UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

October 18, 2013

In response refer to:
2013-9731

Amy Bailey, Chief
California Department of Transportation
Division of Environmental Analysis, MS 27
Biological Studies and Technical Analysis Office
P.O. Box 942874
Sacramento, California 94274-0001

Lieutenant Colonel John K. Baker, Commander and District Engineer
United State Army Corps of Engineers
San Francisco District Headquarters
1455 Market Street
San Francisco, California 94103

Dear Ms. Bailey and Colonel Baker:

Thank you for your December 6, 2010, letter requesting initiation of formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.),* for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans' Districts 1, 2, and 4 (Program), located in northern and central California. Effective October 1, 2012, the California Department of Transportation (Caltrans) is now acting as the lead agency as per the Memorandum of , Understanding (MOU) between the Federal Highway Administration (FHWA) and Caltrans pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21). This law allows the Secretary of Transportation to assign, and Caltrans to assume, responsibility for the environmental review, consultation, or other actions required under any environmental law with respect to one or more highway projects within the state of California where Caltrans uses money from FHWA. The MOU is an extension of previous agreements between FHWA and Caltrans in 2007 and 2010 under a similar law. In addition, the United States Army Corps of Engineers (Corps) proposes to permit a subset of these activities and has also participated in ESA consultation on this project.

This letter transmits NMFS' biological opinion for Caltrans' use of FHWA funding for the Routine Maintenance and Repair Activities Program, and the Corps permits for these activities. Caltrans will act as the lead Federal action agency for ESA section 7 consultation when FHWA money will be used. Where FWHA money is not used, the Corps will be the Federal Action Agency for section 7 consultation (and Caltrans will be the applicant as defined by 50 CFR 402.02). In the enclosed biological opinion (Enclosure 1), NMFS analyzes the effects of the

proposed Program on the threatened Southern Oregon/Northern California Coast coho salmon *(Oncorhynchus kisutch)* Evolutionarily Significant Unit (ESU), endangered Central California Coast coho salmon ESU, threatened California Coastal Chinook salmon *(0. tshawytscha)* ESU, endangered Sacramento River Winter-run Chinook salmon ESU, threatened Central Valley Spring-run Chinook salmon ESU, threatened Northern California steelhead (0. *mykiss)* Distinct Population Segment (DPS), threatened Central California Coast steelhead DPS, threatened South-Central California Coast steelhead DPS, threatened California Central Valley steelhead DPS, threatened Southern DPS of North American green sturgeon *(Acipenser medirostris),* and threatened Southern DPS of Pacific eulachon *(Thaleichthys pacificus).* The biological opinion also analyzes the effects of the Program on the designated critical habitats of the species listed above.

Based on the best available information, NMFS concludes (in the enclosed biological opinion) that Caltrans' Routine Maintenance and Repair Activities Program may affect but is not likely to jeopardize the continued existence of the species listed above, and is not likely to result in the destruction or adverse modification of their critical habitats. An incidental take statement is included with the enclosed biological opinion. The incidental take statement includes non-discretionary terms and conditions for Caltrans and the Corps that are expected to minimize the impacts of incidental take of the species listed above as a result of implementing Program activities. In addition, ESA section 7(a)(l) conservation recommendations are provided in the enclosed biological opinion.

This letter also transmits NMFS' Essential Fish Habitat (EFH) consultation pursuant to section 305(b) ofthe Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA). Activities authorized under the Program will occur in freshwater habitats identified as EFH for Pacific salmon, which are managed under the Pacific Coast Salmon Fishery Management Plan. In Enclosure 2, NMFS concludes Caltrans' Routine Maintenance and Repair Activities Program in freshwater habitats within Caltrans Districts 1, 2, and 4, would adversely affect EFH for Pacific coast salmon. However, the proposed action contains adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH in freshwater habitats. Therefore, NMFS has no EFH Conservation Recommendations to provide to Caltrans or the Corps at this time.

If you have any questions regarding these consultations, please contact Mr. Joe Heublein at (707) 575-1251 or joe.heublein@noaa.gov, Mr. Joel Casagrande at (707) 575-6016, or joel.casagrande@noaa.gov or Mr. Chuck Glasgow at (707) 825-5170 or chuck.glasgow@noaa.gov. For questions regarding EFH, please contact Ms. Korie Schaeffer at (707) 575-6087, or korie.schaeffer@noaa.gov.

Sincerely,

William W. Stelle, Jr.
Acting Regional Administrator

Enclosures (3)

cc: Chris Yates, NMFS, Long Beach
John Cleckler, USFWS, Sacramento
Jerry Roe, USFWS, Sacramento
Richard Macedo, CDFW, Cobb
Melissa Escaron, CDFW, Yountville
Paula Gill, Corps, San Francisco
Administrative File: 151422SWR2011AR00495

Enclosure 1

BIOLOGICAL OPINION

ACTION AGENCIES: California Department of Transportation (Caltrans) and U.S. Army Corps of Engineers (Corps)

ACTION: Caltrans' Routine Maintenance and Repair Activities in Districts 1, 2, and 4, and individual Corps permits for these activities

CONSULTATION CONDUCTED BY: National Marine Fisheries Service, Southwest Region

TRACKING NUMBER: 2013-9731

DATE ISSUED: **October 18, 2013**

I. CONSULTATION HISTORY

Effective October 1, 2012, California Department of Transportation (Caltrans) assumed responsibility for consultation under section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), as per the Memorandum of Understanding (MOU) between the Federal Highway Administration (FHWA) and Caltrans pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21). This law allows the Secretary of Transportation to assign, and Caltrans to assume, responsibility for the environmental review, consultation, or other actions required under any environmental law with respect to one or more highway projects within the state of California that FHWA funds. The MOU is an extension of previous agreements between FHWA and Caltrans in 2007 and 2010 under a similar law.

On December 6, 2010, Caltrans requested formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to the ESA for its proposed Program for Routine Maintenance and Repair Activities in Caltrans Districts 1, 2, and 4 (Program). In this Program, Caltrans will act as the lead Federal action agency for ESA section 7 consultation when FHWA money will be used. Where FWHA money is not used, the Corps will be the Federal Action Agency for section 7 consultation (and Caltrans will be the applicant as defined in 50 CFR 402.02). Consultation was requested due to Caltrans' determination that implementation of qualifying maintenance and repair activities throughout Caltrans Districts 1, 2, and 4, may affect,

and are likely to adversely affect, the following endangered and threatened ESA-listed species: Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) Evolutionary Significant Unit (ESU), Central California Coast (CCC) coho salmon ESU, California Coastal (CC) Chinook salmon (*O. tshawytscha*) ESU, Sacramento River Winter-run (SRWR) Chinook salmon ESU, Central Valley Spring-run (CVSR) Chinook salmon ESU, Northern California (NC) steelhead (*O. mykiss*) Distinct Population Segment (DPS), CCC steelhead DPS, California Central Valley (CV) steelhead DPS, southern DPS of North America green sturgeon (*Acipenser medirostris*), southern DPS of Pacific eulachon (*Thaleichthys pacificus*), but was not likely to adversely affect their designated critical habitats. In addition, Caltrans determined the Program may affect but is not likely to adversely affect Steller sea lion (*Eumetopias jubatus*) designated critical habitat. Finally, Caltrans determined the Program would have no effect on the following species: blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), fin whale (*B. physalus*), sei whale (*B.borealis*), sperm whale (*Physter macrocephalus*), Steller sea lion (*Eumetopias jubatus*), leatherback turtle (*Dermochelys coriacea*), olive ridley turtle (*Lepidochelys olivacea*), loggerhead turtle (*Caretta caretta*), and green turtle (*Chelonia mydas*). As a result, these species for which Caltrans determined the Program would have no effect were excluded from this consultation.

In response to the December 6, 2010, consultation request, NMFS responded with a January 12, 2011, letter initiating consultation and requested a 60-day extension. Subsequent extensions were agreed to by Caltrans and NMFS on June 15, 2011, and September 15, 2011. The December 2010 consultation request and Routine Maintenance Programmatic Biological Assessment (BA) included a wide range of proposed activities. In order to simplify and improve the efficiency of the consultation process, NMFS and Caltrans agreed to split the list of activities into two separate programmatic consultations: those requiring formal consultation and a programmatic biological opinion, and those requiring only informal consultation and a programmatic letter of concurrence.

NMFS and Caltrans staff held several meetings in 2011 and 2012, to discuss the proposed activities, their potential effects on ESA-listed species and critical habitat, minimization measures, and the development of action-specific criteria that would allow the activity to be included under either the formal or informal programmatic consultations. On August 27, 2012, NMFS issued its letter of concurrence to Caltrans for all proposed activities Caltrans determined may affect, but were not likely to adversely affect ESA-listed species and their designated critical habitats (NMFS 2012a; see Enclosure 3).

On September 27, 2012, NMFS and Caltrans agreed to modify or reduce the extent of some proposed activities and remove two activities (rock and substrate blasting and new installation of fishways and stream gradient control structures) from the proposed action. On January 16, 2013, NMFS and Caltrans agreed to a consultation completion date of approximately April 15, 2013,

which was then extended (on April 17, 2013) to June 1, 2013. NMFS, Caltrans, and Corps staff held meetings on February 25, 2013, and March 20, 2013, to discuss oversight and administration of the Program. During the February 25th meeting, Caltrans and NMFS agreed to expand the Program's action area to include all of Caltrans' District 4. In doing so, a small number of streams within the South-Central California Coast (SCCC) steelhead DPS have been added to the Program. During the April 17, 2013, meeting, NMFS and Caltrans agreed to include activities under the previously issued letter of concurrence (*e.g.,* sediment removal, vegetation clearing) under one consultation. Therefore, this biological opinion attaches and incorporates by reference the August 27, 2012, letter of concurrence and includes actions or projects that are both not likely to adversely affect ESA-listed species and likely to adversely affect ESA-listed species. Following Caltrans and NMFS agreement to include the entire Program under one consultation (April 17, 2013), the project description and administration sections of the Program were revised and draft project description and administration sections were completed by Caltrans and NMFS on July 11, 2013.

II. DESCRIPTION OF THE PROPOSED ACTION

The Program involves the maintenance, as needed, of existing Caltrans infrastructure from 2013 through 2023 within Caltrans Districts 1, 2, and 4, which includes the San Francisco Bay Region and coastal/western California north to the Oregon border (the area displayed in Figure 1). Caltrans proposes to use FHWA funds for five Covered Activities. Where FHWA money is not used, the Corps proposes to permit these Covered Activities and Caltrans will be the applicant as defined by 50 CFR 402.02. Covered Activities are as follows:

- Covered Activity-1: Slide Abatement and Repair;
- Covered Activity-2: Safety Improvement;
- Covered Activity-3: Drainage System Maintenance and Repair;
- Covered Activity-4: Bridge Repair, Retrofit, Replacement and Maintenance; and
- Covered Activity-5: Maintenance Planning.

The Program is organized in the following hierarchical structure: Covered Activities are comprised of one or more Site-Specific Projects; and Site-Specific Projects are comprised of one or more Project Actions. Covered Activities and Site-Specific Projects are described in detail in *Section II.B. Description of Covered Activities and Site-Specific Projects*. The Site-Specific Projects and Project Actions proposed for a given Covered Activity will vary with location and conditions. Depending on the circumstances, these Project Actions may be implemented alone or in combination to meet Caltrans' highway maintenance responsibilities.

The Program includes three categories: Category 1- projects that do not require notification prior to construction or completion of a post-project reporting form because of their extremely low

anticipated effects; Category 2- projects that do not require notification prior to construction but do require completion of a post-project reporting form; and Category 3- projects that require notification prior to construction and completion of a post-project reporting form. Category 1 and 2 projects (those that do not require notification prior to construction) are aligned with the group of projects included in NMFS' letter of concurrence (NMFS 2012a). In this letter of concurrence, NMFS concurred with Caltrans and the Corps' determination that these Category 1 and 2 projects are not likely to adversely affect ESA-listed species or their designated critical habitats. To further minimize the effect of the Program on ESA-listed species and designated critical habitat, NMFS and Caltrans agreed to these categories and to exclude or limit the extent of Project Actions covered under the Program. Additionally, a Program administration and oversight process was developed, in-part, to manage this notification process and compliance with Program criteria. Category 1 and 2 projects do not require Caltrans to submit a pre-project notification form, yet Category 2 projects require post-project reporting as indicated in *Section II.B. Project Categorization, Limits, and Minimization Measures*. Some Category 3 projects are likely to adversely affect listed species. Therefore, all Category 3 projects require Caltrans to submit a pre-project notification form to NMFS for review and, if implemented, post-project reporting. Reporting requirements are described in detail in *Section. II.C. Oversight and Administration*.

The Site-Specific Projects covered within this Program include the routine maintenance, repair, and replacement of existing structures and facilities, as well as preventative maintenance activities to preserve existing infrastructure. The activities covered do not include the construction of any new structures or facilities, or expansion of any existing ones. All activities will be single and complete actions; therefore, no interrelated or interdependent activities are anticipated or have been identified.

Except for cleaning and debris removal, individual projects authorized under the Program will be implemented annually between June 15 and October 15. The work window can be extended to November 15 contingent on appropriate dry weather conditions and stream flows. Extensions will be initiated on an as needed basis and as agreed upon by NMFS. Before extending the work window, Caltrans will contact NMFS and provide information regarding the purpose and need of the extension, and a proposed schedule for activities to be performed during this time. Revegetation outside of the active channel may continue beyond October 15 until November 15 if necessary, and will be contingent on weather forecasts. Limited earthmoving associated with preparation of the site for revegetation may occur within the October 16 - November 15 timeframe, but only as necessary for revegetation efforts and as agreed upon by NMFS.

A. Description of Covered Activities and Site-Specific Projects

This section of the biological opinion describes Covered Activities, Site-Specific Projects, and the number of Site-Specific Projects that could occur annually by District. Caltrans proposes to implement its standard maintenance and construction site best management practices (BMPs) and several Project Action-specific Additional Best Management Practices (ABMPs) to minimize the effects of the actions on ESA-listed species and their designated critical habitats. The Project Actions required for completion of individual projects (*i.e.,* Site-Specific Projects) and associated ABMPs are described in *Section II.A.6. Project Actions and BMPs*.

1. Covered Activity-1: Slide abatement and repair

Slide abatement and repair includes: (1) removal of slide and alluvial debris and soil from existing roadways, road shoulders, and adjacent side slopes when they pose a potential hazard to motorists; (2) stabilization of slopes to avoid or minimize debris slides and potential damage to roadways; and (3) stabilization of streambanks and channels to avoid or minimize erosion and potential damage to roadways, bridges, and culverts. These activities are typically undertaken to ensure the continued safe use of existing infrastructure managed by Caltrans.

Equipment required to complete this Covered Activity will depend upon the scale of the material that must be removed, but in general a front-end loader, bulldozer, backhoe, and dump trucks will be required, as well as pickup trucks. A vibratory pile driver may also be required to complete this Covered Activity if sheet piling is installed as temporary or permanent slope protection. A vibratory pile driver may be used in upland areas only. Equipment will generally be operated from the road prism, although in rare instances equipment may be operated outside the developed road prism to remove material and stabilize adjacent slopes. Equipment/vehicle operation is not typically required in surface waters or sensitive habitats (*e.g.,* wetlands, streams, rivers), although operation within such habitats may be unavoidable to complete an Site-Specific Project in a timely manner or to reduce impacts on riparian vegetation or other terrestrial or aquatic species, habitats, or resources. However, if any life stage of any listed species may be present during in-water activities or substantial disturbance, then capture, handling, exclusion, salvage, and relocation will be implemented for the listed species (ABMP-14.5, described *Section II.A.6. Project Actions and BMPs*).

The following Site-Specific Projects can occur as part of this Covered Activity.

a. Site-Specific Project-1.1: Removal of slide and alluvial debris and soil from roadways, road shoulders, and side slopes

Sediment and debris may be deposited on or around roadways by side slope failure and high streamflow. Caltrans removes these materials from the roadways to maintain road function,

provide motorist safety, protect water quality, ensure drainage, and protect infrastructure. Materials outside the roadway or ditch slopes that are unstable and constitute potential slides, materials from slides that have come into the roadway or ditch, and materials that have slipped out of new or old embankments are excavated and removed to Caltrans gravel pits and approved waste material repositories. Where needed, soils from the failing road shoulders/slopes below highway and ditch slopes are removed to reestablish the structural integrity of these areas. During this process, sediment may also be tracked onto the roadways by movement of construction and hauling equipment and must be removed.

The area affected by this Site-Specific Project will vary depending upon the scale of the material that is present on the roadway and that must be removed. The area affected will generally include the managed road prism/right-of-way but could include surface waters or wetlands in some instances.

Table 1: Annual frequency (number of projects) of Site-Specific Project-1.1 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
1.1: Removal of slide and alluvial debris and soil from roadways, road shoulders, and side slopes	35	10	40

b. Site-Specific Project-1.2: Stabilization of side slopes and removal of debris on or near roads to minimize debris slides and damage to roads

The purpose of stabilizing side slopes (*e.g.,* natural and fill slopes, cutbanks) is to minimize erosion and slope failure that could damage roads and other infrastructure, and to stabilize or support the roadway. Replacement and installation of new rock slope protection (RSP) and other stabilizing measures on hill slopes reduces future maintenance and repair activities that could be required to repair and replace lost infrastructure, and that could adversely affect listed species and habitat.

The area affected by this Site-Specific Project will vary depending upon the scale of the side slopes that must be stabilized. The area affected will include upland slopes adjacent to managed road prism/right-of way.

Table 2: Annual frequency of Site-Specific Project-1.2 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
1.2: Stabilization of side slopes to minimize erosion and damage to adjacent roads, bridges, and culverts	30	10	20

c. Site-Specific Project-1.3: Stabilization of stream banks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts

The purpose of stabilizing streambanks and channels is to minimize erosion and streambank failure that could damage roads, bridges, culverts, and other infrastructure. Stabilizing streambanks reduces potential subsequent repair activities that could be required to repair and replace lost infrastructure, and that could adversely affect listed species and habitat.

The area affected by this Site-Specific Project will vary depending upon the extent of the streambank or channel that is located adjacent to a road, bridge or culvert. However, the length of streambank or channel affected is not expected to exceed 500 linear feet. The area affected will be dependent upon the size of the stream and the Project Actions required to complete this Site-Specific Project. It is difficult to determine the square footage of the affected area at the programmatic level due to the variety of streams and rivers that could be affected, which could range from 5 to 50 feet in width (*e.g.,* maximum area expected to be affected could range from 2,500 square feet to 25,000 square feet). As with all projects in the Program, repairs will be associated with existing facilities or installations.

Table 3: Annual frequency of Site-Specific Project-1.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
1.3: Stabilization of streambanks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts	30	10	20

2. Covered Activity-2: Safety Improvement

Safety improvements include activities intended to prolong the life of a roadway, provide safety to motorists, and provide information to motorists (*e.g.,* speed limits, upcoming exits and interchanges, hazards).

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, hauling trucks, backhoe, trencher, drilling rigs/augers, paver, rollers, concrete saw, jackhammer, and other handheld power tools. Equipment/vehicle operation will not be required in surface waters or wetlands. No drilling lubricants will be required to complete this Covered Activity; activities that require drilling lubricants are described below under Covered Activity-5. Augers are relatively small and do not require the use of lubricants for this Covered Activity.

The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

a. Site-Specific Project-2.1: Maintenance, Repair, and Replacement of Asphalt, Concrete, and Other Construction Materials on Roads and Other Infrastructure

Road and bridge surfaces degrade over time in response to the initial design of the pavement, traffic volumes and loads, cumulative traffic volume (especially truck traffic), and environmental factors such as moisture infiltration and heat and cold cycles. Repair and replacement of road surfaces is necessary to maintain the function and safety of roads and bridges.

Paving projects involve patching, repairing, and replacing roadway surfaces and pavements. Caltrans maintains several thousand miles of paved highway in those portions of Districts 1, 2, and 4 within the Program coverage area. Each section of highway paved with asphalt or concrete must be repaved every 10 to 14 years. If the existing pavement is in good condition, it may be covered over with a new layer of asphalt. Repair of badly deteriorated pavement could require grinding of existing pavement or replacement of the road foundation material prior to repaving. This typically involves grinding off and replacing the existing asphalt pavement.

Rehabilitation of small damaged pavement areas often requires "chipsealing"—the addition of hot tar and a layer of small rocks placed on the existing asphalt or concrete paving. This process involves the use of an asphalt plant area where hot liquid asphalt oil is mixed with crushed rock to produce the new asphalt. A rock crusher is also often required at or near the site. When the project is very large or very far from a commercial plant, a portable asphalt plant may be set up in a gravel pit or other staging area near the site.

Table 4: Annual frequency of Site-Specific Project-2.1 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
2.1: Maintenance, repair, and replacement of asphalt, concrete, and other construction materials on roads and other infrastructure	60	30	80

b. Site-Specific Project-2.2: Installation and Replacement of Signs

Signs are needed for road safety and motorist information. Signs are installed when existing signs deteriorate or are destroyed, and when previously unrecognized safety concerns become apparent. Routine road maintenance and other covered construction activities may also require the replacement and installation of road and highway signs. Installation of very large signs, including concrete footings and steel supports, potentially disturbs substantial areas. Trenching may be required to run utilities from existing sources to lighted signs.

The area affected by this Site Specific Project will vary depending upon the scale of the signage to be installed or replaced, but in general the area will not exceed 200 square feet. The area affected will be confined to the existing road prism/right-of-way. This Site-Specific Project will not include operation of equipment or work beyond the existing right-of-way, particularly work within sensitive habitats such as surface waters or wetlands.

Table 5: Annual frequency of Site-Specific Project-2.2 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
2.2: Installation and replacement of signs	200	50	200

c. Site-Specific Project-2.3: Installation and Replacement of Guardrails

Guardrails are needed for road safety and to protect infrastructure, property, and other features adjacent to the roadway. Railings and barriers are used to reduce the potential severity of accidents resulting from vehicles leaving the road, prevent out-of-control vehicles from crossing the median, and decelerate errant vehicles.

The area affected by this Site-Specific Project will vary depending upon the scale of the guardrail to be installed or replaced. The area affected will be confined to include only the existing road prism/right-of way. This Site-Specific Project will not include operation of equipment or work beyond the existing right-of-way, particularly work within sensitive habitats such as surface waters or wetlands.

Table 6: Annual frequency of Site-Specific Project-2.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
2.3: Installation and replacement of guardrails	30	30	30

3. Covered Activity-3: Drainage system maintenance and repair

Drainage system maintenance and repair includes maintenance and repair to channels, ditches, culverts, and bridges to ensure conveyance of surface waters, ensure fish passage, and avoid erosion of infrastructure, adjacent features, and private property.

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, cranes, backhoes, hauling trucks, vibratory pile-driving rigs, graders, trenchers, augers, pavement grinders, pavers, rollers, jack-hammers, vacuum trucks, and hand-held tools such as shovels and rakes. The equipment generally operates from the road prism, although in rare instances equipment may be required to operate outside of the developed road prism. Equipment/vehicle operation is not typically required in surface waters or sensitive habitats (*e.g.,* wetlands), although at times operation within such habitats may be required to complete a Site-Specific

Project in a manner that may reduce impacts on riparian vegetation or other terrestrial species, habitats, or resources. However, if any life stage of any listed species may be present during in-water activities or substantial disturbance, then capture, handling, exclusion, salvage, and relocation will be implemented for the listed species (ABMP-14.5, described *Section II.A.6. Project Actions and BMPs*). All proposed rehabilitation, repair, or replacement activities in channels, ditches, or culverts that are barriers or significant impediments to anadromous fish passage must also include improvement of fish passage in order to be covered under the Program.

The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

a. Site-Specific Project-3.1: Cleaning of drainage channels and ditches to maintain function and avoid damage to adjacent roads

Drainage channels, ditches, and associated components are generally man-made features that on occasion could contain fish. These facilities are cleaned periodically to permit free flow and to avoid erosion and damage to roads and other infrastructure. Excavation of debris and sediment from ditches, channels, and detention or retention basins requires minor grading along ditches and at storm drain outfalls and inlets. Ditches and channels often require cleaning or grading when standing water is on the road shoulder or if deposits fill more than 50 percent of the capacity of the retention/detention basin. Retention or detention basins require periodic maintenance to preserve the line, grade, depth, and cross section to which they were originally designed.

Debris and accumulated sediment is removed by manual cleaning methods or by using a backhoe or a vacuum truck. Solids are stored on Caltrans property, tested, and disposed of at an approved disposal facility or recycled as fill material if suitable. In some cases, especially larger streams or streams where it is beneficial to retain stream sediments and woody debris in the channel, some or all of the material is deposited in the channel but downstream of the culvert or bridge. Liquids may be decanted at an approved decanting facility where Caltrans use is approved.

The length of drainage channel or ditch affected by this Site-Specific Project will vary depending upon the scale of the feature to be cleaned. However, the length is not expected to exceed 500 linear feet. The extent of the area affected will be dependent upon the size of the drainage channel or ditch and the Project Actions required to complete this Site-Specific Project. It is difficult to determine the square footage of the affected area of drainage channels and ditches at the programmatic level due to the variety of these features that could be affected, which could range from 1 feet to 10 feet in width (*e.g.,* maximum area expected to be affected could range from 500 square feet to 5,000 square feet).

Table 7: Annual frequency of Site-Specific Project-3.1 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
3.1: Clearing of drainage channels and ditches to maintain function and avoid damage to adjacent roads	Total	15	10	40
	Fish Bearing Streams	3	2	8

b. Site-Specific Project-3.2: Cleaning of sediment and debris from culverts, bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions

Culverts, box culverts, bridge piers, abutments, and supports, and areas of the stream channel immediately adjacent to these types of infrastructure are cleaned of sediment and debris to provide sufficient depth and grade to ensure designed streamflow under the roadway and in the affected stream channel. Debris and drift is also removed from bridge piers, bearing seats, and abutments**.**

The vast majority of these projects will involve low-impact activities (*i.e.,* removal of sticks, leaves, or 3-4 shovelfuls of sediment). The length of stream channels affected by this Site-Specific Project will vary depending upon the scale of the sediment and debris to be cleaned and removed, but is not expected to exceed 50 linear feet. However, the area affected is difficult to estimate due to the variance in widths of channels where this Site-Specific Project may be implemented, which could range from 1 to 100 feet in width (*e.g.*, maximum area expected to be affected could range from 50 square feet to 5,000 square feet). The extent of the area affected will be dependent upon the size of the stream and the Project Actions required to complete this Site-Specific Project.

This Site-Specific Project is typically (approximately 90 percent of the time) applied to the cleaning of sediment and debris from culverts. Most of these culverts are located on non-fish-bearing streams. However, these features may discharge to fish-bearing waters, and activities within these features could affect fish-bearing waters.

Table 8: Annual frequency of Site-Specific Project-3.2 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts and bridges and to maintain streamflow conditions	Total	8,000*	350*	9,000*

***** According to Caltrans (2010), the vast majority of the estimated annual frequency of this Site-Specific Project involves low-impact activities. Most of the cleaning involves removal of sticks and leaves from culvert inlets and removal of very small amounts of sediment (3–4 shovels full on average). Most of this type of work is done by hand, usually after the first couple of storms each year.

c. Site-Specific Project-3.3: Rehabilitation of culverts to maintain function; and

d. Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where applicable, improve flow conditions to support fish passage and/or sediment transport

Culverts can be damaged by storm events, debris, and cleaning activities. Damage that impairs function or that may result in erosion and damage to the roadway could require replacement, repair, or a retrofit. Culverts may also be replaced, repaired, or retrofitted to accommodate unforeseen flow, sediment, and debris conditions. All culverts replaced in the Program will maintain, improve, or provide fish passage and will ensure that Caltrans-managed infrastructure continues to function in a safe and efficient manner. Culvert repairs and rehabilitation will include repairs to damaged culverts to maintain or improve fish passage through the culverts and to ensure infrastructure function. Culverts may also be retrofitted with baffles, weirs, fishways, and appurtenant grade control structures such as rock, wood, or concrete weirs to provide or improve fish passage.

The length of channel affected by these Site-Specific Projects will vary depending upon the scale of the culvert replacement, repair, or retrofit, and Project Actions required to complete Site-Specific Projects. However, this Site-Specific Project is not expected to affect more than 400 linear feet of channel. It is difficult to determine the square footage of the affected area at the programmatic level due to the variety of channels that could be affected, which could range from 1 to 10 feet in width (*e.g.,* maximum area expected to be affected could range from 400 to 4,000 square feet).

Table 9: Annual frequency in fish bearing streams of Site-Specific Project-3.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
3.3: Rehabilitation of culverts to maintain Function	30	30	30

Table 10: Annual frequency of Site-Specific Project-3.4 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
3.4: Replacement, repair and retrofitting of culverts to maintain function and, where applicable, improve flow conditions to support fish passage and sediment transport	Total	150	80	60
	Fish Bearing Streams	30	30	30

4. Covered Activity-4: Bridge repair, retrofit, replacement, and maintenance

Bridge repair, retrofit, replacement, and maintenance are implemented to prolong the use and function of bridges, ensure motorist safety, and protect the environment. Whether a bridge is repaired, rehabilitated, or replaced depends on the age of a bridge and damage that may occur to a bridge (*e.g.,* from a storm event, earthquake, or vehicle or boat collision).

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, pavement removal equipment, vibratory pile-driving rigs, pavers, rollers, grinders, jackhammers, welding machines, augers, hauling trucks, and hand-held power tools. The equipment operates from the road prism, although in rare instances equipment may be required to operate outside of the developed road prism to repair bridge abutments or supports. With the exception of instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, construction equipment and vehicles will not operate in anadromous waters[1] unless the channel is dewatered or otherwise dry. In rare instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, relocation and exclusion of listed fish from the area will be implemented prior to operating in the wetted channel. All proposed rehabilitation, repair, or replacement activities at bridges that are barriers or significant impediments to anadromous fish passage must also include improvement of fish passage in order to be covered under the Program.

The length of stream affected by this Covered Activity will vary depending upon the scale of the bridge project and the required Project Actions. However, the length affected is not expected to

[1] Anadromous waters are waters where anadromous fish are known to occur. These waters may or may not include anadromous fish critical habitat.

be greater than 400 linear feet of channel. It is difficult to determine the square footage of the affected area at the programmatic level due to the variety of channels that could be affected, which could range from 10 to 50 feet in width (*e.g.,* maximum area expected to be affected could range from 4,000 to 20,000 square feet).

The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

a. Site-Specific Project-4.1: Repair of bridges to maintain function

Bridge maintenance generally includes work such as repairing damage or deterioration in various bridge components; cleaning out drains; repairing expansion joints; cleaning and repairing structural steel; sealing concrete surfaces; and sanding and painting. Bridge maintenance includes work initiated by Caltrans districts and work recommended in bridge inspection reports. Work initiated by the District is generally in response to a problem on a bridge that would affect public safety or the integrity of the structure if not promptly addressed.

Table 11: Annual frequency of Site-Specific Project-4.1 by District

Site-Specific Project		Caltrans District 1	Caltrans District 2	Caltrans District 4
4.1: Repair of bridges to maintain function	Total	50	30	60
	Fish Bearing Streams	10	5	10

b. Site-Specific Project-4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (e.g., earthquake standards)

Aging, storm events, debris, cleaning activities, earthquakes, and collisions by vehicles and boats may damage small bridges. Damage to an extent that impairs safety and function could require rehabilitation. In addition, current standards and specifications may require that bridges be retrofitted. Rehabilitation could include reinforcement of the bridge structure and placement of additional piers and footings.

Table 12: Annual frequency in fish bearing streams of Site-Specific Project-4.2 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (*e.g.*, earthquake standards)	10	5	10

c. Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where applicable, improve flow conditions for fish passage and sediment transport

Aging, storm events, debris, cleaning activities, earthquakes, and collisions by vehicles and boats may damage small bridges. Damage to an extent that impairs safety and function could require bridge replacement. In addition, current standards and specifications may require bridge removal and replacement. Bridges may also be replaced to accommodate unforeseen flow, sediment, and debris conditions. Replacement bridge designs in the Program will improve flow conditions to support fish passage and sediment transport. Additionally, this Site-Specific Project will cover the replacement of culverts with small bridges. Culverts that must be replaced may be replaced with small bridges when financially and technically feasible.

Table 13: Annual frequency in fish bearing streams of Site-Specific Project-4.3 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications and, where applicable, improve flow conditions for fish passage and sediment transport	5	5	5

5. Covered Activity-5: Project planning (geotechnical investigations)

The strength and longevity of bridges, culverts, and other infrastructure ultimately depends on their foundations. Maintenance planning typically involves geotechnical investigations to inform early planning for future activities related to culverts, bridges, and slope stabilization. The following Site-Specific Projects are proposed for coverage as part of this Covered Activity.

Equipment/vehicles required to complete this Covered Activity may include pickup trucks, backhoes, bulldozers, hauling trucks, augers, vibratory pile-driving rigs, drilling rigs, and hand-held power tools. The equipment operates from the road prism, although in rare instances equipment may be required to operate outside of the developed road prism to complete a geotechnical boring in an appropriate area for completion of adequate planning or engineering

efforts. Equipment/vehicle operation rarely occurs in surface waters or sensitive habitats (*e.g.*, wetlands), although operation within such habitats may be unavoidable. With the exception of instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, construction equipment and vehicles will not operate in anadromous waters unless the channel is dewatered or otherwise dry. In rare instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, relocation and exclusion of listed fish from the area will be implemented prior to operating in the wetted channel.

The length of channel affected by this Covered Activity will vary depending upon factors such as ease of site access, test hole location, and number of test holes. However, the length of channel affected will not exceed a total of 30 linear feet of channel in a given project. The intent of the 30 linear foot channel limitation is to provide adequate space to construct a gravel work pad in water that is approximately three feet in depth. It is difficult to determine the square footage of the affected area at the programmatic level due to the different channel access approaches (*i.e.*, bridge deck, barge, temporary work pad, *etc.*) and channels size, which could range from 1 to 50 feet in width (*e.g.,* maximum area expected to be affected could range from 30 to 1,500 square feet). This work will not occur during those times of the year when redds could be present in the work area.

a. Site Specific Project-5.1: Drilling of geotechnical test holes to facilitate the early planning process for future culvert replacement, bridge rehabilitation and replacement, and side slope stabilization projects

The strength and longevity of bridges, culverts, and other infrastructure ultimately depends on their foundations. Part of the design process associated with new structures or retrofitting is to conduct a foundation investigation. In these investigations, geotechnical test holes are drilled to collect subsurface information. This includes depth-to-parent material (rock), rock type and quality, soil type and strength, and groundwater levels. This information is then used to develop a soil/rock profile used to recommend a foundation and design for the project.

Table 14: Annual frequency of Site-Specific Project-5.1 by District

Site-Specific Project	Caltrans District 1	Caltrans District 2	Caltrans District 4
5.1: Drilling of geotechnical test holes to facilitate the early planning process for future culvert replacement, bridge rehabilitation and replacement, and side slope stabilization projects	120	80	220

6. Project Actions and BMPs

Each Site-Specific Project involves the implementation of one or more Project Actions to repair and maintain transportation infrastructure (Table 15). The number and type of Project Actions required for each Site-Specific Project will be determined by the resident engineer during project design. Caltrans will be required to clearly identify which Project Actions they will implement/or have implemented to complete each Site-Specific Project.

Table 15: Site-Specific Projects and associated Project Actions

Site-Specific Project	Project Actions
1.1: Removal of slide and alluvial debris and soil from roadways, road shoulders, and side slopes	1, 2, 3, 4, 5, 10, 11, 13, 15, 20, and 29
1.2: Stabilization of side slopes	1, 2, 3, 4, 5, 10, 11, 13, 15, 20, and 29
1.3: Stabilization of streambanks and channels	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 28, 29, and 30
2.1: Maintenance, repair, and replacement of asphalt, concrete, and other construction materials	1, 2, 3, 4, 5, 6, 9, and 29
2.2: Installation and replacement of signs	1, 2, 3, 4, 5, 6, 8, 10, and 29
2.3: Installation and replacement of guardrails	1, 2, 3, 4, 5, 6, 8, 10, and 29
3.1: Clearing of drainage channels and ditches	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 28, 29, and 30
3.2: Cleaning of sediment and debris from culverts, bridge abutments and supports	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 28, 29, and 30
3.3: Rehabilitation of culverts	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 28, 29, and 30
3.4: Rehabilitation of culverts	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 28, 29, and 30
4.1: Replacement, repair and retrofitting of culverts	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 28, 29, and 30
4.2: Repair of bridges	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 28, 29, and 30
4.3: Replacement of small bridges	1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, and 30
5.1: Drilling of geotechnical test holes	1, 2, 3, 4, 5, 8, 10, 11, 13, 14, 29, and 30

Caltrans and NMFS agreed to exclude two Project Actions from the Program: Project Action-24: Install fishways or stream gradient control structures; and Project Action-27: Blast rock and other substrates. For the remaining Project Actions, various types of BMPs will be implemented to avoid or minimize impacts on fish and wildlife species and their associated habitat covered

under the Program. BMPs include Caltrans' standard maintenance and construction site BMPs, as well as Additional BMPs, or ABMPs, developed specifically for Project Actions in the Program. The standard BMPs have been developed by Caltrans under the Statewide Stormwater Management Plan (SWMP) and National Pollutant Discharge Elimination System (NPDES) permit (Caltrans 1999). A complete list, description, and implementation criteria for each standard maintenance BMP are provided in Appendix C of Caltrans (2010).

Project Actions and associated ABMPs are briefly described at first introduction below. The ABMP list is comprehensive and represents options available to the action agency to minimize effects; various ABMPs will be prescribed depending on site conditions and time of year.

a. Project Action-1: Operate construction equipment and vehicles

- ABMP-1.1: Equipment will be operated during the least sensitive diurnal, seasonal, and meteorological periods relative to the potential effects on listed species and habitat if feasible.
- ABMP-1.2: Equipment will not operate in sensitive areas or habitats, such as wetlands and surface waters (Note: if equipment is necessary in waters or wetlands, see Project Action-14).
- ABMP-1.3: Equipment will be inspected on a daily basis for leaks and completely cleaned of any external petroleum products, hydraulic fluid, coolants, and other deleterious materials prior to operating equipment.
- ABMP-1.4: A Spill Prevention, Control, and Countermeasures (SPCC) Plan will be developed for each project that requires the operation of construction equipment and vehicles. The SPCC Plan will be kept on-site during construction and the appropriate materials and equipment will also be on-site during construction to ensure the SPCC Plan can be implemented. Personnel will be knowledgeable in the use and deployment of the materials and equipment so response to an accidental spill will be timely.

b. Project Action -2: Use of temporary lighting for night construction activities

- ABMP-2.1: Maintenance and construction activities will be avoided at night to the extent practicable.
- ABMP-2.2: When night work cannot be avoided, disturbance of listed species will be avoided and minimized by restricting substantial use of temporary lighting to the least sensitive seasonal and meteorological windows.
- ABMP-2.3: Lights on work areas will be shielded and focused to minimize lighting of listed-species habitat.

c. Project Action -3: Maintain and fuel construction equipment and vehicles

- ABMP-1.2; 1.3; 1.4; and
- ABMP-3.1: Maintenance and fueling of construction equipment and vehicles will occur at least 15 meters from the Ordinary High Water Line (OHWL) or the edge of sensitive habitats (*e.g.*, wetlands).

d. Project Action -4: Clean the roadway of sediment and debris from landslide, flood events, and construction

- ABMP-5.1: Sediment and debris removed from the roadway will be disposed of off-site, at an approved location, where it cannot enter surface waters.

e. Project Action-5: Temporarily or permanently store sediment and debris, and pavement, petroleum products, concrete, and other construction materials

- ABMP-1.4; 5.1.

f. Project Action-6: Apply pavement, petroleum products, concrete, and other construction materials to surface of roads, bridges, and related infrastructure

- ABMP-1.4; and
- ABMP-6.1: Falsework will be installed to keep bridge debris and construction, maintenance, and repair materials from falling into streams during demolition, construction, and substantial maintenance and repair activities.

g. Project Action-7: Treat and discharge water conveyed from the construction area

- ABMP-7.1: Water pumped from areas isolated from surface water to allow construction to occur in the dry will be discharged to an upland area providing overland flow and infiltration before returning to stream. Upland areas may include sediment basins of sufficient size to allow infiltration rather than overflow or adjacent dry gravel/sand bars if the water is clean and no visible plume of sediment is created downstream of the discharge. Other measures may be used such as a baker tank or methods described in BMP NS-2.
- ABMP-7.2: A NMFS approved fish biologist will be on site to observe de-watering activities and to capture/rescue any fish that are observed in an isolated area during de-watering activities.

h. Project Action-8: Use drill rigs and drilling lubricants

- ABMP-1.4; and
- ABMP-8.1: Drilling will be conducted outside of the stream channel or only in dry stream beds, to the extent practicable. If water is present, see ABMP-8.4.
- ABMP-8.2: When geotechnical drilling takes place within the stream channel, including gravel beds and bars, drilling mud will be bentonite without additives; initial drilling through gravel will be accomplished using clean water as a lubricant; after contact with bedrock or consolidated material, drilling mud (*i.e.,* bentonite clay) may be used.
- ABMP-8.3: All drilling fluids and materials will be self-contained and removed from the site after use; drilling will be conducted inside a casing so that all spoils are recoverable in a collection structure.
- ABMP-8.4: If drilling must occur where water is present, the work area will be isolated or the flow will be diverted around the work area.

i. Project Action-9: Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure

- ABMP-1.4; 6.1.

j. Project Action-10: Remove and disturb upland, riparian, and wetland vegetation

- ABMP-1.4; and
- ABMP-10.1: Trees as identified in any special contract provisions or as directed by the Project Engineer will be preserved.
- ABMP-10.2: Hazard trees greater than 24-inches diameter at breast height (DBH) will be removed only by direction of the Project Engineer.
- ABMP-10.3: Trees will be felled in such a manner as not to injure standing trees and other plants to the extent practicable.
- ABMP-10.4: Environmentally Sensitive Areas will be fenced to prevent encroachment of equipment and personnel into wetlands, riparian areas, stream channels and banks, and other sensitive habitats.
- ABMP-10.5: Vegetation will be mowed to a height greater than 4 inches.
- ABMP-10.6: Soil compaction will be minimized by using equipment that can reach over sensitive areas and that minimizes the pressure exerted on the ground.
- ABMP-10.7: Where soil compaction is unintended, compacted soils will be loosened after heavy construction activities are complete.
- ABMP-10.8: Where vegetation removal is temporary to support construction activities, native species will be re-established that are specific to the project location and that comprise a diverse community of woody and herbaceous plants.

k. Project Action-11: Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment

- ABMP-1.4; 10.4; 10.7; 10.8; and

- ABMP-11.1: Storage areas will disturb less than 2.5 acres of vegetated or currently undisturbed area.
- ABMP-11.2: Storage areas will not disturb wetlands or other special status plant communities.
- ABMP-11.3: For permanent storage areas that have been filled to capacity with sediment and debris, the final configuration will conform to natural contours (elevations, profile, and gradient) of surrounding terrain and native plant species will be established that are specific to the project location and comprise a diverse community of woody and herbaceous plants.
- ABMP-11.4: Construction staging and storage areas will be located a minimum of 150 feet from the OHWL and other sensitive habitats (*e.g.*, wetlands).

l. Project Action-12: Construct temporary sediment-settling basins

- ABMP-10.4; 10.7; 10.8; and
- ABMP-12.1: Temporary sediment basins will be cleaned of sediment and the site restored to pre-construction contours (elevations, profile, and gradient) and function post-construction.

m. Project Action-13: Grade temporary access roads, traffic detours, and staging and work areas

- ABMP-10.4; 10.7; 10.8; and
- ABMP-13.1: Temporary access and detours will be located a minimum of 50 feet from the OHWL and other sensitive habitats (*i.e.* wetlands).

n. Project Action-14: Operate construction equipment and vehicles in the stream channel

- ABMP-14.1; 14.5; and 14.8: With the exception of instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, construction equipment and vehicles will not operate in anadromous waters unless the channel is dewatered or otherwise dry. In rare instances when impacts of dewatering are expected to exceed the impacts of equipment or vehicle operation in the wetted channel, relocation and exclusion of listed fish from the area will be implemented prior to operating in the wetted channel.
- ABMP-14.2: Existing roadways and stream crossings will be used for temporary access roads whenever reasonable and safe.
- ABMP-14.3: The number of access and egress points and total area affected by vehicle operation will be minimized; disturbed areas will be located to reduce damage to existing native aquatic vegetation, substantial large woody debris, and spawning gravel.
- ABMP-14.4: Cleaning of culverts and bridge abutments and piers, and placement of RSP and other bank protection will be from the top of the bank or bridge.
- ABMP-14.6: Except for streams identified by NMFS, USFWS, and CDFW as not supporting spawning habitat, all in-water activities will be conducted outside the

spawning and incubation season for listed fish species, where such species occur, or to periods identified in cooperation with NMFS, USFWS, and CDFW to accommodate site-specific conditions.

- ABMP-14.7: Modified or disturbed portions of streams, banks, and riparian areas will be restored as nearly as possible to natural and stable contours (elevations, profile, and gradient).

o. Project Action-15: Construct temporary stream crossings

- ABMP-10.4; 10.8; 14.1; 14.2; 14.3; 14.5; 14.6; 14.7; and
- ABMP-15.1: Stream width, depth, velocity, and slope that provide upstream and downstream passage of adult and juvenile fish will be preserved according to current NMFS and CDFW guidelines and criteria or as developed in cooperation with NMFS and CDFW to accommodate site-specific conditions.
- ABMP-15.2: Temporary fills, cofferdams, and diversion cofferdams that are left in stream channels will be composed of washed, rounded, spawning-sized gravel between 0.4 to 4 inches in diameter; gravel in contact with flowing water will be left in place, modified (*i.e.,* manually spread out using had tools if necessary) to ensure adequate fish passage for all life stages, and then allowed to disperse naturally by high winter flows; materials placed above the ordinary high water mark must be clean washed rock or contained to prevent material conveyance to the stream or mixing with clean gravel.

p. Project Action-16: Remove and disturb aquatic vegetation, stream sediment, and large woody debris (LWD)

- ABMP-10.4; 14.1; 14.5; 14.6; 14.7; 15.2; and
- ABMP-16.1: Disturbance and removal of aquatic vegetation will be minimized.
- ABMP-16.2: The limits of disturbance will be identified; native vegetation, stream channel substrate, and large woody debris disturbed outside these limits should be replaced if damaged.
- ABMP-16.3: The minimum amount of wood, sediment and gravel, and other natural debris will be removed using hand tools, where feasible, only as necessary to maintain and protect culvert and bridge function, ensure suitable fish passage conditions, and minimize disturbance of the streambed .
- ABMP-16.4: LWD subject to damage or removal will be retained and replaced on site after project completion as long as such action would not jeopardize infrastructure or private property or create a liability for Caltrans. LWD not replaced on-site will be stored or offered to other entities for use in other mitigation/restoration projects where feasible.
- ABMP-16.5: Disturbed areas will be minimized by locating temporary work areas to avoid patches of native aquatic vegetation, substantial LWD, and spawning gravel.
- ABMP-16.6: Where vegetation removal is temporary to support construction activities, native species will be re-established that are specific to the project location and that comprise a diverse community of aquatic plants.

- ABMP-16.7: Where spawning gravel is removed temporarily to facilitate construction, it will be stored adjacent to the site then placed back in the channel post-construction at approximately pre-project depth and gradient.
- ABMP-16.8: Excavated material will not be stored or stockpiled in the channel. Any excavated material that will not be placed back in the channel or on the bank after construction will be end-hauled to an approved disposal site.
- ABMP-16.9: Gravel and LWD excavated from the channel that is temporarily stockpiled for reuse in the channel will be stored in a manner that prevents mixing with stream flows.

q. Project Action-17: Install temporary cofferdams and diversion cofferdams

- ABMP-10.4; 14.5; 14.6; 14.7; 15.1; 15.2; and
- ABMP-17.1: Cofferdams and diversion cofferdams will affect no more of the stream channel than is necessary to support completion of the maintenance or construction activity.
- ABMP-17.2: Immediately upon completion of in-channel work, temporary fills, cofferdams, diversion cofferdams, and other in-channel structures that will not remain in the stream, *i.e*., clean, spawning-sized gravel, will be removed in a manner that minimizes disturbance to downstream flows and water quality.
- ABMP-17.3: All structures and imported materials placed in the stream channel or on the banks during construction that are not designed to withstand high flows will be removed before such flows occur.

r. Project Action-18: Temporarily redirect stream flow

- ABMP-7.2; 10.4; 14.5; 14.6; 14.7; 15.1; and
- ABMP-18.1: The extent of stream channel dewatering will be limited to the minimum necessary to support construction activities. Monitoring of the stream diversion will occur periodically each day such devices are in operation to ensure proper function.
- ABMP-18.2: Construction of a temporary channel will proceed from the downstream to the upstream end of the channel.
- ABMP-18.3: Flow will not be diverted from the stream channel until the temporary channel is complete and all applicable soil stabilization/control measures are in place.
- ABMP-18.4: Flow will be diverted the minimum distance necessary to isolate the construction area.
- ABMP-18.5: Water will be released or pumped downstream at an appropriate rate to maintain downstream flows at all times and the outlet of all diversions shall be positioned such that the discharge of water does not result in bank erosion or channel scour and maintains pre-project hydraulic conditions.
- ABMP-18.6: For diversion from streams, rivers, and other water bodies, any water intake structure will be installed, operated, and maintained in accordance with current NMFS, USFWS, and CDFW criteria or as developed in cooperation with NMFS, USFWS, and CDFW to accommodate site-specific conditions.

s. Project Action-19: Temporarily draft water from streams and other water bodies

- ABMP-14.5; 18.6

t. Project Action-20: Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls

- ABMP-20.1: Extension of existing areas of stream bank RSP or other bank protection (*e.g.,* sheet piles) will be avoided and the extent of bank and channel armoring will be limited to the minimum necessary to protect essential infrastructure.
- ABMP-20.2: Threatened infrastructure will be relocated to maintain or reestablish natural stream sediment processes to the extent feasible.
- ABMP-20.3: Bank stabilization will incorporate bioengineering solutions consistent with site-specific engineering requirements.
- ABMP-20.4: Where RSP is necessary, native riparian vegetation and/or LWD in RSP will be incorporated.
- ABMP-20.5: The embankment toe will not extend farther into the active channel than the existing embankment.
- ABMP-20.6: RSP, sheet piles, and other erosion control materials will be pre-washed to remove sediment and/or contaminants.
- ABMP-20.7: Temporary material storage piles (*e.g.,* RSP) will not be placed in the 100 year floodplain during the rainy season (October 15 through May 31), unless material can be relocated within (*i.e.,* before) 12 hours of the onset of a storm.

u. Project Action-21: Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications

- ABMP-1.4; and
- ABMP-21.1: When concrete is poured to construct bridge footings or other infrastructure in the vicinity of flowing water, work must be conducted to prevent contact of wet concrete with water (*e.g.*, within a cofferdam). Concrete or concrete slurry will not come into direct contact with flowing water.

v. Project Action-22: Remove culverts

- ABMP-10.4; 14.1; 14.5; 14.6; 15.1.

w. Project Action-23: Clean, retrofit, or install culverts

- ABMP-10.4; 14.1; 14.5; 14.6; 14.7; 15.1; 17.2; 17.3; 20.1; 20.3; 20.4; 20.6; 20.7; and
- ABMP-23.1: Stream flow through new and replacement culverts, bridges, and over existing stream gradient control structures must meet the velocity depth, and other

passage criteria for salmonid streams as described by the current NMFS and CDFW guidelines or as developed in cooperation with NMFS and CDFW to accommodate site-specific conditions.

- ABMP-23.2: Culverts may be replaced with small bridges.
- ABMP-23.3: Scour holes at the base of bridge piers or abutments and culvert inlets and outlets will be repaired by placing no more riprap (RSP) than is necessary to mitigate the scour.

x. Project Action-25: Remove existing bridge structure, including footings, piers, and piles

- ABMP-6.1; 10.4; 14.1; 14.5; 14.6; 15.1.

y. Project Action-26: Install bridge structures, excluding impact pile-driving

- ABMP-6.1; 10.4; 14.1; 14.5; 14.6; 14.7; 15.1; 17.2; 17.3; 20.1; 20.3; 20.4; 20.6; 20.7; 23.1; 23.3.

z. Project Action-28: Capture, handle, exclude, salvage, and relocate listed species

- ABMP-28.1: If individuals of listed species may be present and subject to potential injury or mortality from construction activities, a qualified biologist will conduct a preconstruction visual survey (*i.e.,* bank observations).
- ABMP-28.2: Caltrans shall retain a qualified biologist with expertise in the areas of anadromous salmonid biology, including handling, collecting, and relocating salmonids, salmonid/habitat relationships and biological monitoring of salmonids. Caltrans shall ensure that all biologists working on a Site-Specific Project will be qualified to conduct fish collections in a manner which minimizes all potential risks to listed salmonids.
- ABMP-28.3: When listed species are present and it is determined that they could be injured or killed by construction activities, a qualified project biologist will identify appropriate methods for capture, handling, exclusion, and relocation of individuals that could be affected.
- ABMP-28.4: Where listed species cannot be captured, handled, excluded, or relocated (*e.g.,* salmonid redd), actions that could injure or kill individual organisms will be avoided or delayed until the species leaves the affected area or the organism reaches a stage that can be captured, handled, excluded, or relocated.
- ABMP-28.5: The project biologist will conduct, monitor, and supervise all capture, handling, exclusion, and relocation activities; ensure that sufficient personnel are available for safe and efficient collection of listed species; and ensure that proper training of personnel has been conducted in identification and safe capture and handling of listed species.
- ABMP-28.6: Electrofishing may be utilized when other standard fish capture methods are likely to be ineffective or other methods fail to remove all fish from the site; the project biologist must have appropriate training and experience in electrofishing techniques and all electrofishing must be conducted according to the *NMFS Guidelines for Electrofishing*

Waters Containing Salmonids Listed under the Endangered Species Act. [Available at: http://swr.nmfs.noaa.gov/sr/Electrofishing_Guidelines.pdf].

- ABMP-28.7: Individual organisms will be relocated the shortest distance possible to habitat unaffected by construction activities.
- ABMP-28.8: Within occupied habitat, capture, handling, exclusion, and relocation activities will be completed no earlier than 48 hours before construction begins to minimize the probability that listed species will recolonize the affected areas.
- ABMP-28.9: Within temporarily drained stream channel areas, salvage activities will be initiated before or at the same time as stream area draining and completed within a time frame necessary to avoid injury and mortality of listed species.
- ABMP-28.10: For projects that involve in-water activities, the project biologist will continuously monitor in-water activities (*e.g.*, placement of cofferdams, dewatering of isolated areas) for the purpose of removing and relocating any listed species that were not detected or could not be removed and relocated prior to construction.
- ABMP-28.11: The project biologist will be present at the work site until all listed species have been removed and relocated.
- ABMP-28.12: The project biologist will maintain detailed records of the species, numbers, life stages, and size classes of listed species observed, collected, relocated, injured, and killed; as well as recording the date and time of each activity or observation.

aa. Project Action-29: Implement BMPs

- ABMP-29.1: The proposed guidance document (described in Caltrans [2010] Programmatic BA) will be followed to ensure compliance with Project permits and authorization, including implementation of the BMPs.
- ABMP-29.2: Before construction activities begin, the project environmental coordinator or biologist will discuss the implementation of the required BMPs with the maintenance crew or construction resident engineer and contractor, and identify and document environmentally sensitive areas and potential occurrence of listed species.
- ABMP-29.3: Before construction activities begin, the project environmental coordinator or biologist will conduct a worker awareness training session for all construction personnel that describes the listed species and their habitat requirements, the specific measures being taken to protect individuals of listed species in the project area, and the boundaries within which project activities will be restricted.
- ABMP-29.4: Caltrans will designate a biological monitor to monitor on-site compliance with all Project BMPs and any unanticipated effects on listed species.
- ABMP-29.5: Non-compliance with BMPs and unanticipated effects on listed species will be reported to the resident engineer or maintenance supervisor immediately.
- ABMP-29.6: When non-compliance is reported, the resident engineer or maintenance supervisor will implement corrective actions immediately to meet all BMPs; where unanticipated effects on listed species cannot be immediately resolved, the resident engineer or maintenance supervisor will stop work that is causing the unanticipated effect until the unanticipated effects are resolved.

ab. Project Action-30: Mitigation framework for potential adverse impacts on species listed under California Endangered Species Act (CESA)

The intent of this Project Action is to ensure all impacts on state-listed species are fully mitigated. As part of the Program, Caltrans will mitigate adverse impacts (*i.e.*, take) of species listed under the CESA and in some cases the California Environmental Quality Act (CEQA). The mitigation approach could involve terrestrial or aquatic habitats. Typical mitigation actions involve offsetting anticipated adverse impacts of the Program through restoring in-stream habitat (*e.g.*, placement of LWD or gravel/rock/boulders), restoring or enhancing riparian habitat conditions, or improving fish passage. In some cases, maintenance projects could be self-mitigating, or projects intended to restore habitat could be proposed in the Program. A project involving fish passage that is self-mitigating would establish or enhance fish access to usable habitat and the anticipated increase in species numbers would compensate for species losses resulting from construction. If activities are not self-mitigating, Caltrans will provide financial assurances that mitigation measures will be carried out prior to undertaking activities resulting in mortalities to state-listed species. Caltrans will coordinate closely with CDFW to ensure that specific mitigation is appropriate for the impacts and species affected. Implementation of this action will be accomplished within the limits of this Program (described below in *Section II.B. Project Categorization, Limits, and Minimization Measures*). Actions will typically occur at sites where Caltrans determines one or more mitigation approaches can be implemented and anticipated habitat improvements offset impacts on covered species or their habitat associated with project implementation. At the start of each Caltrans fiscal year, Caltrans will determine the anticipated level of take of CESA-listed species associated with the Program and the watersheds in which this take will occur. Caltrans will then work to identify up to 10 potentially suitable mitigation options per District and present the CDFW with a recommendation of which options are most appropriate to offset the anticipated level of take for the year.

B. Project Categorization, Limits, and Minimization Measures

The following section outlines project-size limits and minimization measures developed by Caltrans and NMFS and specifically for the Program to protect ESA-listed species and their designated critical habitats. Projects are separated into three categories (Category 1, 2, and 3). Projects may be implemented only if they meet the project-size limits and adhere to the minimization measures outlined below in *Section 1. Category Limits and Minimization Measures*. Category 1 and 2 projects can be implemented without submitting a pre-project notification form to NMFS. Category 2 projects, however, require submission of an annual inventory and reporting list. Caltrans will submit a pre-project notification form to NMFS prior

to implementation of Category 3 projects in order to be included in the Program[2]. Completion of a post-project reporting form is also required for all Category 3 projects.

1. Category Limits and Minimization Measures

The following sections describe the Project Action-level minimization measures, limits, and exclusions for Category 1, 2, and 3 projects. If the proposed Project Actions for an individual Site-Specific Project do not meet (*e.g.,* exceed) the Category 1 or 2 minimization measures and limits, the project is under Category 3 and a pre-project notification form must be submitted by Caltrans to NMFS.

a. Cleaning

Project Action-4: Clean the roadway of sediment and debris from landslide, flood events, and construction.
Project Action -10: Remove and disturb upland, riparian, and wetland vegetation.
Project Action -16: Remove and disturb aquatic vegetation, stream sediment, and LWD.
Project Action -23: Clean, retrofit, or install culverts.

Category 1 cleaning projects involve the removal of up to two cubic yards of material below OHWL with hand tools only (if any life stage of listed fish is present) and with heavy equipment (if all life stages of listed fish are absent). Category 2 cleaning activities involve the removal of between two and five cubic yards of material below the OHWL using heavy equipment when all life stages of listed fish are absent. Category 3 cleaning activities involve the removal of between 2 and 10 cubic yards of material with hand tools below the OHWL when listed fish are present and up to 10 cubic yards of material below the OHWL using heavy equipment. All projects that require dewatering in anadromous waters or designated critical habitat, or capture and relocation of listed species are within Category 3. Therefore, the limits to these categories are as follows:

Category 1 Limits- Cleaning

- Cleaning with hand tools when any life stage of listed fish is present-
    - No more than 2 cubic yards of material may be removed if below the OHWL.
- Cleaning with heavy equipment when all life stages of listed fish absent-

[2] Based on NMFS' review, Project Actions for an individual Site-Specific Project that do not meet these minimization measures or limitations will not be included in this consultation, and therefore, a separate consultation with NMFS may be necessary.

- No more than 2 cubic yards of material may be removed below the OHWL.

Category 2 Limits- Cleaning

- Cleaning with heavy equipment when all life stages of listed fish absent-
  - Between 2 and 5 cubic yards of material may be removed below the OHWL.

Category 3 Limits- Cleaning

- Cleaning with hand tools when any life stage of listed fish is present-
  - Between 2 and 10 cubic yards of material may be removed below the OHWL.
- Cleaning with heavy equipment when any life stage of listed fish is present-
  - No more than 10 cubic yards of material may be removed below the OHWL. Fish relocation may be required if listed fish are present (see *Section II.B.1.f. Dewatering and Fish Relocation* if applicable). In some instances, relocation may not be required for those fish present in areas not likely to be affected by cleaning activities (*i.e.*, side channels or off-channel pools not directly involved in the project). As in all Category 3 projects, this information will be provided in notifications forms prior to project implementation.

b. Vegetation Management

Project Action-10: Remove and disturb upland, riparian, and wetland vegetation.
Project Action-16: Remove and disturb aquatic vegetation, stream sediment, and LWD.

Vegetation management activities that are not a component of a larger project (*e.g.*, grading) involve the removal of vegetation for inspection of culverts or bridges or roadway safety. Category 1 vegetation removal around culverts will be accomplished with hand tools and occur between the roadway and the top of a culvert inlet or outlet (areas are described in greater detail in the list below). Category 1 vegetation removal around bridges will be accomplished by working from the bridge deck. Vegetation removal that cannot be accomplished from the bridge deck or, for culverts, requires vegetation removal below the top of a culvert is in Category 2. Category 2 vegetation removal around culverts or bridges will occur in an area extending from 20 linear feet upstream to 20 linear feet downstream of the edge of a bridge or culvert inlet or outlet (areas are described in greater detail in the list below). Vegetation removal that cannot be accomplished with only hand tools is in Category 3. An example of a vegetation management project involving roadway safety would be the removal of trees that could potentially fall and damage a bridge or culvert or present a roadway hazard. The limits to these categories are as follows:

Category 1 Limits - Vegetation Removal

- Culverts - vegetation removal with hand tools within an area between the roadway and a line running parallel to the roadway and along the top of a culvert inlet or outlet
    - Mature trees may not be removed (mature tree is defined as greater than 12 inches diameter at breast height [dbh]).
- Bridges - vegetation removal (primarily trimming) when working from the bridge deck
    - Mature trees may not be removed.

Category 2 Limits - Vegetation Removal

- Culverts - vegetation removal with hand tools within an area between two lines (parallel to the roadway) extending from 20 linear feet upstream of the culvert inlet to 20 linear feet downstream of the culvert outlet
    - Vegetation removal may not occur in the wetted channel;
    - Mature trees may not be removed; and
    - No more than a total of 5,000 square feet of vegetation may be removed below the OHWL or within 150 linear feet of the OHWL.
- Bridges - vegetation may not be removed outside of the area between two lines (parallel to the roadway) extending from 20 linear feet upstream from the upstream edge of a bridge to 20 linear feet downstream from the downstream edge of a bridge
    - Vegetation removal may not occur in the wetted channel;
    - Mature trees may not be removed; and
    - No more than a total of 5,000 square feet of vegetation may be removed below the OHWL or within 150 linear feet of the OHWL.

Category 3 Limits - Vegetation Removal

- Removal of vegetation with heavy equipment (which may also include use of hand tools) or removal of mature trees
    - Vegetation may not be removed outside of the area extending 20 linear feet from the edge of a bridge or culvert inlet or outlet (area described above); and
    - No more than a total of 5,000 square feet (0.11 acres) of vegetation may be removed below OHWL or within 150 linear feet of the OHWL (see *Section II.1.B.f. Dewatering and Fish Relocation* if applicable).

Caltrans or the Corps will implement the following procedures for management of large woody material[3] encountered at project sites. If the large woody material cannot be retained on site due to safety concerns (including relocating the wood downstream of Caltrans facilities), Caltrans or

[3] Large woody material is defined as logs or limbs greater than or equal to 24 inches in diameter and more than 20 feet in length and their associated root wads.

the Corps will coordinate with the necessary resource agencies (NMFS, USFWS, and CDFW) on potential options, including transfer of the wood to storage facilities for future use at other potential habitat enhancement sites. In the event local storage facilities are at capacity or unavailable in the area, and as agreed upon by the resource agencies, the large woody material can be disposed of at appropriate facilities or become the property of the contractor (if applicable).

c. Grading for Access Roads and Construction of Settling Basins and Storage Areas

Project Action-11: Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment.
Project Action-12: Construct temporary sediment-settling basins.
Project Action-13: Grade temporary access roads and traffic detours.

Category 1 projects involve construction of access roads or storage areas outside of wetted channels, hydrologically connected areas, and greater than 150 linear feet from OHWL or any watercourse. Category 2 projects involve construction of access roads or storage areas outside of wetted channels and above the OHWL. Category 3 projects involve construction of access roads below the OHWL but outside of wetted channels, and construction of storage areas outside of wetted channels and above the OHWL. Therefore, the limits to these categories are as follows:

Category 1 Limits - Grading

- Construction of access roads or storage areas greater than 150 linear feet from the OHWL or any watercourse
    - Access roads or storage areas may not be constructed in wetted channels; and
    - Access roads or storage areas may not be hydrologically connected to watercourses.

Category 2 Limits - Grading

- Construction of access roads or storage areas within 150 linear feet of the OHWL
    - Access roads or storage areas may not be constructed below the OHWL;
    - Access roads or storage areas may not be constructed in wetted channels or designated critical habitat; and
    - Storage areas may not exceed 5,000 square feet in area.

Category 3 Limits - Grading

- Construction of access roads within critical habitat or below the OHWL
    - Access roads may not be constructed in wetted channels.

- Construction of storage areas exceeding 5,000 square feet in areas above the OHWL
    - Storage areas may not be constructed in wetted channels or designated critical habitat.

d. Installation of Rock Slope Protection/erosion control materials

Project Action-13: Grade temporary access roads, traffic detours.
Project Action-20: Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining Walls.

Category 1 projects involve placement of erosion control materials outside of designated critical habitat or anadromous waters. Category 2 projects involve placement of erosion control materials (excluding RSP, sheet piles, retaining walls) within designated critical habitat or other anadromous waters. Category 3 projects involve placement of RSP, sheet piles, or retaining walls for slide, bridge, culvert, or stream bank stabilization. Therefore, the limits to these categories are as follows:

Category 1 Limits - Erosion Control

- Placement RSP, sheet piles, retaining walls or other erosion control materials outside designated critical habitat or anadromous waters.

Category 2 Limits - Erosion Control

- Placement of erosion control materials in designated critical habitat or anadromous waters
    - RSP, sheet piles, or retaining walls may not be placed within designated critical habitat or anadromous waters; and
    - Erosion control materials may not be placed in the wetted channel.

Category 3 Limits - Erosion Control

- Placement of erosion control materials in designated critical habitat or anadromous waters
    - No more than 150 linear feet per stream bank may be stabilized using RSP, sheet piles, or retaining walls as part of a slide, bridge, or bank stabilization project; and
    - No more than 50 linear feet per stream bank may be stabilized using RSP, sheet piles, or retaining walls at either the outlet side or inlet side as part of a culvert project.

e. Drilling Geotechnical Test Holes

Project Action-8: Use drill rigs and drilling lubricants.

Category 1 projects involve geotechnical drilling in dry channels above the OHWL and outside of designated critical habitat. Category 2 projects involve geotechnical drilling in dry channels in designated critical habitat or other anadromous waters. Category 3 projects involve geotechnical drilling in the wetted channel in designated critical habitat or other anadromous waters. Therefore, the limits to these categories are as follows:

Category 1 Limits - Geotechnical Drilling

- Geotechnical drilling above the OHWL
    - Geotechnical drilling may not take place in wetted channels or designated critical habitat.

Category 2 Limits - Geotechnical Drilling

- Geotechnical drilling below the OHWL or within designated critical habitat
    - Geotechnical drilling may not take place in wetted channels.

Category 3 Limits - Geotechnical Drilling

- Geotechnical drilling in wetted channels
    - Heavy equipment, with the exception of drilling casings or temporary barge supports, may not enter the wetted channel unless all life stages of listed species are absent. It is anticipated that clean gravel pads may be constructed in wetted channels to allow access for drill equipment. Gravel pads will be removed post-drilling unless specifically requested in writing by NMFS.

f. Dewatering and Fish Relocation

Project Action-17: Install temporary cofferdams and diversion cofferdams.
Project Action-18: Temporarily redirect stream flow.
Project Action -28: Capture, handle, exclude, salvage, and relocate listed species.

Category 1 involves dewatering in non-fish bearing streams. Category 2 involves dewatering and fish relocation outside of designated critical habitat and anadromous waters when there is no chance of encountering any life stages of listed species. Category 3 involves all dewatering and fish relocation activities in designated critical habitat or anadromous waters or when any life stage of listed fish species are present. Therefore, the limits to these categories are as follows:

Category 1 Limit - Dewatering and Fish Relocation

- Dewatering in non-fish bearing streams.

Category 2 Limits - Dewatering and Fish Relocation

- Dewatering and fish relocation outside anadromous waters or designated critical habitat.

Category 3 Limits - Dewatering and Fish Relocation

- Dewatering and fish relocation involving the **c**apture, handling, exclusion, or salvage of listed species
    - No more than 10 projects per Caltrans District (30 total) may occur annually.

g. Rehabilitation, Retrofit, and Repair of Culverts and Bridges

Project Action-9: Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure.
Project Action-14: Operate construction equipment and vehicles in the stream channel.
Project Action-15: Construct temporary stream crossings.
Project Action-20: Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls.
Project Action-21: Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications.
Project Action-23: Clean, retrofit, or install culverts.
Project Action-25: Remove existing bridge structure, including footings, piers, and piles.
Project Action-26: Install bridge structures, excluding impact pile-driving.

Category 1 projects involve rehabilitation, retrofit, or repair of culverts or bridges outside designated critical habitat or anadromous waters. Category 2 projects involve rehabilitation, retrofit, or repair of culverts or bridge superstructure (above the OHWL) within designated critical habitat or anadromous waters. Category 3 projects involve rehabilitation, retrofit, or repair of culverts or bridges in designated critical habitat or anadromous waters. Therefore, the limits to these categories are as follows:

Category 1 Limits - Rehabilitation, Retrofit, and Repair of Culverts and Bridges

- Rehabilitation, retrofit, or repair of culverts or bridges outside anadromous waters or designated critical habitat.

Category 2 Limits - Rehabilitation, Retrofit, and Repair of Culverts and Bridges

- Rehabilitation, retrofit, or repair of culvert or bridge superstructure within anadromous waters or designated critical habitat
    - Activities associated with rehabilitation, retrofit, or repair of culverts or bridges may not occur below the OHWL.

Category 3 Limits - Rehabilitation, Retrofit, and Repair of Culverts and Bridges

- Rehabilitation, retrofit, or repair of culverts or bridges within designated critical habitat or anadromous waters
    - Designs that involve major channel modification are only included in the Program in exceptional cases (see following bullet). Channel modification is defined as directly and/or indirectly modifying and/or permanently degrading natural channel forming processes and morphology of perennial, intermittent and ephemeral streams, and estuarine habitats. Channel modification includes the following design elements or construction methods: (1) grade control; (2) channel redirection or guide structures; or (3) fishways.
    - Rehabilitation, retrofit, or repair of culverts or bridges that involve channel modification will only occur in lieu of total replacement or removal of inadequate facilities in cases where replacement or removal is infeasible or unreasonable. In these cases, Caltrans will provide rationale for finding replacement infeasible or unreasonable early in the project delivery process (prior to development of an environmental document). Caltrans will provide a copy of this rationale in the pre-project notification form.

h. Replacement of Culverts and Bridges

Project Action-22: Remove culverts.
Project Action-23: Clean, retrofit, or install culverts.
Project Action-25: Remove existing bridge structure, including footings, piers, and piles.
Project Action-26: Install bridge structures, excluding impact pile-driving.

All culvert and bridge replacements covered in the Program require a post-project reporting and are beyond the limits of Category 1. Category 2 involves culvert and bridge replacement in non-fish bearing streams. All culvert and bridge replacement in fish bearing streams are in Category 3. Therefore, the limits to these categories are as follows:

Category 1 Limits - Replacement of Culverts and Bridges

- Culvert and bridge replacement is not included include in Category 1.

Category 2 Limits - Replacement of Culverts and Bridges

- Replacement of culverts and bridges in non-fish bearing streams.

Category 3 Limits - Replacement of Culverts and Bridges

- Culvert and bridge replacement activities in fish bearing streams
    - The following culverts or bridge designs will be covered under the Program and, generally, designs should be selected in this order of preference: (1) hydraulically transparent crossing design (*i.e.,* full floodplain spanning bridge); (2) streambed simulation strategies[4] involving a bottomless arch or box culvert; or 3) streambed simulation or active channel strategies involving sufficiently-sized and sloped embedded culvert.
    - Designs that involve major channel modification (defined above) are not included in the Program. Channel modification includes the following design elements or construction methods: (1) grade control; (2) channel redirection or guide structures; or (3) fishways.

Culvert and Bridge Replacement Objectives

For the lifespan of a culvert or bridge, hydraulic sections will have the capacity to transport wood, water and sediment. Thus culverts or bridges constructed in the Program are not expected to cause aggradation or degradation to a level that will adversely affect geomorphic processes and fish passage. With the exception of RSP to protect wingwalls and bridge abutments, structures that influence geomorphic processes are not anticipated in new design proposals.

Culvert and Bridge Replacement Design Targets

Removal and replacement of culverts or bridges will occur in two general channel types - confined or alluvial channels. A confined channel is unable to shift laterally because it is bounded by geologic valley walls, or other non-deformable boundaries. An alluvial channel is formed in material (sand, gravel, cobbles, or small boulders) that moves during floods. Alluvial

[4] Stream simulation strategies such as "Active Channel and Stream Simulation Design Methods" are described in greater detail in the NMFS Southwest Region Guidelines for Salmonid Passage at Stream Crossings, September 2001.

channels convey channel bed and bank materials under present flow conditions and adjust their location, dimensions, shape, and gradient under the present hydrologic regime. For the most part, streamflow, sediment supply, boundary resistance and woody debris control how alluvial channels change over time.

The above objectives can be achieved by meeting the following design targets for the two channel types:

- *Confined channel* – the hydraulic section of the culvert or bridge will have the capacity to transport sediment and not aggrade or degrade up to at least a flood event occurring on a 20 year recurrence interval (Q_{20}). This may be achieved if the crossing does not affect a stage change of more than 0.5 feet above what would occur in a channel with natural grade and no artificial confinements or controls at Q_{20}.

- *Alluvial channel* - the minimum culvert or bridge width will be equal to or greater than the active channel width, defined as the 'channel migration zone' (CMZ) width. Delineation of the CMZ width would include the stream meander belt width, relative to the lifespan of the structure. For example, a bridge designed for a lifetime of 100 years should not be smaller than the previous 100 year CMZ and the projected future 100 year CMZ width (CMZ_{100}).

In some cases, particularly in confined channels, it may be possible to design a culvert crossing that will not cause significant aggradation at the inlet and degradation at the outlet with an alternative to the design target described above. In those cases Caltrans will provide designs and rationale to NMFS early in the project development process (prior to completion of an environmental document) for their review. NMFS will either agree or disagree with the Caltrans finding that the design will be likely to provide sustained capacity to transport wood, water, and sediment and provide passage for anadromous fish. If NMFS does not agree with the Caltrans rationale, the project will either be redesigned or consulted on individually outside of this Program.

C. Oversight and Administration

The Program includes Federally funded and non-Federally funded infrastructure projects that meet Program criteria described above. Caltrans will be the Federal lead on Federally funded projects; and the Corps will be the Federal lead on a small number of projects that lack Federal funding. Under the latter scenario, Caltrans will be the applicant as defined by 50 CFR 402.02. Caltrans, however, is responsible for administering and overseeing all projects in the Program.

All projects in the Program will have a Caltrans point of contact. Caltrans points of contact include maintenance supervisors and environmental leads that have received Program training.

For Category 1 projects the point of contact will typically be the maintenance supervisor that oversees the area where the project is occurring. For Category 2 and 3 projects the point of contact will typically be the maintenance or capital environmental lead, depending on which division is implementing the specific project. One District environmental lead (maintenance environmental support staff or environmental capital project delivery staff) will be designated as the Program administrative environmental lead and ultimately responsible for all District-wide Program coordination and administration (*e.g.,* submitting forms, project inventory, training). All maintenance supervisors and environmental leads involved in the Program will receive training in Program limits, project categorization, minimization measures, and administration. The same point of contact structure will apply to all projects in the Program regardless of whether Caltrans or the Corps is the specific Federal lead. Projects may be implemented by non-Caltrans staff. The Caltrans point of contact, however, is responsible for informing the on-site supervisor of Category limits, overseeing project implementation, and completing applicable reporting forms. Furthermore, applicable Program and Category limits will be clearly described in project contracts or work orders; Caltrans points of contact will notify NMFS within 24 hours of learning a project has exceeded Category or Program limits. The following list describes Caltrans proposed oversight and administration measures:

1. Category 1 Projects

Caltrans will not provide notification forms or reporting forms to NMFS for Category 1 projects.

2. Category 2 Projects

Caltrans will not provide a Notification Form for Category 2 projects. A Category 2 Reporting Form will be provided to NMFS by the Caltrans point of contact (Enclosure 4) when each Category 2 project is complete. Information included in these forms will be kept in an annual inventory list (*i.e.,* spreadsheet), maintained by the Caltrans District environmental lead which will be submitted to NMFS as described below in *Section II.C.5 Reporting and Monitoring*.

3. Category 3 Projects

Caltrans will provide NMFS a Category 3 Notification Form (Enclosure 4) for all anticipated Category 3 projects (described above). Caltrans District leads will provide a Category 3 Notification Form to the NMFS Northern California Office (NCO) and/or North-Central Coast Office (NCCO) staff. To help ensure fish handling and relocation remains below numbers analyzed and covered under this Program, Caltrans will include annual numbers (current and anticipated) of fish capture and mortality by District in the table included in the Category 3 Notification Form. Category 3 Reporting Forms (Enclosure 4) are required for all completed Category 3 projects as described below in *Section II.C.5 Reporting and Monitoring*.

4. Notification Requirements

Caltrans will provide NMFS the Category 3 Notification Form described above at least 28 days (four weeks) prior to project construction. Notification to NMFS by Caltrans can be an electronic mail or fax to specified contacts in NMFS Area Offices based on the location of the proposed project:

- *Northern California Office:* Chuck Glasgow, NMFS, 1655 Heindon Road, Arcata, CA 95521; chuck.glasgow@noaa.gov; fax: (707)-825-4840.

- *North-Central Coast Office*: Joel Casagrande or Joe Heublein, NMFS, 777 Sonoma Ave, Room 325, Santa Rosa, CA 95404; joel.casagrande@noaa.gov, joe.heublein@noaa.gove; fax: (707) 575-6050.

The Category 3 Notification Form does not require a response from NMFS for a project to proceed; however, if NMFS has concerns with the project after receiving the form, NMFS will contact Caltrans within 28 days of receipt of the form with any listed species or critical habitat concerns, including whether the proposed project qualifies for the Program. If the project is not completed in the same calendar year, then Caltrans will provide a new Category 3 Notification Form for the same project in subsequent years. Any projects that NMFS indicates do not fit the Program may be further clarified or developed by Caltrans. New project information would then be provided to NMFS for comment.

5. Reporting and Monitoring

Completed forms and lists will be provided to the specified contacts in the NMFS NCO and/or NCCO listed above. Post-project reporting forms and lists will be submitted as follows:

a. Category 3: Submit electronic reporting forms to NMFS within 10 business days of project completion.
b. Category 2 and 3: Prior to February 15, submit an electronic and hard copy of all notification and reporting forms (Category 3), and an annual inventory reporting list (Category 2) from the previous calendar year to NMFS.

Caltrans has an ongoing monitoring program associated with its statewide stormwater permit (SSWP)[5], issued by the State Water Resources Control Board. Under the SSWP, Caltrans must monitor BMPs associated with Program activities as described in Appendix C of Caltrans' Programmatic BA (Caltrans 2010). Monitoring strategies that involve both self-monitoring and monitoring by consultant auditors are employed to check on the reasoned and appropriate application of BMPs as well as the effectiveness of those BMPs as applied. Both focused and

[5] http://www.swrcb.ca.gov/water_issues/programs/stormwater/caltrans.shtml

random inspections of sites are undertaken to ensure that the stormwater program is being implemented as designed and that new BMPs are developed and implemented when indicated. Additional layers of protection and enhancement, beyond the SSWP-related BMPs, are realized though the State Water Resources Control Board's total maximum daily load (TMDL) process.

In additional to ongoing SSWP monitoring program described above, Caltrans proposes to monitor implementation of a subset of projects per District. At least one Category 3 (if implemented) and one Category 2 project per district will be monitored each year. The total number of projects monitored each year will depend on the number of projects implemented. Project sites will be selected by Caltrans. The intent of this monitoring is to: (1) ensure adherence to all criteria and requirements (*i.e.,* projects were constructed as proposed); (2) monitor BMP and ABMP implementation and effectiveness (see SSWP monitoring above); and (3) identify potential unanticipated effects to listed species and/or critical habitat.

Monitoring will involve field reviews of a subset of projects (described in the preceding paragraph) implemented under the Program annually. Caltrans will invite NMFS staff to participate in project evaluation and field review. The field reviews will be conducted following project completion and may be re-visited after the following winter season. Caltrans will summarize the data from each site visit in a brief narrative that will include: (1) a summary of site review and monitoring data; (2) a discussion of implementation effectiveness; and (3) a discussion of the clarity and effectiveness of the forms and monitoring. Caltrans will submit the results of all monitoring field reviews, including the results of the SSWP monitoring, to NMFS (see contacts above) by April 15 of the following year (this date can be extended if it is mutually agreed to by NMFS and Caltrans).

6. Annual Meeting, Program Evaluation, and Training

Caltrans will meet annually with NMFS (or more frequently if needed), for the following purposes: (1) for annual review of covered Project Actions; (2) to evaluate and discuss the effectiveness of the Program; and (3) to ensure that activities implemented under the Program continue to minimize adverse effects to listed species and critical habitat. During annual meetings, Caltrans and NMFS will evaluate and discuss the procedures for managing large woody material encountered at project sites as outlined above in *Section II.B. Project Categorization, Limits and Minimization Measures*.

To assist Caltrans with achieving consistent administration and implementation of the Program within and between all three Districts, Caltrans proposes to give an annual training to maintenance and environmental staff that describes the activities covered by the Program , the information necessary for submittal of notification forms, reporting forms, reporting lists, and additional monitoring requirements. The goal of this training will be to provide the appropriate level of training to staff to ensure that projects are accurately categorized and implemented as

described. In addition the training will cover reporting and pre-notification responsibilities. A Caltrans environmental senior and District maintenance manager in each District are responsible for coordinating and implementing the annual Program training. NMFS staff will be invited to attend and assist the training.

7. Elevation/Issue Resolution

Caltrans proposes that if an issue cannot be resolved between Caltrans and NMFS staff, the issue will be elevated to the management level. Managers and staff will then meet to document and discuss the issues, and will work together to come to an agreement. Issues should be elevated when consensus cannot be reached regarding project categorization; adequacy of avoidance, minimization, or other mitigation measures; or issues related to Program inclusion. In addition, questions about relevant laws, regulations, or policy may be elevated. If managers and staff cannot resolve an issue, then the issue will be raised to the next higher level of each agency (policy level).

D. Action Area

The California Resources Agency identifies 10 hydrologic regions throughout the state. Those within the proposed action area include the North Coast, San Francisco Bay, and the Central Coast regions. The action area includes all of Caltrans District 4 and the portions of Caltrans districts 1 and 2 that lie within Figure 1. The portions of each region included in the action area are briefly described below.

1. North Coast

The North Coast region includes all streams in California draining to the Pacific Ocean north of San Francisco Bay. North coast streams pass through or drain from the California coastal mountains. These are typically high-gradient streams with small estuaries. Watersheds are often rugged, with steep valley sides. Valleys are often heavily forested with conifer and mixed evergreen forests and include species such as coast redwood (*Sequoia sempervirens*), Douglas-fir (*Pseudotsuga menziesii*), tanoak (*Notholithocarpus densiflorus*), madrone (*Arbutus menziesii*), California bay laurel (*Umbellularia californica*), and golden chinquapin (*Chrysolepis chrysophylla*). Ridge tops often support chaparral and grassland communities, some coastal areas are occupied by maritime chaparral or coastal scrub communities, and inland valleys and foothill regions are often occupied by oak (*Quercus spp.*) woodland and chaparral communities.

All North Coast watersheds have been affected by various human activities including logging, mining, ranching and agriculture. In the North Coast region, urban centers are few, relatively small in size, and primarily occur along the coast. In this region, waterways and wetlands have

been impacted by sedimentation, loss of estuarine habitat, removal of large woody debris, and streamflow diversions.

Major river systems in the North Coast region include (from north to south): Smith River, Klamath River, Eel River, Mattole River, Ten Mile River, Noyo River, Garcia River, Gualala River, and the Russian River.

ESA-listed fish species under NMFS jurisdiction found in watersheds of the North Coast region include SONCC and CCC coho salmon ESUs, CC Chinook salmon ESU, NC and CCC steelhead DPSs, the Southern DPS of North American green sturgeon, and the southern DPS of Pacific eulachon.

2. San Francisco Bay

The San Francisco Bay region consists of San Francisco Bay and its tributaries (excluding the Sacramento and San Joaquin rivers), the western portion of the Sacramento River–San Joaquin River Delta in eastern Solano and Contra Costa counties, and the coastal streams of the San Francisco Peninsula southward to Pescadero Creek (inclusive). Most of the coastal watersheds in southern Marin County and the San Francisco Peninsula drain valleys dominated by mixed coniferous forests in the headwaters and mixed communities of coastal chaparral, grasslands, and oak woodland on the lower marine terraces. Low elevation stream corridors typically support a mixed willow (*Salix spp.*) and red alder (*Alnus rubra*) riparian community.

San Francisco Bay is the largest estuary on the west coast. It has been highly modified by extensive urbanization, diking and drainage of wetlands, and diversion of significant inflow from the Sacramento and San Joaquin Rivers. Despite extensive environmental degradation, San Francisco Bay and the Delta provide important habitat for protected estuarine resident species (*e.g.,* delta smelt) and ESA-listed anadromous species (*e.g.,* Chinook salmon, steelhead, and green sturgeon).

Major tributaries to San Francisco Bay (excluding the Sacramento and San Joaquin rivers) include the Petaluma River, Napa River, Alameda Creek, Coyote Creek, Guadalupe River, San Francisquito Creek and San Mateo Creek. These tributaries drain arid inland valleys dominated by oak woodlands and chaparral. Many of these drainages are heavily urbanized at lower elevations. Major coastal draining streams of the San Francisco Peninsula include Pilarcitos Creek, Tunitas Creek, San Gregorio Creek, and Pescadero Creek. Many of these coastal systems form bar-built estuaries, or lagoons in summer, which provide important rearing habitats for rearing juvenile salmonids. Major tributaries to the Delta in eastern Contra Costa and Solano counties include Kellogg Creek, Marsh Creek (eastern Contra Costa County), Cache Slough (Ulatis and Alamo creeks), and Lindsay Slough (eastern Solano County).

ESA-listed fish species under NMFS jurisdiction found in watersheds of the San Francisco Bay region include the CCC and CV steelhead DPSs, SRWR and CVSR Chinook salmon ESUs, CCC coho salmon, and southern DPS green sturgeon. Anadromous salmonids and sturgeon migrate through San Francisco Bay and the Delta during their outmigration to the ocean and during their upstream migration to spawn in the Sacramento and San Joaquin River systems and tributaries of the bay.

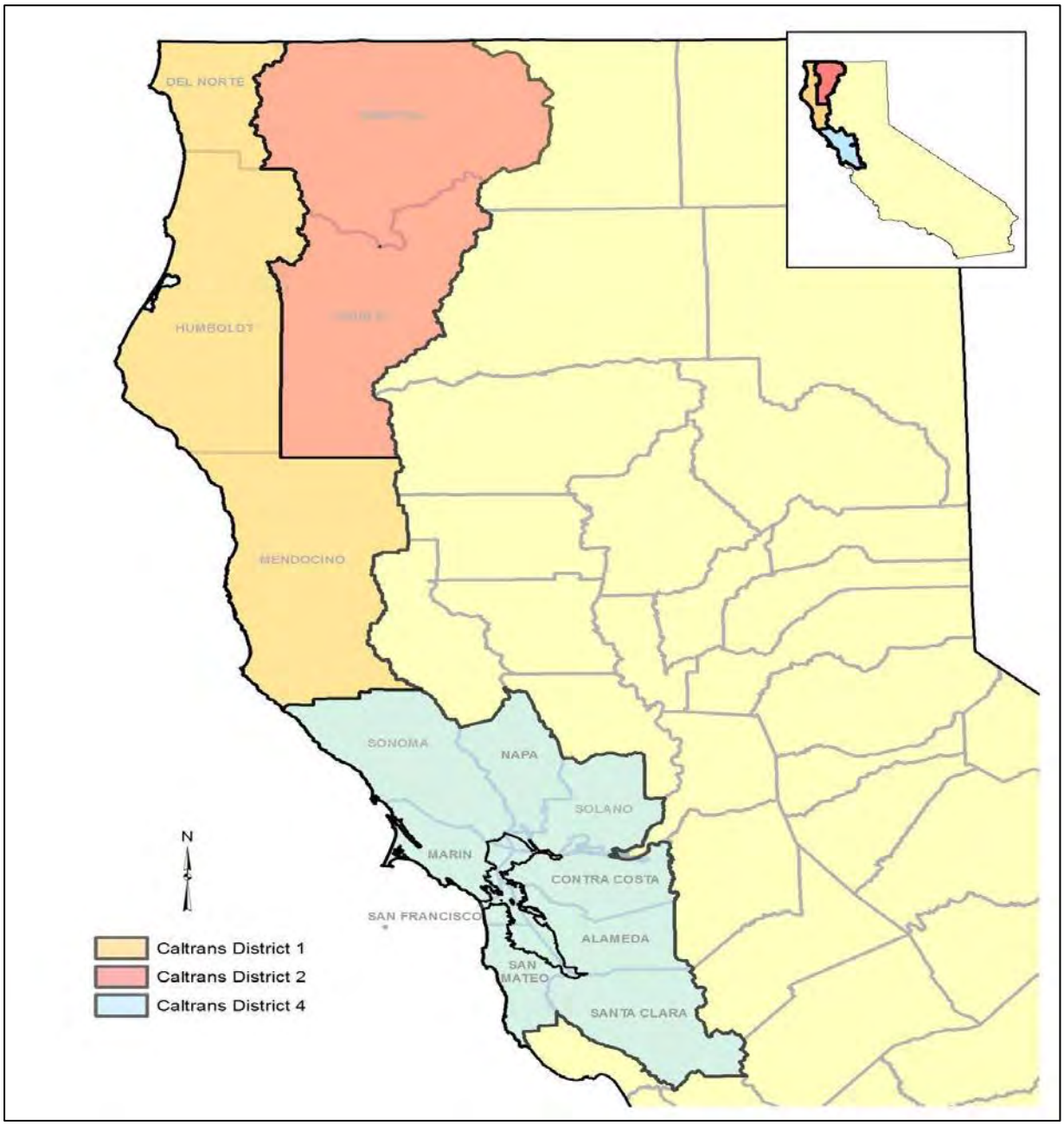

Figure 1. Program action area for the routine maintenance and repair activities in Districts 1, 2, and 4.

3. Central Coast

The Central Coast region encompasses coastal draining watersheds from Pescadero Creek Lagoon (included in the San Francisco Bay region) in San Mateo County south to the Carpinteria salt marsh in Santa Barbara County. However, the action area includes only a portion of this region that overlaps with a portion of Caltrans District 4. Only two small coastal streams from the Central Coast region, Arroyo de los Frijoles and Gazos Creek, are included in the action area. These watersheds drain through valleys on the west slope of the Santa Cruz Mountain Range. The steeper canyons are predominantly occupied by mixed evergreen forests with species such as redwood, Douglas fir, California bay laurel, tanoak, and madrone. Oak woodland, oak-savanna, coastal scrub, maritime chaparral, and grassland communities occupy the foothill and coastal terrace regions. The program also includes streams in the Upper Pajaro River watershed that are within Caltrans District 4 (*i.e.*, those in southern Santa Clara County). These streams drain the east slope of the Santa Cruz Mountains (*e.g.,* Uvas and Llagas creeks) and the west slope of the Diablo Range (*e.g.,* Pacheco Creek). Oak woodland is more common in these drier watersheds and riparian areas are dominated by willow and California sycamore (*Platanus racemosa*). In southern Santa Clara County, agricultural areas are extensive on the valley bottoms. Much of the valley floor and coastal plain habitats in the Central Coast region have been developed for agriculture or urban uses. As a result, many streams and wetlands in this region have been highly degraded due to floodplain encroachment, channelization, removal of riparian vegetation, sedimentation, and impaired water quality and quantity.

ESA-listed fish species under NMFS jurisdiction found in the action area in the Central Coast region include the CCC and SCCC steelhead DPSs and the CCC coho salmon ESU.

III. ANALYTICAL FRAMEWORK

A. Jeopardy Analysis

In accordance with policy and regulation, a jeopardy analysis relies on four components: (1) the Status of the Species, which summarizes the ESU/DPS's range-wide conditions, the factors responsible for that condition, and the species' likelihood of both survival and recovery; (2) the Environmental Baseline,[6] which generally analyzes the condition of ESA-listed species in the action area, the factors responsible for that condition, and the relationship of the action area to the likelihood of both the survival and recovery of ESA-listed species; (3) the Effects of the

[6] Specifically, 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 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process (50 CFR §402.02).

Action,[7] which generally includes the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species in the action area; and (4) Cumulative Effects,[8] which generally evaluates the effects of future, non-Federal activities in the action area on ESA-listed species.

The jeopardy determination is made by adding the effects of the proposed Federal action and any Cumulative Effects to the Environmental Baseline and then determining if the resulting changes in species status 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.

The jeopardy analysis places an emphasis on the range-wide likelihood of both survival and recovery of these listed species and the role of the action area in the survival and recovery of the listed species. The significance of the effects of the proposed Federal action is considered in this context, taken together with cumulative effects, for purposes of making the jeopardy determination. We use a hierarchical approach that focuses first on whether or not the effects on ESA-listed species in the action area will impact their respective population. If the population will be impacted, we then assess whether this impact is likely to affect the ability of the populations to support the survival and recovery of the ESU/DPS.

B. Destruction or Adverse Modification Determination

In this biological opinion, NMFS does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 C.F.R. 402.02, which was invalidated by *Gifford Pinchot Task Force v. USFWS*, 378 F.3d 1059 (9th Cir. 2004), amended by 387 F.3d 968 (9th Cir. 2004). Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

The adverse modification analysis in this biological opinion relies on four components: (1) the Status of Critical Habitat, in which NMFS evaluates the range-wide condition of critical habitat for the ESA-listed species in terms of primary constituent elements (PCEs, such as sites for spawning, rearing, and migration), the factors responsible for that condition, and the conservation value of the critical habitat overall; (2) the Environmental Baseline, which generally evaluates the condition of critical habitat in the action area, the factors responsible for that condition, and the conservation value of the critical habitat in the action area; (3) the Effects

[7] Specifically, Effects of the Action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR § 402.02).

[8] Specifically, 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).

of the Action, which generally includes the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs in the action area and how that will influence the conservation value of affected critical habitat units; and (4) Cumulative Effects, which generally evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the conservation value of affected critical habitat units.

For purposes of the adverse modification determination, we add the effects of the proposed Federal action on designated critical habitat in the action area, and any Cumulative Effects, to the Environmental Baseline and then determine if the resulting changes to the conservation value of critical habitat in the action area are likely to cause an appreciable reduction in the conservation value of critical habitat range-wide. If the proposed action when analyzed in the context described above will negatively affect PCEs of critical habitat in the action area, we then assess whether or not this reduction is likely to cause an appreciable reduction in the conservation value of critical habitat range-wide.

C. Use of Best Available Scientific and Commercial Information

To conduct the assessment, NMFS examined an extensive amount of information from a variety of sources. Detailed background information on the biology and status of the listed species and critical habitat has been published in numerous documents including peer reviewed scientific journals, primary reference materials, and governmental and non-governmental reports. Additional information regarding the effects of the project's actions on the listed species in question, their anticipated response to these actions, and the environmental consequences of the actions as a whole was formulated from the aforementioned resources, the biological assessment for this project, and project meeting notes if applicable. For information that has been taken directly from published, citable documents, those citations have been referenced in the text and listed at the end of this document. A copy of the administrative record for this consultation is on file with the NMFS California Coastal Area Office.

IV. STATUS OF THE SPECIES/CRITICAL HABITAT

In this section of the Biological Opinion, we describe the threatened and endangered species and their designated critical habitat that occur in the action area and that may be exposed to the direct or indirect effects of the proposed action. NMFS has determined that the following species and critical habitat occur within the action area:

Threatened Southern Oregon/Northern California Coast (SONCC) coho salmon ESU
Listing determination (70 FR 37160, June 28, 2005)
Critical habitat designation (64 FR 24049, May 5, 1999);

Endangered Central California Coast (CCC) coho salmon ESU
Listing determination (70 FR 37160, June 28, 2005)
Critical habitat designation (64 FR 24049, May 5, 1999);

Threatened California Coastal (CC) Chinook salmon ESU
Listing determination (70 FR 37160, June 28, 2005)
Critical habitat designation (70 FR 52488, September 2, 2005);

Endangered Sacramento River Winter-run (SRWR) Chinook salmon ESU
Listing determination (59 FR 440, January 4, 1994)
Critical habitat designation (58 FR 33212, June 16, 1993);

Threatened Central Valley Spring-run (CVSR) Chinook salmon ESU
Listing determination (70 FR 37160, June 28, 2005)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened Northern California (NC) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened Central California Coast (CCC) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened South Central California Coast (SCCC) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened California Central Valley (CV) steelhead DPS
Listing determination (71 FR 834, January 5, 2006)
Critical habitat designation (70 FR 52488, September 2, 2005);

Threatened Southern DPS of North American green sturgeon
Listing determination (71 FR 17757, April 7, 2006)
Critical habitat designation (74 FR 52300, October 9, 2009);

Threatened Southern DPS of Pacific eulachon
Listing determination (75 FR 13012, March 18, 2010)
Critical habitat designation (76 FR 65324, October 20, 2011).

In California, designated critical habitat (58 FR 45269, August 27, 1993) for the threatened

Eastern Population Segment of Steller sea lion is limited to Sugarloaf Island near Cape Mendocino and Año Nuevo Island off the southern San Mateo County coast. These islands are not within the action area and the closest Caltrans-owned infrastructure is over one mile away (State Route 1). Therefore, the proposed action will have no effect on designated critical habitat for the threatened Eastern Population Segment of Steller sea lion, and this critical habitat will not be considered further in this biological opinion.

A. Species Description and Life History

1. Coho salmon

The life history of coho salmon in California has been well documented by Shapovalov and Taft (1954) and Hassler (1987). Coho salmon are semelparous, *i.e.*, they die after spawning. In contrast to the life history patterns of other anadromous salmonids, coho salmon in California generally exhibit a relatively simple 3-year life cycle (Shapovalov and Taft 1954). Adult salmon typically begin the freshwater migration from the ocean to their natal streams after heavy late-fall or winter rains breach the sand bars at the mouths of coastal streams (Sandercock 1991). Delays in river entry of over a month are not unusual (Salo and Bayliff 1958, Eames *et al.* 1981). Adult returns typically peak in December and January but continue into March, with spawning occurring shortly after arrival to the spawning ground (Shapovalov and Taft 1954).

Upon emergence from the redd, coho salmon fry seek out shallow water, usually along stream margins. As they grow, juvenile coho salmon often occupy habitat at the heads of pools, which generally provide an optimum mix of high food availability and good cover with low swimming cost (Nielsen 1992). Chapman and Bjornn (1969) determined that larger juveniles tend to occupy the head of pools, whereas smaller juveniles are found further down the pools. As the fish continue to grow, they move into deeper water and expand their territories until, by July and August, they reside exclusively in deep pool habitat.

Coho salmon are typically associated with small to moderately-sized coastal streams characterized by heavily forested watersheds; perennially-flowing reaches of cool, high-quality water; dense riparian canopy; deep pools with abundant overhead cover; instream cover consisting of large, stable woody debris and undercut banks; and gravel or cobble substrates (Sandercock 1991).

Preferred rearing habitat has little or no turbidity and high sustained invertebrate forage production. Juvenile coho salmon feed primarily on drifting terrestrial insects, much of which are produced in the riparian canopy, and on aquatic invertebrates growing within the interstices of the substrate and in leaf litter in pools and side channels. Juvenile coho salmon prefer well shaded pools at least 1 meter deep with dense overhead cover; abundant submerged cover composed of undercut banks, logs, roots, and other woody debris; and water temperatures of 12-

15 °C, but not exceeding 22-25 °C for extended time periods (Brett 1952, Bell 1973, Reiser and Bjornn 1979). Growth is slowed considerably at 18 °C and ceases at 20 °C (Stein *et al*. 1972, Bell 1973). Survival of young coho salmon drops sharply when fine sediment makes up 15 percent or more of the substrate (Quinn 2005).

2. Chinook salmon

Chinook salmon are the largest member of the *Oncorhynchus* genus, with adults weighing more than 120 pounds reported from North American waters (Scott and Crossman 1973; Page and Burr 1991). Chinook salmon exhibit two main life history strategies: ocean-type fish and river-type fish (Healey 1991; Myers *et al*. 1998). In California, ocean-type fish typically are fall or late fall-run fish that enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of rivers, and spawn within a few weeks of freshwater entry. Juvenile ocean-type Chinook salmon (the life-history type present in the action area) emigrate to estuarine or marine environments shortly after emergence from the redd (Healey 1991). The low flows, high river temperatures, and sand bars that develop in smaller coastal rivers in California during the summer months favor an ocean-type life history (Kostow 1995). With this life history, smolts typically outmigrate as subyearlings during April through July (Myers *et al*. 1998). The ocean-type Chinook salmon in California tend to use estuaries and coastal areas for rearing more extensively than river-type Chinook salmon. In California, river-type fish are typically winter- or spring-run fish that have a protracted adult freshwater residency, sometimes spawning several months after entering freshwater. Progeny of river-type fish frequently spend one or more years in freshwater before emigrating.

For the ocean type life-history, fry emergence begins in December and continues into mid-April (Leidy and Leidy 1984). Emergence can be hindered if the interstitial spaces in the redd are not large enough to permit passage of the fry. In laboratory studies, Bjornn and Reiser (1991) observed Chinook salmon and steelhead fry had difficulty emerging from gravel when fine sediments (6.4 millimeter (mm) or less) exceeded 30-40 percent by volume. After emergence, Chinook salmon fry seek out areas behind fallen trees, back eddies, undercut banks and other areas of bank cover (Everest and Chapman 1972). As they grow, their habitat preferences change. Juveniles move away from stream margins and begin to use deeper water areas with slightly faster water velocities, but continue to use available cover to minimize the risk of predation and reduce energy expenditure. Fish size appears to be positively correlated with water velocity and depth (Chapman and Bjornn 1969, Everest and Chapman 1972). Optimal temperatures for both Chinook salmon fry and fingerlings range from 12-14 °C, with maximum growth rates at 12.8 °C (Boles 1988). Juvenile Chinook salmon feed on small terrestrial and aquatic insects and aquatic crustaceans. Cover, in the form of rocks, submerged aquatic vegetation, logs, riparian vegetation, and undercut banks provide food, shade, and protect juveniles from predation.

3. Steelhead

Steelhead are anadromous forms of *O. mykiss*, spending some time in both freshwater and saltwater. Steelhead can be divided into two reproductive ecotypes, based upon their state of sexual maturity at the time of river entry (*i.e.,* winter or summer runs) and the duration of their spawning migration. Winter-run steelhead, the more common form of the two ecotypes, typically migrate upstream during high flows between November and April. In many streams, the timing of upstream migration begins only after stream flows are high enough to breach the sand bars at the stream mouths. Summer-run steelhead migrate upstream from March through September. In contrast to other species of *Oncorhynchus*, steelhead may spawn more than one season before dying (iteroparity); although one-time spawners represent the majority (Shapovalov and Taft 1954).

Steelhead young usually rear in freshwater for one to three years before migrating to the ocean as smolts in the spring. Steelhead may remain in the ocean for one to five years (two to three years is most common) before returning to their natal streams to spawn (Shapovalov and Taft 1954, Busby *et al.* 1996). Smolt out-migration typically occurs from February through June, with peak periods in April and May (Fukushima and Lesh 1998). Outmigration appears to be more closely associated with size than age and a decline in the hydrograph (Shapovalov and Taft 1954). Once in the ocean, the distribution of steelhead is not well known. Coded wire tag recoveries indicate most steelhead tend to migrate north and south along the continental shelf (Barnhart 1986).

For steelhead embryos, survival to emergence is inversely related to the proportion of fine sediment in the spawning gravels. Steelhead are slightly more tolerant of sediment levels than other salmonids, with significant reductions in survival when particles less than 0.25 inches in diameter comprise 20 to 25 percent of the substrate. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart 1986). Upon emerging from the gravel, fry rear in edge-water habitats and move gradually to deeper and faster habitats as they grow (Chapman and Bjornn 1969, Everest and Chapman 1972, Smith and Li, 1983). During this period, cover (*i.e.,* overhanging and emergent vegetation, boulders, and woody material) is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Meehan and Bjornn 1991).

As juveniles, steelhead tend to use riffles and other fast water habitats (*i.e.,* runs and heads of pools) during summer where food, in the form of drifting invertebrates, is more abundant (Smith and Li 1983). Young steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. In winter, juvenile steelhead become less active and hide in available cover, including gravel or woody debris, under cut banks, and dense streamside vegetation. Steelhead typically spend much of their juvenile lifestage in freshwater habitats, particularly inland populations. However, for many coastal systems, the use of estuaries and seasonal lagoons by juvenile steelhead for rearing is much more

extensive. Studies have confirmed estuaries (including seasonal, bar-built lagoons) play an important role in their lifecycle because they are generally more productive than upstream riverine habitats, growth while rearing in the lagoon is often substantial and, therefore, achieving a larger size prior to ocean entry greatly improves ocean survival (Smith 1990, Bond 2006, Hayes *et al.* 2008, Hayes *et al.* 2011).

In riverine habitats, adequate flow, temperature, and food availability are important factors for determining distribution, survival, and growth. Water temperature affects the metabolic rate of rearing juvenile steelhead which, in turn, influences growth, survival, and habitat selection (Smith and Li 1983, Barnhart 1986, Myrick and Cech 2005, Casagrande 2010). Optimal temperatures for steelhead growth are between 10 and 20°C (Hokanson *et al.* 1977, Wurtsbaugh and Davis 1977, Myrick and Cech 2005). Variability in the diurnal water temperature range is also important for survival and growth (Hokanson *et al.* 1977, Busby *et al.* 1996).

Suspended sediment concentrations can also influence the distribution and growth of steelhead (Bell 1973, Sigler *et al.* 1984, Newcombe and Jensen 1996). Elevated suspended sediment concentrations result in a decrease in water clarity, or turbidity. This directly impairs visibility for feeding and, depending on the severity and duration, turbidity may result in emigration from the area (Sigler *et al.* 1984). As the suspended sediment settles in the stream bed, it can clog the interstitial spaces between coarser substrate thereby impacting invertebrate production and community composition (Waters 1995). As noted above for other salmonids, a high concentration of fine sediments will impair substrate suitability for spawning and egg survival (Newcombe and Jensen 1996). Bell (1973) found suspended sediment loads of less than 25 milligrams per liter (mg/L) were typically suitable for rearing juvenile steelhead.

4. Green sturgeon

The North American green sturgeon ranges from the Bering Sea, Alaska, to Ensenada, Mexico. Presently, spawning has been confirmed to occur in the Klamath and Rogue rivers (Northern DPS) and the Sacramento and Feather rivers[9] (Southern DPS). Adults spawn in large rivers during the spring and early summer and eggs are laid in turbulent areas on the river bottom and settle into the interstitial spaces between cobble and gravel (Adams *et al*. 2007). Green sturgeon require cool water temperatures for egg and larval development, with optimal temperatures ranging from 11 to 17 ˚C (Van Eenennaam *et al*. 2005). Eggs hatch after 6–8 days, and larval feeding begins 10–15 days post-hatch; metamorphosis of larvae into juveniles typically occurs after a minimum of 45 days (post-hatch) when fish have reached 60–80 mm total length (TL) (Beamesderfer *et al*. 2007). After rearing in freshwater or the estuary of their natal river for one to four years, young green sturgeon move into coastal waters (Nakamoto *et al*. 1995, Adams *et*

[9] Spawning was recently confirmed in the Feather River downstream of Oroville Dam (Findings reported in annual report for 2011 4(d) project 16073: Lower Feather River Green Sturgeon Spawning Survey by A. Seesholtz, DWR).

al. 2002). Juvenile green sturgeon captured in the Klamath River estuary ranged from 320 to 660 mm TL (Nakamoto *et al.* 1995). Records of juvenile green sturgeon in San Francisco estuary are limited, but juveniles captured in the Delta are typically greater than 200 mm TL (Adams *et al.* 2002), suggesting Southern DPS green sturgeon also spend several months rearing in freshwater before entering the estuary. Laboratory studies, conducted by Allen and Cech, Jr. (2007), indicated juveniles approximately 6 months old (approximately 34 cm TL) were tolerant of saltwater, but approximately 1.5 year old (approximately 75 cm TL) green sturgeon appeared more capable of successful osmoregulation in salt water. Furthermore, green sturgeon observed from coastal marine waters in limited entry groundfish bottom trawl and California halibut commercial fisheries between 2007 and December 2010 (n=88) were greater than 60 cm fork length (or greater than approximately 65 cm TL) (WCGOP 2011, unpublished data). Green sturgeon are one of the most marine-oriented and widely distributed of the sturgeons; sexually immature fish that have entered coastal marine waters ("subadults ") spend several years at sea before reaching reproductive maturity and returning to freshwater to spawn for the first time (Nakamoto *et al*. 1995).

The length at first reproductive maturity is estimated to be 152 cm TL (14-16 years) for males and 162 cm TL (16-20 years) for females in the Klamath River (Van Eenennaam *et al*. 2006), and 145 cm TL for males and 166 cm TL for females in the Rogue River (Erickson and Webb 2007). Adult green sturgeon are iteroparous and believed to spawn every 2-4 years (Moyle 2002, Erickson and Webb 2007). Although males are capable of spawning annually, female sturgeon typically require two years to complete vitellogenesis (*i.e.,* process of yolk formation necessary prior to spawning).

Mature green sturgeon enter their natal river in the spring and, in the Northern DPS, typically leave the river during the subsequent autumn when water temperatures drop below 10 °C and flows increase (Erickson and Webb 2007). Telemetry studies by Heublein *et al.* (2009) revealed adults typically enter San Francisco Bay and begin their upstream spawning migrations between late February and early May. Based on egg capture and upstream migration of tagged fish, peak spawning is estimated to occur in deep turbulent sections of the Sacramento River between April and mid-June (Poytress *et al*. 2011, Heublein *et al.* 2009). In the Southern DPS, tagged adult green sturgeon displayed two outmigration strategies; presumably after spawning, green sturgeon emigrated from Sacramento River during summer months, or remained in the river until the onset of winter flows (Heublein *et al.* 2009).

Subadult and adult green sturgeon move between coastal waters and various estuaries along the U.S. West Coast between San Francisco Bay, California, and Grays Harbor, Washington (Lindley *et al*. 2008, Lindley *et al*. 2011). Multiple rivers and estuaries are visited by dense aggregations of green sturgeon in summer months (Moser and Lindley 2007, Lindley *et al*. 2011). Notably, capture of green sturgeon in San Pablo Bay and detections of tagged green

sturgeon indicated adult and subadult green sturgeon can be present in the Bay during all months of the year (Kelly *et al*. 2007, Heublein *et al.* 2009, Lindley *et al.* 2011). Relatively little is known about how green sturgeon use habitats in the coastal ocean and in estuaries, or the purpose of their episodic aggregations there at certain times (Lindley *et al*. 2008, Lindley *et al*. 2011). Genetic studies examining the stock composition of estuarine aggregations (Israel *et al*. 2009) indicate that almost all green sturgeon in the San Francisco Bay system belong to the Southern DPS. This is corroborated by tagging and tracking studies which found that no green sturgeon tagged in the Klamath or Rogue rivers (*i.e.,* Northern DPS spawning rivers) were detected in San Francisco Bay (Lindley *et al*. 2011). However, green sturgeon in coastal waters adjacent to San Francisco Bay may include Northern DPS green sturgeon. Genetic analysis of tissue samples collected from observed green sturgeon bycatch in coastal waters adjacent to San Francisco Bay indicated that approximately 17 percent (*i.e.,* 3 out of 18) of the green sturgeon encountered and sampled belonged to the Northern DPS and approximately 83 percent (*i.e.,* 15 out of 18) belonged to the Southern DPS (Israel 2010).

Green sturgeon feed on benthic invertebrates and fish (Adams *et al.* 2002). Radtke (1966) analysed stomach contents of juvenile green sturgeon captured in the Delta and found the majority of their diet was benthic invertebrates such as mysid shrimp and amphipods (*Corophium spp*). Manual tracking of acoustically-tagged green sturgeon in the San Francisco Bay estuary indicates they are generally demersal but make occasional forays to surface waters, perhaps to assist their migration (Kelly *et al*. 2007). Recent telemetry data in coastal ocean habitats suggest that green sturgeon spent a longer duration in areas with high seafloor complexity, especially where a greater proportion of the substrate consists of boulders (Huff *et al*. 2011). However, while presumably feeding on benthic invertebrates in estuaries green sturgeon do not appear to utilize hard substrates (Dumbauld *et al*. 2008). Preliminary data from mapping surveys conducted in Willapa Bay, Washington, showed densities of "feeding pits" (depressions in the substrate believed to be formed when green sturgeon feed) were highest over shallow intertidal mud flats, while harder substrates (*e.g.,* gravel) had no pits (M. Moser, unpublished data). In their natal rivers, telemetry data indicates mature green sturgeon prefer deep pools, presumably for the purposes of spawning and conserving/restoring energy (Erickson and Webb 2007, Heublein *et al*. 2009). Similar tracking studies involving juvenile green sturgeon have not been conducted, and their behavior and habitat preferences in rivers and estuaries are largely unknown.

5. Pacific Eulachon

Eulachon are a smelt native to eastern North Pacific waters. Historically, Pacific eulachon ranged from the Bering Sea to Monterey Bay, California (Hart and McHugh 1944, Eschmeyer *et al.* 1983a, Minckley *et al.* 1986, Hay and McCarter 2000). However, over the past several decades the southern extent of their distribution has receded northward to the Mad River in

northern California. The Southern DPS of Pacific eulachon extends from the Nass River of British Columbia to the Mad River of California.

Eulachon are semelparous and anadromous, spending most of their lives in marine environments before returning to freshwater to spawn once and die. Because larvae exit the freshwater system almost immediately, they likely retain homing only to the estuarine system that their natal streams drain (Hay and McCarter 2000, Beacham *et al.* 2005). Specific spawning rivers within the natal system are likely selected based upon environmental conditions at the time of return (Hay and Beacham 2005).

Adult eulachon have been observed in California's Humboldt Bay, Klamath, Mad, Russian, and Sacramento Rivers as well as Redwood Creek, the Umpqua and Rogue Rivers in Oregon, and Washington's Puget Sound, Hood Canal, Bear, Naselle, Nemah, Wynoochee, Quinault, Queets, and Nooksack Rivers (Odemar 1964, Moyle 2002, Minckley *et al.* 1986, Emmett *et al.* 1991, Jennings 1996, Wright 1999, Larson and Belchik 1998, Musick *et al.* 2000, WDFW and ODFW 2001). Spawning has been documented in the Elwha River and the Strait of Juan de Fuca, but sightings or spawning in these Oregon and Washington rivers is very limited or unknown (Wright 1999, Shaffer *et al.* 2007). For southern DPS eulachon, most spawning is believed to occur in the Columbia River and its tributaries (Grays, Skamokawa, Elochoman, Kalama, Lewis, and Sandy rivers), with less production from the Mad and Klamath Rivers, as well as sporadic production in the other Oregon and Washington rivers (Emmett *et al.* 1991, Musick *et al.* 2000, WDFW and ODFW 2001). Eulachon from southern rivers generally spawn at a younger age than eulachon from more northern rivers (Clarke *et al.* 2007).

Spawn timing depends upon the river system involved (Willson *et al.* 2006). In the Columbia River and farther south, spawning occurs from late January to May, although river entry occurs as early as December (Hay and McCarter 2000). The peak of eulachon runs in Washington State is from February through March. Fraser River spawning is significantly later, in April and May (Hay and McCarter 2000). The populations in the Klamath River, Mad River, Redwood Creek, and Sacramento River are thought to be extirpated or nearly so[10].

The timing of eulachon entry into spawning rivers is likely tied to water temperature and tidal cycles (Ricker *et al.* 1954, WDFW and ODFW 2001, Lewis *et al.* 2002, Spangler 2002). Spawning normally occurs when water temperature is between 39° and 50° Fahrenheit. Adults may migrate up to 100 miles upstream to reach spawning grounds (Hart and McHugh 1944). Males tend to arrive on spawning grounds earlier than females and tend to stay longer, making them more susceptible to commercial and recreational fisheries (Hart and McHugh 1944). However, males outnumber females by a roughly 2:1 margin. Eulachon sperm is viable for only minutes and a key factor of eulachon spawning may be male grouping en mass to broadcast their

[10] http://www.nmfs.noaa.gov/pr/species/fish/pacificeulachon.htm (last visited on September 26, 2013)

sperm. Once milt reaches downstream females, each female releases 7,000 to 31,000 eggs (in the Columbia River) at which time fertilization occurs (WDFW and ODFW 2001). Females lay eggs over sand, course gravel, or detrital substrate. This reproductive strategy requires high eulachon density to ensure fertilization. Eggs attach to gravel or sand and incubate for 30 to 40 days after which larvae drift to estuaries and coastal marine waters (Wydoski and Whitney 1979) and after three to five years, adults migrate back to natal basins to spawn.

Eulachon generally die following spawning (Scott and Crossman 1973, Clarke *et al.*2007). Maximum known lifespan is 9 years of age, but 20 to 30 percent of individuals live to 4 years and most individuals survive to 3 years of age, although spawning has been noted as early as 2 years of age (Wydoski and Whitney 1979, Barrett *et al.*1984, Hugg 1996, Hay and McCarter 2000, WDFW and ODFW 2001). The age distribution of spawners varies between river and from year-to-year (Willson *et al.*2006).

Adult eulachon are found in coastal and offshore marine habitats possibly to 2,000 feet deep, but more frequently between 50 and 600 feet deep (Allen and Smith 1988, Hay and McCarter 2000, Willson *et al.*2006). Following hatching in freshwater, larvae and juveniles become thoroughly mixed in coastal waters generally less than 50 feet deep and move deeper as they grow (Barraclough 1964, Hay and McCarter 2000). Larval and post larval eulachon prey upon phytoplankton, copepods, copepods eggs, mysids, barnacle larvae, worm larvae, and other eulachon larvae until they reach adult size (WDFW and ODFW 2001). During this time, the primary prey of eulachon are copepods and euphausiids, including Thysanoessa *spp.*, unidentified malacostracans, and cumaceans (Smith and Saalfeld 1955, Barraclough 1964, Wydoski and Whitney 1979, Drake and Wilson 1991, Studevant *et al.*1999, Hay and McCarter 2000).

B. Status of Species

1. Status of the SONCC coho salmon ESU

A comprehensive review of estimates of historic abundance, decline, and present status of coho salmon in California is provided by Brown *et al.* (1994). They estimated that the coho salmon annual spawning population in California ranged between 200,000 and 500,000 fish in the 1940s, which declined to about 100,000 fish by the 1960s, followed by a further decline to about 31,000 fish by 1991. Brown *et al.* (1994) concluded that the California coho salmon population had declined more than 94 percent since the 1940s, with the greatest decline occurring since the 1960s. More recent population estimates vary from approximately 600 to 5,500 adults (Brown *et al.* 1994). Available information suggests that SONCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative) and has experienced many local extirpations (NMFS 2001, Good *et al.* 2005). In addition, the SONCC coho salmon ESU has experienced range constriction, fragmentation, and a

loss genetic diversity. Many subpopulations that may have acted to support the species' overall numbers and geographic distribution have likely been lost. While the amount of data supporting these conclusions is not extensive, NMFS is unaware of information that suggests a more positive assessment of the condition of the SONCC coho salmon ESU and its critical habitat. Recent status reviews for SONCC coho salmon conclude that this ESU is likely to become endangered within the foreseeable future (NMFS 2001, Good *et al.* 2005). In 2005 NMFS evaluated the listing status of the SONCC coho salmon ESU and concluded that the SONCC coho salmon ESU continues to warrant listing under the ESA as a threatened species (70 FR 37160, June 28, 2005). Negative trends in the last five years are likely due to the apparent low marine survival that have contributed to observed declines in SONCC coho salmon (Williams *et al.* 2011). The most recent status review conducted by NMFS Southwest Fisheries Science Center (Williams *et al.* 2011) raises concerns regarding recent negative population trends across the ESU, but does not suggest a change in extinction risk for the SONCC coho salmon ESU. In its most recent five-year review, NMFS recommended that the SONCC coho salmon ESU remain listed as a threatened species (NMFS 2011a, 76 FR 50477, August 15, 2011).

2. Status of the CCC coho salmon ESU

Historically, the CCC coho salmon ESU was comprised of approximately 76 coho salmon populations.[11] Most of these were dependent populations that needed immigration from other nearby populations to ensure their long term survival, as described above. Historically, there were 11 functionally independent populations and one potentially independent population of CCC coho salmon (Spence *et al.* 2008). Most of the populations in the CCC coho salmon ESU are currently doing poorly. Low abundance is common, and some populations have been extirpated, as described below. A comprehensive review of estimates of historic abundance, decline, and present abundance of coho salmon in California is provided by Brown *et al*. (1994). They estimated that annual spawning numbers of coho salmon in California ranged between 200,000 and 500,000 fish in the 1940's, which declined to about 100,000 fish by the 1960's, followed by a further decline to about 31,000 fish by 1991. Brown *et al.* (1994) concluded that the abundance of California coho salmon had declined more than 94 percent since the 1940's, with the greatest decline occurring since the 1960's. More recent abundance estimates vary from approximately 600 to 5,500 adults (Good *et al.* 2005). Recent NMFS status reviews (NMFS 2001, NMFS 2003, Good *et al.* 2005, Spence *et al.* 2008) indicate that the CCC coho salmon are likely continuing to decline in number.

CCC coho salmon have also experienced acute range restriction and fragmentation (Brown and Moyle 1991). Adams *et al.* (1999) found that in the mid 1990's coho salmon were present in 51

[11] Population as defined by Bjorkstedt *et al*. 2005 and McElhany *et al*. 2000 as, in brief summary, a group of fish of the same species that spawns in a particular locality at a particular season and does not interbreed substantially with fish from any other group. Such fish groups may include more than one stream. These authors use this definition as a starting point from which they define four types of populations (not all of which are mentioned here).

percent (98 of 191) of the streams where they were historically present, and documented an additional 23 streams within the CCC coho salmon ESU in which coho salmon were found for which there were no historical records.

Recent genetic research in progress by both the NMFS Southwest Fisheries Science Center and the Bodega Marine Laboratory has documented a reduction in genetic diversity within subpopulations of the CCC coho salmon ESU (Bjorkstedt *et al.* 2005). The influence of hatchery fish on wild stocks has also contributed to the lack of diversity through outbreeding depression and disease. Available information suggests that CCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative). The CCC coho salmon ESU has experienced range constriction, fragmentation, and a loss genetic diversity.

Many dependent populations that supported the species overall numbers and geographic distributions have been extirpated. This suggests that populations that historically provided support to dependent populations via immigration have not been able to provide enough immigrants for many dependent populations for several decades. The near-term (10 - 20 years) viability of many of the extant independent CCC coho salmon populations (Garcia River, Gualala River, Russian River, and San Lorenzo River) is of serious concern.

Recent information clearly documents CCC coho salmon abundance is very low, and the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative). Many subpopulations that may have acted to support the species' overall numbers and geographic distribution have been lost. The extant subpopulations of CCC coho salmon may not have enough fish to survive additional natural and human caused environmental change. Recent status reviews for CCC coho salmon conclude that this ESU is presently in danger of extinction (NMFS 2001, NMFS 2003, Good *et al.* 2005, Spence and Williams 2011). On June 28, 2005, NMFS issued a final listing determination for the CCC coho salmon ESU, changing their status from threatened to endangered (70 FR 37160). The most recent status review (Spence and Williams 2011) documents conditions for CCC coho salmon have worsened since the last status review in 2005 (Good *et al.* 2005). Poor returns from 2006 to 2010 indicate that adult abundance for the CCC coho salmon ESU has continued to decline to the extent risk of extinction has increased since Good *et al*. concluded CCC coho were in danger of extinction in 2005. In its most recent five-year review, NMFS recommended that the CCC coho salmon ESU remain listed as an endangered species (NMFS 2011c, 76 FR 50477, August 15, 2011).

3. Status of the SRWR Chinook salmon ESU

The Sacramento River winter-run Chinook salmon ESU has been completely displaced from its historical spawning habitat by the construction of Shasta and Keswick dams. Approximately 300 miles of tributary spawning habitat in the upper Sacramento River is now inaccessible to the

ESU. Most components of the Sacramento River winter-run Chinook salmon life history (*e.g.*, spawning, incubation, freshwater rearing) have been compromised by the habitat blockage in the upper Sacramento River. The remaining spawning habitat in the upper Sacramento River is artificially maintained by cool water releases from Shasta and Keswick dams, and the spatial distribution of spawners is largely governed by the water year type and the ability of the Central Valley Project to manage water temperatures in the upper Sacramento River.

Between the time Shasta Dam was built and the Sacramento River winter-run Chinook salmon were listed as endangered, major impacts to the population occurred from warm water releases from Shasta Dam, juvenile and adult passage constraints at the Red Bluff Diversion Dam (RBDD), water exports in the southern Delta, and entrainment at a large number of unscreened or poorly-screened water diversions. The naturally spawning component of this ESU has exhibited marked improvements in abundance and productivity in the 2000s (CDFG 2008a). These increases in abundance are encouraging, relative to the years of critically low abundance of the 1980s and early 1990s; however, returns of several West Coast Chinook salmon and coho salmon stocks were lower than expected in 2007 (MacFarlane *et al.* 2008), and stocks remained low through 2009.

A captive broodstock artificial propagation program for Sacramento River winter-run Chinook salmon has operated since the early 1990s as part of recovery actions for this ESU. As many as 150,000 juvenile salmon have been released by this program, but in most cases the number of fish released was in the tens of thousands (Good *et al.* 2005). NMFS reviewed this hatchery program in 2004 and concluded that as much as 10 percent of the natural spawners may be attributable to the program's support of the population (69 FR 33102, June 14, 2004). The artificial propagation program has contributed to maintaining diversity through careful use of methods that ensure genetic diversity. If improvements in natural production continue, the artificial propagation program may be discontinued (69 FR 33102).

Several actions have been taken to improve habitat conditions and population abundance for Sacramento River winter-run Chinook salmon including changes in ocean and inland fishing harvest that increase ocean survival and adult escapement, and implementation of habitat restoration efforts throughout the Central Valley. However, this population remains below established recovery goals and the naturally-spawned component of the ESU is dependent on one extant population in the Sacramento River. There is particular concern about risks to the ESU's genetic diversity (genetic diversity is probably limited because there is only one remaining population) life-history variability, local adaptation, and spatial structure (Good *et al.* 2005, 70 FR 37160, June 28, 2005). The status of the Sacramento River winter-run Chinook salmon ESU is little changed since the last status review, and new information available since Good *et al.* (2005) does not appear to suggest a change in extinction risk (Williams *et al.* 2011). In its most recent five-year review, NMFS recommended that the Sacramento River winter-run Chinook

salmon ESU remain listed as an endangered species (NMFS 2011e, 76 FR 50447, August 15, 2011).

4. Status of the CVSR Chinook salmon ESU

Although protective measures likely have contributed to recent increases in Central Valley spring-run Chinook salmon abundance, the ESU is still below levels observed from the 1960s through 1990. Threats from hatchery production (*i.e.*, competition for food between naturally-spawned and hatchery fish, run hybridization and genomic homogenization), climatic variation, high water temperatures, predation, and water diversions still persist.

Wild runs of CVSR Chinook salmon persist in a fraction of the streams where they historically occurred (NMFS 2009). These include, the upper reaches of the Sacramento River, Antelope Creek, Battle Creek, Beegum Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Feather River, Mill Creek, and Yuba River (CDFG 1998). Only the Deer, Mill, and Butte creek populations are considered to be independent populations and these three populations are all within the same diversity strata (NMFS 2009). Because wild CVSR Chinook salmon ESU populations are confined to relatively few remaining watersheds and continue to display broad fluctuations in abundance, the Biological Review Team (BRT) (Good *et al.* 2005) concluded that the ESU is likely to become endangered within the foreseeable future. According to Population Viability Assessment (PVA) models and other population viability criteria, Lindley *et al.* (2007) concluded that the CVSR Chinook salmon populations in Butte and Deer creeks were at a low risk of extinction. The Mill Creek population was classified as being at a moderate risk of extinction based on the PVA model, however, it met the criteria for a low risk of extinction for all other viability criteria.

Data from the 2009 and 2010 adult CVSR Chinook salmon return counts indicate a decline in returning adults across the range of CVSR Chinook salmon within the Central Valley of California. Poor ocean conditions are suspected as the principal short term cause because of the wide geographic range of declines (MacFarlane *et al.* 2008, Lindley *et al.* 2009). Preliminary data from the 2011 adult returns indicate an increase in returning adults across their range (Jeffrey Jahn, personal communication 2012).

Williams *et al.* (2011) conclude that the status of CVSR Chinook salmon ESU has probably deteriorated since the 2005 status review. Improvements, evident in the status of two populations, are certainly not enough to warrant downgrading of the ESU extinction risk. The degradation in status of the three formerly low- or moderate- risk independent populations is cause for concern. New information available since Good *et al.* (2005) indicates an increased extinction risk. In its most recent five-year review, NMFS recommended that this ESU remain listed as a threatened species while also recommending monitoring and reassessment within 2-3

years if a positive trend does not become evident (NMFS 2011b, 76 FR 50447, August 15, 2011).

5. Status of the CC Chinook Salmon ESU

The CC Chinook salmon ESU was historically comprised of approximately 38 Chinook salmon populations (Spence *et al*. 2008). Many of these populations (about 21) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts. The remaining populations were likely more dependent upon immigration from nearby independent populations than dependent populations of other salmonids (Spence *et al*. 2008). The most recent estimate of ESU-wide CC Chinook salmon abundance is 73,000 fish, predominantly in the Eel River (55,500) with smaller populations in Redwood Creek, Mad River, Mattole River (5,000 each), Russian River (500), and several small streams in Del Norte and Humboldt Counties (Myers *et al*. 1998).

Data available to assess trends in abundance are limited. Nehlsen *et al*. (1991) identified seven CC Chinook salmon stocks at high extinction risk and seven stocks at moderate extinction risk. Higgins *et al*. (1992) provided a more detailed analysis of some of these stocks, and identified nine CC Chinook salmon stocks at risk or of concern. Four of these stock assessments agreed with Nehlsen *et al*. (1991) designations, while five fall-run Chinook salmon stocks were either reassessed from a moderate risk of extinction to stocks of concern (Redwood Creek, Mad River, and Eel River) or were additions to the Nehlsen *et al*. (1991) list as stocks of special concern (Little River and Bear River).

As with previous reviews, the 2005 BRT review concluded the CC Chinook salmon ESU is likely to become endangered in the foreseeable future (Good *et al*. 2005). Widespread declines in abundance and the present distribution of small populations with sometimes sporadic occurrences contribute to the risks faced by the CC Chinook salmon ESU. The BRT was concerned about the paucity of information and resultant uncertainty associated with estimates of abundance, natural productivity, and distribution of Chinook salmon in this ESU (Good *et al*. 2005). As a result, NMFS confirmed the listing of CC Chinook salmon as threatened under the ESA on June 28, 2005 (70 FR 37160).

Data from counts in 2007/08 and 2008/09 show a severe decline in returning adult Chinook salmon along the coast of California and Oregon compared to the same cohort in 2004/05. Ocean conditions are suspected as the principal short term cause because of the wide geographic range of declines (MacFarlane *et al.* 2008; Lindley *et al.* 2009). However, the number of adult CC Chinook salmon returns in watersheds near the study area (*i.e.,* Russian River Watershed) increased substantially in 2010/2011 and 2011/12 compared to 2008/09 and 2009/10 returns.[12]

[12] http://www.scwa.ca.gov/chinook/ (last visited on September 26, 2013)

In the Eel River Watershed, adult CC Chinook salmon returns during the fall-winter of 2012/2013 were the highest observed in since the 1930s. Increases in adult Chinook salmon returns during 2010/2011 have been observed in the Central Valley populations as well.

Williams *et al.* (2011) concluded it is difficult to characterize the status of the CC Chinook salmon ESU based on available data. However, Williams *et al.* (2011) reported the loss of representation from one diversity stratum, the loss of the spring-run history type in two diversity substrata, and the diminished connectivity between populations in the northern and southern half of the ESU poses a concern regarding viability criteria for this ESU. Williams *et al*. (2011) did not find evidence of a substantial change in conditions since the last status review (Good 2005). Based on a consideration of this updated information, Williams *et al.* (2011) concluded the extinction risk of the CC Chinook salmon ESU has not changed since the last status review. In its most recent five-year review, NMFS recommended that the CC Chinook salmon ESU remain listed as a threatened species (NMFS 2011c, 76 FR 50447, August 15, 2011).

6. Status of the NC Steelhead DPS

Historically, the NC steelhead DPS was comprised of 38 independent populations (16 functionally and 22 potentially independent) of winter run steelhead and 10 functionally independent populations of summer run steelhead (Spence *et al.* 2012, Bjorkstedt *et al.* 2005). Based on the limited data available (*i.e.,* dam counts of portions of stocks in several rivers, limited spawner surveys), NMFS' initial status review of NC steelhead (Busby *et al*. 1996) determined that population abundance was very low relative to historical estimates (1930s and 1960s dam counts), and recent trends were downward in most stocks. DPS-wide population numbers are severely reduced from pre-1960s levels, when approximately 198,000 adult steelhead migrated upstream to spawn in the major rivers of this DPS (Busby *et al*. 1996, 65 FR 36074, June 7, 2000).

Updated status reviews reached the same conclusion, and noted the poor amount of data available, especially for winter run steelhead (NMFS 1997a, Adams 2000, Good *et al*. 2005). Comprehensive geographic distribution information is not available for this DPS, but NC steelhead remain widely distributed (Williams *et al.* 2011). It is known that dams on the Mad River and Eel River block large amounts of habitat historically used by NC steelhead (Busby *et al*. 1996, Spence *et al.* 2008). Also, the proportion of hatchery returns compared to wild stocks in recent returns to the Mad and Eel river basins have exposed their respective wild population to genetic introgression and the potential for deleterious interactions between native stock and introduced steelhead (Williams *et al.* 2011). Historical hatchery practices at the Mad River hatchery are of particular concern, and included out-planting of non-native Mad River hatchery fish to other streams in the DPS and the production of non-native summer steelhead (65 FR 36074, June 7, 2000). The conclusion of the 2005 status review (Good *et al*. 2005) echoes that of previous reviews. Abundance and productivity in this DPS are of most concern, relative to

NC steelhead spatial structure (distribution on the landscape) and diversity (level of genetic introgression). The lack of data available also remains a risk because of uncertainty regarding the condition of some stream populations.

The most recent status review update by Williams *et al.* (2011) reports a mixture of patterns in population trend information, with more populations showing declines than increases. Although little information is available to assess the status of most populations in the NC steelhead DPS, overall Williams *et al.* (2011) found little evidence to suggest a change in status compared to the last status review by Good *et al.* (2005). In its most recent five-year review, NMFS recommended that the NC steelhead DPS remain listed as a threatened species (76 FR 76386, December 7, 2011).

7. Status of the CCC steelhead DPS

Historically, approximately 70 populations of steelhead existed in the CCC steelhead DPS (Spence *et al.* 2008, Spence *et al.* 2012). Many of these populations (about 37) were independent, or potentially independent, meaning they had a high likelihood of surviving for 100 years absent anthropogenic impacts (Bjorkstedt *et al.* 2005). The remaining populations were dependent upon immigration from nearby CCC steelhead DPS populations to ensure their viability (McElhany *et al*. 2000; Bjorkstedt *et al*. 2005).

While historical and present data on abundance are limited, CCC steelhead numbers are substantially reduced from historical levels. A total of 94,000 adult steelhead were estimated to spawn in the rivers of this DPS in the mid-1960s, including 50,000 fish in the Russian River – the largest population within the DPS (Busby *et al.* 1996). Near the end of the 20th Century, McEwan (2001) estimated the wild run population in the Russian River Watershed was between 1,700-7,000 fish. Abundance estimates for smaller coastal streams in the DPS indicate low but stable levels with estimates for several streams (Lagunitas, Waddell, Scott, San Vicente, Soquel, and Aptos creeks) of individual run sizes of 500 fish or less (62 FR 43937, August 18, 1997). For more detailed information on trends in CCC steelhead abundance, see: Busby *et al*. 1996, NMFS 1997a, Good *et al*. 2005, and Williams *et al.* 2011.

Some loss of genetic diversity has been documented and attributed to previous among-basin transfers of stock and local hatchery production in interior populations in the Russian River (Bjorkstedt *et al.* 2005). Reduced population sizes and fragmentation of habitat in San Francisco streams has likely also led to loss of genetic diversity in these populations.

The CCC steelhead DPS has experienced a serious decline in abundance and long-term population trends suggest a negative growth rate. This indicates the DPS may not be viable in the long term. DPS populations that historically provided enough steelhead immigrants to support dependent populations may no longer be able to do so, placing dependent populations at

increased risk of extirpation. However, because CCC steelhead remain present in most streams throughout the DPS, roughly approximating the known historical range, CCC steelhead likely possess a resilience that could slow their decline relative to other salmonid DPSs in worse condition. The 2005 status review concluded that steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Good *et al*. 2005). On January 5, 2006, NMFS issued a final determination that the CCC steelhead DPS is a threatened species, as previously listed (71 FR 834, January 5, 2006).

A more recent viability assessment of CCC steelhead concluded that populations in watersheds that drain to San Francisco Bay are highly unlikely to be viable, and that the limited information available did not indicate that any other CCC steelhead populations could be demonstrated to be viable (Spence *et al.* 2008). Data from the 2008/09 through 2010/2011 adult CCC steelhead returns indicate a decline in returning adults across their range compared to other recent returns (*e.g.,* 2006/2007, 2007/2008) (Jeffrey Jahn, NMFS, personal communication, August 2011). The most recent status update concludes that steelhead in the CCC steelhead DPS remain "likely to become endangered in the foreseeable future" (Williams *et al.* 2011), as new and additional information available since the previous status review (Good *et al.* 2005) does not appear to suggest a change in extinction risk. In its most recent five-year review, NMFS recommended that the CCC steelhead DPS remain listed as a threatened species (76 FR 76386, December 7, 2011).

8. Status of the SCCC steelhead DPS

Boughton *et al.* (2007) determined the SCCC steelhead DPS consists of 12 discrete sub-populations which represent localized groups of interbreeding individuals. Steelhead populations are present in most streams in the SCCC DPS, however, these populations are fragmented and unstable (Good *et al.* 2005). Severe habitat degradation and compromised genetic integrity of some populations pose a serious risk to the survival and recovery of the SCCC steelhead DPS (Good *et al.* 2005). None of these sub-populations currently meet the definition of viable and most can be characterized by low population abundance, variable or negative population growth rates, and reduced spatial structure and diversity. The sub-populations in the Pajaro River and Salinas River watersheds are in particularly poor condition (relative to watershed size) and exhibit a greater lack of viability than many of the coastal subpopulations.

Populations of SCCC steelhead throughout the DPS have exhibited a long-term negative trend since the mid-1960s. In the mid-1960s, total spawning populations were estimated at 17,750 individuals (Good *et al.* 2005). Available information shows the SCCC steelhead population continued to decline from the 1970s to the 1990s (Busby *et al.* 1996) and more recent data indicate this trend continues (Good *et al.* 2005). Current SCCC steelhead run-sizes in the five largest systems in the DPS (Pajaro River, Salinas River, Carmel River, Little Sur River, and Big

Sur River) are likely greatly reduced from 4,750 adults in 1965 (CDFG 1965) to less than 500 returning adult fish in 1996. More recent estimates for total run-size do not exist for the SCCC steelhead DPS (Good *et al.* 2005).

In the winters of 2008/09 and 2009/10, adult returns in many streams within the DPS were considerably reduced relative to higher returns at the beginning of the decade. This has been attributed largely to poor ocean conditions along the eastern Pacific Ocean (Lindley *et al.* 2009). During the winter of 2010/11, the number of returning adult steelhead in some populations within the DPS rebounded, including the Carmel River where the total number of returning adults at the San Clemente Dam[13] was similar to recent high returns observed at the beginning of the decade.

On January 5, 2006, NMFS confirmed the listing of SCCC steelhead as threatened under the ESA (71 FR 834). In the most recent status update (Williams *et al.* 2011) NMFS concluded there was no evidence to suggest the status of the SCCC steelhead DPS has changed appreciably since the publication of the previous status review (Good *et al.* 2005) and therefore NMFS recommended in its most recent five-year review that the SCCC steelhead DPS remain listed as a threatened species (76 FR 76386, December 7, 2011).

9. Status of the CV steelhead DPS

Population trend data remain extremely limited for CV steelhead (Williams *et al.* 2011). Historic CV steelhead run sizes are difficult to estimate given the paucity of data, but may have approached one to two million adults annually (McEwan 2001). By the early 1960s the steelhead run size had declined to about 40,000 adults (McEwan 2001). Over the past 30 years, the naturally-spawned steelhead populations in the upper Sacramento River have declined substantially. Hallock *et al.* (1961) estimated an average of 20,540 adult steelhead through the 1960s in the Sacramento River, upstream of the Feather River. Steelhead counts at Red Bluff Diversion Dam (RBDD) declined from an average of 11,187 for the period of 1967 to 1977, to an average of approximately 2,000 through the early 1990s, with an estimated total annual run size for the entire Sacramento-San Joaquin system, based on RBDD counts, to be no more than 10,000 adults (McEwan and Jackson 1996, McEwan 2001). Steelhead escapement surveys at RBDD ended in 1993 due to changes in dam operations.

The best best poplation-level data come from Battle Creek where Coleman National Fish Hatchery (NFH) operates a weir that blocks upstream movement of fish (Williams *et al*. 2011). However, changes in hatchery policies and transfer of fish over the years complicate the interpretation of these data. For example, starting in 2005, Coleman NFH stopped transferring all adipose fin clipped (hatchery-origin) steelhead above the weir resulting in a large decrease in

[13] http://www.mpwmd.dst.ca.us/fishcounter/fishcounter.htm (last visited on September 26, 2013)

the overall numbers of fish passing the weir in subsequent years. As a result, the only unbiased time series for Battle Creek is the number of unclipped (wild) steelhead returning since 2001. These data show a slight decline over the last ten years mostly because of the high returns observed in 2002 and 2003. Williams *et al.* (2011) indicate the Battle Creek population declined significantly since the early 2000s, but their analysis did not take into account the fact that hatchery fish were not transferred above the barrier weir after 2005. Prior to halting the transfer of adipose fin-clipped steelhead above the weir in 2005, the majority of fish transferred were of hatchery origin in the early 2000s.

Steelhead returns to Coleman NFH have varied considerably over the past five years. Since 2003, adults returning to the hatchery have been classified as wild (unclipped) or hatchery produced (adipose fin-clipped). Wild adults counted at the hatchery each year represent a small fraction of overall returns, but their numbers have remained relatively stable in the range of 200-300 fish each year. Numbers of hatchery-origin fish have fluctuated much more however, ranging from 624 to 2,968 fish.

Steelhead redd counts are made in Clear Creek and the American River, but the data are currently insufficient to compute population metrics (Williams *et al.* 2011). An average of 151 steelhead redds have been counted annually in Clear Creek from 2001 to 2010 and the total number of observed redds has steadily increased since Saeltzer Dam was removed in 2000. The vast majority of steelhead in Clear Creek are likely of natural origin since hatchery fish are not stocked there and no hatchery origin fish were found during monitoring through at least 2008.

In the American River an average of 154 redds were counted annually between 2002-2010 and the available data suggest a declining trend (Hannon and Deason 2008). The East Bay Municipal Utilities District (EBMUD) has included steelhead in their redd surveys on the lower Mokelumne River since the 1999-2000 spawning season. Based on data from these surveys, the overall trend suggests that redd numbers have slightly increased over the years. According to Satterthwaite *et al.* (2010), it is likely that most of the *O. mykiss* spawning in the Mokelumne River are non-anadromous (or resident) fish rather than steelhead.

Steelhead returns to the Feather River Hatchery have decreased substantially in the last several years with only 679 in 2008, 312 in 2009 and 86 in 2010. Because almost all of the returning fish are of hatchery origin and stocking levels have remained fairly constant over the years, the data suggest that adverse freshwater and/or ocean survival conditions have caused or at least contributed to these declining hatchery returns. The Central Valley experienced three consecutive years of drought (2007-2009) which would likely have impacted parr and smolt growth and survival. Poor conditions are known to have occurred in at least 2005 and 2006 which impacted Chinook populations in the Central Valley and may well have also impacted steelhead populations. Preliminary return data for 2011 from CDFW suggest a strong rebound in

return numbers for 2011, with 712 adults returning to the hatchery through April 5. Based on steelhead returns to the hatcheries and the redd counts on Clear Creek, the American River, and the Mokelumne River, it appears wild fish may not have been impacted by poor freshwater and marine rearing conditions as much as hatchery-origin fish over the last several years. This may reflect greater fitness of naturally-produced steelhead relative to hatchery fish, and certainly merits further study.

The Chipps Island midwater trawl dataset from the United States Fish and Wildlife Service (USFWS) provides information on the trend in the overall abundance of the CV steelhead DPS (Williams *et al.* 2011). Updated through 2010, the trawl data indicate that the apparent decline in natural production of steelhead has continued since the 2005 status review. Catch per-unit-effort has fluctuated over the past decade, but the proportion of the catch that is adipose-clipped (100 percent of all hatchery produced steelhead have been adipose fin clipped since 1998) has steadily increased, exceeding 90 percent in recent years and reaching 95 percent in 2010 (Williams *et al.* 2011). Because hatchery releases have been fairly constant over the years, these data suggest that natural production of steelhead has been declining. Steelhead salvage counts from fish collection facilities at the Federal and State pumping plants in the southern Delta have fluctuated dramatically since 1993. In most years since 1998 (the year 100 percent mark of all hatchery steelhead began), the majority of salvaged steelhead have been of hatchery origin (USBOR 2008).

Until recently, CV steelhead were thought to be extirpated from the San Joaquin River system. Recent monitoring has detected small self-sustaining populations of steelhead in the Stanislaus, Mokelumne, and Calaveras rivers, and other streams previously thought to be devoid of steelhead (McEwan 2001). On the Stanislaus river, steelhead smolts have been captured in rotary screw traps at Caswell State Park and Oakdale each year since 1995 (Demko *et al.* 2000, Demko *et al.* 2001, Watry et al. 2008). It is possible that naturally-spawning populations exist in many other streams but are undetected due to lack of monitoring programs (IEP Steelhead Project Work Team 1999). Incidental catches and observations of steelhead juveniles also have occurred on the Tuolumne and Merced rivers during fall-run Chinook salmon monitoring activities, indicating that steelhead are widespread throughout accessible streams and rivers in the CV (Good *et al.* 2005). CDFW staff has prepared juvenile migrant CV steelhead catch summaries from the San Joaquin River near Mossdale representing migrants from the Stanislaus, Tuolumne, and Merced rivers. Based on trawl recoveries at Mossdale between 1988 and 2002, as well as rotary screw trap efforts in all three tributaries, CDFW staff stated that it is "clear from this data that rainbow trout do occur in all the tributaries as migrants and that the vast majority of them occur on the Stanislaus River" (Letter from Dean Marston, CDFW, to Madelyn Martinez, NMFS, January 9, 2003). The documented returns on the order of single fish in these tributaries suggest that existing populations of CV steelhead on the Tuolumne, Merced, and lower San Joaquin rivers are severely depressed.

Williams *et al.* 2011 have concluded the status of the CV steelhead DPS has worsened since the 2005 status review (Good *et al.* 2005), when the BRT concluded the DPS was in danger of extinction. In its most recent five-year review, NMFS recommended that this DPS remain listed as a threatened species while also recommending monitoring and reassessment within 2-3 years if a positive trend does not become evident (NMFS 2011d, 76 FR 50447, August 15, 2011).

10. Status of the southern DPS of North American green sturgeon

To date, little population-level data have been collected for green sturgeon. In particular, there are no published abundance estimates for either Northern DPS or Southern DPS green sturgeon in any of the natal rivers based on survey data (Israel *et al*. in prep). As a result, efforts to estimate green sturgeon population size have had to rely on sub-optimal data with known potential biases, including monitoring designed for white sturgeon (*Acipenser transmontanus*) populations, harvest time series, or entrainment from water diversion and export facilities (Adams *et al*. 2007). Of these sources, only the water diversion data indicate a possible trend, suggesting Southern DPS green sturgeon abundance or recruitment has declined since 1986 in the Sacramento River (Adams *et al*. 2007).

More recent genetic techniques and monitoring surveys are beginning to clarify questions about green sturgeon population size. Genetic data collected from incidental captured larval green sturgeon in salmon out-migrant traps suggest that the number of adult green sturgeon in the upper Sacramento River (Southern DPS green sturgeon) remained roughly constant between 2002 and 2006 in river reaches above Red Bluff (Israel and May 2010). Recently developed surveys using dual-frequency identification sonar (DIDSON) have estimated 175 to 250 sturgeon (±50) in the mainstem Sacramento River during the spawning season in 2010 and 2011 (personal communication with Ethan Mora, UC Davis, on January 10, 2012). However, this estimate includes considerable uncertainty; all sturgeon detections were assumed to be green sturgeon and a small number of white sturgeon were potentially misidentified as green sturgeon. Furthermore, spawning population estimates assumed individual fish did not move in and out of survey areas throughout the season (*i.e.,* observations of multiple individuals moving in and out of an area could be recorded as one individual). Given these uncertainties, caution must be taken in using these estimates to infer the spawning run size for the Sacramento River, until further analyses are completed.

Recruitment data for Southern DPS green sturgeon are essentially nonexistent. Incidental catches of larval green sturgeon in the mainstem Sacramento River and of juvenile green sturgeon at the state and Federal pumping facilities in the South Delta suggest that green sturgeon are successful at spawning, but that annual year class strength may be highly variable (Beamesderfer *et al*. 2007, Adams *et al*. 2007). Successful recruitment into the population is unclear. Because green sturgeon are long-lived and spawn multiple times throughout their lifetime, spawning failure in one year can be made up for in another spawning year. In general,

sturgeon year class strength appears to be episodic with overall abundance dependent on a few successful spawning events (NMFS 2010).

Recently, Erickson *et al*. (unpublished) estimated spawning run sizes for Northern DPS rivers ranging from 426 to 734 adult green sturgeon using mark-recapture methods (Israel *et al*. in prep). These estimates appear to be inconsistent with harvest data indicating that 200 to 450 Northern DPS green sturgeon were harvested each year in the Klamath River tribal fishery from 1985 to 2003, with no evidence of declining catches (Adams *et al*. 2007). The inconsistencies may be due to error in the population estimates and/or because the recent population estimates were based on data collected from a different time period compared to the tribal harvest data. Adams *et al*. (2007) concluded the abundance of mature green sturgeon in the Southern DPS is much smaller than in the Northern DPS (Adams *et al*. 2007), but the absolute and relative abundance of the two DPSs remain highly uncertain. Carefully designed studies remain needed to provide absolute estimates of abundance for the species.

Recently enacted fishing regulations and conservation measures have reduced current fishery impacts to green sturgeon throughout its range.[14] For example, commercial and sport fisheries in California, Oregon, Washington (United States), and British Columbia (Canada) now ban retention of green sturgeon.

Green sturgeon face a variety of threats in the freshwater, estuarine, and marine environments within which they move throughout their life history. Threats to this species include: reduction/loss of spawning areas, insufficient freshwater flow rates in spawning areas, contaminants (*e.g.,* pesticides), harvest bycatch, poaching, entrainment by water projects, influence of exotic species, small population size, impassable barriers, and elevated water temperatures (Adams *et al*. 2007). The most recent status review update concluded the Southern DPS green sturgeon is likely to become endangered in the foreseeable future (NMFS 2005a). A principal factor in NMFS' conclusion was the reduction of potential spawning habitat to a single area in the Sacramento River due to migration barriers (*e.g.,* dams). Historical spawning habitat may have extended up into the three major branches of the upper Sacramento River above the current location of Shasta Dam; however, those habitats have been made inaccessible or altered by dams (Mora *et al*. 2009, Adams *et al*. 2007). The reduction of spawning habitat to a single system increases the vulnerability of the spawning population to catastrophic events and of early life stages to variable environmental conditions within the system. Severe threats to the single remaining spawning population, coupled with the inability to alleviate those threats using current conservation measures, led to the decision to list the species as threatened on April 7, 2006 (71 FR 17757).

[14] http://www.nmfs.noaa.gov/pr/species/fish/greensturgeon.htm (last visited on September 26, 2013)

11. Status of the Southern DPS of Pacific eulachon

The Southern DPS of Pacific eulachon was listed as threatened on March 18, 2010 (75 FR 13012). This species is threatened by decreased abundance, natural predation, commercial and recreational fishing pressure (directed and bycatch), and loss of habitat (NMFS 2008, Gustafson *et al.* 2010). Population decline is anticipated as a result of climate change and bycatch in commercial shrimp fisheries. However, eulachon are highly fecund and have the ability to rebound quickly if given the opportunity, a feature that is likely necessary to withstand significant predation pressure and high mortality likely experienced by pelagic larvae (Bailey and Houde 1989, NMFS 2008, Gustafson *et al.* 2010).

Eulachon formerly experienced widespread, abundant runs and have been a staple of Native American diets for centuries along the northwest coast. However, such runs that were formerly present in several California rivers as late as the 1960s and 1970s (*i.e.,* Klamath River, Mad River, and Redwood Creek) are thought to no longer occur (Larson and Belchik 1998, Moyle 2002, Gustafson *et al.* 2010). Eulachon have not been observed in the Mad River or Redwood Creek since the mid-1990s, although the sampling efforts within these watersheds have been low or non-existent (Moyle 2002).

C. Status of Critical Habitat

In designating critical habitat, NMFS considers, among other things, the following requirements of the species: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing offspring; and, generally; and (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species (50 CFR 424.12(b)). In addition to these factors, NMFS also focuses on PCEs, principal biological or physical constituent elements within the defined area that are essential to the conservation of the species.

1. Status of Critical Habitat for ESA-listed Salmonids

Designated critical habitat for Chinook salmon and steelhead overlap the action area including both freshwater and estuarine habitats. In designating critical habitat for Chinook salmon and steelhead, NMFS focused on areas that are important for the species' overall conservation by protecting quality growth, reproduction, and feeding. The critical habitat designation for these species identifies the known primary constituent elements (PCEs) that are necessary to support one or more steelhead or Chinook salmon life stages, including: (1) freshwater spawning, (2) freshwater rearing, (3) freshwater migration, (4) estuarine areas, (5) nearshore marine areas, and (6) offshore marine areas. Within the PCEs, essential elements of SRWR and CC Chinook salmon ESU and NC, CCC, and SCCC steelhead DPS critical habitats include adequate (1)

substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, (10) safe passage conditions, and (11) salinity conditions (70 FR 52488, September 2, 2005).

Designated critical habitat for coho salmon overlap the action area including both freshwater and estuarine habitats. In designating critical habitat for coho salmon, NMFS focused on the known physical and biological features within the designated area that are essential to the conservation of the species. These essential features may include, but are not limited to, spawning sites, food resources, water quality and quantity, and riparian vegetation. Within the essential habitat types (spawning, rearing, migration corridors), essential features of coho salmon critical habitat include adequate (1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions (64 FR 24049, May 5, 1999).

The essential habitat types of designated critical habitat for coho salmon and PCEs of designated critical habitat for steelhead and Chinook salmon are those accessible freshwater habitat areas that support spawning, incubation and rearing, migratory corridors free of obstruction or excessive predation, and estuarine areas with good water quality and that are free of excessive predation. Timber harvest and associated activities, road construction, urbanization and increased impervious surfaces, migration barriers, water diversions, and large dams throughout a large portion of the freshwater range of the ESUs and DPSs continue to result in habitat degradation, reduction of spawning and rearing habitats, and reduction of stream flows. The result of these continuing land management practices in many locations has limited reproductive success, reduced rearing habitat quality and quantity, and caused migration barriers to both juveniles and adults. These factors limit the conservation value (*i.e.,* limiting the numbers of salmonids that can be supported) of designated critical habitat within freshwater habitats at the ESU or DPS scale.

The condition of critical habitat for ESA-listed salmonids, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable populations. NMFS has determined that present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat[15]: logging, agricultural and mining activities, urbanization, stream/river channelization, dams, hydroelectric power generation, wetland loss, and water withdrawals, including unscreened diversions for irrigation. Impacts of concern include alteration of stream bank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels, loss of large woody debris, degradation of water quality,

[15] Other factors, such as over fishing and artificial propagation have also contributed to the current population status of this species. All these human induced factors have exacerbated the adverse effects of natural factors such as drought and poor ocean conditions.

removal of riparian vegetation resulting in increased stream bank erosion, increases in erosion and sedimentation in streams from upland areas, loss of shade (higher water temperatures) and loss of nutrient inputs (Busby *et al.* 1996, Adams *et al.* 2002, Good *et al.* 2005, Spence *et al.* 2008, Williams *et al.* 2011, 70 FR 52488). Water development has drastically altered natural hydrologic cycles in many of the streams and rivers within the covered ESUs and DPSs. Alteration of flows results in migration delays, loss of suitable habitat due to dewatering and blockage; stranding of fish from rapid flow fluctuations; entrainment of juveniles into poorly screened or unscreened diversions, and increased water temperatures harmful to salmonids.

2. Status of Critical Habitat for the southern DPS of green sturgeon

Designated critical habitat for the southern DPS of green sturgeon overlaps the action area including estuarine habitats found in Humboldt, San Francisco, San Pablo Bay, and Suisun bays, and the tidally influenced portions of streams draining to these bays. In designating critical habitat for the southern DPS of green sturgeon, NMFS focused on the known physical and biological features within the designated area that are essential to the conservation of the species. PCEs for green sturgeon have been designated for freshwater riverine systems, estuarine habitats, and nearshore coastal areas (not included in the action area). The specific PCEs essential for the conservation of the Southern DPS of green sturgeon in freshwater riverine habitats include: (1) food resources, (2) substrate type and size, (3) water flow, (4) water quality, (5) migratory corridor, (6) water depth, and (7) sediment quality. The specific PCEs essential for the conservation of the Southern DPS in estuarine habitats include: (1) food resources, (2) water flow, (3) water quality, (4) migratory corridor, (5) water depth, and (6) sediment quality (74 FR 52300, October 9, 2009).

The condition of critical habitat for the southern DPS of green sturgeon, specifically its ability to provide for its conservation, has been degraded from conditions known to support viable populations. NMFS has determined that present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat: stream flow management, dams and diversions, agricultural, timber, and mining activities (both past and present), urbanization, river channelization, and the loss or alteration of wetland habitats. Impacts of concern include alteration of river bank and channel morphology, alteration of water temperatures, loss of historic spawning and rearing habitat, fragmentation of freshwater and estuarine habitats, loss of downstream recruitment of spawning gravels, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, and increases in erosion and sedimentation in streams from upland areas (Adams *et al.* 2002, NMFS 2005a, 71 FR 17757, 74 FR 52300). In particular, substantial water resource development throughout California's Central Valley has altered the natural hydrologic cycles of these rivers, which in turn, has had profound ecological consequences on the health and productivity of the Sacramento-San Joaquin River Delta, San Francisco Bay, and the species that rely on these habitats, including the southern DPS of green sturgeon.

3. Status of Critical Habitat for the southern DPS Pacific eulachon

Designated critical habitat for southern DPS of Pacific eulachon overlaps the action area including freshwater and estuarine habitats specifically in the Klamath River, Redwood Creek, and the Mad River of northern California. The physical or biological features essential to the conservation of the southern DPS of Pacific eulachon fall into three major categories reflecting key life history phases: (1) freshwater spawning and incubation sites, (2) freshwater and estuarine migration corridors, and (3) nearshore and offshore marine foraging habitat (not included in the action area). The components of the freshwater spawning and incubation sites include: (1) flow regime, (2) water quality, (3) water temperature, and (4) substrate. The components of the freshwater and estuarine migration corridor essential feature include: (1) migratory corridor, (2) flow regime, (3) water quality, (4) water temperature, and (5) food resources (76 FR 65324).

The condition of critical habitat for the southern DPS of Pacific eulachon, specifically its conservation value for the DPS, has been degraded from conditions known to support viable populations. NMFS has determined that present depressed population conditions are, in part, the result of the following human-induced factors affecting critical habitat: stream flow management, dams and diversions, and both past and present dredging activities (Larson and Belchik 1998, Moody 2008, NMFS 2008, Gustafson *et al.* 2010, 75 FR 13012, 76 FR 65324).

Although restoration activities have improved critical habitat conditions in some areas, particularly in upstream freshwater, reduced habitat complexity, poor water quality, and reduced habitat availability continues to persist in many locations due to past and present land use and management practices, and therefore the current condition of critical habitat for the ESA-listed fish species described above remains degraded, and currently does not provide the full extent of conservation value necessary for their recovery.

D. Factors Responsible for Stock Declines

NMFS has identified many reasons (primarily anthropogenic) for the decline of the above listed species (Busby *et al.* 1996, Adams *et al.* 2002, Good *et al.* 2005, NMFS 2005a, Moody 2008, NMFS 2008, Spence and Williams 2011, Williams *et al.* 2011, 75 FR 13012, 76 FR 65324). The foremost reason for the decline in these anadromous populations is the degradation and/or destruction of freshwater and estuarine habitat, including critical habitat, caused by (as described briefly above) anthropogenic disturbances such as urban development, agriculture, logging, water resource development, dams, and the past and ongoing dredging of coastal marine habitats, estuaries, and rivers they inhabit. Additional factors contributing to the decline of salmonid, green sturgeon and Pacific eulachon populations are: poor estuary/lagoon management (Smith 1990), commercial and recreational harvest (Gustafson *et al.* 2010, NMFS 2012c), artificial propagation (Waples 1991, NMFS 2005a, Williams *et al.* 2011), natural stochastic events,

marine mammal predation (NMFS 1997b, Wright *et al.* 2007), reduced marine-derived nutrient transport (Bilby *et al.* 1996, Bilby *et al.* 1998, Gresh *et al.* 2000, Moore *et al.* 2011), and more recently poor ocean conditions (Lindley *et al.* 2009, Gustafson *et al.* 2010).

E. Additional Threats to Species and Critical Habitat

Global climate change presents an additional potential threat to coastal salmonid ESUs/DPSs, green sturgeon, and Pacific eulachon and their critical habitats. Modeling of projected climate change impacts in California suggests that average summer air temperatures are expected to increase (Lindley *et al*. 2007). Heat waves are expected to occur more often, and heat wave temperatures are likely to be higher (Hayhoe *et al*. 2004). Total precipitation in California may decline; critically dry years may increase (Lindley et al. 2007, Schneider 2007). The Sierra Nevada snow pack may decrease by as much as 70 to 90 percent by the end of this century under the highest emission scenarios modeled (Luers *et al*. 2006). Wildfires are expected to increase in frequency and magnitude, by as much as 55 percent under the medium emissions scenarios modeled (Luers *et al*. 2006). Vegetative cover may also change, with decreases in evergreen conifer forests and increases in grasslands and mixed evergreen forests. The likely change in amount of rainfall in Northern and Central Coastal streams under various warming scenarios is less certain, although as noted above, total rainfall across the state is expected to decline. For the California North Coast, some models show large increases (75 to 200 percent) in rainfall amounts while other models show decreases of 15 to 30 percent (Hayhoe *et al*. 2004). Many of these changes are likely to further degrade habitat of these listed species by, for example, reducing stream flows during the summer and raising summer water temperatures. Estuaries may also experience changes detrimental to salmonids, green sturgeon, and Pacific eulachon. Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia *et al.* 2002). In marine environments, ecosystems and habitats important to salmonids, green sturgeon, and Pacific eulachon are likely to experience changes in temperatures, circulation and chemistry, and food supplies (Feely *et al.* 2004, Brewer and Barry 2008, Osgood 2008, Turley 2008). The projections described above are for the mid to late 21st Century. In shorter time frames, climate conditions not caused by the human addition of carbon dioxide to the atmosphere are more likely to predominate (Cox and Stephenson 2007, Smith *et al.* 2007).

V. ENVIRONMENTAL BASELINE

This environmental baseline section provides an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat (including designated critical habitat), and ecosystem in the action area. 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 consultation, and the impacts of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The action area includes all coastal anadromous California streams from the Oregon/California border south to the San Mateo/Santa Cruz County boundary, all tributaries draining into San Francisco and San Pablo bays, tributaries to the Sacramento-San Joaquin Delta in eastern Contra Costa, Alameda, and Solano Counites, and a small portion of the upper Pajaro River watershed located in southern Santa Clara County (Figure 1). The action area encompasses a range of environmental conditions, and includes all or part of two endangered salmon ESUs, three threatened salmon ESUs, four threatened steelhead DPSs, one threatened green sturgeon DPS, and one threatened Pacific eulachon DPS. Only a small portion of the SCCC steelhead DPS overlaps with the action area (*i.e.,* Upper Pajaro River tributaries).

The climate in the action area generally falls into two types: coastal and valley climates. The action area in the central and northern California Coast has a Mediterranean climate characterized by cool wet winters with typically high runoff, and dry warm summers characterized by greatly reduced instream flows. Fog is a dominant climatic feature along the coast, generally occurring daily in the summer and not infrequently throughout the rest of the year. Higher elevations and inland areas tend to be relatively fog free. Most precipitation falls during the winter and early spring as rain, with occasional snow above 1,600 feet. This portion of the action area receives one of the highest annual amounts of rainfall in California, with a few areas averaging over 85 inches a year. Mean rainfall amounts range from 9 to 125 inches, and in general, precipitation totals are typically less farther south. Extreme rain events do occur, with over 240 inches being recorded over parts of the action area during 1982-83. Along the coast, average air temperatures range from 46 to 56 °F. Further inland and in the southern part of the action area, annual air temperatures are much more varied, ranging from below freezing in winter to over 100 °F during the summer months.

High seasonal rainfall on bedrock and other geologic units with relatively low permeability, erodible soils, and steep slopes contribute to the flashy nature (stream flows rise and fall quickly) of the watersheds within the action area in the northern and central California coast. In addition, these high natural runoff rates have been increased by extensive road systems and other land uses. High seasonal rainfall combined with rapid runoff rates on unstable soils delivers large amounts of sediment to river systems. As a result, many river systems within this portion of the action area contain a relatively large sediment load, typically deposited throughout the lower gradient reaches of these systems. In the southern half of the action area, it is not uncommon for many streams without augmented stream flow to go intermittent during summer, particularly in dry years.

Native vegetation varies from redwood (*Sequoia sempervirens*) forest along the lower drainages to Douglas fir (*Pseudotsuga menziesii*) intermixed with hardwoods and chaparral, to ponderosa pine (*Pinus ponderosa*) and Jeffery pine (*Pinus jefferyi*) stands along the upper elevations. Areas of grasslands are also found along the main ridge tops and south facing slopes of the watersheds.

In the North Coast region, forestry is the dominant land-use throughout the area with smaller amounts of agriculture, mining, and urban developments. Urban development within the North Coast region is found primarily on the estuaries of the larger streams, though there are some small towns and rural residences scattered throughout the area. Dams in the Klamath, Shasta, Trinity, Eel, and Russian rivers regulate stream flow and block access to considerable amounts of historic spawning and rearing habitat.

Urban development and agriculture are the dominant land uses in the San Francisco Bay region. Extensive areas of freshwater and estuarine habitat have been coverted or highly degraded due to these developments. Numerous smaller dams and reservoirs are found throughout the region that impact remaining habitats and also block historic spawning and rearing habitat for salmonid species.

In the Central Coast region, agriculture and urban development are the dominant land uses. Similar to the San Francisco Bay region, extensive areas of historic spawning and rearing habitat have been lost or highly degraded due to these land uses or practices and small dams and water diversions continue to impact the remaining available habitats.

A. Status of the Species and Critical Habitat in the Action Area

The action area includes all or portions of the ESUs and DPSs identified above. Because of the large action area and the overlap with all or portions of the ESUs and DPSs identified above, the status of each individual ESU or DPS within the action area is provided above in section *IV.B. Status of the Species* and will not be repeated in this section, and the status of critical habitat in the action area is provided above in section *IV.C. Status of Critical Habitat* and will not be repeated in this section. Factors affecting the status of the species and critical habitat in the action area are provided above in *IV.D. Factors Responsible for Stock Declines* and will not be repeated in this section as those factors relate to the Environmental Baseline.

A more detailed description of status and trends can be found in the following documents: Weitkamp *et al*. (1995), Busby *et al*. (1996), NMFS (1996), Myers *et al*. (1998), NMFS (1998), Adams *et al.* (2002), CDFG (2002), Good *et al.* (2005), NMFS (2005a), Moody (2008), NMFS (2008), Gustafson *et al.* (2010), Spence and Williams (2011), Williams *et al.* (2011), and 75 FR 13012.

B. Previous Section 7 Consultations in the Action Area

Since the first listing by NMFS of a species under the ESA within the Program action area (SRWR Chinook salmon ESU in 1989 - 54 FR 32085, August 4, 1989), NMFS has conducted more than 1,500 individual section 7 consultations throughout the action area. Of these consultations, a vast majority (likely more than 80 percent) resulted in NMFS' concurrence that the proposed project was not likely to adversely affect ESA-listed species or their designated critical habitats and would instead result in discountable and insignificant impacts to species and critical habitats.

For those consultations where the proposed actions were likely to adversely affect ESA-listed fish species or their designated critical habitat, NMFS produced biological opinions which contained reasonable and prudent measures to minimize the impacts of incidental take of listed species. Many of these projects resulted in improved habitat conditions and improved our understanding of the species status, trends and behaviors (*i.e.,* projects involving habitat restoration, fish passage enhancement or scientific research). A few consultations on proposed actions (less than five) resulted in a jeopardy determination by NMFS. Proposed actions receiving a jeopardy determination are implementing reasonable and prudent alternatives to ensure the continued conservation of listed species and their designated critical habitats.

VI. EFFECTS OF THE PROPOSED ACTION

The purpose of this section is to identify the direct and indirect effects of the proposed action, and the effects of any interrelated or interdependent activities, on endangered and threatened ESA-listed fish species. Our approach was based on knowledge and review of the ecological literature and other relevant materials. We used this information to gauge the likely effects of the proposed project via an exposure and response framework that focuses on what stressors (physical, chemical, or biotic), directly or indirectly caused by the proposed action, that salmonids are likely to be exposed to. Next, we evaluate the likely response of ESA-listed fish species to these stressors in terms of changes to survival, growth, and reproduction, and changes to the ability of PCEs to support the value of critical habitat in the action area. PCEs include sites essential to support one or more life stages of the species. These sites for migration, spawning, and rearing in turn contain physical and biological features that are essential to the conservation of the species. Where data to quantitatively determine the effects of the proposed action on ESA-listed fish species and their critical habitat were limited or not available our assessment of effects focused mostly on qualitative identification of likely stressors and responses.

As described above, Category 1 and Category 2 projects are aligned with projects included in NMFS' concurrence letter issued to Caltrans and the Corps for Caltrans' Routine Maintenance,

Small Project, and Repair Program in August 2012 (NMFS 2012a). In this letter, NMFS concurred with Caltrans and the Corps' determination that these projects were not likely to adversely affect listed species or critical habitat. This biological opinion incorporates the analysis of effects and conclusions of NMFS' concurrence letter by reference, and the concurrence letter is included as an attachment to this biological opinion. Therefore, the following section analyzes the effects of Category 3 projects on listed species and critical habitat. The total number of projects and the location of individual projects within each Caltrans District area included in the Program annually will vary from year to year depending on various factors including, but not limited to, funding and scheduling. Based on the types of projects proposed under the Program and NMFS' familiarity with the implementation and outcomes of these types of projects and or activities, NMFS anticipates impacts to ESA-listed species and their designated critical habitat may result from the following: 1) fish capture and relocation, 2) dewatering, 3) increased mobilization of sediment, 4) vegetation removal, and 5) exposure to toxic chemicals. The specific timing and duration of each individual activity will vary depending on the project type, specific project methods, and site conditions. However, the duration and magnitude of direct effects to listed species and to critical habitat associated with implementation of actions will be significantly minimized due to the multiple minimization measures and BMPs that will be utilized during implementation as described above in the *Description of the Proposed Action* section and below. For the activities listed above, if impacts are likely to adversely affect listed species they will be relocated or excluded from the area of impact. Therefore, NMFS has determined that fish capture and relocation is the only Program activity likely to adversely affect listed species (described in detail below).

In the *Compendium of Pile Driving Sound Data* (Illingworth & Rodkin 2012), the most recent pile driving case studies are compiled in order to provide information regarding the underwater sound pressure levels generated by various installation methods and pile types. NMFS, along with the Fisheries Hydroacoustic Working Group (FHWG), uses a dual metric threshold criteria to correlate physical injury to fish exposed to underwater sound produced during pile driving with impact hammers. Specifically, this includes a single strike peak sound pressure level (SPL) of 206 dB (re: 1μPa) and a cumulative sound exposure level (cSEL) of 187 dB (re: 1 μPa^2sec) for fish 2 grams or greater, or 183 dB (re: 1 μPa^2sec) for fish less than 2 grams. If either threshold is exceeded, then physical injury is assumed to occur. All pile driving case studies which exceeded NMFS dual metric threshold criteria for physical injury to fish involved substantially larger piles and installation equipment than what will be necessary for geotechnical drilling in the Program (Illingworth & Rodkin 2012). Therefore, underwater noise generated by geotechnical drilling activities (*i.e.,* driving drill casings and samplers) is expected to be well below levels that are considered harmful to listed fish.

The species (SONCC and CCC coho salmon ESUs; CC, SRWR, and CVSR Chinook salmon ESUs; NC, CCC, SCCC and CV steelhead DPSs; the Southern DPS of North American green

sturgeon; and the Southern DPS of Pacific Eulachon), and designated critical habitat that may be present and/or affected will vary depending on the location of each individual activity. For example, some sites may occur in rivers and streams that have multiple species of salmonids (*e.g.,* Chinook salmon, coho salmon, and steelhead), while other sites may be located in streams where only steelhead are present. Only a small number of streams within the SCCC steelhead DPS (*i.e.,* Upper Pajaro River tributaries within Santa Clara County) are included in the action area, and therefore, a majority of the steelhead within the SCCC DPS and their designated critical habitat will not be affected by the proposed activities.

Within the action area, listed Central Valley salmonids, green sturgeon, and Pacific eulachon are rarely if ever encountered during routine infrastructure projects that involve dewatering and fish relocation. Dewatering and fish relocation activities will primarily occur in freshwater habitats. The extent of freshwater habitat for CV steelhead present in the Program action area is limited to a small number of streams in eastern Solano and Contra Costa counties. In recent years, the presence of CV steelhead in these streams is unknown, but considered unlikely due to substantial habitat modifications. The freshwater habitats in these areas are not within the known distribution of SRWR or CVSR Chinook salmon or green sturgeon. Considering the Program work window (June 15 to October 15, as described in the *Description of the Proposed Action* section) and the poor quality of available freshwater rearing habitat during this period (*i.e.,* dry or unsuitable water quality conditions) at Caltrans maintained infrastructure on these streams, NMFS does not anticipate Central Valley salmonids or green sturgeon will be present during dewatering and fish relocation activities, and therefore these species are not likely to be adversely affected. Furthermore, none of the freshwater habitats in the region described above are designated critical habitat for Central Valley salmonids or green sturgeon.

Dewatering and fish relocation activities in open, tidal habitats of San Francisco Bay and the Delta are rare and primarily involve dewatering of small areas (such as the area around a bridge pier) for bridge or culvert replacement or repair. NMFS is not aware of any recent encounter of listed Central Valley species occurring during dewatering associated with these small-scale infrastructure related projects. Furthermore, dewatering along the shoreline for actions such as bank stabilization can be implemented using methods that would preclude the need for fish capture and relocation (*i.e.,* gradual placement of gravel pads and exclusionary screens). Therefore, potential affects to ESA-listed Central Valley salmonid species and green sturgeon from Program actions occurring in the tidal habitats of San Francisco Bay and the Delta will be limited to the temporary and localized impacts associated with elevated turbidity and vegetation removal along the shoreline. The effects of these activities are described below.

Based on the above information, impacts of dewatering and fish relocation projects during the summer low-flow period will be limited to rearing juvenile SONCC and CCC coho salmon, CC Chinook salmon, and NC, CCC, and SCCC steelhead. We anticipate that a relatively small

number of juvenile salmon and/or steelhead may be present at each individual project work site (described in detail below), and, as described above in Section II.B.1.f, no more than 30 projects involving relocation of ESA-listed fish will be authorized each year under this Program (*i.e.,* 10 projects per Caltrans District annually).

A. Dewatering, Fish Capture and Relocation

1. Fish Capture and Relocation

Maintenance projects in stream channels with perennial flows, or stream channels with water present during project implementation, will include fish relocation activities prior to dewatering the project work site. Depending on the scope of the project, the following Site-Specific Projects could require fish relocation activities (PA-28: Capture, handle, exclude, salvage, and relocate listed species):

- Site-Specific Project-1.3: Stabilization of stream banks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts;
- Site-Specific Project-3.1: Cleaning of drainage channels and ditches to maintain function and avoid damage to adjacent roads;
- Site-Specific Project-3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions;
- Site-Specific Project-3.3: Rehabilitation of culverts to maintain function;
- Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where practicable, improve flow conditions to support fish passage and sediment transport;
- Site-Specific Project-4.1: Repair of bridges to maintain function;
- Site-Specific Project-4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (*e.g.,* earthquake standards); and
- Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where practicable, improve flow conditions for fish passage and sediment transport.

As described above, up to 10 projects involving PA-28 (capture, handle, exclude, salvage, and relocate listed species) will occur annually per District for a maximum of 30 projects per year.

Qualified biologists will capture fish (and amphibians) and relocate them outside of the project work site to avoid direct mortality and minimize the exposure of listed species to construction impacts. Fish in the immediate project area will be captured by seine, dip net and/or by electrofishing, and will then be transported and released to a suitable instream location. Effects associated with fish relocation activities will be minimized due to the multiple minimization

measures that will be utilized because Caltrans will use the measures described in the *California Salmonid Stream Habitat and Restoration Manual Part IX: Measures to Minimize Injury and Mortality of Fish and Amphibian Species During Dewatering* (Flosi *et al.* 2004) and *NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act, June 2000* (NMFS 2000).

2. Dewatering

Depending on site conditions and the scope of the project, the following Site-Specific Projects could require dewatering (PA-17: Install temporary cofferdams and diversion cofferdams; and PA-18: Temporarily redirect stream flow):

- Site-Specific Project-1.3: Stabilization of stream banks and channels to minimize erosion and damage to adjacent roads, bridges, and culverts;
- Site-Specific Project-3.1: Cleaning of drainage channels and ditches to maintain function and avoid damage to adjacent roads;
- Site-Specific Project-3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions;
- Site-Specific Project-3.3: Rehabilitation of culverts to maintain function;
- Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where practicable, improve flow conditions to support fish passage and sediment transport;
- Site-Specific Project-4.1: Repair of bridges to maintain function;
- Site-Specific Project-4.2: Rehabilitation of small bridges to maintain bridge function and meet current standards and specifications (*e.g.,* earthquake standards); and
- Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where practicable, improve flow conditions for fish passage and sediment transport.

Dewatering of an area will be accomplished within a few days or less and, if present, flow will be maintained downstream of dewatered areas. Therefore, changes in flow are not anticipated to occur downstream of project sites during dewatering activities. Stream flow in the vicinity of each project site should be the same as free-flowing conditions except at the dewatered reach where stream flow is bypassed.

Stream flow diversion and dewatering are expected to cause temporary loss, alteration, and reduction of aquatic habitat. Caltrans anticipates that only a small reach of stream at each project site will be dewatered for in-channel construction activities (typically less than 100 meters in length). Stream flow diversions could concentrate or strand individual rearing juvenile coho

salmon, Chinook salmon, and steelhead in residual wetted areas (Cushman 1985) before they are relocated, or cause them to move to adjacent areas of poor habitat (Clothier 1953, Clothier 1954, Kraft 1972, Campbell and Scott 1984). Rearing juvenile salmon, steelhead, or both could be killed or injured if crushed during diversion activities, though direct mortality is expected to be minimal due to relocation prior to installation of the diversion.

3. Fish Handling Estimates

In District 1, CCC and NC steelhead, CCC and SONCC coho salmon, and CC Chinook salmon occur. In District 2, NC steelhead, SONCC coho salmon, and CC Chinook salmon occur. In District 4, CCC, SCCC and NC steelhead, CCC coho salmon, and CC Chinook salmon occur. Dewatering and fish relocation activities will occur during the summer or early fall low-flow period, after emigrating smolts have left and before adults have immigrated to project sites. Juvenile steelhead and coho salmon (to a much lesser extent) will make up the majority of salmonids present during dewatering and relocation activities. Few CC Chinook salmon are expected since the majority of Chinook salmon juveniles emigrate in spring and early summer as smolts.

Caltrans worked closely with NMFS to complete a thorough review of the available scientific literature to estimate the density of federally protected juvenile fish species under NMFS jurisdiction (*i.e.* Chinook salmon, coho salmon and steelhead) where present within the coverage area. The density data were provided for various streams and rivers within the action area (Caltrans 2010). Based on these data, Caltrans (2010) presented multiple values of fish densities for each species (*i.e.,* average, highest, lowest, and 90th percentile). Caltrans applied these densities to the typical project length that requires fish relocation (approximately 100 meters of stream channel) to generate estimated fish handling numbers by species per project. Caltrans (2010) estimated the following frequency of projects requiring fish relocation per District per year: District 1: 2 projects, District 2: 1 project, District 4: 2 projects (5 total projects). Caltrans (2010) used these estimates to expand fish handling numbers by species to an annual District level.

NMFS used the 90th percentile densities (0.53 coho salmon per meter and 0.72 steelhead per meter), typical project length (100 meters), and estimated annual number of projects requiring fish relocation to estimate District and Program-level take for each species. Due to seasonal restrictions on dewatering and fish relocation and the quality of habitat surrounding Caltrans infrastructure, projects are likely to occur in areas where the densities of juvenile salmonids are extremely low. Therefore, the majority of projects will result in very few, if any, capture and relocation of ESA-listed species. Based on this information, Caltrans and NMFS have agreed to limit the total number of projects that involve relocation of ESA-listed species to 10 projects per district, per year, rather than limit the number of projects to the values used to estimate fish

relocation numbers (1 to 2 projects per district). The annual maximum numbers for each species, however, may not exceed the estimates presented below.

Depending upon where fish relocation projects for each District occur within the District boundaries, and which ESU or DPS occurs at that project site, each District's annual total for fish relocation could include varying numbers of each ESU/DPS. Therefore, to calculate the amount of fish relocated by each District per year, the total number of coho (SONCC, CCC combined), Chinook (only CC Chinook), and steelhead (NC, CCC, SCCC combined) were used.

NMFS conservatively estimates that no more than 362 juvenile steelhead, 260 juvenile coho salmon, and 75 juvenile Chinook salmon per year (*i.e.,* 3,620 juvenile steelhead, 2,600 juvenile coho salmon, and 750 juvenile Chinook salmon over the 10 year Program) will be captured and relocated. By Caltrans District, the following numbers of juvenile salmonids may be captured and relocated in a given calendar year:

- District 1: 145 steelhead, 108 coho salmon, and 25 Chinook salmon;
- District 2: 72 steelhead, 54 coho salmon, and 25 Chinook salmon;
- District 4: 145 steelhead, 108 coho salmon, and 25 Chinook salmon;
- Combined Districts: 362 juvenile steelhead, 260 juvenile coho salmon, and 75 juvenile Chinook salmon; and
- Program total (over 10 years): 3,620 juvenile steelhead, 2,600 juvenile coho salmon, and 750 juvenile Chinook salmon.

In the worst case scenarios, annual numbers in each District could come from only one ESU or DPS. The following list describes these worst case scenarios.

CC Chinook salmon- Only CC Chinook salmon will be encountered under the Program and, therefore, a maximum of 75 CC Chinook salmon could be captured and relocated annually (25 CC Chinook in District 1; 25 CC Chinook in District 2; 25 CC Chinook in District 4).

CCC steelhead- If all steelhead encountered in District 1 and 4 are CCC steelhead, a maximum of 290 CCC steelhead could be captured and relocated annually (145 CCC steelhead in District 1; 145 CCC steelhead in District 4).

SCCC steelhead- If all steelhead encountered in District 4 are SCCC steelhead, a maximum of 145 SCCC steelhead could be captured and relocated annually (145 SCCC steelhead in District 4).

NC steelhead- If all steelhead encountered in District 1, 2, and 4 are NC steelhead, a maximum of 362 NC steelhead could be captured and relocated annually (145 NC steelhead in District 1; 72 NC steelhead in District 2; 145 NC steelhead in District 4).

CCC coho salmon- If all coho salmon encountered in District 1 and 4 are CCC coho salmon, a maximum of 216 CCC coho salmon could be captured and relocated annually (108 CCC coho salmon in District 1; 108 CCC coho salmon in District 4).

SONCC coho salmon- If all coho salmon encountered in District 1 and 2 are SONCC coho salmon, a maximum of 162 SONCC coho salmon could be captured and relocated annually (108 SONCC coho salmon in District 1; 54 SONCC coho salmon in District 2).

4. Fish Mortality and Injury Estimates

Fish relocation activities do pose risk of injury or mortality to rearing juvenile coho salmon, Chinook salmon, and steelhead. Any fish collecting gear, whether passive (Hubert 1996) or active (Hayes *et al.* 1996), has some associated risk to fish, including stress, disease transmission, injury, or death. The amount of injury and mortality attributable to fish capture varies widely depending on the method used, the ambient conditions, and the expertise and experience of the field crew. The effects of seining and dip-netting on juvenile salmonids include stress, scale loss, physical damage, suffocation, and desiccation. Electrofishing can kill juvenile salmonids, and researchers have found serious sublethal effects including spinal injuries (Reynolds 1983, Habera *et al.* 1996, Habera *et al.* 1999, Nielsen 1998, and Nordwall 1999). The long-term effects of electrofishing on salmonids are not well understood. Although chronic effects may occur, NMFS assumes that most impacts from electrofishing occur at the time of sampling. Since fish relocation activities will be conducted by a designated qualified fisheries biologist following NMFS' electrofishing guidelines (NMFS 2000), injury and mortality of listed juvenile salmonids during capture will be minimized.

Although sites selected for relocating fish should have similar water temperature as the capture site and should have ample habitat, in some instances relocated fish may endure short-term stress from crowding at the relocation sites. Relocated fish may also have to compete with other salmonids causing increased competition for available resources such as food and habitat (Keeley 2003). Some of the fish at the relocation sites may choose not to remain in these areas and may move either upstream or downstream to areas that have more habitat and less density of fish. As each fish moves, competition remains either localized to a small area or quickly diminishes as fish disperse. NMFS cannot estimate the number of fish affected by competition, but does not expect this impact will be large enough to affect the survival chances of individual fish. For example, most fish relocation activities will involve a small number of fish that will be released into habitats that have similar conditions (*i.e.,* habitat quantity and quality) to the areas where fish were removed. In cases where this is not possible, fish will be released in multiple

sites to facilitate fish dispersion and limit competition. Once the project is complete and the diversion facilities are removed, juvenile salmonid rearing space will return to the dewatered area.

Fish relocation activities are expected to minimize individual project impacts to juvenile salmon and steelhead by removing them from project sites where they may have experienced high rates of injury and mortality. Due to the number and timing of proposed fish relocation activities and the small areas and typically low densities of salmonids where fish relocation activities are proposed, fish relocation is only anticipated to affect a small number of rearing juvenile salmon (primarily coho) and/or steelhead (these numbers are described in greater detail below). Rearing juvenile coho salmon and/or steelhead present in the immediate project work area will be subject to disturbance, capture, relocation, and related short-term effects. Most of the adverse effects associated with fish relocation activities are anticipated to be non-lethal, however, a very low number of rearing juvenile (mostly young of year) coho salmon and/or steelhead captured may be injured or killed. Data on fish relocation efforts since 2004 shows most mortality rates are below three percent for steelhead (Collins 2004; CDFG 2005, 2006, 2007, 2008b, 2009, 2010). Fish that avoid capture during relocation would be exposed to risks associated with dewatering (described below).

During dewatering, a fisheries biologist will remain at the project work site to net and rescue any fish that become stranded. Juvenile salmon and steelhead that avoid capture in the project work area will die during dewatering activities. Due to the limited number of projects allowed which would require dewatering (30 annually), the spatial distribution of those projects, the small area affected during dewatering at each site, and the low numbers of juvenile salmonids expected to be present within each project site due to relocation activities and degraded habitat, NMFS anticipates the number of juvenile salmon and/or steelhead that will be killed as a result of stranding during site dewatering activities is low (*i.e.*, less than 1 percent of the total present during dewatering).

Abundance of benthic (bottom dwelling) aquatic macroinvertebrates may be temporarily reduced when stream habitat is dewatered (Cushman 1985). Effects to aquatic macroinvertebrates resulting from stream flow diversions and dewatering will be temporary because construction activities will be relatively short-lived, and rapid recolonization (about one to two months) of disturbed areas by macroinvertebrates (Cushman 1985, Thomas 1985, Harvey 1986) is expected following rewatering. In addition, the effect of macroinvertebrate loss on juvenile salmon, steelhead, or both is likely to be negligible because food from upstream sources (via drift) would be available downstream of the dewatered areas since stream flows will be maintained around the project work site. Based on the foregoing, the reduction of aquatic macroinvertebrates as a result of dewatering is not expected to reduce growth rates of listed species in the action area.

Except on rare occasions, fish relocation activities will also involve dewatering. Therefore, for purposes of these estimates, NMFS assumes all fish relocation activities will also involve dewatering. NMFS estimates mortality will be less than 4 percent total (*i.e.,* 3 percent capture and relocation plus 1 percent dewatering) of those steelhead, coho salmon, and Chinook salmon that are encountered during fish relocation and dewatering. Based on the estimated maximum number of listed salmonids captured or relocated annually (described above), the maximum annual mortality by District are expected to be:

- District 1: 5 steelhead, 4 coho salmon, and 1 Chinook salmon;
- District 2: 2 steelhead, 2 coho salmon, and 1 Chinook salmon;
- District 4: 5 steelhead, 4 coho salmon, and 1 Chinook salmon.

In the worst case scenarios, annual mortality in each District could come from only one ESU or DPS. The following list describes these worst case scenarios:

CC Chinook salmon- Only CC Chinook salmon will be encountered under the Program, and therefore a maximum of 3 CC Chinook salmon are expected to be injured or killed annually during capture, relocation, and dewatering activities (1 CC Chinook in District 1; 1 CC Chinook in District 2; 1 CC Chinook in District 4).

CCC steelhead- If all steelhead encountered in Districts 1 and 4 are CCC steelhead, a maximum of 10 CCC steelhead could be injured or killed annually (5 CCC steelhead in District 1; 5 CCC steelhead in District 4).

SCCC steelhead- If all steelhead encountered in District 4 are SCCC steelhead, a maximum of 5 SCCC steelhead could be injured or killed annually (5 SCCC steelhead in District 4).

NC steelhead- If all steelhead encountered in Districts 1, 2, and 4 are NC steelhead, a maximum of 12 NC steelhead could be injured or killed annually (5 NC steelhead in District 1; 2 NC steelhead in District 2; 5 NC steelhead in District 4).

CCC coho salmon- If all coho salmon encountered in Districts 1 and 4 are CCC coho salmon, a maximum of 8 CCC coho salmon could be injured or killed annually (4 CCC coho salmon in District 1; 4 CCC coho salmon in District 4).

SONCC coho salmon- If all coho salmon encountered in Districts 1 and 2 are SONCC coho salmon, a maximum of 6 SONCC coho salmon could be injured or killed annually (4 SONCC coho salmon in District 1; 2 SONCC coho salmon in District 2).

B. Increased Mobilization of Sediment

Implementation of all Site-Specific Projects authorized in the proposed Program have the potential to temporarily increase suspended sediment levels within the project work site and downstream areas which may cause temporary increases in turbidity. The anticipated increases in suspended sediment concentrations and turbidity levels resulting from individual maintenance activities (*i.e.,* Project Actions) authorized under this Program, including but not limited to construction and removal of dewatering facilities, cleaning of accumulated sediments from culverts or bridge structures, access road construction, and geotechnical drilling, are expected to be minor and temporary due to the small work footprint of most projects and the time of year (dry season, low flow conditions), which makes the mobilization of large volumes of sediment unlikely. Furthermore, Caltrans will minimize impacts related to increases in suspended sediment and turbidity by implementing multiple erosion control, water quality protection, and sediment containment minimization measures and BMPs described in Caltrans (2010).

High concentrations of suspended sediment can disrupt normal feeding behavior and efficiency (Cordone and Kelly 1961, Berg and Northcote 1985), reduce growth rates (Sigler *et al.* 1984, Sigler 1988, Swetka and Hartman 2001), and increase plasma cortisol levels (Servizi and Martens 1992). High turbidity concentrations can reduce dissolved oxygen in the water column, result in reduced respiratory functions, reduce tolerance to diseases, and can also cause fish mortality (Sigler *et al.* 1984; Berg and Northcote 1985; Gregory and Northcote 1993; Waters 1995). Even small pulses of turbid water will cause salmonids to disperse from established territories (Waters 1995), which can displace fish into less suitable habitat and/or increase competition and predation, decreasing chances of survival. With regard to physical habitat condition, increased sediment deposition can fill pools and reduce the amount of cover available to fish, decreasing the survival of juveniles. Alexander and Hansen (1986) measured a 50 percent reduction in brook trout (*Salvelinus fontinalis*) density in a Michigan stream after manually increasing the sand sediment load by a factor of four. In a similar study, Bjornn *et al.* (1977) observed that salmonid density in an Idaho stream declined faster than available pool volume after the addition of 34.5 cubic meters of fine sediment into a 165 meter study section. Both studies attributed reduced fish densities to a loss of rearing habitat caused by increased sediment deposition. However, streams subject to infrequent episodes adding small volumes of sediment to the channel may not experience dramatic morphological changes (Rogers 2000).

Much of the research discussed above focused on turbidity levels higher than those expected to occur during implementation of the proposed activities. NMFS anticipates the resulting elevated turbidity levels will be minor and only occur for a short time, well below levels and durations shown in scientific studies as causing injury or harm to salmonids (see for example Newcombe and Jensen 1996). Most of the possible project-related sediment will likely mobilize during the initial high flow event the following winter season. These temporary increases in turbidity will be negligible when compared with the elevated background levels generated during the initial

high flow event. Therefore, minor and short-term sediment input resulting from maintenance activities is not anticipated to appreciably affect the survival, reproduction, or distribution of listed salmonids, green sturgeon, or Pacific eulachon within an individual project area.

The small temporal and spatial scale effects of sediment input associated with the Program will likely preclude significant additive effects at the watershed or population scale. Hence, NMFS expects sediment effects generated by each individual project will likely impact only the PCEs for water quality in the immediate footprint of the project location and a short distance of channel downstream of the site, with effects diminishing farther downstream of the project. Furthermore, many of the activities outlined for inclusion under this Program are, for the most part, intended to repair deficient infrastructure or reduce sedimentation from eroding banks and culverts that are presently, and will likely continue, degrading critical habitat or fish passage conditions. As described above, effects on freshwater PCEs from individual projects are expected to be short-term and minor. NMFS anticipates the PCEs for water quality in estuarine habitats for salmonids, green sturgeon and Pacific eulachon may also experience temporary yet insignificant increases in turbidity at individual project sites. Estuaries (*e.g.,* San Francisco Bay and Delta) are typically more turbid than upstream freshwater riverine habitats and they are large enough that fish to can relocate to other unaffected areas.

C. Vegetation Removal

All Site-Specific Projects could include some level of vegetation management actions including the removal or trimming of riparian, aquatic, and upland vegetation as part of their proposed routine maintenance activities. This will include vegetation management activities that will occur below the OHWL, in designated critical habitat for the SONCC and CCC coho salmon ESUs, SRWR, CVSR, and CC Chinook salmon ESUs, NC, CCC, CV, and SCCC steelhead DPSs, and the southern DPSs of green sturgeon and Pacific eulachon. Listed salmonids (juvenile SONCC and CCC coho salmon, CC Chinook salmon, and NC, CCC, and SCCC steelhead) will be relocated or excluded from areas where vegetation removal activities are likely to adversely affect listed species (*i.e.,* removal of aquatic vegetation with heavy equipment). Covered activities likely to have larger impacts to vegetation will be associated with culvert repair and replacement, bridge repair and replacement, and access roads associated with these and other activities. The removal of vegetation as a result of implementing these activities will only occur when it is necessary for the protection of existing infrastructure (such as bridges, bridge abutments, wingwalls, piers, culverts, or road embankments) threatened by flow-related erosion or debris collection, or to prepare or access a worksite. Typically, the area of vegetation removed in association with the proposed maintenance activities is relatively small. NMFS will be notified of proposals to remove mature trees or vegetation greater than 20 feet from infrastructure and, if necessary, provide guidance on avoidance of sensitive areas. Furthermore, projects will not remove more than 5,000 square feet (0.11 acres) of riparian or wetland/aquatic

vegetation below the OHWL or within 150 linear feet of the OHWL (see section *II. B. Project Categorization, Limits, and Minimization Measures*).

Streamside and wetland/aquatic vegetation is expected to be altered (*i.e.,* trimmed), and in some situations, lost (*i.e.,* felled or grubbed). Alteration or loss of streamside and wetland/aquatic vegetation is of concern due to the benefits it provides to aquatic ecosystems and populations of rearing fish. Riparian zones and wetland/aquatic vegetation serve important functions in stream ecosystems such as providing shade (Poole and Berman 2001), sediment storage and filtering (Cooper *et al*. 1987, Mitsch and Gosselink 2000), nutrient inputs (Murphy and Meehan 1991), water quality improvements (Mitsch and Gosselink 2000), channel and stream bank stability (Platts 1991), source of woody debris that creates fish habitat diversity (Bryant 1983, Lisle 1986, Shirvell 1990), and both cover and shelter for fish (Bustard and Narver 1975, Wesche *et al*. 1987, Murphy and Meehan 1991). Small perennial streams are especially sensitive to loss of riparian habitat and shade, which moderates stream temperatures by insulating the stream from solar radiation and reducing heat exchange with the surrounding air. The reduction of vegetation and debris also affects aquatic insects in the channel by limiting their food source or substrate in which they live. However, with the application of BMPs and other minimization measures described below, NMFS expects the effects of vegetation removal and management on salmonids, green sturgeon, and Pacific eulachon and their habitat will be minor and short-term for a variety reasons, as described below.

Caltrans has proposed several measures to minimize impacts associated with vegetation removal as part of implemented activities under the Program. As noted above, the amount of vegetation typically removed in association with the proposed activities is small, and is usually restricted to localized areas at existing infrastructure (*e.g.,* culvert inlets/outlets, bridge piers or wingwalls). Wherever possible, vegetation will be trimmed leaving their root systems intact; willows and emergent vegetation resprout and grow rapidly (Conroy and Svejcar 1991). Caltrans will select access routes where vegetation clearing and removal will occur in areas with the least amount of riparian or wetland/aquatic vegetation disturbance and/or are dominated by non-native plant species. Caltrans has proposed to revegetate all disturbed areas with native species at required ratios as determined by CDFW[16], except where revegetation will interfere with Caltrans' infrastructures, create fish passage problems, limit visual access to culvert inlets and outlets, or require continued and sustained maintenance. The replacement of non-native vegetation with native vegetation is expected to benefit habitat for listed species, particularly juvenile salmonids, over the long term. In most cases, adjacent instream and riparian vegetation, not targeted for removal, would continue to provide a source of shade, allochthonous material, and instream cover.

[16] Revegetation ratios are based on the size of the trees to be removed, specifically their diameter at breast height. Larger trees generally require larger ratios.

Vegetation removal will only occur on an as-needed basis and therefore it is difficult to accurately anticipate the number, scope and frequency of projects in a particular watershed or stream. Potential impacts to PCEs of designated critical habitat from vegetation clearing may include an increase in water temperatures by reducing shade, a localized reduction of allochthonous inputs, and a loss of cover in the channel. Based on the proposed BMPs and minimization measured described above, NMFS concludes the impacts associated with vegetation removal associated with their maintenance activities are unlikely to appreciably diminish the value of PCE's for spawning, rearing, or migration for ESA-listed salmonids, southern DPS of green sturgeon, or similar physical and biological features essential for the conservation of the southern DPS of Pacific eulachon. Furthermore, based on the factors described above, NMFS does not anticipate the removal of vegetation will result in taking of ESA-listed salmonids.

D. Toxic Chemicals

All Site-Specific Projects could involve the use of equipment and equipment refueling, fluid leakage, and maintenance activities (*i.e.,* herbicides for vegetation management along roadsides or in drainage ditches) within and near the stream channel that pose some risk of contamination and potential harm to ESA-listed fish or their habitats. However, equipment fueling will occur at least 50 feet from the OHWL, and all equipment will be washed and inspected for leaks prior to entering waterways and periodically during the day. In addition to toxic chemicals associated with construction equipment, water that comes into contact with wet cement during construction of a maintenance project can also adversely affect water quality and could potentially adversely affect ESA-listed salmonids. However, cement will be installed and cure in dewatered or dry areas and, therefore, water quality will not be adversely affected. For instream construction activities, NMFS does not anticipate any localized water quality degradation from toxic chemicals; therefore, a reduction in the fitness of individual listed fish residing within the action area is not anticipated. NMFS anticipates that proposed minimization measures and responses by Caltrans to any accidental spill of toxic materials would be sufficient to restrict the effects to the immediate area and not enter the waterway; therefore, NMFS expects that the function of critical habitat (particularly the PCEs associated with water quality) for ESA-listed salmonid ESUs/DPSs within the action area, as well as the southern DPSs of green sturgeon and Pacific eulachon, will not be impaired.

E. Beneficial Effects

The following Site-Specific Projects could include some beneficial effects on listed species and designated critical habitat:

- Site-Specific Project-3.2: Cleaning of sediment and debris from culverts and bridge abutments and supports to minimize erosion and damage to roads, culverts, and bridges and to maintain streamflow conditions;
- Site-Specific Project-3.3: Rehabilitation of culverts to maintain function;
- Site-Specific Project-3.4: Replacement, repair, and retrofitting of culverts to maintain culvert function and, where applicable, improve flow conditions to support fish passage and sediment transport; and
- Site-Specific Project-4.3: Replacement of small bridges to maintain bridge function, meet current standards and specifications, and, where applicable, improve flow conditions for fish passage and sediment transport.

Examples of these benefits include removal of debris from a culvert that is blocking the conveyance of water and sediment, and impairing fish passage; or retrofit of a dysfunctional or inadequate fishway. Bridges and culverts replaced under this Program are all expected to improve both upstream and downstream habitat (and habitat accessibility) through enhancement of geomorphic function, water conveyance, and fish passage through crossings and will decrease the likelihood of infrastructure failure, thus preventing potential occurrences of significant bank erosion and stream habitat impairment. The extent of these beneficial effects could be substantial. Replacement of one bridge or culvert that blocks fish passage or habitat continuity could restore spawning and/or rearing to a potentially large area. This in turn could have a population level effect on salmonid abundance and distribution. A more common activity, such as cleaning, could have an immediate benefit to fish passage and habitat through restoring flow and by preventing catastrophic failure of banks or Caltrans infrastructure. Therefore, cleaning, which may occur multiple times across the large action area, could also have population or species level beneficial effects.

VII. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions, not involving Federal activities that are reasonably certain to occur in the action area considered in this opinion. 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.

Because of the relatively large action area, it is difficult to identify specific numbers of future state, tribal, local, or private actions that are reasonably certain to occur within the action area. However, geographic trends in land use, climate change, and population growth do provide some indication of what can be expected in the future. The effects of climate change in the action area are described above in *IV.E. Additional Threats to Species and Critical Habitat* and will not be repeated in this section as those effects relate to Cumulative Effects. However, the effects of climate change in the action area during the period of the proposed action have not been

specifically determined and will likely be within the approximate range of those currently occurring. State, tribal, local, or private actions that may affect listed species within the action area include timber management, suppression of wildfires, industrial activities, population growth resulting in residential and commercial development. These actions, while broad in scale, are likely to continue into the future at a rate similar to that experienced in the past.

A. Timber Management

Timber management is prevalent within the action area and includes, for example, the harvest, yarding, loading, and hauling of timber; site preparation, such as identifying areas of harvest; and road building. Timber management also includes the replanting of harvest areas, vegetation management, and thinning.

Future timber harvest levels in the action area cannot be predicted; however, it is assumed that, for the foreseeable future, levels will be within the approximate range of those occurring since the listing of the northern spotted owl in 1992. Between 1992 and 2011 for the counties within the action area, the average annual harvest volume was 894 million board feet (MMBF), with most of the harvest occurring in Humboldt, Mendocino, and Siskiyou Counties[17]. It is assumed similar trends in harvest will continue.

Facilities are expected to operate within applicable laws. Where wastewater discharge may affect habitat for listed species, it is expected that the ESA and CESA will be enforced. Most sawmills processing logs from timber harvest activities in the action area are expected to remain in operation for the foreseeable future, based on a relatively steady supply of timber, as discussed above. The reduction in available old-growth logs will probably result in closure or retooling of those mills designed to process large logs.

Implementation of timber harvest plans (THPs) under the California Forest Practice Rules (CFPRs) has not consistently provided protection against unauthorized take of Pacific salmon. An independent scientific review panel found in 1999 that the CFPRs and their implementation did not adequately achieve functioning habitat conditions necessary to protect listed salmonids (Ligon *et al*. 1999). Following that finding, the California Department of Forestry and Fire Protection adopted interim rules to attempt to strengthen the CFPRs. Overall, NMFS continues to find the implementation of these interim rules still does not "ensure the achievement of properly functioning habitat for conservation of anadromous salmonids throughout their range in California" (Simpson Resource Company 2002, as cited in Caltrans 2010). Until these issues are resolved, unauthorized take from direct and indirect effects on covered salmonids from timber harvest and its associated activities may occur. The extent and amount of any unauthorized take of salmonids are unknown.

[17] http://frap.cdf.ca.gov/projects/BOE/BOETimberTax.html (last visited on September 26, 2013)

Reasonably foreseeable effects of timber management activities may also affect designated critical habitat for covered species within the action area. Direct and indirect effects of timber management has the potential to degrade all PCEs in freshwater habitats of Pacific salmon and steelhead designated critical habitat that are present within the action area. This is particularly true for coastal populations where timber harvest is a predominant land use.

B. Suppression and Control of Wildfires

Based on current practice, the California Department of Forestry and Fire Protection in conjunction with other state and federal agencies will likely be involved in the suppression or control of wildfires in the action area during the term of the proposed action. Future levels of suppression or control of wildfires in the action area cannot be predicted; however, it is assumed that, for the foreseeable future, levels will be within the approximate range of those currently occurring.

Suppression or control measures may include thinning and removal of fuels (*e.g.*, trees, downed branches, and litter), conducting prescribed burns before a wildfire incident, constructing fire breaks, setting backfires, and cooling the fire edge with water. Equipment such as helicopters, aircraft, fire engines, bulldozers, and hand crews operate at various times of the year. These activities may result in the disturbance of covered species. An undetermined number of individuals may be affected by this activity annually during each year of the proposed action.

In addition, suppression or control of wildfires may include the removal or modification of vegetation as a result of the construction of firebreaks or the setting of backfires to control the spread of fire. An undetermined amount of suitable habitat for covered species may be removed or modified by this activity.

C. Industrial Activities

Currently, quarrying, gravel mining, and associated processing operations are located within the action area, and will likely continue to be operated by non-federal parties. Current operations fall under the jurisdiction of the California Coastal Commission (for those activities conducted within the state's coastal zone), the Corps, and any local governments, and will likely continue to do so in the future. Future demand cannot be estimated, but it may increase as private timber and agricultural landowners look for ways to increase revenue generated from their lands. The effects on listed species from quarries and rock mines depend on the type of mining, size of the quarry or mine, and distance from surface waters and groundwater features. Rock mining near surface waters can cause increased sedimentation, accelerated erosion, incised stream banks, streambed instability, and changes to substrate. Surface mining may compact soils, remove vegetative cover and the humic layer, and increase surface runoff. Mining may also cause the loss of riparian vegetation and cause the transportation of toxic chemicals to surface waters. Because the effects

of quarries and rock mines depend on several variables, the extent of effects of the operations on covered species within the action area are unknown.

D. Population Growth

The U.S. Census Bureau estimates California's population at approximately 38 million in 2012, up from 37.25 million in 2010. The state population is projected to increase to about 40.1 million by 2015. Between 1990 (29.76 million) and 2000 (33.87 million), the state experienced a 13.82 percent growth in population. California had the 18th-highest population growth by percentage among all states in that time period. However, most of this population growth was concentrated outside the northern coastal areas in the action area, with only three of the counties within the action area experiencing growth rates above the state average (Sonoma at 18.13 percent, Del Norte at 17.25 percent, and Contra Costa at 18.05 percent). Trinity County experienced a negative growth rate for that time period (loss of 0.31 percent). The areas with the highest population densities are in the coastal areas surrounding the major cities of Los Angeles, San Diego, and the San Francisco Bay Area, as well as within the interior valleys such as the Sacramento Valley. Future growth patterns are expected to continue to follow historical patterns.

Population growth results in increasing residential and commercial development. Primary effects of land development include direct habitat loss, decreased water quality, contamination of natural resources (*e.g.*, groundwater, surface waters, and land), changes to runoff patterns, habitat fragmentation, isolation of wildlife populations, and decreased habitat diversity. As development increases, the general quantity and quality of habitat suitable for threatened and endangered species will most likely decrease.

The amount of build-out associated with the projected population growth will likely lead to further habitat degradation, focused primarily in current metropolitan areas. Actions taken to mitigate for the potential impacts of development, such as avoidance of habitat critical to species survival and conservation, as well as strong urban/rural boundaries, can help minimize and slow the rate of habitat degradation, in some instances avoiding degradation entirely.

VIII. INTEGRATION AND SYNTHESIS OF EFFECTS

Coho salmon populations throughout the action area have shown a dramatic decrease in both numbers and distribution (Spence *et al.* 2008, Spence and Williams 2011, and Williams *et al.* 2011); SONCC coho salmon and CCC coho salmon do not occupy many of the streams where they were found historically. Although SONCC coho salmon are relatively more abundant and better distributed than CCC coho salmon, both the presence-absence and trend data available suggest that the SONCC coho salmon numbers continue to decline, and the ESU remains likely to become endangered in the foreseeable future (Williams *et al.* 2011).

For CCC coho salmon, the available information suggests their abundance is very low, the ESU is not able to produce enough offspring to maintain itself (population growth rates are negative), and populations have experienced range constriction, fragmentation, and a loss of genetic diversity (Spence and Williams 2011). Many subpopulations that may have acted to support the species' overall numbers and geographic distribution have likely been extirpated or reduced to critically low numbers supported largely by conservation hatchery plantings (*i.e.,* Russian, San Francisco Bay Area, and Napa HUCs). The poor condition of their habitat in many areas and the compromised genetic integrity of some stocks pose a serious risk to the survival and recovery of CCC coho salmon (NMFS 2012b). Spence and Williams (2011) concluded the available population trends since the last status review indicate conditions have worsened for populations in the CCC coho salmon ESU, and that the risk of extinction appears to have increased since 2005, when Good *et al.* (2005) concluded the ESU was in danger of extinction.

Information on the current abundance and distribution of CC Chinook salmon throughout the ESU is sparse. Previous status reviews (Myers *et al.* 1998, Good *et al.* 2005) concluded that CC Chinook salmon were likely to become endangered in the foreseeable future. Contributing factors for this determination were the apparent loss of the spring-run life history type throughout the entire ESU as well as the apparent loss of several populations in the southern portion of the ESU including the Ten Mile, Noyo, Big, Little, Navarro, Gualala, and Garcia rivers (Good *et al.* 2005, Williams *et al.* 2011). Williams *et al.* (2011) concluded there was not sufficient evidence to suggest a significant improvement in the ESU, nor did new and additional information available since Good *et al.* (2005) warrant a change in extinction risk (*i.e.,* likely to become endangered). However, in the Eel River[18], adult CC Chinook salmon returns during the fall-winter of 2012/2013 were the highest observed in since the 1930s and in the Russian River, the number of adults counted in the lower river was the highest total since counting began by the Sonoma County Water Agency in 2000.[19]

Steelhead populations throughout NC, CCC, and SCCC DPSs have decreased in abundance, but are still widely distributed (Good *et al.* 2005, Williams *et al.* 2011). Although each of these DPSs have experienced significant declines in abundance, and long-term population trends suggest a negative growth rate, they have maintained a better distribution overall when compared to coho salmon ESUs. This suggests that, while there are significant threats to the population, they possess a resilience (based in part, on a more flexible life history) that likely slows their decline. However, the poor condition of their habitat in many areas and the compromised genetic integrity of some stocks pose a risk to the survival and recovery of these steelhead DPSs. Based on the above information, recent status reviews (Williams *et al.* 2011) and available

[18] http://www.eelriverrecovery.org/ (last visited on September 26, 2013)
[19] http://www.scwa.ca.gov/chinook/ (last visited on September 26, 2013)

information all indicate NC, CCC, and SCCC steelhead are likely to become endangered in the foreseeable future.

Some of the currently accessible listed salmonid, green sturgeon, and eulachon habitat throughout the action area has been severely degraded, and the condition of designated critical habitats, specifically its ability to provide for the conservation of listed salmonid, green sturgeon, and eulachon analyzed in this biological opinion, has also been degraded from conditions known to support viable populations. A number of anthropogenic factors have been identified as causes contributing to the modification and curtailment of listed fish habitat in central and northern California. These include: logging, agricultural, urban development, mining, stream channelization, dams and diversions, and wetland/riparian habitat loss. Impacts of concern include alteration of stream bank and channel morphology, alteration of water temperatures, loss of spawning and rearing habitat, fragmentation of habitat, loss of downstream recruitment of spawning gravels and large wood in channels, degradation of water quality, removal of riparian vegetation resulting in increased stream bank erosion, increases in erosion entry to streams from upland areas, loss of shade (higher water temperatures), and loss of nutrient inputs (61 FR 56138, October 31, 1996).

As described in section *VII. Cumulative Effects* above, it is difficult to identify specific number of actions included under the cumulative effects that are reasonably certain to occur within the action area. These actions, while broad in scale, are likely to continue into the future at a rate similar to that experienced in the past.

Although projects proposed under Caltrans' Program will be for the purpose of maintaining and providing structurally sound transportation infrastructure while in some cases generally improving accessibility to and quality of habitat, adverse effects to listed salmonids and salmonid, green sturgeon, and eulachon critical habitats are expected. Adverse effects to listed salmonids at project sites are primarily expected to be in the form of short-term behavioral effects with a minimal amount of mortality. Salmonids present during the implementation of any of these projects may be disturbed, displaced, injured or killed by project activities, and salmonids present in some project work areas will be subjected to capture, relocation, dewatering and related stressors.

Based on several factors including the lack of recent confirmed spawning of SRWR Chinook salmon, CVSR Chinook salmon, CV steelhead, and the Southern DPSs of green sturgeon and Pacific eulachon in watersheds within the action area, the time of year project activities will be implemented, the life histories and migration timing of these species, and the infrequency and small scale of dewatering and fish relocation projects, NMFS does not anticipate take of these species.

The number of fish injured or killed during relocation, dewatering or construction is not expected to have a detectable effect on the overall individual stream populations of salmonids. This is because only a small portion of an ESU/DPS's entire juvenile population will be exposed to electrofishing over the Program's ten year period and only a very small portion of those salmonids electrofished will be injured or killed (*i.e.,* no more than three percent). An even smaller portion of an ESU/DPS's juvenile population will be injured or killed during dewatering and construction activities *(i.e.,* one percent). In addition, much of the SCCC steelhead DPS will not be impacted because of the geographic limits of the action area. It is unlikely that the loss of a few juveniles from each watershed each year will reduce future adult returns. Due to the relatively large number of juveniles produced by each spawning pair, salmon and steelhead spawning in these watersheds in future years are likely to produce enough juveniles to replace the ones that may be lost during relocation and dewatering.

Caltrans' routine maintenance activities authorized through this consultation will be designed and implemented consistent with techniques and minimization measures outlined in the project description, including NMFS/CDFW's guidelines for salmonid passage at stream crossings, NMFS' electrofishing guidelines, and NMFS' screening guidelines in order to minimize adverse effects to salmonids. Although there will be short-term impacts to salmonid habitat, including critical habitats, associated with a small percentage of projects implemented annually, NMFS anticipates most projects will either have temporary impacts (*i.e.,* adverse), or will provide long-term improvements (*i.e.,* beneficial) to salmonid, green sturgeon, and Pacific eulachon habitat. NMFS does not anticipate any of the implemented activities, individually or in combination, performed as described and intended, will have a significant adverse impact to critical habitat or the populations themselves.

Based on the above information, NMFS concludes that the effects of Caltrans' proposed Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4 are not likely to reduce the reproduction, numbers, or distribution of the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, southern DPS of green sturgeon or southern DPS of Pacific Eulachon; and are not likely to diminish the conservation value of designated critical habitat for the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, Southern DPS of North American green sturgeon, or Southern DPS of Pacific Eulachon.

IX. CONCLUSION

After reviewing the best available scientific and commercial information, the current status of the species and critical habitat, the environmental baseline for the action area, the effects of the

action, as proposed, and the cumulative effects, it is NMFS' biological opinion that implementation of Caltrans' proposed Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4 is not likely to jeopardize the continued existence of the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, southern DPS of green sturgeon, and southern DPS of Pacific Eulachon.

After reviewing the best available scientific and commercial information, the current status of the critical habitat, the environmental baseline for the action area, the effects of the action, as proposed, and the cumulative effects, it is NMFS' biological opinion that Caltrans' proposed Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4 is not likely to destroy or adversely modify designated critical habitat for the SONCC coho salmon ESU, CCC coho salmon EUS, CC Chinook salmon ESU, CVSR Chinook salmon ESU, SRWR Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, SCCC steelhead DPS, CV steelhead DPS, Southern DPS of North American green sturgeon, or the Southern DPS of Pacific Eulachon.

X. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without 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 NMFS as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by Caltrans and the Corps, for the exemption in section 7(o)(2) to apply. Caltrans and the Corps have a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans, or its contractors, or the Corps (1) fail to assume and implement the terms and conditions or (2) fail to require its designees to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Caltrans, as lead Federal action agency, the Corps or the Corps' applicant, must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement (50 CFR §402.14(i)(3)).

A. Amount or Extent of Take

NMFS estimates that no more than 362 juvenile steelhead, 260 juvenile coho salmon, and 75 juvenile Chinook salmon may be present during dewatering activities in a given calendar year (*i.e.* 3,620 juvenile steelhead, 2,600 juvenile coho salmon, and 750 juvenile Chinook salmon over the 10-year Program). For certain activities (described above) any fish present during the construction window will need to be captured and relocated. Based on the low mortality rates associated with typical relocation efforts, NMFS anticipates no more than four percent of the juvenile salmonids present in the areas to be dewatered will be killed or injured during capture, relocation and dewatering.

Incidental take is limited on an annual basis per Caltrans District. Take will be exceeded if any of the following annual District specific measures are exceeded:

District 1

- Annually, if more than 10 projects involving capture or relocation of listed salmonids occur, OR
- Annually, if more than a total of 145 steelhead, 108 coho salmon, or 25 Chinook salmon are present during dewatering, fish capture, and relocation, OR
- Annually, if more than a total of 5 steelhead, 4 coho salmon, and 1 Chinook salmon are injured or killed during dewatering, fish capture, and relocation.

District 2

- Annually, if more than 10 projects involving capture or relocation of listed salmonids occur, OR
- Annually, if more than a total of 72 steelhead, 54 coho salmon, and 25 Chinook salmon are present during dewatering or fish capture and relocation, OR
- Annually, if more than a total of 2 steelhead, 1 coho salmon, and 1 Chinook salmon are injured or killed during dewatering, fish capture, and relocation.

District 4

- Annually, if more than 10 projects involving capture or relocation of listed salmonids occur, OR
- Annually, if more than a total of 145 steelhead, 108 coho salmon, or 25 Chinook salmon are present during dewatering or fish capture and relocation, OR
- Annually, if more than a total of 5 steelhead, 4 coho salmon, and 1 Chinook salmon are injured or killed during dewatering, fish capture, and relocation.

B. Effect of the Take

In the accompanying opinion, NMFS determined this level of anticipated take is not likely to jeopardize the continued existence of the SONCC coho salmon ESU, CCC coho salmon ESU, CC Chinook salmon ESU, NC steelhead DPS, CCC steelhead DPS, or SCCC steelhead DPS.

C. Reasonable and Prudent Measures

NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of SONCC coho salmon, CCC coho salmon, CC Chinook salmon, NC steelhead, CCC steelhead, and SCCC steelhead:

1. Measures shall be taken to minimize the amount or extent of incidental take of listed salmonids resulting from Program activities

D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, Caltrans, and their contractors or designees, and the Corps, must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. The following terms and conditions implement reasonable and prudent measure 1, which states that measures shall be taken to minimize the amount or extent of incidental take of listed salmonids resulting from Program activities:

    a. The Caltrans or Corps biologist (or their designee) shall notify NMFS biologists Joe Heublein at (707) 575-1251 or joe.heublein@noaa.gov, or Joel Casagrande at (707) 575-6016 or joel.casagrande@noaa.gov, or Chuck Glasgow at (707) or chuck.glasgow@noaa.gov one week prior to capture activities in order to provide an opportunity for NMFS staff to observe the activities.

    b. Captured fish shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream and fish shall not be removed from this water except when released. To avoid predation, the biologist shall have at least two containers and segregate young-of-year fish from larger age-classes and other potential aquatic predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which habitat conditions are present to allow for survival of transported fish and fish already present.

c. If any salmonids are found dead or injured, the biologist shall contact the following NMFS biologists by phone immediately: Joe Heublein (707) 575-1251, Joel Casagrande (707) 575-6016, in the NMFS North-Central Coast Office, or Chuck Glasgow (707) 825-5170 in the NMFS Northern California Office. The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All salmonid mortalities shall be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location of collection, fork length measured, and will be frozen as soon as possible. Frozen samples shall be retained until specific instructions are provided by NMFS. The Caltrans or Corps biologist may not transfer biological samples to anyone other than the NMFS North-Central Coast Office without obtaining prior written approval from NMFS. Any such transfer will be subject to such conditions as NMFS deems appropriate.

d. All cofferdams, pumps, pipes and sheet plastic will be removed from the stream upon Project completion; any clean native gravel used for the cofferdams will be left in the channel to augment available spawning habitat but will be graded to ensure the gravel does not impede or prevent fish passage for adult or juvenile salmonids.

e. All pumps used to divert live stream flow, outside the dewatered work area, will be screened and maintained throughout the construction period to comply with NMFS' Fish Screening Criteria for Anadromous Salmonids (1997). See: http://swr.nmfs.noaa.gov/hcd/fishscrn.pdf.

f. An electronic copy of reporting forms will be provided to NMFS within 10 business days of Category 3 project completion.

g. Caltrans will identify fish passage barriers in the Program and propose passage improvements for NMFS approval.

XI. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, or to develop information.

- NMFS encourages Caltrans to prioritize and expedite the improvement of (or provide funding for the improvement of) fish passage at existing barriers located within or

associated with Caltrans maintained facilities per the requirements of California State Senate Bill 857.

- To offset unavoidable temporary and permanent impacts to riparian habitats (including designated critical habitats) and the potential take of ESA-listed salmonids associated with implementation of the proposed activities, NMFS recommends and strongly encourages Caltrans purchase compensatory mitigation credits at established conservation banks located within the Programmatic action area.

- Caltrans, with assistance from NMFS and other state, federal, and local resource agencies, should continue with the development and implementation of a large woody material inventory tracking system for materials stored at agency facilities. The inventory system will track the quantity, size, and quality of large woody material at each storage facility, which could then serve as a resource for restoration planners that may need large wood for local habitat enhancement projects.

XII. REINITIATION NOTICE

This concludes formal consultation for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans Districts 1, 2, and 4, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by Caltrans or the Corps, where discretionary Federal involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (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 identified action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

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Enclosure 2

ESSENTIAL FISH HABITAT CONSULTATION

ACTION AGENCIES: California Department of Transportation (Caltrans) and U.S. Army Corps of Engineers (Corps)

ACTION: Caltrans' Routine Maintenance and Repair Activities Program in Districts 1, 2, and 4, and individual Corps permits for these activities

CONSULTATION CONDUCTED BY: National Marine Fisheries Service, Southwest Region

TRACKING NUMBER: 2013-9731

DATE ISSUED: **September 30, 2013**

I. STATUTORY AND REGULATORY INFORMATION

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, establishes a national program to manage and conserve the fisheries of the United States through the development of federal Fishery Management Plans (FMPs), and federal regulation of domestic fisheries under those FMPs, within the 200-mile U.S. Exclusive Economic Zone ("EEZ"). 16 U.S.C. § 1801 *et seq*. To ensure habitat considerations receive increased attention for the conservation and management of fishery resources, the amended MSA required each existing, and any new, FMP to "describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 1855(b)(1)(A) of this title, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat." 16 U.S.C. § 1853(a)(7). Essential Fish Habitat (EFH) is defined in the MSA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" 16 U.S.C. § 1802(10). The components of this definition are interpreted at 50 C.F.R. § 600.10 as follows: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a

sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

Pursuant to the MSA, each federal agency is mandated to consult with NOAA's National marine Fisheries Service (NMFS) (as delegated by the Secretary of Commerce) with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH under this Act. 16 U.S.C. § 1855(b)(2). The MSA further mandates that where NMFS receives information from a Fishery Management Council or federal or state agency or determines from other sources that an action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by any federal or state agency would adversely affect any EFH identified under this Act, NMFS has an obligation to recommend to such agency measures that can be taken by such agency to conserve EFH. 16 U.S.C. § 1855(4)(A). The term "adverse effect" is interpreted at 50 C.F.R. § 600.810(a) as any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations 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 quantity and/or quality of EFH. In addition, adverse effects to EFH may result from actions occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

If NMFS determines that an action would adversely affect EFH and subsequently recommends measures to conserve such habitat, the MSA proscribes that the Federal action agency that receives the conservation recommendation must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations. 16 U.S.C. § 1855(b)(4)(B).

II. ACTION AREA

The action area includes all coastal anadromous California streams from the Oregon/California border south to the San Mateo/Santa Cruz County boundary, San Francisco and San Pablo bays (including tributaries), the Sacramento-San Joaquin Delta (including tributaries) in eastern Contra Costa, Alameda, and Solano Counites, and a small portion of the upper Pajaro River watershed located in southern Santa Clara County (see Figure 1 of the Biological Opinion). The covered action area lies within Caltrans District 4 and portions of Caltrans districts 1 and 2 (Figure 1).

The action area occurs within EFH for coho salmon (*Oncorhynchus kisutch*) and Chinook salmon which are managed within the Pacific Salmon Fishery Management Plan (FMP). However, only activities proposed in freshwater habitats for Pacific salmonids will be authorized under this consultation. In freshwater, Pacific Salmon EFH overlaps with designated critical habitat for listed salmonids. Therefore, the proposed action contains measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. Proposed activities in tidal habitats (*i.e.,* brackish or marine waters) could occur in EFH associated with non-salmonid FMPs (*e.g.,* groundfish) and require specific EFH conservation recommendations not included in the preceding biological opinion. Therefore, proposed activities in tidal habitats require a separate EFH consultation with NMFS.

III. PROPOSED ACTION

California Department of Transportation (Caltrans) proposes to use Federal Highway Administration (FHWA) funds to implement routine maintenance and repair activities at existing Caltrans owned infrastructure located in Caltrans District 4 and coastal draining portions of Districts 1 and 2 from 2013 to 2023. Where FHWA money is not used, the Corps proposes to permit these Covered Activities and Caltrans will be the applicant as defined by 50 CFR 402.02. The five general Covered Activities are as follows:

- Covered Activity-1: Slide Abatement and Repair;
- Covered Activity-2: Safety Improvement;
- Covered Activity-3: Drainage System Maintenance and Repair;
- Covered Activity-4: Bridge Repair, Retrofit, Replacement and Maintenance; and
- Covered Activity-5: Maintenance Planning.

Under the Covered Activities are associated Site-Specific Projects and Project Actions, including various best management practices. These are each described in the preceding Biological Opinion.

IV. EFFECTS OF THE PROJECT PROPOSED ACTION

NMFS has evaluated the proposed project action for potential adverse effects to EFH pursuant to Section 305(b) of the MSA. Based on information developed during consultation, potential adverse effects to Pacific salmon EFH from de-watering and in-channel construction activities include: (1) temporary increase in turbidity, and (2) disturbance to benthic invertebrate community. These effects are described in the preceding biological opinion.

V. EFH CONSERVATION RECOMMENDATIONS

As described in the above effects analysis, NMFS has determined that the proposed action would adversely affect Pacific Salmon EFH. However, the proposed action contains adequate measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. Therefore, NMFS has no additional EFH Conservation Recommendations to provide.

VI. SUPPLEMENTAL CONSULTATION

Pursuant to 50 CFR 600.920(l), Caltrans or the Corps must reinitiate EFH consultation with NMFS 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

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

In response refer to:
2011/05415

AUG 11 7012

Mr. Gregg Erickson, Chief
California Department of Transportation
Division of Environmental Analysis, MS 27
Biological Studies and Technical Analysis Office
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P.O. Box 942874
Sacramento, California 94274-0001

Dear Mr. Erickson:

On October 10, 2011, NOAA's National Marine Fisheries Service (NMFS) received your letter and biological assessment (BA) requesting informal consultation on the following activities that are part of the Caltrans' Routine Maintenance, Small Project, and Repair Program in districts 1, 2, and 4 (program), pursuant to section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.)* and its implementing regulations (50 CFR Part 402). The activities described in this consultation, are part of Caltrans' larger maintenance program, and include the following categories: 1) cleaning activities, (2) slide and slipout abatement and repair, (3) bridge maintenance and repair, (4) vegetation management, (5) grading and establishment of staging and storage areas, (6) grading of existing permanent and establishment of new temporary access roads and traffic detours, (7) drilling of geotechnical test holes, (8) construction of settling basins, (9) installation of rock slope protection (RSP)/erosion control materials and, (9) implementation of best management practices (BMPs). The remaining activities will be included in a related, but separate biological opinion, which will include activities that involve take of listed species, water drafting and dewatering, and infrastructure removal and replacement. In addition, the U.S. Army Corps of Engineers (Corps) proposes to permit these activities and is acting as a co-applicant. Caltrans is the designated non-Federal representative for the Federal Highway Administration (FHWA), which is funding activities contained within the program. Effective July 1, 2007, FHWA assigned, and Caltrans assumed the authority to approve most highway projects in California and the responsibility to conduct any environmental consultations required as a condition of such approval. Pursuant to FHWA's designation of Caltrans as a non-federal representative for the purposes of ESA Section 7 consultation with NMFS, Caltrans is acting as a Federal action agency for this consultation. The Corps is acting as a co-applicant and will be the permitting authority for this program under Section 10 of the Rivers and Harbors Act of 1899, and section 404 of the Clean Water Act.

Caltrans also requested consultation on essential fish habitat (EFH) for species managed under Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagics Fishery

Management Plans, pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), 16 U.S.C. § 1855(b). This Jetter also serves as consultation under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) of 1934, as amended.

I. COVERED SPECIES

This consultation applies to the following species and designated critical habitat:

Chinook Salmon *(Oncorhynchus tshawytscha)*

California Coastal Chinook salmon ESU
Threatened (70 FR 37160, June 28, 2005)
Critical habitat (70 FR 52488, September 2, 2005)

Sacramento River Winter-Run Chinook salmon ESU
Endangered (70 FR 37160, June 28, 2005)
Critical habitat (58 FR 33212, June 16, 1993)

Central Valley Spring-Run Chinook salmon ESU
Threatened (70 FR 37160, June 28, 2005)
Critical habitat (70 FR 52488, September 2, 2005)

Coho Salmon *(Oncorhynchus kisutch)*

Southern Oregon/Northern California Coast coho salmon ESU
Threatened (76 FR 50447, August 15, 2011)
Critical habitat (64 FR 24049, May 5, 1999)

Central California Coast coho salmon ESU
Endangered (70 FR 37160, June 28, 2005)
Critical habitat (64 FR 24049, May 5, 1999)

Steelhead *(Oncorhynchus mykiss)*

Northern California steelhead DPS
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005)

Central California Coast steelhead DPS
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005)

California Central Valley steelhead DPS
Threatened (71 FR 834, January 5, 2006)
Critical habitat (70 FR 52488, September 2, 2005)

Green Sturgeon *(Acipenser medirostris)*

Southern DPS of North American Green Sturgeon
Threatened (70 FR 17386, April 7, 2006)
Critical habitat (74 FR 52300, October 9, 2009)

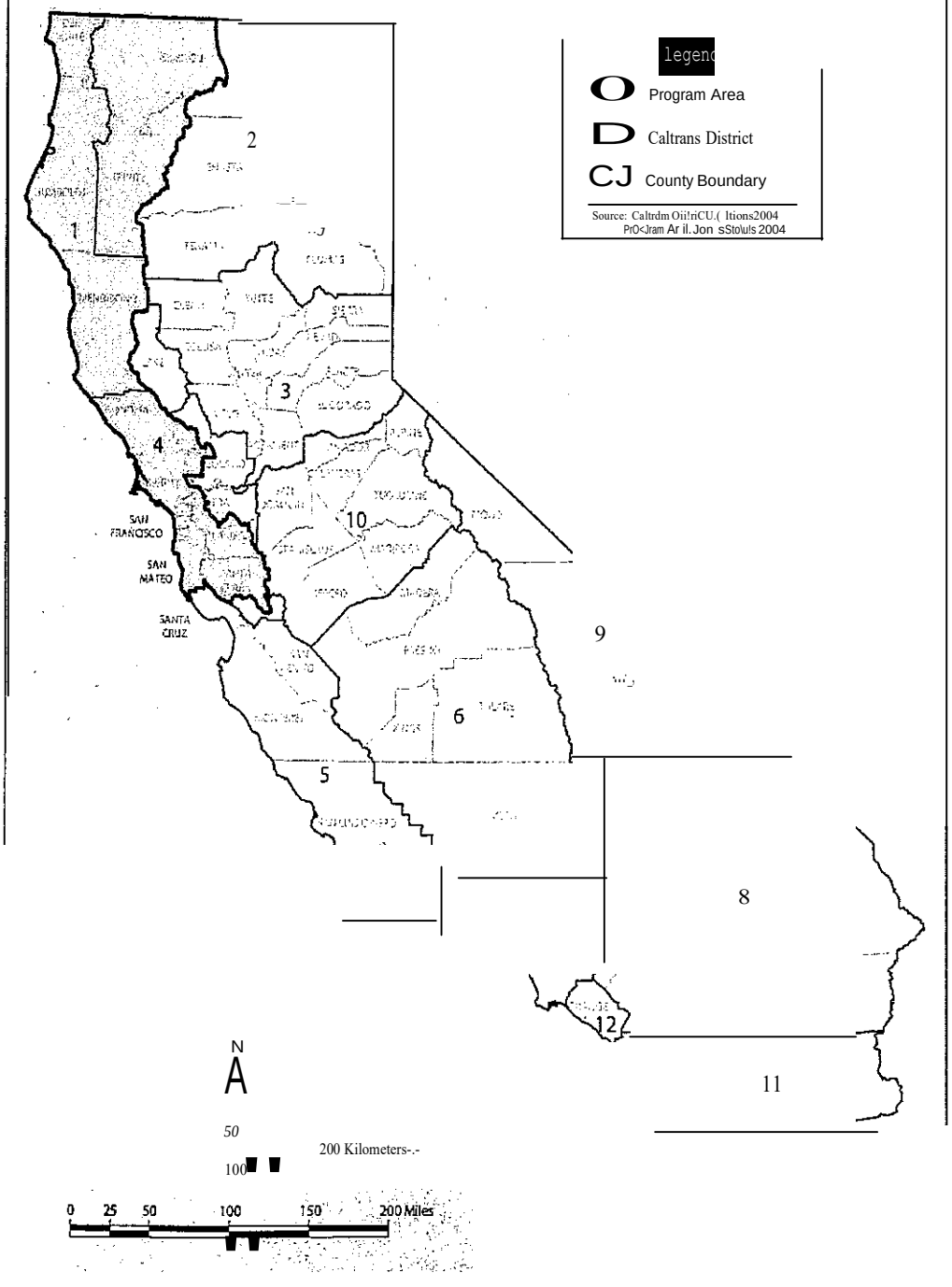
Eulachon *(Thaleichthys pacificus)*

Eulachon-Southern DPS
Threatened (75 FR 13012, March 18, 2010)
Critical habitat (76 FR 65324, October 20, 2011)

II. ACTION AREA

The action area is defined in 50 CFR 402 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The action area for this program encompasses parts or all of drainages within Caltrans districts I, 2, and 4 that are within the range of salmon and steelhead. The action area begins at the Oregon border, extends down the California coast to near Santa Cruz, extends inland, and includes San Francisco Bay up to the Carquinez Strait. The Sacramento River basin and areas draining to the Delta in or above the Carquinez Strait are excluded and only coastal streams and streams that directly discharge to San Francisco Bay are covered, including the Petaluma, Napa and Guadalupe Rivers. See Figure 1-1 for further information.

Figure 1-1: Program Area



III. DESCRIPTION OF THE PROPOSED ACTION

Caltrans proposes to administer portions of their maintenance program by implementing the following routine maintenance, small project, and repair activities over the next 10 years: **(!)** cleaning activities, (2) slide and slipout abatement and repair, (3) bridge maintenance and repair, (4) vegetation management, (5) grading and establishment of staging and storage areas, (6) grading of existing permanent and establishment of new temporary access roads and traffic detours, (7) drilling of geotechnical test holes, (8) construction of settling basins, (9) installation of rock slope protection (RSP)/erosion control materials and, (9) implementation of best management practices (BMPs). Activities may be executed on and around all state and federal highway infrastructures, including but not limited to roads, bridges, culverts, right-of-ways, and other Caltrans owned areas adjacent to existing facilities. Activities occurring in both designated critical habitat areas or non-designated stream and upland locations are covered if they follow all applicable criteria and guidelines

Proposed project design criteria are listed by project category. These criteria include project timing, methods and materials approved for use, and any special reporting requirements. Larger, complex actions *(e.g.,* building of new infrastructure, projects needing engineering review or approval, replacement of infrastructure) cannot be separated into component elements in order to be covered by this consultation, and therefore will be consulted on individually.

A. Maintenance Activities

1. Cleaning Activities

Caltrans proposes to clean water conveyance structures of sediment and debris in order to assure proper functioning, accommodate passage of aquatic organisms, and avert failure. Types of infrastructure that may require regular cleaning include: culverts, drainage ditches, bridge abutments, and piers. Cleaning may require the use of a shovel, rake, other hand tools, a vactor, or heavy equipment such as a backhoe or excavator, and may require minutes to several hours or days to complete. For a complete list of potential cleaning activities see the 2006 Caltrans Maintenance Manual Volume I (Caltrans 2006).

Caltrans proposes to perform the following cleaning and maintenance activities, and adhere to project specific criteria as needed:

a. Cleaning of sediment and debris in a wetted channel, from culverts, stream channels, ditches, drainage channels, bridge abutments, and other infrastructure using only hand tools. A maximum of 2 cubic yards can be moved per site when listed species are present.

b. Cleaning of sediment and debris with heavy equipment from any infrastructure, including culverts, drainage channels, and bridge abutments. Heavy equipment includes the use of vactoring power heads, and winches. A maximum of 2 cubic yards per site can be moved when listed species are present.

c. Cleaning of sediment and debris with heavy equipment from any.infrastructure, including culverts, drainage channels, and bridge abutments using heavy equipment. Heavy equipment includes the use of vactoring power heads, and winches. A maximum of 10 cubic yards per site can be removed if listed species are not present.

Specific Criteria

a. Heavy equipment must be operated outside of the wetted channel and above the Ordinary High Water Line (OHWL) unless the channel is dry or if all life stages of listed species are absent.
b. Applicable BMPs and Additional Best Management Practices (ABMPs) must be implemented before, during, and after each project.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Removal of more than 2 cubic yards of sediment and debris from culverts, drainage channels, ditches, bridge abutments and other infrastructure in a wetted channel when using heavy equipment, when listed species are not present.

2. Slide and Slipout Abatement and Repair

Caltrans proposes to implement slide abatement and repair activities that involve the repair of damaged infrastructure, and the clean-up and removal of sediment and debris from roadsides, right-of-ways, stream banks, bridges, piers and abutments. Clean up may include, but is not limited to the use of the following equipment: shovels, excavators, bulldozers, backhoes, and hand tools.

Repair activities will occur once all debris has been removed. Caltrans will perform the following slide abatement and repair activities as needed and adhere to project criteria:

a. Paving
b. Asphalt overlay
c. Placement of cement or fill material
d. Striping
e. Road improvement activities necessary to refurbish damaged roadways.
f. Excavation
g. Culvert repair and replacement
h. Drainage pipe installation
1. Temporary road building
J. Drilling
k. Backfilling
l. Installation of guard rails
m. Stabilization of road cuts and upslope areas
n. Weed abatement
o. Construction of retaining walls and other slope stabilization structures that are above the OHWL and do not create a change in hydrology.

p. Slide abatement and repair activities using hand tools. A maximum of 10 cubic yards of sediment and debris can be removed per site.
q. Slide abatement and repair activities using heavy equipment. A maximum of 10 cubic yards of sediment and debris can be removed per site.
r. All other abatement and repair activities related to landslides and infrastructure failure, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs, and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. Heavy equipment must be operated outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent. Wark below the OHWL must adhere to these guidelines or be done using hand tools only.
b. Heavy equipment must remain on the road prism.
c. Heavy equipment guidelines including the channel being dry or Caltrans demonstrating (through surveys, historical and current data, existence of known barriers, etc.) no listed species are present must be followed.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Any removal of sediment, soil and debris below OHWL using heavy equipment.

3. Bridge Maintenance and Repair

Caltrans proposes to implement the following bridge maintenance and repair activities as needed and adhere to project specific criteria as described below:

a. Repairing damage or deterioration in various bridge components
b. Removing debris and drift from bridge piers
c. Fixing bearing seats
d. Cleaning abutments
e. Cleaning drains
f. Repairing expansion joints
g. Cleaning and painting structural steel
h. Sealing concrete surfaces
1. Maintenance and repair of electrical and mechanical equipment on moveable span bridges
J. Widening and replacement of railings
k. Maintenance and repair activities associated with the operation of the moveable spans.
l. Cleaning activities associated with bridge maintenance and repair.
m. All other non-construction related activities that are required to complete bridge maintenance and repair activities, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs, and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. Bridge repair and maintenance activities must follow reporting requirements as discussed above".
b. Heavy equipment must be operated outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent.

There are no post-project reporting requirements for bridge maintenance activities that do not have a cleaning component.

4. Vegetation Management Projects

Caltrans proposes to employ appropriate management *(i.e.,* maintenance) of vegetation on roadsides using an Integrated Vegetation Management (NM) program. This program consists of using permanent vegetation control techniques that reduce the need for ongoing vegetation management. These techniques can include, but are not limited to, the following treatments: (1) concrete or asphalt application, (2) fiber or rubber weed control mat application, (3) stamped asphalt application, (4) irrigation, (5) mulch application, (6) rock blanket or rock slope protection installation in upland areas, (7) plant removal and replacement, (8) fertilization, weed and pest control, (9) growth retardant application, (10) pruning, (11) washing, (12) planting, and, (13) herbicidal fabric application . Vegetation that cannot be controlled using these techniques will be managed and removed by cutting, mowing, bulldozing, or burning, using equipment such as backhoes; front-end loaders, torches, and/or chainsaws. For a complete list of potential maintenance activities relating to vegetation management see Caltrans (2006). Heavy equipment must operate outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent.

Caltrans proposes to perform the following vegetation management activities as needed and will adhere to the project specific criteria described below:

a. Removal of riparian (of, on, or relating to the banks of a natural watercourse) and aquatic (rooted submerged) vegetation when not associated with other project types, when listed species are not present, and when no critical habitat has been designated.
b. Removal of upland vegetation when watercourse, including hydrologically connected drainage channels, are absent.
c. All other activities required for the management, maintenance and control of vegetation, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs, and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. A maximum of 10,000 cubic feet of vegetation can be removed per site.
b. Work below the OHWL must be accomplished using hand tools only or adhere to the heavy equipment guidelines below.
c. Heavy equipment must operate outside of the wetted channel and above the OHWL unless the channel is dry or if all life stages of listed species are absent.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Removal of riparian and aquatic vegetation with heavy equipment.

5. Grading and establishment of Staging and Storage areas

A staging area is a designated area where vehicles. supplies, and construction equipment are positioned for access and use at a construction site. Storage areas are used to store materials, construction wastes, water, wood, soil, or rock by the roadside, and are often necessary for highway maintenance and construction activities. Staging and storage areas may be temporary (life of the project) or permanent.

Caltrans proposes to implement the following activities as needed and adhere to project specific criteria described below:

a. Installation of new staging or storage areas more than 150 feet from any watercourse
b. Gradirig and leveling of existing staging and storage areas that are more than 150 feet from any watercourse.
c. vegetation removal
d. ground leveling and grading
e. storage of vehicles and equipment
f. fueling of vehicles
g. Installation of artificial lighting sources.
h. Any other activities required for the maintenance or establishment of staging and storage areas, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs.

Specific Criteria

a. Areas cannot be constructed within 150 feet of a stream channel or be hydrologically connected to any watercourse.

b. When practicable, staging areas will be placed in previously disturbed areas or on the road prism to minimize ground disturbance.

c. Following use, all temporary staging areas will be re-vegetated and returned to their natural condition within 2 years of cessation of their use.

There are no post-project reporting requirements for any staging/storage area projects.

6. Drilling Geotechnical Test Holes

Caltrans proposes to utilize Geotechnical drilling as often as necessary for a variety of projects including, but not limited to: (1) building of retaining walls, (2) geotechnical investigations for bridge placements, and (3) installation of piles and other support structures. Geotechnical drilling typically consists of using a crane-deployed-platform to drill holes. To avoid chemical

contamination of watercourses, a completely enclosed mud drilling system, consisting of a Bentonite clay or water slurry mixture is pumped and circulated inside the casing during drilling so none of the drilling products escape. The drill rig typicaly accesses the area using existing roads or barge. Where access roads need to be developed, the road will be restored to the original topography andre-vegetated upon completion of geotechnical investigations. See below for further information regarding grading and establishment of temporary access roads. Geotechnical drilling projects may require: (J) drilling with or without a platform, (2) craning in equipment, (3) construction of access roads and drilling pads, (4) removal of trees, shrubs, and other vegetation, (5) and intermittent lane closures with traffic control. There is usually no water drafting required and no drilling is permitted in the wetted channel.

Caltrans proposes to implement the following activities as needed and adhere to project specific criteria described below:

a. Drilling performed within 200 feet of any watercourse, channel or drainage ditch when water is present.
b. All other non-drilling activities related to and necessary to complete these types of projects, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. Heavy equipment must operate outside of the wetted channel and above the OHWL unless the channel is dry or if listed species are absent.
b. No drilling is permitted in the wetted channel.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Drilling performed within 200 feet of any watercourse, channel or drainage ditch when water is present.
b. All other non-drilling activities related to and necessary to complete these types of projects, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

7. Grading of existing permanent, and establishment of new temporary access roads and traffic detours

Caltrans proposes to establish new temporary roads, traffic detours and the grading of existing roads where construction activities necessitate the closure of an existing road or when access to infrastructure is required but cannot be achieved using existing roads. Typical grading and road construction activities include: (1) the disturbance of existing soil and debris using a shovel, dozer or grader, (2) the movement of gravel and debris from the areas, and (3) leveling, reshaping, and smoothing of the road surface. These activities are typically accomplished using heavy equipment with an attached bucket or blade. Temporary roads are typically comprised of

crushed rock or concrete and are outsloped for maximum water drainage. Crushed rock or concrete is typically used as an overlay as well to provide a smooth road surface and minimize dust. Road construction may also involve the building of water bars, ditches, deflectors and drainage dips to assist in drainage and maintain road integrity. When temporary roads are no longer needed, they are typically seeded with a mix of native plants and returned to their pre-project contour wherever possible.

The following activities will be performed as needed and adhere to specific project criteria listed below:

a. Grading of permanent access roads and construction of temporary access roads and traffic detours.
b. All other activities related to establishment and maintenance of temporary access roads and traffic detours, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. New access roads must be above the OHWL, must not enter a wetted channel or watercourse, and cannot cross a wetted channel.
b. Heavy equipment must operate outside of the wetted channel and OHWL unless the channel is dry or listed species are absent.

Caltrans proposes to perform post project reporting on the following types of projects:

a. Grading or ground disturbance, associated with construction of temporary access roads, within 150 feet of any watercourse.

8. Construction of Settling Basins

Caltrans proposes to construct settling basins, where necessary, to provide on-site water and pollution management during and after construction activities. A settling basin is a temporary or permanent basin formed by excavating and/or constructing an embankment so that sediment-laden runoff is temporarily detained, allowing sediment to settle out before the runoff is discharged into adjacent areas. Typically, settling basins are considered for use on projects: (1) with disturbed areas during the rainy season, (2) where sediment-laden water may enter the drainage system or watercourses, (3) where post construction detention basins are required, (4) associated with dikes, temporary channels, and pipes to convey runoff from disturbed areas; or (5) at outlets of disturbed soil areas. A typical temporary settling basin has a design life of 12 to 28 months and will be maintained until the site is permanently protected against erosion or a permanent detention basin is constructed.

The following activities will be performed as needed and adhere to specific project criteria listed below: .

a. Construction of settling basins that adhere to specific criteria detailed below.

b. All other activities related to the construction of settling basins, such as transport of equipment, development of Storm Water Pollution Prevention Plans, installation of BMPs and fueling and maintenance of vehicles and equipment.

Specific Criteria

a. All settling basins will be constructed in conjunction with erosion control BMPs to minimize the amount of sediment flowing into the basin.
b. The length of the basin must be more than twice the width of the basin, and the depth must be no less than 3 feet.
c. Settling basins will also require features to accommodate overflow or bypass flows that exceed the storm event that the basin was designed to withstand. See Caltrans 2003 for a complete list of design requirements for temporary settling basins.

No post-project reporting is required for this type of activity.

9. Installation of Rock Slope Protection/erosion control materials

The following activities will be performed as needed:

a. Installation of RSP at the outlet or wing walls of existing culverts, in non-fish bearing streams, where there is no evidence of historic or current presence, and critical habitat has not been designated.

Caltrans proposes to perform post project reporting on all types of these projects.B. Best Management Practices

Caltrans proposes to implement appropriate BMPs at all sites. BMPs are effective, practical, structural or nonstructural methods that prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water, or that otherwise protect water quality and beneficial uses from potential degradation. BMPs will be applied to projects involving: (1) erosion control, (2) waste, water or material management; (3) water conveyance, (4) hydroseeding and handseeding, (5) material delivery, storage, and use; (6) paving operations, (7) vegetation management and preservation, (8) spill prevention and control, (9) stockpile management, (10) streambank stabilization, (11) structure demolition, (12) vehicle and equipment cleaning, maintenance, and refueling, and (13) water conservation practices. A complete list of potential BMPs are listed in Appendix C of the 2010 Programmatic Biological Assessment (Caltrans 2010), the Caltrans Storm Water Quality Handbook Maintenance Staff Guide (Caltrans 2003), and the Caltrans Storm Water Quality Handbook Construction Site Best Management Practices Manual (Caltrans 2003a). Caltrans has the flexibility to choose the most appropriate BMP for each site and will maintain all BMPs to function in their intended manner. ABMPs as described in the Programmatic Biological Assessment (Caltrans 2010) will be implemented where necessary, as determined by Caltrans staff. A complete list of these ABMPs can be found in the Appendix C of the Programmatic Biological Assessment (Caltrans 2010).

C. General Design Criteria common to all activities

Caltrans proposes to adhere to the following general design criteria, where applicable, for all projects that are part of this program:

a. Downed trees and logs suitable for restoration activities will be retained on site for future use in restoration projects. If they cannot be retained on site, Caltrans will stockpile usable trees at an appropriate facility for future use. If the storage area becomes full or if Caltrans has no location available for storage, then the removed trees can be given to the contractor or disposed of in other appropriate ways. Efforts will be made to make the wood available for restoration activities whenever feasible.

b. Dry season work windows for activities not involving cleaning or debris removal:

June 15 to October 15

c. The general in-water construction season can be extended to November 15 pending appropriate dry weather conditions and stream flows. Extensions will be initiated on an as needed basis. To grant an extension, Caltrans must contact NMFS and provide information regarding the purpose and need of the extension, and a proposed schedule for activities to be performed during this time.

d. Where available, Caltrans will use existing ingress and egress points, or perform work from the top of the stream banks.

e. Any vegetated area which is temporarily disturbed during construction within designated critical habitat will be replanted with native plants. Areas along stream banks will be restored and maintained with native riparian vegetation. All areas left bare as a result of construction activities will be restored to a natural state through replanting, or other means with native trees, shrubs, sterile plants, grasses, or some combination thereof. No exotic plants will be used.

f. Any disturbed ground must receive appropriate erosion control treatment *(e.g.,* mulching, seeding, planting) prior to the end of the construction season, prior to a cessation of operations due to forecasted wet weather, within seven days of project completion, or during the appropriate planting season. Maintenance will use all practicable techniques to prevent sediment from entering any water body.

g. Erosion control measures will be in place at all times during construction activities, particularly in areas where rainfall is expected or predicted during the construction season. Erosion control structures will be maintained throughout, and after construction activities. Sediment will be removed from sediment controls once it has reached one-third of tbe exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 0.5 feet. Settling basins will be maintained so that no more tban 0.25 feet of sediment depth accumulates within traps or sumps.

h. Adequate erosion control supplies and tools *(e.g.,* gravel, straw bales, shovels) will be kept onsite during all activities to ensure that supplies are available at all times to prevent materials from entering water bodies.

1. Equipment must be checked daily, prior to use, for leaks. Equipment cannot be used until leak is fixed. Prior to use, all equipment must be cleaned to remove external oil, grease, dirt or mud. Wash sites must be located at least 100 feet from any wetted channel and not be hydrologically connected.

J· Refueling must be done outside of the active channel and 50 feet above the OHWL at all sites.

k. A spill prevention plan must be developed before covered activities can begin, and must be kept on site during all times.

l. Placement of concrete and concrete slurry must be done in a dry area, within a cofferdam.

m. Application of materials such as asphalt, concrete and other construction materials must be done during the appropriate work windows. Petroleum products, chemicals, fresh cement, or water contaminated by the aforementioned will not be allowed to enter flowing water. Caltrans must have a spill prevention and management plan on site for all projects where material management is necessary.

n. Caltrans will supply NMFS with a copy of the culvert evaluation summary that is generated by the maintenance crews each fall.

IV. PROGRAM ADMINISTRATION

A. Reporting

Caltrans proposes to comply with the following reporting requirements set forth under this consultation: (1) identify projects with post project reporting requirements, (2) complete a post-project reporting form (PPRF) for each project that has a reporting requirement, (3) compile all PPRFs, and (4) prior to October I submit an electronic and hard copy report to NMFS with the following information, where appropriate:

1. Name of employee/project manager for the project
2. Project location- County, road number, closest road mile marker, and stream name.
3. Activity category
4. Listed Species Present (Y or N), what species.
5. Date of initiation and date of completion
6. List of BMPs applied
7. Estimated amount of vegetation removed
8. Estimated amount of sediment and debris removed from channel
9. Type of Heavy equipment used
10. Heavy Equipment guidelines followed? Problems?

11. Location of cleaning activities (in the channel, out of the channel below OHWL, aboveOHWL)
12. Quantity of Trees Removed
13. Number of geotechnical test holes
14. Length of newly established temporary road
15. Width of newly established road
16. Length of grading for existing roads

For each district, Caltrans proposes to have the Caltrans field maintenance supervisor or a delegated crew member be responsible for completing the PPRF and provide the completed form to the Caltrans area superintendent. Caltrans will ensure that the forms will then be compiled by the Caltrans district maintenance manager and submitted to NMFS. It is the responsibility of all Caltrans staff using this consultation to obtain and maintain competence in interpreting and implementing the Program. Corrections to the program activities or reinitiation can be implemented at any time, and do not need to wait for the annual monitoring and evaluation meeting to be discussed.

B. Monitoring

Objectives

Caltrans proposes to monitor project implementation of project activities in order to ensure: (1) adherence to all criteria and requirements, (2) to monitor what is or is not being successfully implemented, (3) monitor BMP implementation, and (4) to identify areas of concern. The objectives of the monitoring are to answer the following questions:

1. Is Caltrans following the required criteria for each activity type as described in the consultation? Are they following all guidelines and criteria for size, quantity, and location of allowed activities?
2. Is Caltrans implementing the appropriate BMPs at each project site? Are BMPs being appropriately maintained in order to continue to adequately function?
3. Are BMPs having the intended effect and minimizing impacts?
4. Are there unanticipated effects to listed species and/or critical habitat that were not identified at the time of the consultation? If so, is reinitiation warranted?
5. Is Caltrans experiencing internal confusion or problems interpreting the criteria set forth?
6. Is it necessary to update the consultation to clarify criteria?
7. Is Caltrans working collaboratively with NMFS and other resource agencies to ensure that the consultation is implemented correctly?

Data Collection

Caltrans will collect all the data for this monitoring plan. Data collection will involve a field review/site visit on a selected number of projects involving the following measures:

1. A subset of the projects reported on in the annual report will be selected for site visit and field review. NMFS staff may assist in project selection and field review if time allows,

however, it is Caltrans responsibility to annually conduct all monitoring and reporting activities.

2. At least one project from each category will be visited during the field review. Multiple projects of the same type may be visited to adequately gauge implementation success. Caltrans will determine the number of projects necessary to achieve data collection objectives.

3. Caltrans proposes to invite NMFS to attend all monitoring meetings and give NMFS the opportunity to assist with field review and site selection. Caltrans will organize and lead the field review and is responsible for making sure that all necessary staff and personnel attend site reviews to ensure a complete review of the project is accomplished.

Results

At the end of the field reviews, Caltrans will compile the data and submit to NMFS a brief narrative documenting the results of the field review. This narrative will include: (1) a discussion of implementation successes, (2) identified problems and proposed solutions, and (3) proposed improvement to required criteria compliance. Project monitoring may be conducted concurrently or after the fact. Monitoring frequency will be reconsidered annually as part of the monitoring program.

C. **General Administration**

Caltrans proposes to implement the following general administration procedures for the program. NMFS and Caltrans will meet annually and more as needed, for the following purposes: (I) for annual review of covered projects; (2) to evaluate and discuss the effectiveness of the program in order to continue providing a streamlined process; (3) to ensure that activities authorized by the program continue to minimize adverse effects to listed species and critical habitat; and (4) to update procedures, BMPs, and project criteria, if necessary. Modifications to the program will be discussed and developed during these meetings. At any time, NMFS or Caltrans may revoke or revise this program if it is determined that it is not being implemented as intended, or if re-initiation of consultation is required.

D. Training

To assist Caltrans with achieving consistent administration and implementation of the program through all three districts, Caltrans proposes to give an annual training to maintenance and environmental staff that describes the activities covered by the consultation, information necessary for submittal of pre-project notification packages, and reporting and monitoring requirements. The Caltrans environmental senior and district maintenance manager in each district are responsible for coordinating and implementing the annual training about implementation of the program. The training will be presented by Caltrans staff, with NMFS staff in attendance to provide support if time and workload allow.

E. Elevation/Issue Resolution

Caltrans proposes that if an issue cannot be resolved between Caltrans and NMFS staff, the issue will be elevated to the management level. Managers and staff will then meet to document and discuss the issues, and will work together to come to an agreement. Issues should be elevated when consensus cannot be reached regarding the determination of effect severity; adequacy of avoidance, minimization, or mitigation measures; or issues related to the applicability of the LOC. In addition, questions about relevant laws, regulations, or policy may be elevated. If managers and staff cannot resolve the issue, then it will be raised to the next higher level (policy level).

V. ESA CONSULTATION

NMFS used the best available information, including project specific design criteria, and past consultations on similar activities when preparing this letter of concurrence. Potential effects from similar activities to the proposed action on critical habitat include: (1) increases in suspended sediment inputs and stream temperature; (2) sedimentation of redds and spawning gravels; (3) chemical contamination; (4) decreases in available riparian vegetation; (5) decreases in prey availability; (6) decreases in streambank stability; (7) loss of rearing, migratory, and spawning habitat; (8) decreases in habitat access; and (9) exposure to noise pollution. These impacts could in turn result in effects to individuals including: (1) decreased foraging ability; (2) internal injuries; (3) increases in disease transmission rates; (4) decreased fitness and viability; (5) mortality; and (6) decreased spawning success.

However, the proposed project design criteria include measures to avoid, minimize or reduce effects to insignificant or discountable levels. In addition, project review and monitoring is expected to provide information regarding adherence to project criteria implemented to avoid or minimize adverse effects. Annual reviews of the program will allow for an overall assessment of the program where applied across Caltrans Districts 1, 2 and 4.

a. Water Quality

Proposed maintenance activities all have the potential to cause sediment mobilization. Sediment transported to a stream channel may alter water quality by increasing turbidity and suspended sediment levels. Exposure to increased turbidity and suspended sediment are expected to be insignificant for adults because they occupy freshwater habitats in fall and winter months when ambient turbidity levels are already elevated and the small amount of mobilized sediment from project activities will not result in measurable increases. Juveniles exposed to the anticipated small increase in suspended sediments will likely use avoidance behavior to find habitat that contains suitable water quality.

To minimize the potential for sediment disturbance and delivery to a waterbody, erosion control BMPs will be utilized for each project, at each site, and may consist of silt fences, fiber rolls, straw wattles, or catchment basins that will prevent mobilized sediment from entering a stream channel. See Caltrans (2012) for a complete list of potential erosion control BMPs. Additionally, where feasible, Caltrans will revegetate sites to pre-project or better conditions,

thereby decreasing the potential for sediment mobilization. All BMPs will be maintained to ensure proper functioning. Any sediment delivered to the stream channel will likely be a small quantity and will be flushed downstream immediately, where it will be diluted. Turbidity from these events will likely be delivered to the wetted channel during the first few precipitation events, and turbidity levels will return to background levels within hours to days. Indirect effects include the potential for sediment to become mobilized during future precipitation events. However, the use of erosion control BMPs will reduce potential effects from these events to insignificant levels. Exposure to sediment mobilization and subsequent changes in water quality will be short term and are anticipated to be insignificant to both individual listed fishes and their critical habitat.

Riparian and upland vegetation may be removed during all implementation of the proposed action. Removal of vegetation may cause changes in water quality, changes in vegetation characteristics, and changes in quantities of allocthonous materials. There may also be a temporary decrease in food/prey availability while vegetation regrows. The surrounding areas that contain vegetation will continue to provide shade, food and prey resources and allochthonous materials while other vegetation grows back. Due to the relatively small amount of vegetation proposed for removal at each site, quick regeneration of removed material, and the existence of additional plants and trees to provide shade, the removal of vegetation will be minimal and therefore have an insignificant effect on essential features of critical habitat. Potential effects to individuals are described above. Changes in water quality and associated effects will be short term and last through one growing season, and juveniles will likely find other suitable areas for rearing during this time. Adults are not expected to be exposed to these impacts when occupying freshwater habitat during the fall and winter when water temperatures are lower, dissolved oxygen concentrations are suitable, and water flows are suitable for spawning activities.

b. Noise, Motion, and Vibration Disturbance

All maintenance and repair activities may require the use of heavy equipment. Noise, motion, and vibration disturbance produced by heavy equipment operation may occur at all sites where heavy equipment is operating. Potential effects to individuals include those listed above. Responses to these effects range from no change in behavior to movements that might displace fish from their normal locations (Slotte *et al.* 2004). Proposed maintenance activities are typically short term and may last no more than one day at each site. Where possible, Caltrans will use hand tools and other non-motorized equipment to perform activities, decreasing the potential for individuals to be exposed to noise disturbance. Exposure to individuals will be temporary, or individuals will be able to avoid exposure by temporarily relocating either upstream or downstream into adjacent suitable habitat. Once these activities cease, individuals will have the opportunity to recolonize the areas and environmental conditions relating to noise will return to pre-project conditions. Effects to critical habitat are expected to be insignificant.

c. Vegetation Removal

Vegetation removal may occur in association with all maintenance activities. A maximum of 10,000 sq. feet of vegetation per site can be removed at one time, and additional criteria for how

vegetation is removed will minimize exposure to potential effects. Covered activities involving vegetation removal may occur in the riparian zone, along stream banks vertically up to the OHWL, or in upland locations. Potential effects to critical habitat include decreased streambank stabilization, decreased cover and allocthonous material input, decreases in the input of food or prey, decreased shade, increased water temperature, and increased sediment mobilization. Effects to indivictuals may include decreased fitness, increased disease transmission rates from decreased water quality, and exposure to increased water temperatures that can cause stress and decreased viability. The closer to the wetted channel the vegetation is removed, the higher likelihood that individuals will be exposed to effects, however, most activities will be designed to avoid vegetation removal and will include the implementation of BMPs.

The potential for exposure will be insignificant given the utilization of BMPs and work will be performed mainly in the dry season. Juvenile over-wintering habitat, such as that associated with woody debris and rootwads may be reduced until riparian vegetation grows back, however, this effect will be insignificant because adjacent rearing habitat will exist in all areas and be available for use. Juveniles will likely use avoidance behavior to find suitable habitat that is not been impacted and contains adequate refuge from high velocities. In the event that streamside riparian vegetation needs to be removed, the loss of riparian vegetation is expected to be small, and limited to mostly shrubs and willows which are generally faster to recover or reestablish than hardwoods or conifers. Willows and other riparian vegetation regenerate quickly, and will provide soil stabilization and begin to intercept runoff within one growing season. Effects to over-wintering habitat will be insignificant because most velocity refuge areas and long term large woody debris jams are comprised of larger, coniferous tree species.

Caltrans will implement a re-vegetation plan at all sites, and this is expected to further minimize the temporary loss of vegetation. Projects involving vegetation disturbance will have an insignificant effect from the cutting of trees and vegetation as no vegetation will be permanently removed. Where possible, only limbs and other overhanging parts will be removed, leaving behind additional shrubs and vegetation. These materials will continue to provide ground cover and future recruitment for large woody debris jams and over-wintering habitat features. Limbs and branches will likely be left on site and will continue to provide sediment and runoff interception, and provide ground cover. Therefore, NMFS does not anticipate adverse effects to listed species from the removal of riparian and upland vegetation associated with project implementation.

d. Chemical Contamination

Equipment refueling, fluid leaks and maintenance activities within and near the stream channel pose some risk of exposure to contamination. These activities will likely take place as part of larger projects described in category A. In addition to toxic chemicals associated with construction equipment, water that comes into contact with wet cement during construction can also adversely affect water quality and cause potential take of listed salmonids. Potential effects to listed species include: decreased fitness, increased occurrence of mortality, decreased water quality, and inability to use the area due to contamination. All projects will include the BMP measures outlined in the 2010 Programmatic Biological Assessment (Caltrans 2010), the Caltrans Storm Water Quality Handbook Maintenance Staff Guide (Caltrans 2003), and the

Caltrans Storm Water Quality Handbook Construction Site Best Management Practices Manual (Caltrans 2003a). Utilization of the BMPs will prevent contaminated sediment and water from entering adjacent watercourses. Therefore, water quality degradation from toxic chemicals associated with maintenance and construction activities will be discountable.

e. ESA Determination

Based on the information provided by Caltrans, NMFS agrees that the above described portions of Caltrans' routine maintenance and repair program may affect, but is not likely to adversely affect the listed species or designated critical habitat identified in Section I. Reinitiation of consultation may be necessary where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (!)new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered, or (3) a new species is listed or critical habitat designated that may be affected by the action.

VI. EFH CONSULTATION

The Pacific Fishery Management Council has delineated EFH for Pacific Coast salmon, Groundfish, and Coastal Pelagic species, which includes many areas where the program will take place. NMFS has evaluated the program for potential adverse effects to EFH pursuant to section 305(b)(2) of the MSFCA. Under the EFH implementing regulations [50 C.P.R. 600.8IO(a)], the term "adverse effect" is defined as "any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations 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 quantity and/or quality of EFH." NMFS determined that the program would adversely affect EFH. Effects to EFH include: (!)decreases in soil stability; (2) decreases in water quality; (3) decreases in prey availability; (4) loss of complex cover; (5) decreases in riparian vegetation and allocthonous materials; and (6) sedimentation of spawning gravels.

The proposed project contains measures to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH. The implementation of BMPs and adherence to specific project criteria that limits the size and scope of projects will minimize effects to EFH and listed species. NMFS has no additional measures to provide as EFH conservation recommendations. Pursuant to 50 CFR § 600.920(!), Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH.

VII. FWCA CONSULTATION

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. § 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose,

including navigation and drainage [16 U.S.C. § 662(a)]. Consistent with this consultation requirement, NMFS may provide recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and the MSFCMA. NMFS has no additional recommendations under the FWCA as the Project, as proposed, will not affect the conservation of fish species or their habitats.

Please contact Mrs. L. Kasey Sirkin at (707) 825-1620, or via email at kasey.sirkin@noaa.gov, if you have any questions regarding these consultations.

reD

odney R. Mcinr;;t
Regional Administrator

CC: Copy to file 151422SWR2011AR00495

References

California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbook, Maintenance Staff Guide.

California Department of Transportation (Caltrans). 2003a. Caltrans Storm Water Quality Handbook, Construction Site Best Management Practices Manual. 257 pp.

California Department of Transportation (Caltrans). 2010. Programmatic Authorization for Caltrans' Routine Maintenance and Repair Activities in Districts 1, 2, and 4 NMFS Programmatic Biological Assessment.

National Marine Fisheries Service (NMFS). 2001. Water Drafting Specifications, National Marine Fisheries Service, Southwest Region, August 2001, 4 pp.

Slotte, A., Hansen, K., Dalen, J., and One, E. 2004. Acoustic mapping of pelagic fish distribution and abundance in relation to a seismic shooting area off the Norwegian west coast. Fish. Res. 67: 143-150.

Enclosure 4

CATEGORY 3: NOTIFICATION FORM

Project biologist and contact information:

Name: _____Email: _____Phone: ( ) _____-_____

Project name

_____

Location (District, County, Route, Post Mile)

_____

Watershed: _____ Stream name: _____

Schedule

Start (day-month-year): ___-___-____ End: ____-____-____

For multi-season projects please provide construction scenario as best possible:

_____

_____

_____

Project and Affected Area description and proposed passage improvement (if applicable):

Culvert/bridge replacement (y/n)? ____ Culvert/bridge retrofit (y/n)? ___

Fish present (y/n) ____ Fish bearing (y/n)? ____ Perennial (y/n)? ____ Fish passage barrier (y/n)? ___

Freshwater habitat (y/n)? ____ (for non-freshwater habitat, separate EFH consultation required)

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Map/photo/image showing project Affected Area attached (y/n)? ____

Species Impacts Table (per District and current Calendar Year)

Covered Species	**Number of Completed and Ongoing Projects to Date Involving Listed Fish Handling**	**Total Number of Fish Handled (h) and Mortality (m) to Date**	**Estimated Number of Fish Handling and Mortality (mortality=handling*0.04) of Proposed Project**	**Combined Handling and Mortality (To Date + Estimated)**
Fish		h/m	h/m	h/m
Chinook Salmon				
California Coastal ESU		/	/	/
Coho Salmon				
Central California Coast ESU		/	/	/
Southern Oregon/Northern California Coastal ESU		/	/	/
Steelhead				
Northern California DPS		/	/	/
Central California Coast DPS		/	/	/
South Central California Coast DPS		/	/	/

Habitat Impacts Table

Covered Species	**Critical Habitat Present in Affected Area yes/no/unknown(y/n/u)**	**Species in Watershed or Drainage (y/n/u)**	**Species in Affected Area During Project Implementation (y/n/u)**	**Permanent Habitat Removal (acres/ft^2)**	**Temporary Habitat Removal (acres/ft^2)**
Fish					
Eulachon					
Southern DPS					
Chinook Salmon					
California Coastal ESU					
Sacramento River Winter-Run ESU					
Central Valley Spring-Run ESU					
Coho Salmon					
Central California Coast ESU					
Southern Oregon/Northern California Coastal ESU					
Steelhead					
Northern California DPS					
Central California Coast DPS					
Southern Central California Coast DPS					
California Central Valley DPS					
Green Sturgeon					
Southern DPS					

Specific Actions Checklist

Check to indicate proposed action and associated ABMPs (described in detail in Caltrans PBA 2010)

___**PA-1:** Operate construction equipment and vehicles (ABMP-1.1, 1.2, 1.3, and 1.4)
___**PA-2:** Use temporary lighting for night construction activities (ABMP-2.1, 2.2, and 2.3)
___**PA-3:** Maintain and fuel construction equipment and vehicles (ABMP-1.2, 1.3, 1.4, and 3.1)
___**PA-4:** Clean the roadway of sediment and debris from landslide, flood events, and Construction (ABMP-5.1)
___**PA-5:** Temporarily and permanently store sediment and debris, and pavement, petroleum products, concrete, and other construction materials (ABMP-1.4 and 5.1)
___**PA-6:** Apply pavement, petroleum products, concrete, and other construction materials to surface of roads, bridges, and related infrastructure (ABMP-1.4 and 6.1)
___**PA-7:** Treat and discharge water conveyed from the construction area (ABMP-7.1 and 7.2)
___**PA-8:** Use drill rigs and drilling lubricants (ABMP-1.4, 8.1, 8.2, 8.3, and 8.4)
___**PA-9:** Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure (ABMP-1.4 and 6.1)
___**PA-10:** Remove and disturb upland, riparian, and wetland vegetation (ABMP-1.4, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, and 10.8)
___**PA-11:** Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment (ABMP-1.4, 10.4, 10.7, 10.8, 11.1, 11.2, 11.3, and 11.4)
___**PA-12:** Construct temporary sediment-settling basins (ABMP-10.4, 10.7, 10.8, and 12.1)
___**PA-13:** Grade temporary access roads, traffic detours, and staging and work areas (ABMP-10.4, 10.7, 10.8, and 13.1)
___**PA-14:** Operate construction equipment and vehicles in the stream channel (ABMP-10.4, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, and 14.8)
___**PA-15:** Construct temporary stream crossings (ABMP-10.4, 10.8, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 15.1, and 15.2)
___**PA-16:** Remove and disturb aquatic vegetation, stream sediment, and LWD (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.2, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, and 16.9)
___**PA-17:** Install temporary cofferdams and diversion cofferdams (ABMP-10.4, 14.5, 14.6, 14.7, 15.1, 15.2, 17.1, 17.2, and 17.3)
___**PA-18:** Temporarily redirect stream flow (ABMP-7.2, 10.4, 14.5, 14.6, 14.7, 15.1, 18.1, 18.2, 18.3, 18.4, 18.5, and 18.6)
___**PA-19:** Temporarily draft water from streams and other water bodies (ABMP-14.5 and 18.6)
___**PA-20:** Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.1, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, and 20.7)
___**PA-21:** Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications (ABMP-1.4 and 21.1)
___**PA-22:** Remove culverts (ABMP-10.4, 14.1, 14.5, 14.6, and 15.1)
___**PA-23:** Clean, retrofit, or install culverts (ABMP-10.4, 14.1, 14.5, 14.6, 14.7, 15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, and 23.1)
___**PA-25:** Remove existing bridge structure, including footings, piers, and piles (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, and 15.1)
___**PA-26:** Install bridge structures, excluding pile-driving (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, 14.7,

15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, 23.1, and 23.3)

___**PA-28:** Capture, handle, exclude, salvage, and relocate listed species (ABMP-28.1 through 28.12)

___**PA-29:** Implement BMPs (ABMP-29.1 through 29.7)

___**PA-30:** Mitigation framework for potential adverse impacts on species listed under CESA

Program limits and minimization measures checklist

(described in detail in NMFS PBO 2013)

a. Cleaning

Will cleaning require dewatering or fish relocation (y/n)? ___
(If yes, see *Section e. Dewatering and Fish Relocation* below)

b. Vegetation and LWD Management

Will the project require vegetation removal (y/n)? ____Area (feet^2/acres) _____
Will the proposed project occur within 150 linear feet of the OHWL (y/n)? ___
(If yes, no more than 5,000 feet^2 or 0.12 acres of riparian or wetland/aquatic vegetation may be removed in the Program)

Will vegetation within 300 feet of any water body be removed (y/n)? ____
Will trees within 300 feet of any water body be removed (y/n)? ____number: >6 inches____
>12 inches____>18inches____>24inches____
Tree species to be removed: _____

c. Grading for Access Roads and Construction of Settling Basins and Storage Areas

Will proposed grading and establishment of staging and storage areas occur within 150 feet of any watercourse (y/n)? ____ Area (feet^2/acres) _____

d. Installation of Rock Slope Protection/erosion control materials

Does the proposed bank stabilization project involve a bridge, slip out, or other large roadway stabilization (y/n)? ____
Linear feet of stream bank proposed for stabilization? right bank ____ left bank ____
(No more than 150 linear feet per stream bank may be installed in the Program)

Does the proposed bank stabilization project involve a culvert (y/n)? ____
Linear feet of stream bank proposed for stabilization? right bank ____ left bank ____
(No more than 50 linear feet per stream bank may be installed at either the outlet side or inlet side as part of a culvert project in the Program)

e. Drilling Geotechnical Test Holes

Will drilling occur in the wetted channel (y/n)? ____

Proposed number of holes and specific location

_____

f. Dewatering and Fish Relocation

Will the proposed project involve dewatering (y/n)? ____ linear feet of stream dewatered ____
(See *Species Impacts Table* above)

g. Rehabilitation, Retrofit, and Repair of Culverts and Bridges

Does the project involve channel modification (defined as directly and/or indirectly modifying and/or permanently degrading natural channel forming processes and morphology of perennial, intermittent and ephemeral streams, and estuarine habitats) (y/n)? ____
If yes, describe below why total replacement and/or removal of the facility is infeasible or unreasonable

_____
_____
_____
_____

Do proposed rehabilitation, retrofit, and repair activities involve fish passage structures (y/n)? ____

Additional information attached (designs, images, geotechnical reports, etc.) (y/n)? ____

h. Replacement of Culverts and Bridges

Is RSP or similar protection structures proposed for in-channel piers (y/n)? ____
If yes, will the structures cause aggradation or degradation to a level that will adversely affect geomorphic processes and fish passage through the design life of the facility (if yes, the project is not approved)?

Replacement in confined channels: Are bridge abutments or culvert walls outside of the active channel and at a position that does not affect a stage change of more than 0.5 feet above what would occur in a channel with natural grade and no artificial confinements at Q_{20}) (y/n)? ___

Replacement in alluvial channels: Is culvert or bridge width equal to or greater than the CMZ width for design life of the facility (y/n)? ____

If no to the applicable design target, provide alternative design targets and description of how the facility will not cause aggradation or degradation to a level that will adversely affect geomorphic processes and fish passage through the design life of the facility

Additional information attached (designs, images, geotechnical reports, etc.) (y/n)? ____

Additional Questions/Comments

Will the project create new impervious surface (y/n)? ____ Area (feet^2/acres) _____
Will wetlands be impacted (y/n)? ____ Area (feet^2/acres) _____
Will the project involve activities that will result in the permanent loss/gain or modification of designated critical habitat (as defined by NMFS) (y/n)? ____
If yes, describe how much, what type, impact mechanism, and to what extent the habitat would be lost/gained or modified for each species affected

Does the project involve revegetation (hydroseeding, shrub or tree plantings, etc.) (y/n)? ____
Will trees or shrubs be planted (y/n)? ____
If yes to either, briefly describe below

CATEGORY 3 : POST-PROJECT REPORTING FORM

Project biologist and contact information:

Name: _____Email: _____Phone: ( ) _____-_____

Project name

_____

Location (District, County, Route, Post Mile)

_____

Watershed: _____ Stream name: _____

Schedule

Start (day-month-year): ___-___-___ Completion: ___-___-___

Multi-season project schedule:

_____

_____

_____

Description of completed project, affected Area, and passage improvement (if applicable):

Culvert/bridge replacement (y/n)? ____ Culvert/bridge retrofit (y/n)? ___

Fish present (y/n) ____ Fish bearing (y/n)? ____ Perennial (y/n)? ____ Fish passage barrier (y/n)? ___

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Map/photo/image showing completed project attached (y/n)? ___

Species Impacts Table (per District and current Calendar Year)

Covered Species	**Number of Completed and Ongoing Projects to Date Involving Listed Fish Handling**	**Current Project Fish Handling (h) and Mortality (m)**	**Total Fish Handling and Mortality (To Date + Current Project)**
Fish		h/m	h/m
Chinook Salmon			
California Coastal ESU		/	/
Coho Salmon			
Central California Coast ESU		/	/
Southern Oregon/Northern California Coastal ESU		/	/
Steelhead			
Northern California DPS		/	/
Central California Coast DPS		/	/
South Central California Coast DPS		/	/

Habitat Impacts Table

Covered Species	**Critical Habitat Present in Action Area (y/n)**	**Species in Watershed or Drainage (y/n)**	**Species in Action Area During Project Implementation (y/n)**	**Permanent Habitat Removal (acres/ft^2)**	**Temporary Habitat Removal (acres/ft^2)**
Fish					
Eulachon					
Southern DPS					
Chinook Salmon					
California Coastal ESU					
Sacramento River Winter-Run ESU					
Central Valley Spring-Run ESU					
Coho Salmon					
Central California Coast ESU					
Southern Oregon/Northern California Coastal ESU					
Steelhead					
Northern California DPS					
Central California Coast DPS					
Southern Central California Coast DPS					
California Central Valley DPS					
Green Sturgeon					
Southern DPS					

Specific Actions Checklist

Check to indicate implementation of action and associated ABMPs (described in detail in Caltrans PBA 2010 and NMFS 2013)

___**PA-1:** Operate construction equipment and vehicles (ABMP-1.1, 1.2, 1.3, and 1.4)
___**PA-2:** Use temporary lighting for night construction activities (ABMP-2.1, 2.2, and 2.3)
___**PA-3:** Maintain and fuel construction equipment and vehicles (ABMP-1.2, 1.3, 1.4, and 3.1)
___**PA-4:** Clean the roadway of sediment and debris from landslide, flood events, and Construction (ABMP-5.1)
___**PA-5:** Temporarily and permanently store sediment and debris, and pavement, petroleum products, concrete, and other construction materials (ABMP-1.4 and 5.1)
___**PA-6:** Apply pavement, petroleum products, concrete, and other construction materials to surface of roads, bridges, and related infrastructure (ABMP-1.4 and 6.1)
___**PA-7:** Treat and discharge water conveyed from the construction area (ABMP-7.1 and 7.2)
___**PA-8:** Use drill rigs and drilling lubricants (ABMP-1.4, 8.1, 8.2, 8.3, and 8.4)
___**PA-9:** Paint, wash, seal, and caulk bridges, guardrails, and other infrastructure (ABMP-1.4 and 6.1)
___**PA-10:** Remove and disturb upland, riparian, and wetland vegetation (ABMP-1.4, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, and 10.8)
___**PA-11:** Grade and establish temporary and permanent staging/storage areas for sediment, debris, and construction materials and equipment (ABMP-1.4, 10.4, 10.7, 10.8, 11.1, 11.2, 11.3, and 11.4)
___**PA-12:** Construct temporary sediment-settling basins (ABMP-10.4, 10.7, 10.8, and 12.1)
___**PA-13:** Grade temporary access roads, traffic detours, and staging and work areas (ABMP-10.4, 10.7, 10.8, and 13.1)
___**PA-14:** Operate construction equipment and vehicles in the stream channel (ABMP-10.4, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, and 14.8)
___**PA-15:** Construct temporary stream crossings (ABMP-10.4, 10.8, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 15.1, and 15.2)
___**PA-16:** Remove and disturb aquatic vegetation, stream sediment, and LWD (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.2, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, and 16.9)
___**PA-17:** Install temporary cofferdams and diversion cofferdams (ABMP-10.4, 14.5, 14.6, 14.7, 15.1, 15.2, 17.1, 17.2, and 17.3)
___**PA-18:** Temporarily redirect stream flow (ABMP-7.2, 10.4, 14.5, 14.6, 14.7, 15.1, 18.1, 18.2, 18.3, 18.4, 18.5, and 18.6)
___**PA-19:** Temporarily draft water from streams and other water bodies (ABMP-14.5 and 18.6)
___**PA-20:** Install permanent and temporary rock slope protection (RSP), sheet piles, and retaining walls (ABMP-10.4, 14.1, 14.2, 14.5, 14.6, 14.7, 15.1, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, and 20.7)
___**PA-21:** Place concrete and concrete slurry seal coat in cofferdams, footing and bridge forms, culvert bedding, and other applications (ABMP-1.4 and 21.1)
___**PA-22:** Remove culverts (ABMP-10.4, 14.1, 14.5, 14.6, and 15.1)
___**PA-23:** Clean, retrofit, or install culverts (ABMP-10.4, 14.1, 14.5, 14.6, 14.7, 15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, and 23.1)
___**PA-25:** Remove existing bridge structure, including footings, piers, and piles (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, and 15.1)

___**PA-26:** Install bridge structures, excluding pile-driving (ABMP-6.1, 10.4, 14.1, 14.5, 14.6, 14.7, 15.1, 17.2, 17.3, 20.1, 20.3, 20.4, 20.6, 20.7, 23.1, and 23.3)
___**PA-28:** Capture, handle, exclude, salvage, and relocate listed species (ABMP-28.1 through 28.12)
___**PA-29:** Implement BMPs (ABMP-29.1 through 29.7)
___**PA-30:** Mitigation framework for potential adverse impacts on species listed under CESA

Program limits and minimization measures checklist

a. Cleaning

Did cleaning require dewatering or fish relocation (y/n)? ___
(If yes, see *Section f. Dewatering and Fish Relocation* below)

b. Vegetation and LWD Management

Did the project involve vegetation removal (y/n)? ____Area (feet^2/acres) _____
Did the project occur within 150 linear feet of the OHWL (y/n)? ____
Vegetation within 300 feet of any water body removed (y/n)? ____
Trees within 300 feet of any water body removed (y/n)? ____number: >6 inches____
>12 inches____>18inches____>24inches____
Tree species removed: _____

c. Grading for Access Roads and Construction of Settling Basins and Storage Areas

Establishment of staging and storage areas within 150 feet of watercourse (y/n)? ____ Area (feet^2/acres)
_____

d. Installation of Rock Slope Protection/erosion control materials

Final description of slope stabilization or erosion control
_____
_____
_____
_____
Additional information attached (final designs, images, etc.) (y/n)? ____

e. Drilling Geotechnical Test Holes

Did drilling occur in the wetted channel (y/n)? ____

Number of holes and specific location
_____

f. Dewatering and Fish Relocation

Dewatering (y/n)? ____linear feet of stream dewatered _____
(See *Species Impacts Table* above)

g. Rehabilitation, Retrofit, and Repair of Culverts and Bridges

Final description of rehabilitation, retrofit, or repair of culvert or bridge

_____
_____
_____
_____

Additional information attached (final designs, images, etc.) (y/n)? ____

h. Replacement of Culverts and Bridges

Final description of culvert or bridge replacement

_____
_____
_____
_____

Additional information attached (final designs, images, etc.) (y/n)? ____

Additional Questions/Comments

New impervious surface created (y/n)? ____ Area (feet^2/acres) _____
Wetlands impacted (y/n)? ____ Area (feet^2/acres) _____
Permanent loss/gain or modification of designated critical habitat (as defined by NMFS) (y/n)? ____
If yes, describe how much, what type, impact mechanism, and to what extent the habitat was lost/gained or modified for each species affected

_____
_____
_____
_____
_____
_____
_____
_____
_____

Did the project involve revegetation (hydroseeding, shrub or tree plantings, etc.) (y/n)? ____
Trees or shrubs be planted (y/n)? ____ If yes to either, briefly describe below

_____
_____
_____
_____
_____

CATEGORY 2: INVENTORY AND REPORTING FORM

Project lead and contact information:

Name: _____Email: _____Phone: ( ) _____-_____

Location (District, County, Route, Post Mile)

_____

Watershed: _____ Stream name: _____

Schedule
Start (day-month-year): ___-___-____ End: ____-____-____

Project type checklist

Check project type and fill associated field(s) below

____***Cleaning*** (removal of material below the OHWL with heavy equipment when all life stages of listed fish are absent)
Volume of material removed in cubic yards (*must be between 2 and 5 cubic yards*): ____

____***Vegetation and LWD Management*** (vegetation removal outside of the wetted channel within and 20 linear feet of a bridge or culvert with hand tools)
Area of vegetation removal within 150 linear feet of the OHWL in square feet (*must be below 5,000 square* feet): ____

____***Grading for Access Roads and Construction of Settling Basins and Storage Areas*** (grading above the OHWL and outside of wetted channels and designated critical habitat)
Graded area within 150 linear feet of OHWL in square feet (*must be below 5,000 square* feet):
____

____ ***Installation of erosion control materials*** (placement of erosion control materials in designated critical habitat and outside of the wetted channels)
Type of materials installed (*RSP, sheet piles, or retaining walls may not be placed designated critical habitat*) _____
_____

____ ***Drilling Geotechnical Test Holes*** (geotechnical drilling below the OHWL or within designated critical habitat)
Number of holes and specific location (*geotechnical drilling may not take place in wetted channels*) _____

____ ***Dewatering and Fish Relocation*** (dewatering and fish relocation outside anadromous waters or designated critical habitat)
List of fish species, approximate length, and approximate number handled (*listed fish may not be handled*) _____
_____
_____
_____

____ ***Rehabilitation, Retrofit, and Repair of Culverts and Bridges*** (rehabilitation, retrofit, or repair of culvert or bridge superstructures within anadromous waters or designated critical habitat)
List of structures rehabilitated, retrofitted, or repaired (*activities may not occur below the OHWL*) _____
_____

____ ***Replacement of Culverts and Bridges*** (replacement of culverts and bridges in non-fish bearing streams)
Brief description of culvert or bridge replacement _____
_____
_____