodate roads, to create agricultural land, for sewage treatment ponds, to convey flows, and for other developments. This channelization and reconfiguration has resulted in reduced area for overbank flow and reduced channel meandering. Whether by erosive processes, historical placer mining or channel reconfiguration, these deepened channels have lowered the shallow groundwater table, particularly in the upper tributary reaches (Placer and Sacramento Counties 2003).

2.4.2.12. Restoration Activities

A number of restoration activities have been undertaken in the action area and more are expected in the future. These restoration efforts include the Auburn Ravine Fish Passage Project, the SSWD Pleasant Grove Canal fish screen project, Sundance-Lakeview Farms Restoration Project, and the Miners Ravine Restoration Project.

The Auburn Ravine Fish Passage Improvement project entailed construction of a fish ladder to enhance Chinook salmon and steelhead trout passage over the Nevada Irrigation District's stream gaging structure located in the Lincoln Crossing Nature Preserve, 1,000 feet downstream of Highway 65 in Lincoln (McKenzie 2020). This is a "nature-like fishway" consisting of a series of constructed rock chutes and armored step pools in a way that mimics the morphology of a natural channel. The constructed chutes and pools span the channel downstream of the existing gaging station and are designed to dissipate stream power over the drop from the facility's existing concrete flume to the streambed below. It provides upstream passage for adult fish to access spawning habitat located above the gaging station and downstream passage for migrating juvenile fishes while maintaining the ability to accurately measure stream flows occurring during the typical irrigation season (April 15–October 15). Permitting and construction were completed in 2011, and Chinook salmon ascended the fish ladder at the gaging station site in November 2012 (Johnson 2013).

The SSWD Pleasant Grove Canal fish screen project was completed in December 2015. The canal is an 80 cubic feet per second gravity canal located off of the Auburn Ravine in Placer County (McKenzie 2020). The project was screened with two 14-foot diameter Intake Screens, Inc. (ISI) cone screens and necessary screen components. As a part of the project, a PG&E power line was also installed to power the fish screen system through the Aitken Ranch Mitigation Bank.

The goal of the Sundance-Lakeview Farms Wetlands Restoration Project was to enhance existing wildlife habitat on its approximately 440-acre property in western Placer County (Placer County 2021b). Work was limited to a 60-acre parcel north of Coon Creek and adjacent to Dowd Road and its 380-acre hunting preserve, which is under a conservation easement held by the National Resource Conservation Service. The scope of work encompasses 7.04 acres of riparian area restoration within a setback levee as well as 2,527 linear feet of stream restoration. Project work included widening of the riparian habitat along the stream channel, biotechnical bank stabilization (through installation of native sedges, rushes, grasses, and trees) to create a habitat corridor, and expansion of the floodplain. Work was completed in November 2008.

Miners Ravine Restoration Project occurred across three sites within the Placer County-owned Miners Ravine Nature Preserve (Placer County 2011). The Miners Ravine Nature Preserve is on

Auburn Folsom Road north of Douglas Boulevard in Granite Bay. The Miners Ravine Preserve restoration project included debris removal, floodplain creation/restoration, public education, re-contour and stabilization of stream banks, and revegetation of native riparian species. Initial work commenced in late September 2002 and was substantially completed by December 1, 2002.

2.4.2.13. Fish Hatcheries

Artificial propagation programs (*i.e.*, hatchery production) for steelhead, fall-run Chinook salmon, and late fall-run Chinook salmon in the Central Valley present multiple threats to wild populations (NMFS 2014b). During spawning, hatchery- and natural-origin salmonids may compete for habitat, and interbreeding may reduce genetic integrity. Throughout juvenile rearing and outmigration, hatchery- and natural-origin salmonids may compete for habitat and food. When larger, juvenile, hatchery-origin steelhead are released into the river and may predate on smaller natural-origin salmonids. Hatchery programs in the Central Valley are currently operated to mitigate for natural habitats that have already been permanently lost as a result of dam construction. The loss of this available habitat results in dramatic reductions in natural population abundance, which is mitigated for through the operation of hatcheries. These hatchery programs are also intended to supplement natural spawning populations and contribute to commercial and recreational fisheries. Hatcheries in the California Central Valley that produce steelhead, fall-run Chinook salmon, and/or late fall-run Chinook salmon are Coleman National Fish Hatchery, Feather River Hatchery, Nimbus Fish Hatchery, Mokelumne River Hatchery, and Merced River Hatchery. Coleman National Fish Hatchery is run by USFWS and Nimbus Fish Hatchery is funded by the U.S. Bureau of Reclamation, so these hatcheries will be considered part of the environmental baseline. Feather River Hatchery, Mokelumne River Hatchery, and Merced River Hatchery are state-run hatcheries and will be considered in the cumulative effects, section 2.6.2.

Increases in the proportion of hatchery fish relative to naturally produced fish, the use of out-of-basin stocks for hatchery production, and the straying of hatchery-produced adults have degraded the genetic integrity of Chinook salmon and steelhead populations in the Central Valley through reductions in genetic diversity and increases in hatchery influence (NMFS 2014b). Threats related to hatchery programs in the Central Valley include the mortality of natural-origin steelhead in fisheries targeting hatchery-origin fish, disease transmission, genetic introgression by hatchery-origin fish that spawn naturally and interbreed with natural populations, and competition for food and spawning areas (NMFS 2014b). Recent evaluations of these hatchery programs and hatchery and genetic management plans (HGMPs) have proposed or recommended changes in hatchery policies and management to address these impacts (California Hatchery Scientific Review Group 2012).

The genetic impacts of artificial propagation programs in the Central Valley are primarily caused by straying of hatchery fish and the subsequent interbreeding of hatchery fish with wild fish. Practices such as transferring eggs between hatcheries and trucking hatchery-produced smolts to distant sites for release contribute to elevated straying levels (California Hatchery Scientific Review Group 2012). To maximize survival, and as a result of the degraded conditions of downstream migration corridors in the Central Valley, most Chinook salmon hatchery production has been routinely released off-site, significantly downstream of the hatchery or in the estuary. The exception is Coleman National Fish Hatchery, where hatchery managers have

consistently implemented in-river releases to reduce straying (NMFS 2014a). This approach was temporarily suspended during the 2014–2015 drought when environmental conditions in Battle Creek and the upper Sacramento River were likely to result in adverse impacts and significant mortality. In order to circumvent these unfavorable conditions, the majority of the Chinook salmon produced at Coleman National Fish Hatchery and other Central Valley hatcheries were trucked and released offsite. Although this offsite release practice has improved survival rates and resulted in increased ocean harvest of hatchery fish, it has also led to widespread straying of hatchery fish throughout the Sacramento-San Joaquin system (California Hatchery Scientific Review Group 2012).

Genetic effects are expected to be greatest when hatchery stocks originate from outside of the basin in which they are released and are adapted to environmental conditions atypical of the Central Valley. For example, Nimbus Fish Hatchery on the American River rears steelhead that originate from coastal streams (Eel/Mad Rivers) and releases them into the Sacramento River basin. Adult steelhead from the Nimbus Fish Hatchery that do not return to the hatchery but instead spawn naturally in the Central Valley would be expected to pass along traits associated with improving fitness in coastal streams, which may differ dramatically from conditions in the Central Valley. One of the recommendations in the California Hatchery Scientific Review Group (2012) report was to identify and designate new local sources of steelhead broodstock to replace the current out-of-basin steelhead stock at Nimbus Fish Hatchery.

Hatchery-origin fish can also pose a threat to wild Chinook salmon and steelhead stocks through the spread of disease, genetic impacts, competition for food and other resources between hatchery and wild fish, predation of hatchery fish on wild fish, and increased fishing pressure on wild stocks as a result of hatchery production (Waples 1991). The steady production of Chinook salmon and steelhead in Central Valley hatcheries, concomitant with decreased levels of natural production, has led to a reversal of the relative numbers of hatchery and natural salmonid stocks in the Central Valley. For example, the Chipps Island midwater trawl data provide information on the trend in abundance for the CCV steelhead DPS as a whole. Updated through 2019, the trawl data indicate that the production of natural-origin steelhead remains very low relative to hatchery production. Catch-per-unit effort has fluctuated and generally increased over the past decade, but the proportion of the catch that is adipose fin-clipped (100% of hatchery-origin steelhead production have been adipose fin-clipped starting in 1998) has risen steadily, exceeding 90% in recent years and reaching 96% during the drought in 2015. This suggests that the vast majority of steelhead outmigrating from the Delta are of hatchery-origin. The lack of improved natural production as estimated by exit at Chipps Island, and low abundances coupled with large hatchery influence is a cause for concern.

Impacts of hatchery fish can occur in both freshwater and marine ecosystems. Limited marine carrying capacity has implications for naturally produced fish experiencing competition with hatchery production (Hatchery Scientific Review Group 2004). Increased salmonid abundance in the marine environment may also decrease growth and size at maturity, and reduce fecundity, egg size, age at maturity, and survival (Bigler et al. 1996). There may be years when hatchery production may be in excess of the marine carrying capacity, placing depressed natural fish at a disadvantage by directly inhibiting their opportunity to recover (Hatchery Scientific Review Group 2004).

2.4.3. Recovery Plan for CCV Steelhead DPS

The recovery plan (NMFS 2014b), included recovery delisting criteria and diversity group priorities. For CCV steelhead, these include the following: two viable populations in the Basalt and Porous Lava diversity group (Battle Creek and reintroduction into the McCloud River, as well as maintaining core 2/dependent populations in Cow Creek, and other tributaries); one viable population in the Northwestern California diversity group (Clear Creek, and maintaining core 2 population in Cottonwood/Beegum Creek); four viable populations in the Northern Sierra Nevada diversity group (Antelope, Deer, and Mill Creeks, and reintroduction in the Yuba River upstream of Englebright Dam), as well as maintaining core 2 populations (lower Yuba River, Butte Creek, Feather River, Big Chico Creek, Auburn Ravine, and the American River); and two viable populations in the Southern Sierra Nevada diversity group. Currently, none of these populations are considered viable.

The PCCP action area includes a portion of priority watersheds in the Northern Sierra Nevada diversity group identified for the recovery of CCV steelhead. Improvements to habitat for these populations would support recovery.

2.5. Effects of the Action

Under the ESA, “effects of the action” are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

Of the proposed Covered Activities, some types are expected to have only beneficial effects to covered fish species and habitat. These types include protection of riparian habitat, protection of riverine habitat, protection of oak woodlands for fish, and riparian habitat restoration activities that will occur outside of the wetted channel and without disturbance to existing riparian. The PCCP plans to protect 2,200 acres of riverine/riparian habitat consisting of at least 1,410 acres of riparian and 88.6 linear miles of streams/riverine habitat. Maximum adverse effects presented below are limits, which cannot be exceeded without amending the permits and the plan (section 10.5.3 of the PCCP).

Many of the Covered Activities will have temporary or permanent effects to covered fish species and habitat, most of which will be mitigated for through the conservation activities. Specifically, the assessment will consider the potential short- and long-term impacts related to covered fish species and their habitat resulting from the construction, operation, maintenance, and research and monitoring associated with Covered Activities, as well as any other activities expected to occur as a result of Covered Activities (*i.e.*, public use of trails), including:

- contaminants or hazardous materials entering the water;
- increased turbidity and suspended sediment;

- physical disturbance effects;
- acoustic effects from pile driving;
- temporary and permanent loss of riparian vegetation;
- temporary and permanent loss of riverine habitat;
- injury or death resulting from dewatering;
- fish capture and relocation;
- disturbance and contaminants resulting from increased urbanization; and
- disturbance from use of new trails by the public.

2.5.1. Effects of the Action on Covered Fish Species

2.5.1.1. Water Quality

Water quality may be impaired by Covered Activities including land conversion and urbanization. This threat includes dissolved oxygen, heavy metals, disturbed sediments, and agricultural and urban runoff. Impacts to water quality may adversely affect adult immigration, staging, and spawning; eggs; and juvenile rearing and outmigration from or through the action area. Impaired water quality may lead to reduced growth, survival probability, reproductive success, and/or lifetime reproductive success.

Water quality encompasses the physical, chemical, and biological properties of aquatic environments. Physical properties include temperature, turbidity, and dissolved gases. Chemical properties include pH, hardness, organic and inorganic contaminants, and metals. Biological properties include pathogens, fishes, insects, algae, and other organisms (Karr and Dudley 1981).

2.5.1.1.1. Contaminants and Pollution-related Effects

Some of the Covered Activities described in the proposed action will involve heavy construction equipment and many potential sources of hazardous material contamination in the action area. Potential sources of pollutants include hazardous material spills, petroleum product leaks in construction equipment, introduction of metals from the operation of equipment and vehicles, stormwater drainage, cleaning of irrigation channels, fire retardant use, and the disturbance of sediments that may contain hazardous suspended particulates. BMPs will be implemented, minimizing the probability of spills, but some pollutant incursion into the action area is likely from non-spill sources. Unlike sedimentation, turbidity, and other short-term effects, potential pollution-related effects may be persistent in the action area and may affect multiple life stages if they were to occur.

Incursion of contaminants into the action area has the potential to adversely affect CCV steelhead, CV fall-run Chinook salmon, and/or CV late fall-run Chinook salmon that may be migrating, rearing, or spawning/incubating in the action area at or after the time of a pollution

event. Construction equipment and heavy machinery will be present in the action area, and metals may be deposited through their use and operation (Paul and Meyer 2008).

Metals, such as copper and aluminum, may also be deposited within the action area due to cleaning and flushing of channels in the PCWA channel system. Metals have been shown to alter juvenile salmonid behavior through disruptions to various physiological mechanisms, including sensory disruption, endocrine disruption, neurological dysfunction, and metabolic disruption (Scott and Sloman 2004).

Oil-based products used in combustion engines are known to contain polycyclic aromatic hydrocarbons (PAHs), which have been known to bio-accumulate in other fish taxa, such as flatfishes (order Pleuronectiformes) and have carcinogenic, mutagenic, and cytotoxic effects (Johnson *et al.* 2002). The exact toxicological effects of PAHs in juvenile salmonids are not well understood, although studies have shown that increased exposure of salmonids to PAHs reduced immunosuppression, increasing their susceptibility to pathogens (Arkoosh *et al.* 1998, Arkoosh and Collier 2002).

Covered fish species are expected to be present in the action area during construction activities in low numbers and would likely be exposed if a pollution event occurred. If contaminants were to settle within the substrate in the action area, fish could be adversely affected later in time when the substrate becomes disturbed and contaminants resurface.

Avoidance and minimization measures are described in section 1.3.5 and will aid in reducing the potential risk of exposure to contaminants. However, small amounts of pollutants or contaminants may be introduced to small localized portions of the action area during the 50-year permit term. Fish present in areas exposed to contaminants would be expected to experience harm through physiological impacts, temporary displacement, reduced feeding, and increased predation, and a very small proportion could die as a result of increased contaminants. Expected effects of contaminants include behavioral effects, physical injury, or death to all life stages of fish unable to leave the area subjected to contaminants. Juvenile fish and eggs will be more vulnerable to these effects than adult fish due to their smaller size, longer time spent in the action area, and decreased or lack of mobility and swimming speed.

2.5.1.1.2. Increased Sedimentation and Turbidity

Increased sedimentation and turbidity may result from Covered Activities in and along the river banks. Sedimentation and high turbidity levels are expected to have varying effects among different covered fish species and different life stages present in the action area during in-water work. High levels of suspended sediment reduce the ability of fish to feed and respire, resulting in increased stress levels and reduced growth rates, and reduced tolerance to fish diseases and toxicants (Waters 1995). Spawning occurs within the action area, so impacts to egg life stages by sedimentation and turbidity may also occur. In a lab study, juvenile steelhead were found to occupy a parcel of water by choice between 57 and 77 nephelometric turbidity units (NTU) (Sigler *et al.* 1984). This result suggests that juvenile salmonids may not exhibit avoidance behavior in low to moderate turbidity levels during migration. One effect of high turbidity levels that has important implications for juvenile salmonids is that predator avoidance behavior has been shown to decrease at increased levels of turbidity (Gregory 1993). Decreased growth and

survival amidst increased sediment and turbidity levels have also been shown to result from reduced prey detection and availability and physical injury due to increased activity, aggression, and gill fouling (Sigler *et al.* 1984, Suttle *et al.* 2004, Kemp *et al.* 2011).

Fish responses to increased turbidity and suspended sediment can range from behavioral changes (*e.g.*, alarm reactions, abandonment of cover that could lead to predation, and avoidance) to sublethal effects (*e.g.*, reduced feeding rate), and, at high suspended sediment concentrations for prolonged periods, lethal effects (Newcombe and Jensen 1996). Temporary spikes in suspended sediment may result in behavioral avoidance of the site by fishes; several studies have documented active avoidance of turbid areas by juvenile and adult salmonids (Bisson and Bilby 1982, Sigler *et al.* 1984, Lloyd *et al.* 1987, Servizi and Martens 1992). Individual salmonids that encounter increased turbidity or sediment concentrations will likely move away from affected areas into suitable surrounding habitat (Sigler *et al.* 1984).

High turbidity and suspended sediment levels can lead to reduced growth, survival, and reproduction due to reduced foraging ability, impaired disease resistance, or interference with cues necessary for orientation in homing and migration (Lloyd *et al.* 1987). Laboratory studies have demonstrated that chronic or prolonged exposure to high turbidity and suspended sediment levels can lead to reduced growth rates in juvenile salmonids. For example, Sigler *et al.* (1984) found that steelhead exhibited reduced growth rates and higher emigration rates in turbid water (25–50 NTU) compared to clear water.

Increases in turbidity associated with instream work are likely to be brief and remain localized to approximately 300 feet downstream, attenuating downstream as suspended sediment settles out of the water column. Also, avoidance and minimization techniques will be implemented during Covered Activities as well as BMPs to minimize sedimentation and turbidity increases (described in section 1.3.5). These actions will reduce the extent of adverse effects associated with Covered Activities. Due to their use of the nearshore habitat in the action area, juvenile covered fish in close proximity to construction activities are expected to be subject to mobilized sediment and short-term increases in turbidity. Sedimentation and turbidity are expected to cause behavioral effects, physical injury, or death to all life stages of fish unable to leave the area subjected to high levels of sedimentation and turbidity. Juvenile fish and eggs will be more vulnerable to these effects than adult fish due to their smaller size, longer time spent in the action area and in nearshore habitat, and decreased or lack of mobility and swimming speed.

2.5.1.1.3. Erosion Control

Erosion control is part of the conservation strategy. These actions may temporarily increase sedimentation and turbidity within the action area as described above, but will eventually improve water quality for the long term. Erosion control will reduce sedimentation and turbidity, which can lead to improved growth, survival, and reproduction due to increased foraging ability, predator detection, and egg survival.

2.5.1.2. Physical Disturbance

Physical disturbance of aquatic habitat may occur during construction activities and the placement of materials in streams. Physical disturbances have the potential to result in injury or

death to covered fish species. Physical disturbance may include debris falling into the active channel, placement of structures in streams, tools and/or equipment falling into the active channel, or noise generated by displaced rock and sediment and the operation of construction machinery. Any life stages of covered fish species present during in-water work would be affected by physical disturbance. BMPs, avoidance, and minimization techniques will be implemented, reducing the probability and magnitude of physical disturbance effects in the action area.

Adult and juvenile covered fish species could potentially encounter falling debris, be hit, or become trapped by equipment as work occurs, which could cause physical injury or death. Physical disturbance noise may alter behavior, which may result in displacement from a position normally occupied in their habitat for short or long durations. Depending on the innate behavior that is being disrupted, the effects could be varied. This is of particular concern for juvenile fish as there are innate behaviors that are essential to their maturation and survival, such as feeding, sheltering, and migratory patterns. For example, construction activities could cause cessation or alteration of migratory behavior. In the context of the action area, the migratory and rearing behavior of juvenile salmonids may be affected by various physical disturbance effects.

Avoidance and minimization measures are described in section 1.3.5 and will aid in reducing the potential risk and magnitude of effects of physical disturbance. The primary expected effects of physical disturbances is behavioral effects, however physical injury, or death is also expected to occur in low numbers. Juvenile fish and eggs will be more vulnerable to these effects than adult fish due to their smaller size, longer time spent in the action area, and decreased or lack of mobility and swimming speed.

2.5.1.3. Acoustic Effects from Pile Driving

2.5.1.3.1. Vibratory Pile Driving

Pile driving for Covered Activities will use vibratory hammers instead of impact hammers to the maximum extent practical. Vibratory hammers use counter-rotating eccentric weights to transmit vertical vibrations into the pile, causing the sediment surrounding the pile to liquefy and allow the pile to penetrate the substrate. The vibratory hammer produces sound energy that is spread out over time and is generally 10 to 20 decibels (dB) lower than impact pile driving for the same type and size pile (Buehler *et al.* 2015). Based on the results of hydroacoustic monitoring of vibratory hammer pile installations (Buehler *et al.* 2015), the sound levels generated by vibratory hammer use will be considerably below the injury and mortality thresholds for both single strike and cumulative sound exposure level (SEL). Pile-driving activities by vibratory hammer are expected to result in noise that startles covered fish. Startled fish may hide, move to adjacent suitable habitat, or cease activities, such as feeding or holding station, until the disturbance has ended. In addition, sound associated with vibratory pile driving may mask environmentally relevant noise that could prevent covered fish from detecting predators or conspecifics. Those fish exposed to vibratory hammer activity are expected to experience behavioral responses.

2.5.1.3.2. Impact Pile Driving

Piles that are driven into streambed substrate propagate sound vibrations through the water that can damage a fish's swim bladder and other organs by causing sudden rapid changes in pressure. This causes the swim bladder to resonate (vibrate), thus rupturing or hemorrhaging tissue in the swim bladder directly or in tissues adjacent to the organ (Gisiner 1998, Popper *et al.* 2006). The swim bladder is the primary physiological mechanism that controls a fish's buoyancy. A perforated or hemorrhaged swim bladder has the potential to compromise the ability of a fish to orient itself both horizontally and vertically in the water column. This can result in a diminished ability to feed, migrate, and avoid predators. Sensory cells and other internal organ tissue may also be damaged by noise generated during pile-driving activities as sound reverberates through a fish's viscera (Gaspin 1975). In addition, morphological changes to the form and structure of auditory organs (sensory cilia and inner ear otoliths within the saccule, utricle, and lagenae) have been observed after intense noise exposure (Hastings 1995). It is important to note that acute injury resulting from acoustic impacts should be scaled based on the mass of a given fish. Juveniles and fry have less inertial resistance to a passing sound wave and are therefore more at risk for non-auditory tissue damage (Popper and Hastings 2009).

Fish can also be injured or killed when exposed to lower sound pressure levels for longer periods of time. Hastings (1995) found death rates of 50 percent and 56 percent for gouramis (*Trichogaster* sp.) when exposed to continuous sounds at 192 dB (re 1 μ Pa) at 400 Hz and 198 dB (re 1 μ Pa) at 150 Hz, respectively, and 25 percent for goldfish (*Carassius auratus*) when exposed to sounds of 204 dB (re 1 μ Pa) at 250 Hz for two hours or less. Hastings (1995) also reported that acoustic "stunning," a potentially lethal effect resulting in a physiological shutdown of body functions, immobilized gourami within eight to thirty minutes of exposure to the aforementioned sounds.

Multiple studies have shown responses in the form of behavioral changes in fish due to human-produced noise (Wardle *et al.* 2001, Slotte *et al.* 2004, Popper and Hastings 2009). Instantaneous behavioral responses may range from slight variations (mild awareness) to a startle response. Fish may also exhibit movements that displace them from a position normally occupied in their habitat for short or long durations. Depending on the innate behavior that is being disrupted, the adverse effects could be varied. This is of particular concern for juvenile fish as there are innate behaviors that are essential to their maturation and survival, such as feeding, sheltering, and migratory patterns. An example of an adverse effect would be cessation or alteration of migratory behavior. In the context of the implementation of the Covered Activities, the migratory behavior of juvenile salmonids is expected to be affected by acoustic impacts of pile driving. Though pile driving may affect migratory behavior, it is not expected to prevent salmonids from passing upstream or downstream, because pile driving will not be continuous through the day and will not occur at night, when the majority of fish migrate.

Cumulative acoustic effects are expected for any situation in which multiple strikes are being made to an object with a single strike peak dB level above the effective quiet threshold of 150 dB. NMFS currently uses a dual metric criteria to assess onset of injury for fish exposed to pile-driving sounds (Fisheries Hydroacoustic Working Group 2008). Specifically, this includes a peak level of 206 dB and an accumulated SEL of 187 dB for fish equal to or greater than 2 grams or 183 dB for fish less than 2 grams. If either threshold is exceeded, then physical injury is assumed to occur. There is uncertainty as to the decibel level at which fish exhibit a behavioral response to high levels of underwater sound produced when driving piles in or near water. Based

on the information currently available, and until new data indicate otherwise, NMFS uses a 150 dB RMS threshold for behavioral responses in salmonids. Though the dB value is the same, the 150 dB RMS threshold for behavioral effects is unrelated to the 150 dB effective quiet threshold.

Avoidance and minimization measures (described in section 1.3.5) for pile driving include limiting pile driving to daylight hours to minimize exposure as it allows migration through the area at night, vibrating piles to the maximum extent possible, using the smallest driver and minimum force necessary to complete work, and the use of attenuation methods. Distances to the thresholds for acoustic effects will vary under different construction scenarios depending on the type and size of piles, the number of strikes per pile, and the type of attenuation used. As a result, pile driving with an impact hammer is expected to result in behavioral effects, physical injury, or death to all life stages of fish unable to leave the area subjected to impact pile driving. Smaller fish and eggs will be more vulnerable to these effects due to their smaller size, and thus greater sensitivity to acoustic impacts, and decreased or lack of both mobility and swimming speed.

2.5.1.4. Dewatering

Some Covered Activities may employ temporary dewatering of a portion of a stream associated with the activity. Any dewatering activities will result in a temporary reduction in the amount of available habitat to in-stream species, including covered fish species. During the installation of temporary diversion systems, covered fish species may swim away from the noise and activity, resulting in displacement from preferred habitat and altered behavior. If covered fish species are expected to be present based on project timing, fish will be captured and relocated. Covered fish species that evade capture and remain in the construction area may be injured or killed from construction activities. This includes desiccation if fish remain in the dewatered area, or death if fish are crushed by personnel or equipment. Redds that are dewatered may lead to desiccation and death of eggs. However, because experienced biologists will be collecting fish, most fish are expected to be removed from the area before construction and redds are expected to be avoided.

Avoidance and minimization measures are described in section 1.3.5 and will aid in reducing the potential risk and magnitude of dewatering effects. Those fish that evade capture and remain in the area to be dewatered are expected to be injured or killed. Adult fish will likely be able to move out of the construction area, but small numbers of juveniles are more likely to be stranded in smaller pools and remain undetected.

2.5.1.5. Fish Capture

2.5.1.5.1. Fish Capture from Dewatering Activities

For some Covered Activities where dewatering will occur, any fish present will first be captured and removed from the area to be dewatered. Fish capture and relocation may cause stress, injury, or death, even though it will be conducted by a qualified fish biologist and intends to prevent stress, injury, or death from Covered Activities. Adult fish will likely be able to move out of the construction area and are not expected to be captured/relocated. Juvenile fish are expected to be captured and handled in small numbers due to longer time spent in the action area and decreased swimming speed. A small proportion of fish captured are expected to be injured or killed, as well as a small proportion killed due to remaining undetected in the dewatered area.

2.5.1.5.2. Fish Surveys and Capture for Research, Monitoring, and Adaptive Management

Fish surveys and capture are planned to occur as part of research or monitoring activities that support conservation programs and inform adaptive management. Fish surveys and capture for research and monitoring will occur in the reserve system and potentially on land being considered for acquisition. Visual surveys will be conducted for spawning adult salmonids. This may include counting live adults, carcasses, and/or redds, and may also include using rotary screw traps, nets, snorkel surveys, and other methods to determine juvenile salmonid abundances.

Access to streams to conduct research/monitoring may cause temporary disturbances to riparian habitat, physical disturbances within the stream, sedimentation, and increased turbidity. Visual surveys for adults, carcasses, and redds may lead to physical disturbance within the stream, sedimentation, and turbidity. These may cause behavioral changes to spawning adults and could potentially impact eggs.

Juvenile fish captured for research/monitoring will be handled, measured, marked, and tagged. Exact numbers of fish expected to be captured for research and monitoring are currently unknown as baseline data for the action area is sparse and surveys are still in the preliminary planning process, but targets will be a very small proportion of the population. NMFS will be involved in the research/monitoring planning process following PCCP implementation. Research and monitoring efforts will also aid in adaptive management of the PCCP, which is expected to benefit covered fish species and habitat. The capture and handling of fish for research and monitoring purposes will cause stress, injury, or death to a moderate number of fish over the permit term, even though it will be conducted by a qualified fish biologist. Adult fish will not be targeted and are expected to evade capture by juvenile sampling equipment so will likely be captured in extremely low numbers. Approximately 100 juveniles of each of the three covered fish species, are expected to be captured throughout the action area per survey year, a small proportion of which may be injured or killed.

Avoidance and minimization measures are described in section 1.3.5 and will aid in reducing the potential risk and magnitude of injury or death.

2.5.1.6. Water Quantity

Some of the Covered Activities are expected to use ground and surface water. These uses may decrease the amount of water available in streams for covered fish species. Reduced flows may impact covered fish species' ability to migrate and get past barriers, and may increase water temperatures. These impacts may affect spawning, migrating, and/or rearing salmonids. Some PCCP conservation actions will reduce existing issues related to water quantity and will improve the ability of covered fish species to move up or downstream. Effects to water quantity as a result of Covered Activities are expected to be minimal.

2.5.1.7. Disturbance to Riparian Habitat

The PCCP described the expected extent of effects to riverine and riparian habitat, by combining the two, see PCCP 3-16 (Placer County 2020b). The maximum amount of temporary effects to riverine/riparian habitat is estimated at 165 acres, with a maximum of 115 acres that can be

effects to riparian habitat. The maximum amount of permanent effects to riverine/riparian habitat is estimated at 490 acres of riverine/riparian habitat with a maximum of 375 acres that can be riparian habitat. Assuming an even distribution of the maximum amount of riparian habitat effects over the 50-year permit term, an average of 2.3 acres per year will be temporarily impacted and 7.5 acres per year will be permanently impacted.

The PCCP defined temporary effects as disturbed areas that must recover to pre-project or ecologically improved conditions within 1 year. Further, the PCCP describes that if the same permittee does the same project every ten years on the same piece of land and temporarily impacts the same two acres, that area will only be counted as two acres of temporary impacts. Temporary effects will be subject to a temporary effect fee (see section 9.4.1.5 of the PCCP, Temporary Effect Fee). Most construction projects will not qualify as temporary effects under the PCCP due to their size and their level of land disturbance, which usually cannot conform to the required 1-year timeframe for complete restoration. Most of the temporary effects anticipated to occur under the PCCP relate to urban development, such as construction corridors for pipelines, utilities, roads, and other infrastructure for flood control. The PCCP estimated the extent of temporary effects as a proportion of the estimate of permanent effects. For future in-stream flood management and future new and replaced stream crossings, temporary effects were calculated as follows:

- 35 percent for aquatic/wetland and riverine/riparian complex in the valley, A1 and A2
- 25 percent for aquatic/wetland and riverine/riparian complex in the foothills, A3 and A4
- 200 percent for aquatic/wetland and riverine/riparian complex in Plan Area B

Examples of permitted temporary effects include routine maintenance in stream channels for flood control, maintenance along roadsides for highways, and short-term disturbance of the landscape for a linear project, such as a pipeline. Because of the way a project site is determined (see PCCP section 6.2), most disturbed areas associated with urban development will be included in the permanent site footprint and assessed as permanent effects.

Impacts to riparian habitat will be avoided to the maximum extent practicable. Temporary and permanent loss of riparian habitat is expected to occur as a result of Covered Activities. Disturbed riparian areas, not intended for future road access or gravel placement, will be revegetated with native plant species within a year following the completion of construction activities. Areas that are revegetated within a year are expected to have multiple years of impacts to fish, until vegetation returns to full growth (typically 2–5 years for riparian habitat), and will be considered permanent effects under the PCCP. Permanent loss of riparian habitat will be mitigated for by restoration of riparian habitat at a ratio of 1.52:1. Effects on salmonid habitat will be mitigated in kind (for example, impacts to riparian habitat in spawning areas will be mitigated by restoration of spawning area riparian habitat within the plan area). Temporary loss of riparian habitat will be assessed a temporary effect fee, see section 9.4.1.5 of the PCCP for more details (Placer County 2020b).

Loss of riparian vegetation is expected to impact covered fish species by reducing instream cover, which may lead to increased water temperatures, reduced access to food input, and

reduced escape cover for juveniles from predators. Juvenile life stages of covered fish species are most likely to be impacted by disturbance to riparian vegetation. Loss of riparian habitat is likely to result in reduced fitness, reduced growth, and/or reduced survival. However, these impacts are expected to be offset through mitigation. The stay-ahead provision of the PCCP requires that within each calendar year the amount of habitat protected, restored, or created is equal to or greater than that type of habitat loss from Covered Activities.

Avoidance and minimization measures are described in section 1.3.5 and will aid in reducing disturbance to riparian habitat.

2.5.1.8. Disturbance to Riverine Habitat

Since the PCCP combined estimated impacts to riverine and riparian habitat, there is no maximum for temporary or permanent impacts to riverine habitat, other than the combined maximum for riverine/riparian habitat. So, if the maximum temporary effects to riparian habitat occurs, up to 50 acres of riverine habitat may be temporarily affected. However, if less than the 115 acres of temporary effects to riparian habitat are expressed, more impacts to riverine habitat can occur up to the maximum for riverine/riparian habitat of 165 acres. This same concept holds for the permanent impacts to a total of 490 acres of riverine/riparian habitat of which a maximum of 375 acres can be to riparian habitat. So, if the maximum permanent impacts to riparian habitat occur, 115 acres of riverine habitat may be permanently affected. If less than the 375 acres of permanent effects to riparian habitat are expressed, more impacts to riverine habitat can occur up to the maximum for riverine/riparian habitat of 490 acres. Assuming an even distribution of the maximum amount of riverine habitat effects over the 50-year permit term, an average of 3.3 acres per year will be temporarily impacted and 9.8 acres per year will be permanently impacted.

Impacts to riverine habitat will be avoided to the maximum extent practicable. Permanent loss of riverine habitat will be mitigated by restoration of riverine habitat at a ratio of 1.52:1. Effects on salmonid habitat will be mitigated in kind.

The PCCP estimates effects from in-stream programs by the linear extent of riverine habitat affected, which are summarized in Table 7. The PCCP plan area contains 576.15 total stream miles; 68.17 of those miles are spawning/rearing habitat for salmonids, and 24.49 of those miles are migration/rearing habitat for salmonids. Temporary effects to 21.5 miles are expected from all road crossings, of which 3.6 miles are in spawning/rearing habitat and 0.38 in migration/rearing habitat. PCWA pipelines outside of roadways are expected to temporarily affect 0.19 miles of streams, 0.03 in spawning/rearing habitat and 0.01 in migration/rearing habitat. Flood control projects are expected to temporarily impact 14.82 total stream miles of which 4.72 will be in spawning/rearing habitat and 2.45 in migration/rearing habitat.

Table 7. Temporary and permanent effects to streams and salmonid habitat.

	Temporary Effects (miles)				Permanent Effects (miles)			
	All Streams	Spawning/ Migration/ Rearing Habitat	Migration/ Rearing Habitat	All Salmonid Habitat	All Streams	Spawning/ Migration/ Rearing Habitat	Migration/ Rearing Habitat	All Salmonid Habitat
All Road Crossings	21.5	3.6	0.38	3.98	4.75	0.77	0.09	0.86
PCWA Pipelines Outside Roadway	0.19	0.03	0.01	0.04	0.02	0.01	0.01	0.02
Flood Control	14.82	4.72	2.45	7.17	0.74	0.24	0.12	0.36
All In-Stream Activities	36.51	8.35	2.84	11.19	5.51	1.02	0.22	1.24
Total Stream Miles	576.15	68.17	24.49	92.66	576.15	68.17	24.49	92.66
Proportion of Existing Streams	6.3%	12.3%	11.6%	12.1%	1.0%	1.5%	0.9%	1.3%

Adapted from PCCP tables 4-7A and 4-7B (Placer County 2020b).

All in-stream activities together are expected to temporarily impact 36.51 miles, 8.35 miles in spawning/rearing habitat and 2.84 in migration/rearing habitat or 12.3% and 11.6%, respectively. Total salmonid habitat temporary effects will be 11.19 miles.

Permanent effects to 4.75 miles are expected from all road crossings, 0.77 miles in spawning/rearing habitat and 0.09 in migration/rearing habitat. PCWA pipelines outside of roadways are expected to permanently affect 0.02 miles of streams, 0.01 in spawning/rearing habitat and 0.01 in migration/rearing habitat. Flood control projects are expected to permanently impact 0.74 total stream miles of which 0.24 will be in spawning/rearing habitat and 0.12 in migration/rearing habitat.

All in-stream activities together are expected to permanently impact 5.51 miles, 1.02 miles in spawning/rearing habitat and 0.22 in migration/rearing habitat or 1.5% and 0.9%, respectively. Total salmonid habitat permanent effects will be 1.24 miles. Loss of riverine habitat is expected to impact covered fish species by reducing available instream habitat, creating obstructions resulting in blocked or delayed migration, and decreasing habitat for aquatic insects that serve as prey for fish. Loss of riverine habitat is likely to result in reduced fitness, reduced growth, and/or reduced survival. However, these impacts are expected to be offset through mitigation. The stay-ahead provision of the PCCP requires that within each calendar year the amount of habitat protected, restored, or created is equal to or greater than that type of habitat loss from Covered Activities.

Avoidance and minimization measures are described in section 1.3.5 and will aid in reducing disturbance to riverine habitat.

2.5.1.9. Riparian Habitat Restoration

Riparian habitat restoration will occur as part of the conservation strategy and as mitigation for Covered Activities that impact riparian habitat. Restoration activities that will occur outside of the wetted channel and without disturbance to existing riparian vegetation are expected to have only beneficial effects to covered fish species and their habitat. Restoration activities that occur within the wetted channel or disturb existing riparian vegetation will have temporary impacts on covered fish species and their habitat, such as sedimentation, turbidity, and temporary loss of riparian habitat, as described in the sections above.

A minimum of 32 acres of riparian habitat will be restored. Additionally, impacts from other Covered Activities will be mitigated by the restoration of riparian habitat at a ratio of 1.52:1 up to an additional 1,425 acres of combined riverine/riparian complex. Effects on salmonid habitat will be mitigated in kind. Enhancement of riparian habitat will also occur as part of the conservation strategy. Vegetation management, including the removal of invasive weeds, may also be employed to help improve riparian habitat. Restoration of riparian vegetation will provide increased temperature refugia and increased instream cover for juvenile covered fish species. These improvements are expected to increase juvenile growth and survival.

2.5.1.10. Riverine Habitat Restoration and Stream Enhancement

Riverine habitat restoration will occur as mitigation for Covered Activities that impact riverine habitat. Some restoration activities will have temporary impacts on covered fish species and their habitat, such as sedimentation, increased turbidity, and temporary loss of riparian habitat.

Impacts from other Covered Activities will be mitigated by the restoration of riverine habitat at a ratio of 1.52:1 up to an additional 1,425 acres of combined riverine/riparian complex. Effects on salmonid habitat will be mitigated in kind. Enhancement of riverine habitat will also occur as part of the conservation strategy. Vegetation management, including the removal of invasive weeds in streams, may also be employed to help improve riverine habitat. Effects within the stream system will be mitigated by stream enhancements. Stream enhancements may include actions, such as removing or modifying barriers to fish passage, screening unscreened water diversions, improvement of in-channel features, and control of non-native animal species.

2.5.1.10.1. Fish Passage Improvements

As part of the conservation strategy and as mitigation for effects within the stream system, fish passage improvements to barriers and diversions will occur. Several potential barriers to fish passage have been identified and will be removed or improved. The PCA will remove or modify two high-priority fish passage barriers: the barrier at Doty Ravine at Garden Bar Road and one other barrier identified in Table 2. As partnerships allow, the PCA will remove or modify up to three more of the fish passage barriers identified in Table 2. If the PCA is successful in negotiating with partners to remove and/or create reliable fish passage at Hemphill Dam on Auburn Ravine that would remove a significant barrier to fish passage and allow improved passage for at least six miles up Auburn Ravine. Fish passage improvements will have some temporary effects to covered fish species and their habitat, such as physical disturbance effects, sedimentation and turbidity, and temporary loss of riparian habitat, as described in the sections above. Barrier removal projects will ultimately benefit covered fish species, as they will improve upstream and downstream migration for salmonids. Some of the fish barriers currently limit anadromy, so removal of those will increase habitat availability and survival for fish.

The PCA aims to modify all unscreened diversions on salmonid streams in the reserve system. Modifications to unscreened diversions, including installation of fish screens, would result in short-term construction effects to fish, such as physical disturbance effects, sedimentation and turbidity, dewatering, fish capture/relocation, and temporary loss of riparian habitat. Unscreened diversions present a risk of entrainment and death to covered fish species, so screening currently unscreened diversions will improve migration for salmonids and improve survival in and through

the action area. Juvenile fish are most susceptible to entrainment and death due to unscreened diversions, so screening previously unscreened diversions will increase their survival within the action area.

2.5.1.10.2. Control of Introduced Predators

The control of introduced predators may have temporary impacts on covered fish species and their habitat. Gaining access to streams and capturing predators may cause effects, such as sedimentation, turbidity, dewatering, covered fish species capture/relocation, and temporary loss of riparian habitat. As introduced predators decrease the survival of covered fish species, the control of introduced predators will benefit covered fish species in the action area. Since juvenile fish are most susceptible to predation, removal of predators will increase their survival within the action area.

2.5.1.10.3 Improvement of In-channel Features

Improvements to in-channel features, such as those described above in section 1.3.3.7.2.2, may have temporary impacts on covered fish species and their habitat. Gaining access to streams and moving features to improve in-channel habitat may cause effects, such as physical disturbance, dewatering, fish capture, sedimentation, increased turbidity, and temporary loss of riparian and/or riverine habitat. Improvements to in-channel features will eventually benefit covered fish species by providing additional and improved habitat and protection from predators. These improvements are expected to improve adult spawning success, egg survival, and juvenile growth and survival.

2.5.1.10.4. Floodplain Enhancement

Floodplain enhancement activities, such as levee setbacks and grading, may have temporary impacts on covered fish species and their habitat, such as physical disturbance, sedimentation, turbidity, and temporary loss of riparian habitat, as described in the sections above. These improvements will eventually benefit covered fish species by providing additional and improved juvenile rearing habitat and protection from predators. These improvements are expected to increase juvenile growth and survival.

2.5.1.11. Adaptive Management

Adaptive management is a decision-making process that will be used during PCCP implementation to adjust future management actions based on new information. Adaptive management is based on a flexible approach whereby actions can be adjusted as uncertainties become better understood or as conditions change. Integrating adaptive management and monitoring will help successfully implement the PCCP conservation strategy. Adaptive management actions are developed, in part, from the results of monitoring.

Effects to fish will include those for fish capture and handling for research, monitoring, and adaptive management, described above in section 2.5.1.2. The adaptive management aims to reduce impacts to Covered Species and habitat over the permit term. The PCA will share information gained through the adaptive management process to other county and State agencies,

so these decisions will help to improve survival for all life stages of fish present in the plan area and potentially beyond as information is shared with other entities.

2.5.1.12. Effects from Other Activities

A maximum of 70 miles of new trails will be created within the reserve system, an addition of approximately 50 acres of trails. Creation of the trails is a Covered Activity, but public use of new trails created as part of the PCCP is considered here as an “other activity” that would not occur but for the proposed action. Increased human recreation activity is expected to occur, resulting in new disturbances to covered fish species in areas previously inaccessible. Introduction of human-generated noise, litter, pets, and in-stream foot traffic into previously inaccessible areas is expected to occur with the creation of recreational trails in acquired open space areas. In-stream foot traffic by people and pets is expected to lead to physical disturbance, sedimentation, and turbidity. Greater access to streams by the public is expected to lead to infrequent disturbance of spawning adults, rare destruction of redds and eggs, and disturbance to rearing juveniles resulting in behavioral modifications (leaving the area).

2.5.2. Effects of the Action on Critical Habitat and Covered Fish Habitat

Covered Activities are expected to have short- and long-term effects on habitat quantity and quality, including effects to the PBFs of designated critical habitat of CCV steelhead and analogous features for CV fall-run and CV late fall-run Chinook salmon. The PBFs within the action area for CCV steelhead are: (1) freshwater rearing sites; (2) freshwater migration corridors; and (3) spawning habitat. While critical habitat has not been designated for CV fall-run or CV late fall-run Chinook salmon, their habitat uses and needs are similar to CCV steelhead, so effects to PBFs for CCV steelhead will be similar to the analogous features of CV fall-run and CV late fall-run Chinook salmon habitat and will be discussed together.

The PCCP split salmonid habitat into spawning/rearing and migrating/rearing throughout the PCCP (Placer County 2020b). Since migration will also occur in and through spawning areas, this opinion will consider protections to both the PCCP’s spawning/rearing habitat and migrating/rearing habitat as protections to migration habitat.

Temporary effects to rearing, migration, and spawning habitat PBFs for covered fish species include dewatering, changes in water quality, and changes in water quantity. Permanent effects to habitat include incursion of new structures into streams, changes to flow, increased urban and suburban runoff, protection of riverine and riparian habitat, restoration of riverine and riparian habitat, fish passage improvements, stream enhancement, floodplain enhancement, and control of non-native species. The PCCP will protect 900 acres of riparian habitat along salmonid habitat and 35 miles of riverine habitat. These protections include 558 acres of riparian habitat along salmonid spawning habitat and 25 miles of riverine habitat in salmonid spawning habitat. Additionally, permanent effects to salmonid habitat due to Covered Activities will be mitigated for in kind at a ratio of 1.52:1 for riverine/riparian effects, and streams will be enhanced to promote habitat complexity and function at a ratio of 1.5:1 for affected stream habitat.

2.6. Cumulative Effects

“Cumulative effects” are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area’s future environmental conditions caused by global climate change that are properly part of the environmental baseline vs. cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (section 2.4).

2.6.1. Increased Urbanization

Increases in urbanization and housing developments that are not a part of PCCP Covered Activities due to being in non-participating cities or that are upstream of the action area could impact habitat by altering watershed characteristics and changing both water use and stormwater runoff patterns within the action area. Increased growth will place additional burdens on resource allocations, including natural gas, electricity, and water, as well as on infrastructure, such as wastewater sanitation plants, roads and highways, and public utilities. Some of these actions, particularly those which are situated away from water bodies, will not require Federal permits, and thus will not undergo review through the ESA section 7 consultation process with NMFS. Increased urbanization and development will result in increased traffic as the state and cities continue to build roads to access the buildout areas. These activities will result in construction disturbance, noise, and increased runoff from roads, which can degrade water quality.

Increased urbanization of nearby areas may also increase recreational activities in the action area. Among the activities expected to increase in volume and frequency is recreational boating. Boating activities typically result in increased wave action and propeller wash in waterways. This potentially will degrade riparian and wetland habitat by eroding channel banks and mid-channel islands, thereby causing an increase in siltation and turbidity. Wakes and propeller wash also churn up benthic sediments thereby potentially re-suspending contaminated sediments and degrading areas of submerged vegetation. This will reduce habitat quality for the invertebrate forage base required for the survival of juvenile salmonids and green sturgeon moving through the system. Increased recreational boat operation is anticipated to result in more contamination from the operation of gasoline and diesel-powered engines on watercraft entering the associated water bodies.

2.6.2. Fish Hatcheries

More than 32 million fall-run Chinook salmon, 2 million spring-run Chinook salmon, 1 million late fall-run Chinook salmon, 0.25 million winter-run Chinook salmon, and 2 million steelhead are released annually from six hatcheries producing anadromous salmonids in the Central Valley. All of these facilities are currently operated to mitigate for natural habitats that have already been

permanently lost as a result of dam construction. The loss of this available habitat results in dramatic reductions in the abundance of natural populations, which is mitigated for through the operation of hatcheries. Production of non-listed Central Valley fall-run Chinook salmon is the largest contributor of hatchery-origin Chinook salmon in the state, with a total combined release of nearly 30 million smolts annually. These fish originate from the following five hatchery facilities: Coleman National Fish Hatchery, Feather River Hatchery, Nimbus Fish Hatchery, Mokelumne River Hatchery, and Merced River Hatchery. Coleman National Fish Hatchery is run by USFWS and Nimbus Fish Hatchery is funded by the U.S. Bureau of Reclamation, so these hatcheries were considered in the environmental baseline, section 2.4.2.13. Releasing large numbers of hatchery fish can pose a threat to natural-origin Chinook salmon populations through genetic impacts, displacement, competition for food and other resources, predation of hatchery fish on natural-origin fish, and increased fishing pressure on natural-origin stocks as a result of hatchery production (Waples 1991).

The relatively low number of adult spawners needed to sustain a hatchery population can result in high harvest-to-escapement ratios in waters where fishing regulations are set according to hatchery population. California salmon fishing regulations are set according to the combined abundance of hatchery and natural stocks, which can lead to over-exploitation and reduction in the abundance of natural-origin populations existing in the same system as hatchery populations due to incidental bycatch (McEwan 2001). Currently, hatchery-produced fall-run Chinook salmon comprise the majority of fall-run adults returning to Central Valley streams. Hatcheries in the Central Valley follow a 25 percent constant fractional marking/tagging regime for hatchery-produced fall-run Chinook salmon juveniles. Any returning populations with adipose fin-clipped adult escapement greater than 25 percent, would indicate that hatchery-produced fish are the predominate source in those spawning populations.

More localized impacts of hatcheries may also affect salmonid populations in the action area. Recent evaluations of these hatchery programs have proposed or recommended changes in hatchery policies and management to address these impacts (California Hatchery Scientific Review Group 2012). However, the lack of approved HGMPs for a number of Central Valley hatchery programs has been identified as a potential risk to ESA-listed salmonids in the Central Valley. The California Hatchery Scientific Review Group (2012) recommends that the funding entities for each hatchery facility provide the necessary resources to prepare and implement HGMPs for all California anadromous fish hatchery programs. The detailed descriptions and operational protocols provided in HGMPs are expected to help to guide adaptive management decisions made at the hatchery and provide accountability for deviations from established operational protocols. Until HGMPs are completed and approved for all hatchery programs in the Central Valley, the production of hatchery-origin Chinook salmon and steelhead are expected to remain at current levels and off-site releases will continue for a proportion of the annual production, which may result in straying to streams within the action area.

2.6.3. Recreational Fishing

While hatchery CCV steelhead and Chinook salmon are targeted in recreational fisheries, incidental catch of naturally produced CCV steelhead can occur in portions of the action area that do not have seasons timed to protect CCV steelhead (NMFS 2014b). Since 1998, all hatchery CCV steelhead have been marked with an adipose fin clip, allowing anglers to tell the

difference between hatchery and wild CCV steelhead. Current regulations restrict anglers from keeping non-clipped CCV steelhead in Central Valley streams, except in the upper Sacramento River.

Current sport fishing regulations do not prevent wild CCV steelhead from being caught and released many times over while on the spawning grounds, where they are more vulnerable to fishing pressure. Studies on hooking mortality based on spring-run Chinook salmon have found a 12 percent mortality rate for the Oregon in-river sport fishery (Lindsay *et al.* 2004). Applying a 30 percent contact rate for Central Valley rivers (*i.e.*, the average of estimated Central Valley harvest rates), approximately 3.6 percent of adult steelhead die before spawning from being caught and released in the recreational fishery. Studies have consistently demonstrated that hooking mortality increases with water temperatures. Mortality rates for steelhead may be lower than those for Chinook salmon, due to lower water temperatures.

In addition, survival of eggs is reduced by anglers walking on redds in spawning areas while targeting hatchery CCV steelhead or salmon. Roberts and White (1992) identified up to 43 percent mortality from a single wading over developing trout eggs, and up to 96 percent mortality from twice daily wading over developing trout eggs. Salmon and trout eggs are sensitive to mechanical shock at all times during development (Leitritz and Lewis 1980). While state angling regulations have moved towards restrictions on selected sport fishing to protect listed fish species, hook-and-release mortality of steelhead and trampling of redds by wading anglers may continue to cause a threat.

Fish that were caught and released within the action area may be killed, injured, or stressed and less able to handle other effects. Migrating fish that were caught or released upstream or downstream of the action area may have reduced survivability to further effects as they continue their migrations through the action area.

2.6.4. Agricultural Practices

Non-Federal actions that may affect the action area include ongoing agricultural activities. Farming and ranching activities within, adjacent to, or upstream of the action area may have negative effects on water quality due to runoff laden with agricultural chemicals. Ongoing ranching operations, such as road construction, road maintenance, or intensive livestock grazing, may limit or degrade habitat for species. Stormwater and irrigation discharges related to agricultural activities contain numerous pesticides and herbicides that may adversely affect salmonid reproductive success and survival rates (King *et al.* 2014). Grazing activities from cattle operations can degrade or reduce suitable critical habitat for listed salmonids by increasing erosion and sedimentation, as well as introducing nitrogen, ammonia, and other nutrients into the watershed, which then flow into the receiving waters of the associated watersheds. Agricultural practices in the action area may adversely affect riparian and wetland habitats through upland modifications of the watershed that lead to increased siltation or reductions in water flow.

2.6.5. Non-agricultural Pesticide Use

Though pesticide use will not be covered by the Federal permits, it will be covered by the State permits, so will occur within the action area. As covered by the State PCCP permits, pesticides

will be used to achieve invasive plant or invasive animal control. Any pesticide use must comply with the EPA's Endangered Species Protection Program. In areas downstream of pesticide/herbicide use, stormwater and irrigation discharges may contain pesticides and herbicides. Pesticides and herbicides may adversely affect salmonid reproductive success and survival rates (King *et al.* 2014).

2.6.6. Mining Activities

Increased water turbidity levels for prolonged periods of time may result from adjacent mining activities and increased urbanization and/or development of riparian habitat, which could adversely affect the ability of young salmonids to feed effectively and result in reduced growth and survival. Turbidity may cause harm, injury, or mortality to juvenile anadromous fish in the vicinity and downstream of the project area. High turbidity levels can reduce the ability of covered fish to feed and respire, resulting in increased stress levels and reduced growth rates, and reduce tolerance to fish diseases and toxicants. Mining activities may adversely affect water quality, riparian function, and stream productivity.

2.6.7. Water Supply

The PCCP proposes that the permits cover the actions of two water suppliers (the PCWA and the City of Lincoln), while two other water suppliers—NID and South Sutter Irrigation District—also have a network of irrigation canals and use some of the same creeks for water transport. NID and South Sutter Irrigation District are not permittees to the PCCP, and, therefore, unless they apply through Placer County or the City of Lincoln to have their projects covered, they are not included as part of the Federal action.

Water transportation and diversions can affect the upstream migration of salmonids (*e.g.*, CCV steelhead and CV fall-run Chinook salmon), while low flows can impede fish passage (NMFS 2014c). Altered flow regimes can influence migratory cues, water quality, sedimentation, and water temperature. Low flows limit habitat area and adversely affect water quality by elevating water temperatures and depressing dissolved oxygen, which stress multiple fish life stages. Low flows can also confuse or detain migrating juveniles, resulting in entrainment at diversions.

2.7. Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (section 2.5) to the environmental baseline (section 2.4) and the cumulative effects (section 2.6), taking into account the status of the species and critical habitat (section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

CCV steelhead DPS, CV fall-run Chinook salmon ESU, and CV late fall-run Chinook salmon ESU have experienced significant declines in abundance and available habitat in the California Central Valley relative to historical conditions. The status of the species (section 2.2) details the

current range-wide status of these ESUs and DPS and CCV steelhead critical habitat, indicating the status of CCV steelhead appears to have remained unchanged since 2011 and the DPS was in danger of becoming endangered, and CV fall-run Chinook salmon and CV late fall-run Chinook salmon populations have shown a decline in recent years. The environmental baseline (section 2.4) describes the current baseline conditions found in the action area. Factors affecting Covered Species in the action area include passage barriers, entrainment and low flows due to diversions, and loss of riparian and floodplain habitat. Section 2.2.1 discusses the vulnerability of listed species and critical habitat to climate change projections in the California Central Valley and specifically in the action area. Reduced summer flows and increased water temperatures will likely be exacerbated by increasing surface temperatures in the action area. Some watersheds within the action area are manipulated systems with flow and temperature regimes that differ drastically from their historical condition. Cumulative effects (section 2.6) are likely to include effects of aquaculture and fish hatcheries, recreational fishing, agricultural practices, mining activities, decreased water supply, and increased urbanization that is not part of Covered Activities.

2.7.1. Summary of Effects of the Proposed Action to Listed Species

Minimal or minor effects to all life stages are expected to occur as a result of the proposed action, including short-term localized increases in turbidity, or water levels, resulting in behavioral modification. Small proportions of populations are expected to be harassed during Covered Activities, and small numbers of juvenile or adult covered fish species are expected to be injured or killed when they are captured and relocated from areas to be dewatered or captured for research and monitoring. However, the avoidance and minimization measures proposed will minimize the extent of injuries and mortalities to listed salmonids. Impact pile driving is expected to result in behavioral effects, injury, or death from acoustic effects. Behavioral effects from pile driving would include temporary disruptions in the feeding, sheltering, and migratory behavior of adult and juvenile covered fish species, resulting in reduced growth and increased susceptibility to predation. Though pile driving will likely result in delay in fish passage, it is not expected to prevent fish species from passing upstream or downstream, because pile driving will not be continuous through the day, and will not occur at night when the majority of fish migrate.

Covered fish species are expected to be adversely affected through general physical disturbance effects, sedimentation and increased turbidity, and pollution and contamination. With the avoidance and minimization measures included in the PCCP, potential injuries or mortalities associated with these activities are expected to be reduced.

Beneficial effects to fish will include adaptive management, fish passage improvements, screening of previously unscreened diversions, control of introduced predators, improvement of in-channel features, and floodplain enhancement. These improvements will increase survival of covered fish species within the action area.

2.7.2. Effects of the Proposed Action to Critical Habitat and Covered Fish Habitat

The PCCP combines the anticipated effects to riverine and riparian habitat within designated critical habitat or covered fish habitat. The maximum amount of temporary effects to riverine/riparian habitat is 165 acres of which a maximum of 115 acres can be to riparian habitat.

If the maximum temporary effects to riparian habitat are expressed, up to 50 acres of riverine habitat may be temporarily affected. However, if less than the 115 acres of temporary effects to riparian habitat are expressed, more impacts to riverine habitat can occur up to the total impacts to riverine/riparian habitat of 165 acres. This same concept holds for the permanent impacts to a total of 490 acres of riverine/riparian habitat, of which a maximum of 375 acres can be to riparian habitat. So, if the maximum permanent impacts to riparian habitat occur, 115 acres of riverine habitat may be permanently affected. If less than the 375 acres of permanent effects to riparian habitat are expressed, more impacts to riverine habitat can occur up to the total impacts to riverine/riparian habitat of 490 acres. The expected result of these temporary and permanent effects to PBFs of riverine and riparian habitat is a decrease in fitness, reduced growth, and/or reduced survival for fish species.

To offset these impacts to habitat, the project will implement restoration of a minimum of 32 acres of riparian habitat. Temporary effects to riparian and riverine habitat will be returned to pre-project conditions within one year of construction activities. Permanent impacts to riparian and riverine habitat will be mitigated for via conservation activities at a ratio of 1.52:1. So, if the maximum amount of permanent effects to riparian habitat occur, there will be a net addition of an additional 570 acres of riparian habitat. If the maximum amount of permanent effects to riparian/riverine habitat occur 174.8 to 744.8 acres of riverine habitat will be restored, depending on the extent of permanent riparian effects. The stay-ahead provision of the PCCP requires that within each calendar year the amount of habitat protected, restored, or created is equal to or greater than that type of habitat loss from Covered Activities. This offset of impacts is expected to result in an increase in fitness, increased growth, and/or increased survival for fish species.

Removal of fish passage barriers and screening of previously unscreened diversions will increase available habitat for fish and increase survival during migration. These improvements will result in an increase in fitness and increased survival for fish species.

2.7.3. Survival and Recovery of the DPS/ESU

The action area contains spawning populations of CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon, making it an important area in terms of range-wide conservation or recovery for these species. The recovery plan (NMFS 2014b) identified Auburn Ravine as a core 2 population and Dry Creek and Bear River as core 3 populations for CCV steelhead. The recovery plan does not classify Raccoon Creek on its own, but often groups Raccoon Creek with Auburn Ravine.

Delisting criteria for CCV steelhead is described in the recovery plan (NMFS 2014b), and includes establishing and maintaining nine viable populations (core 1) for the DPS, none of which are currently viable. Core 1 populations have a known ability or potential to support independent viable populations. Core 2 populations meet, or have the potential to meet, the biological recovery standard for moderate risk of extinction. These watersheds have lower potential to support viable populations than core 1 populations, due to lower abundance, or amount and quality of habitat. These populations provide increased life history diversity to the DPS and are likely to provide a buffering effect against local catastrophic occurrences that could affect other nearby populations, especially in geographic areas where the number of core 1 populations is lowest. Core 3 watersheds have populations that are present on an intermittent

basis and require straying from other nearby populations for their existence. These populations likely do not have the potential to meet the abundance criteria for moderate risk of extinction, but are important because, like core 1 populations, core 3 populations aid in recovery of the species by providing genetic diversity and dispersal connectivity to the greater DPS.

We expect Covered Species to use available habitat in adjacent areas, because the majority of effects are minimized through the use of AMMs, and the area of permanent impacts is fairly small compared to the available habitat in the action area and the range-wide DPS/ESU. Further, any permanent effects to salmonid habitat will be mitigated for in kind, so that permanent effects will lead to a net increase in available quality habitat over the permit term of 50 years.

The addition of adverse and minimal effects to CCV steelhead, CV fall-run Chinook salmon, and CV late fall-run Chinook salmon within the action area to the environmental baseline and the cumulative effects, taking into account the status of the species and critical habitat, is not expected to (1) reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated critical habitat as a whole for the conservation of the species.

2.8. Conclusion

After reviewing and analyzing the current status of the covered fish species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of CCV steelhead, CV fall-run Chinook salmon, or CV late fall-run Chinook salmon, nor destroy or adversely modify designated critical habitat for CCV steelhead. No critical habitat has been designated or proposed for CV fall-run Chinook salmon or CV late fall-run Chinook salmon, however, if critical habitat is designated in the action area in the future, the proposed action is not likely to destroy or adversely modify designated critical habitat.

2.9. Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

NMFS anticipates incidental take of the following Covered Species, currently not listed or proposed for listing under the ESA, during the 50-year permit term: CV fall-run and CV late fall-

run Chinook salmon. There are no take prohibitions under the ESA for these salmon runs at the time of writing this biological opinion. The incidental take statement and ITP shall become effective for CV fall-run and CV late fall-run Chinook salmon if they become listed under the ESA during the terms of this opinion and the ITP.

For any USACE permits required for construction components under the Covered Activities, and to the extent this opinion satisfies the level of detail needed to analyze the associated effects, this biological opinion satisfies the requirements for the USACE to consult with NMFS under section 7 of the ESA.

2.9.1. Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

NMFS anticipates that covered fish species will be harassed, harmed, or killed due to impacts related to impaired water quality, physical disturbance effects, acoustic effects from pile driving, dewatering, and fish capture and relocation.

NMFS cannot precisely quantify and track the amount or number of individuals per species that are expected to be taken incidentally as a result of Covered Activities. This is due to the variability and uncertainty associated with the exact number and nature of Covered Activities to occur in anadromous streams, the response of listed species to the effects of Covered Activities, the varying population size of each species, annual variation in the timing of migration, individual habitat use within the action area, and difficulty in observing injured or dead fishes. However, it is possible to estimate the extent of incidental take by designating as ecological surrogates, which are those elements of the project that are expected to result in incidental take. Ecological surrogates are more predictable and/or measurable and monitoring those surrogates will determine the extent to which incidental take is occurring.

Incidental take will occur during trapping and handling of covered fish species for research and monitoring within the reserve system and on land being considered for acquisition into the reserve system. Approximately 100 juveniles of each of the three covered fish species, are expected to be captured throughout the action area per survey year, a small proportion of which may be injured or killed. Harassment, harm, or death resulting from capture, handling, measuring, or marking fish is expected to occur. Incidental mortality is expected to be less than 5% of fish captured and released. If more than five CCV steelhead juveniles or ten Chinook salmon are killed in any survey year, the anticipated incidental take levels described are also exceeded, triggering the need to reinitiate consultation.

Harassment, harm, or death resulting from fish capture and relocation due to Covered Activities that include dewatering. Fish present and unable to avoid the fish capture location would be harassed, harmed, or killed during fish capture and relocation. Incidental mortality is expected to be less than 3% of fish captured and released. If mortality greater than 3% occurs, the anticipated incidental take levels described are also exceeded, triggering the need to reinitiate consultation.

The most appropriate threshold for most of the incidental take associated with the PCCP are ecological surrogates of temporary and permanent habitat disturbance during Covered Activities.

The ecological surrogate for covered fish species responses that result from habitat disturbance is described as follows. If permanent physical disturbance of 655 acres or temporary disturbance of 165 acres of combined riparian/riverine habitat is exceeded, the anticipated incidental take levels described are also exceeded, triggering the need to reinitiate consultation. NMFS anticipates incidental take due to habitat disturbance from the following:

- (1) Harassment, harm, or death resulting from habitat-related disturbances during construction activities, resulting in the incursion of contaminants into the action area. Increases in contaminants are reasonably certain to result in harm to the species through modification or degradation of the PBFs for rearing, spawning, and migration that will result in physiological impacts (*i.e.*, to the gills of fishes), temporary displacement of individuals, reduced feeding, and increased predation. A very small proportion of fish present would be expected to die as a result of contaminant increases.
- (2) Harassment, harm, or death resulting from habitat-related disturbances during construction activities, resulting in turbidity increases extending up to 100 feet from the bank and 300 feet downstream. Increases in turbidity are reasonably certain to result in harm to the species through modification or degradation of the PBFs for rearing and migration that will result in physiological impacts (*i.e.*, to the gills of fishes), temporary displacement of individuals, reduced feeding, and increased predation. A very small proportion of fish present would be expected to die as a result of turbidity increases.
- (3) Harassment, harm, or death during construction 100 feet beyond the construction footprint in all directions on the stream side of Covered Activities, including moving, removal, or addition of material into the active channel during construction, modification, or removal of structures. Fish present in the action area would startle and move to adjacent deeper water resulting in increased predation and reduced survival. Fish present and unable to avoid the construction site activities would be crushed and killed.
- (4) Harassment, harm, or death resulting from exposure to temporary high noise levels (> 206 dB peak) or sustained exposure to lower sound levels (>183 or >187 dB SEL, depending on fish size) within the water column during pile driving with impact hammers. Fish present and unable to avoid waters that reach the 206 dB peak may be harmed or killed, and juvenile and adult fish present and unable to avoid waters that reach the 183 or 187 dB SEL, respectively, may be injured or killed.
- (5) Harm from temporary and permanent physical disturbance to a total area of up to 490 acres of riparian habitat. The maximum amount of temporary effects to riparian habitat is 115 acres. The maximum amount of permanent impacts to riparian habitat is 375 acres. Removal of vegetation is reasonably certain to result in harm to the species through modification or degradation of the PBFs for spawning, rearing, and migration that will result in temporary displacement of individuals, loss of cover, increased predation, and reduced growth due to decreased food inputs.
- (6) Harm from temporary and permanent physical disturbance to a total area of up to 655 acres of riverine habitat. The maximum amount of temporary effects to riverine habitat

is 165 acres. The maximum amount of permanent impacts to riverine habitat is 490 acres. Disturbance to riverine habitat is reasonably certain to result in harm to the species through modification or degradation of the PBFs for spawning, rearing, and migration that will result in temporary displacement of individuals, loss of cover, and increased predation.

Harassment, harm, or death resulting from other activities (recreation). Fish or eggs present and unable to avoid people or dogs in the water will be harassed, harmed, or killed. A maximum of 70 miles of new trails will be created within the reserve system, an addition of approximately 50 acres of trails. If this is exceeded, the anticipated incidental take levels described are also exceeded, triggering the need to reinitiate consultation.

2.9.2. Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the covered fish species or destruction or adverse modification of critical habitat.

2.9.3. Reasonable and Prudent Measures

“Reasonable and prudent measures” are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

NMFS believes that implementation of the entire PCCP constitutes measures appropriate to minimize take of all covered fish species. The following chapters of the PCCP will specifically minimize the take of covered fish species:

- Conservation Strategy (Chapter 5)
- Program Participation and Conditions on Covered Activities (Chapter 6)
- Monitoring and Adaptive Management (Chapter 7)
- Plan Implementation (Chapter 8)

Additionally, NMFS includes the following reasonable and prudent measure:

- (1) The permittees shall take measures to ensure that individual Covered Activities authorized annually through the PCCP will minimize incidental take of covered fish species, will monitor and report incidental take of covered fish species, and where feasible, obtain specific project information to better assess the effects and benefits of Covered Activities authorized through the PCCP.

2.9.4. Terms and Conditions

The terms and conditions described below are non-discretionary, and NMFS or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). NMFS or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

- (1) The following terms and conditions implement reasonable and prudent measure 1:
 - a. In order to monitor the impact and track incidental take of covered fish species, the permittees, which are responsible for administration of the PCCP, must annually submit to NMFS a report of the previous year's Covered Activities. The annual report shall include a summary of the specific type and location of each project, stratified by individual project, 5th field HUC, affected species, and ESU/DPS. Further, the report shall include:
 - i. Summary narrative detailing fish relocation and survey activities, including the number and species of fish captured and the number and species injured or killed. Any capture, injury, or mortality of adult covered fish species will be noted in the monitoring data and report. Any injuries or mortality from a fish relocation site that exceeds 3 percent of the affected Covered Species shall have an explanation describing why. Any injuries or mortality from a fish survey that exceeds 5 percent of the affected Covered Species shall have an explanation describing why.
 - ii. The amount of aquatic habitat disturbed at each project site, in linear feet and/or acres.
 - iii. The total number and species of fish captured and the total number and species injured or killed during the previous three years of PCCP implementation.
 - iv. The number and type of instream structures implemented within salmonid stream channels.
 - v. The number and type of fish passage barriers that have been remediated or removed including screening of previously unscreened diversions, fish ladders built, dams removed, etc. including the number of miles of restored access to unoccupied salmonid habitat.
 - vi. The annual and running total amounts of riparian habitat temporarily impacted, permanently impacted, and restored.
 - vii. The annual and running total amounts of riverine habitat temporarily impacted, permanently impacted, and restored.

- b. The annual report(s) shall be filed not later than July 1st, covering the previous calendar year. The report should be submitted (preferably by email) to the following:

Assistant Regional Administrator
California Central Valley Office
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento CA 95814
Phone: (916) 930-3600
Fax: (916) 930-3629
Email: cevo.consultationrequests@noaa.gov

2.10. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

- (1) All permittees and participating special entities should conduct in-water work only during the recommended work window of June 1 to October 31.
- (2) All permittees and participating special entities should minimize any potential take whenever possible, and implement practices that avoid or minimize negative impacts to salmon, steelhead, and their critical habitat.
- (3) All permittees and participating special entities should support and promote aquatic and riparian habitat restoration within Placer County, especially those with listed aquatic species. Practices that avoid or minimize adverse effects to listed species should be encouraged.
- (4) All permittees and participating special entities should work cooperatively with State and Federal agencies, private landowners, governments, and local watershed groups to identify opportunities for cooperative analysis and funding to support salmonid habitat restoration projects and implement high priority actions in the NMFS Central Valley Salmon and Steelhead Recovery Plan.
- (5) All permittees and participating special entities should encourage and post interpretative signage near critical habitat and waters that may contain Covered Species to inform land users of the endangered and threatened salmon and steelhead that occur within Placer County and actions that they can take to help and/or prevent further harm to those species. Signage could include information about the months when Covered Species are present or spawning, appearance of redds, notice to avoid redds, how to avoid impact to species, etc.

- (6) All permittees and participating special entities should work cooperatively with State and Federal agencies, private landowners, governments, local watershed groups, and any other applicable entities to maintain flows and water temperatures in Auburn Ravine to sustain the Covered Species.
- (7) All permittees and participating special entities should consider alternative management options to beaver and beaver dam removal where dams could positively affect salmonids and their habitat. These management options could include protecting culverts by screening the entrance, notching beaver dams rather than removing, or attracting beavers to other locations where they could be beneficial. All permittees should stay informed on best management and conservation practices for beavers and their dams. The PCA should stay informed on research on beavers' impacts on salmonid habitat. The PCA should consider working with partners to conduct or fund similar research within the reserve system.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Placer County Conservation Program Habitat Conservation Plan.

As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

3. MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the physical, biological, and chemical properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on

EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH [CFR 600.905(b)].

This analysis is based, in part, on the EFH assessment determined by NMFS and descriptions of EFH for Pacific Coast salmon (Pacific Fishery Management Council [PFMC] and NMFS 2014b) contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce.

NMFS completed this EFH consultation on the proposed issuance of an ITP by NMFS for the PCCP, in accordance with section 305(b)(2) of the MSA (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

NMFS has completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the [NOAA Library Institutional Repository](#). A complete record of this consultation is on file at NMFS' California Central Valley Office.

3.1. Essential Fish Habitat Affected by the Project

EFH is designated under the Pacific Coast Salmon FMP, which includes the action area of the proposed action. EFH in the action area consists of adult migration habitat, spawning habitat, and juvenile rearing and migration habitat for two Chinook salmon runs (fall- and late fall-run Chinook salmon). Habitat areas of particular concern (HAPCs) that may be either directly or indirectly adversely affected include: (1) complex channels and floodplain habitats, (2) thermal refugia, and (3) spawning habitat. The other HAPCs for Pacific Coast Salmon: (4) estuaries, and (5) marine and estuarine submerged aquatic vegetation, are not present in the action area.

3.2. Adverse Effects on Essential Fish Habitat

Chinook salmon EFH affected by the PCCP includes Covered Activities that are unable to avoid impacts to riparian and/or riverine habitat. The action area provides three general habitat functions essential to one or more life stages, including freshwater spawning and egg incubation, juvenile rearing, and juvenile and adult migration for Chinook salmon. The relative value of these habitats is based on the condition of the habitat itself and the functions that they provide. With regard to the proposed action, and where the specific action components are expected to cause a change in habitat conditions, the changes are identified based on flow, water temperature, and the availability of spawning, rearing, and migration habitats. Long-term effects of Covered Activities are expected to include a loss of approximately 490 acres of EFH within the action area. Temporary effects of Covered Activities are expected to impact 165 acres of EFH. A minimum of 32 acres of riparian habitat will be restored. Additionally, impacts from other Covered Activities will be mitigated by the restoration of riparian habitat at a ratio of

1.52:1 up to an additional 1,425 acres of combined riverine/riparian complex. Therefore, up to 1,457 acres of combined riverine/riparian complex may be restored, which would be a net increase in EFH of up to 967 acres.

Consistent with the ESA portion of this document, which determined that aspects of the proposed action would result in impacts to covered fish species and covered fish habitat, we conclude that aspects of the proposed action would also adversely affect EFH for Chinook salmon. Effects to the HAPCs listed in Section 3.1 were described in Section 2.5 and subsections. A list of temporary and permanent adverse effects to EFH HAPCs is included in this EFH consultation. We conclude that the following adverse effects on EFH designated for Pacific Coast Salmon are reasonably certain to occur (affected HAPCs are indicated by number, corresponding to the HAPCs listed above in Section 3.1).

3.2.1. Water Quality

3.2.1.1. Contaminants and Pollution-related Effects

- Degraded water quality (1, 2, 3)
- Reduction in aquatic macroinvertebrate production (1)

3.2.1.2. Sedimentation and Turbidity

- Reduced habitat complexity (1)
- Degraded water quality (1, 2, 3)
- Reduction in aquatic macroinvertebrate production (1)

3.2.2. Physical Disturbance Effects

- Reduced habitat complexity (1)
- Degraded water quality (1, 2, 3)

3.2.3. Acoustic Effects from Impact Pile Driving

- Ensonification of eggs (3)

3.2.4. Dewatering

- Reduced habitat complexity (1)
- Degraded water quality (1, 2, 3)
- Reduction in aquatic macroinvertebrate production (1)

3.2.5. Land Conversion and Urbanization

- Reduced habitat complexity (1)
- Degraded water quality (1, 2, 3)
- Reduction in aquatic macroinvertebrate production (1)

3.2.6. Water Quantity

- Reduced habitat complexity (1)
- Degraded water quality (1, 2, 3)
- Reduction in aquatic macroinvertebrate production (1)

3.2.7. Disturbance to Riparian Habitat

- Reduced habitat complexity (1)
- Degraded water quality (1, 2, 3)
- Reduction in aquatic macroinvertebrate production (1)

3.2.8. Disturbance to Riverine Habitat

- Reduced habitat complexity (1)
- Degraded water quality (1, 2, 3)
- Reduction in aquatic macroinvertebrate production (1)

3.3. Essential Fish Habitat Conservation Recommendations

The restoration and conservation planned by the PCCP will offset adverse effects to EFH, so no further conservation recommendations are provided. Therefore, the statutory response requirement will be met through the reporting requirements as outlined in the terms and conditions of this opinion.

3.4. Supplemental Consultation

NMFS must reinitiate EFH consultation with itself if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

4.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are NMFS, USACE, USFWS, and PCCP permittees. Other interested users could include Placer County, City of Lincoln, SPRTA, PCWA, PCA, CDFW, DWR, Central Valley Regional Water Quality Control Board, U.S. Environmental Protection Agency (EPA), Friends of Auburn Ravine, Save Auburn Ravine Salmon and Steelhead. Individual copies of this opinion were provided to NMFS, USFWS, USACE, and Placer County. The document will be available within two weeks at the NOAA Library Institutional Repository [<https://repository.library.noaa.gov/welcome>]. The format and naming adheres to conventional standards for style.

4.2. Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3. Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion and EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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6. APPENDICES