

NOAA RESTORATION CENTER'S
PROGRAMMATIC APPROACH
TO ESA/EFH CONSULTATION STREAMLINING
FOR FISHERIES HABITAT RESTORATION
PROJECTS

(NMFS SANTA ROSA, CA OFFICE)

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1. PROGRAMMATIC APPROACH OVERVIEW

Most fisheries habitat restoration projects conducted in California are required to obtain a myriad of permits from various federal, state, and local agencies. Although the permitting processes is essential to ensure projects are conducted in a manner that comply with all applicable regulations, the time and cost associated with permitting has become a disincentive for restoration practitioners and could be limiting the implementation of fisheries habitat restoration in the region. For compliance with the federal Endangered Species Act (ESA), the National Marine Fisheries Service (NMFS) typically reviews proposed restoration projects in concert with the Corps of Engineers (Corps) during the Clean Water Act (CWA) Section 404 permit process via individual consultations pursuant to section 7 of the ESA. In addition, the Corps and NMFS may also conduct consultations to assess potential effects to essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). To more efficiently process permit applications submitted to the Corps and address NMFS consultation requirements, the NOAA Restoration Center (NOAA RC) and the Corps have completed a programmatic consultation with the West Coast Region of NMFS to facilitate approval of fisheries restoration projects in coastal California within the jurisdictional boundaries of the Corps' San Francisco District Regulatory Division.

The goal of this Program is to improve and expedite the federal authorization process for permitting restoration projects that benefit listed salmonids and their habitat in North-Central, Central and South-Central, California by streamlining the NMFS section 7 and EFH consultations.

Activities included under the Program may be permitted by the Corps under section 404 of the CWA through, but not limited to, the following permits: Nationwide Permit 27 for Wetland and Riparian Restoration and Creation Activities, and Nationwide Permit 33 for Temporary Construction, Access or Dewatering; or a new Regional General Permit (RGP) that may be issued in the future by the Corps, San Francisco District. Some projects may require an Individual Permit from the Corps if they do not qualify for an existing RGP or Nationwide Permit. In addition, the Corps (or NOAA RC occasionally) will request consultation under section 7 of the ESA with the U.S. Fish and Wildlife Service (FWS) for projects that may affect listed species under the jurisdiction of the FWS.

Other permits/authorizations required for project implementation

Section 2080 of the California Fish and Game Code prohibits take of any state-listed species (i.e., coho salmon or other non-fish species). Projects that may have impacts to state-listed species require an Incidental Take Permit under section 2081(b) and (c) or a consistency determination under section 2080.1 of the Fish and Game Code from the California Department of Fish and Wildlife (CDFW).

Projects that divert or obstruct the natural flow of, or change or use any material from the streambed, bank, or channel will require CDFW notification under Fish and Game Code section 1600 *et seq.* through a Lake or Streambed Alteration Agreement (LSAA). Small-scale projects under 5 acres in size may qualify for alternative CDFW permitting under the Habitat Restoration and Enhancement Act (AB 2193), beginning in January 2015. Some projects may qualify for an exemption under the California Environmental Quality Act (CEQA) such as Categorical Exemption 15333 for Small Habitat Restoration Projects. Those that do not must be analyzed pursuant to and comply with the provisions of CEQA through a Mitigated Negative Declaration or other means.

In addition, applicants for the majority of project types described in this document must comply with section 401 of the CWA, either through the State Water Resource Control Board's General Water Quality Certification for Small Habitat Restoration Projects or with an individual Water Quality Certification from the appropriate Regional Water Quality Control Board.

Projects in the Coastal Zone require a Coastal Development Permit or other approval from the California Coastal Commission (Commission) or a certified Local Coastal Program; projects with federal funding or authorization can be approved through a federal consistency determination reviewed by the Commission. Local permits may also be necessary.

As described in greater detail below, the NOAA RC will play the lead role in the approval, administration and oversight of projects authorized through the Program. NOAA RC staff will screen individual projects under consideration for inclusion under the Program, and will track implementation of individual projects. Such tracking will include documentation and reporting to the Santa Rosa Office of NMFS of any incidental take that results from projects authorized under the Program.

2. PROGRAM AREA AND PROJECT TYPES

If a restoration project qualifies for the Program, the Santa Rosa RC staff will oversee such projects in Humboldt (CCC coho salmon ESU only), Mendocino (excluding the Eel and Mattole River watersheds), Sonoma, Marin, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Francisco, San Mateo, Santa Cruz, San Benito, Monterey and San Luis Obispo counties (Figure 1). The Corps will issue permits for such projects under section 10 of the Rivers and Harbors Act of 1899, and section 404 of the CWA, as necessary. The restoration projects will be within the NMFS's North-Central Coast Office (NCCO, located in Santa Rosa, CA) jurisdictional area (Figure 1) and include projects permitted from 2016 forward into the future. Proposed restoration projects are categorized as follows: instream habitat improvements, instream barrier modification for fish passage improvement, streambank and riparian habitat restoration, upslope watershed restoration, removal of small dams (permanent, flashboard and other seasonal), creation of off-channel/side-channel habitat features and water conservation projects (developing alternative off-stream water supply, water storage tanks and water measuring devices). Projects that will not be authorized under this Program include water diversion or required bypass flow requirements, flow operations from dams, large construction projects, or other projects that are not described below.

RC staff in Santa Rosa, California will administer and oversee the Program to facilitate implementation of the restoration projects occurring in the jurisdiction of the NCCO of NMFS. Restoration projects may be submitted to the program by either the Corps or the RC. The RC will take the lead for the program and participate in the screening of individual projects under consideration for inclusion in the Program, and will track implementation of individual projects. Such tracking will include documentation and reporting to the NMFS NCCO of the number, type and location of projects and any incidental take that result from individual projects under this Program.

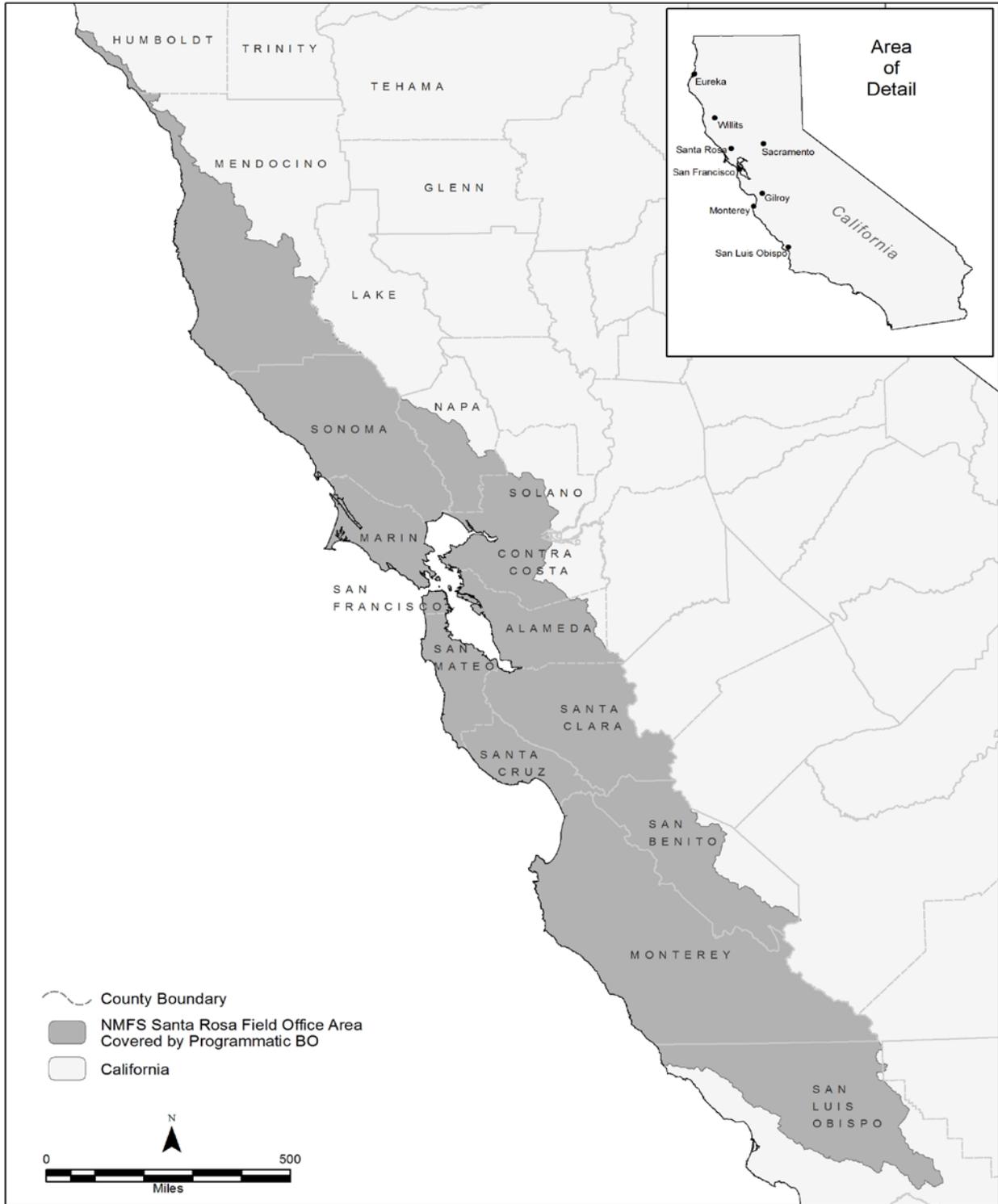


Figure 1. Map showing the area where certain types of restoration activities can be included in the proposed RC and Corps restoration Program. Action area does not include the San Francisco Bay.

2.1 PROJECT TYPES

Habitat restoration projects authorized by the Program include several types presented in CDFW's *California Salmonid Stream Habitat Restoration Manual, Fourth Edition, Volume II, Part IX: Fish Passage Evaluation at Stream Crossings; Part X: Upslope Assessment and Restoration Practices; Part XI: Riparian Habitat Restoration; and Part XII: Fish Passage Design and Implementation* (Flosi et al. 2010, hereafter referred to as "CDFW Manual"). Additionally, some restoration project activities that are not described in the current CDFW Manual can also be part of the Program and are listed below starting at section 2.2.

2.2 PROGRAM ACTIVITIES DESCRIBED IN THE CDFW MANUAL

2.2.1 INSTREAM HABITAT IMPROVEMENTS

Instream habitat structures and improvements are intended to provide predator escape and resting cover, increase spawning habitat, improve upstream and downstream migration corridors, improve pool to riffle ratios, and add habitat complexity and diversity. Specific techniques for instream habitat improvements may include: placement of cover structures (divide logs; engineered logjams; complex wood jams; digger logs; spider logs; and log, root wad, and boulder combinations, etc.), boulder structures (boulder weirs, vortex boulder weirs, boulder clusters, and single and opposing log wing-deflectors, etc.), log structures (log weirs, upsurge weirs, single and opposing log wing-deflectors, engineered log jams, and Hewitt ramps, etc.), and placement of imported spawning gravel. Implementation of these types of projects may require the use of heavy equipment (*i.e.*, self-propelled logging yarders, mechanical excavators, backhoes, helicopters, etc.), however, hand labor will be used when possible. Large woody debris (LWD) may also be used to enhance pool formation and improve stream reaches. Projects may include both anchored and unanchored logs, depending on site conditions and wood availability. Depending upon complexity of the project after it is reviewed by an RC technical monitor, a NMFS or CDFW engineer will be given the chance to review and comment on select projects' designs if needed and decide the level of review required. See the CDFW Manual for additional project information.

2.2.2 INSTREAM BARRIER MODIFICATION FOR FISH PASSAGE IMPROVEMENT

Instream barrier modification projects are intended to improve anadromous salmonid passage and increase access to currently inaccessible or difficult-to-access salmonid habitat. Projects may include those designed to improve fish passage at existing culverts, bridges, small dams, flood control structures, and paved and unpaved fords, or Arizona crossings, through replacement, removal, or retrofitting of these existing structures. These projects may include the use of gradient control weirs upstream or downstream of the barriers to control water velocity, water surface elevation, and/or provide sufficient pool habitat to facilitate jumps. Also, interior baffles or weirs may be used to mediate velocity and the effects of shallow sheet flow, or roughened ramps to provide stability and make up grade around other in-stream structures. Weirs and baffles may also be used to improve passage in flood control channels (particularly concrete-lined channels). Implementing these types of projects may require the use of heavy equipment (*i.e.* mechanical excavators, backhoes, cranes, etc.).

Part IX of the CDFW Manual, *Fish Passage Evaluation at Stream Crossings*, provides consistent methods for evaluating fish passage through culverts at stream crossings, and will aid in assessing fish passage through other types of stream crossings, such as bridges and paved or hardened fords.

The objectives of Part IX are to provide the user with: consistent methods for evaluating salmonid passage through stream crossings; ranking criteria for prioritizing stream crossing sites for treatment; treatment options to provide unimpeded fish passage; a stream crossing remediation project checklist; guidance measures to minimize impacts during stream crossing remediation construction; and methods for monitoring the effectiveness of corrective treatments.

The most recent chapter in the CDFW Manual (Part XII), *Fish Passage Design and Implementation*, provides technical guidance for the design of fish passage projects at stream crossings, small dams and water diversion structures. The objectives of CDFW Part XII are to “guide designers through the general process of selecting a design approach for passage improvement.” It provides “concepts, a design framework, and procedures to design stream crossings and fishways that satisfy ecological objectives, including: efficient and safe passage of all aquatic organisms and life stages, continuity of geomorphic processes such as the movement of debris and sediment, accommodation of behavior and swimming ability of organisms to be passed, diversity of physical and hydraulic conditions leading to high diversity of passage opportunities, projects that are self-sustaining and durable, and passage of terrestrial organisms that move within the riparian corridor (Flosi *et al.* 2010).”

Projects that are authorized under the Program must be designed and implemented consistent with CDFW’s *Culvert Criteria for Fish Passage* (Appendix IX-A, CDFW Manual, Flosi *et al.* 2010). A NMFS or CDFW engineer will be given the opportunity to review and comment and make recommendations on all fish passage improvement project designs.

2.2.3 STREAM BANK AND RIPARIAN HABITAT RESTORATION

The proposed activities will seek to reduce excess fine sediment from bank erosion by restoring incised or failing stream banks with appropriate site-specific techniques including: laying back stream banks, creating inset floodplains, and installing tree and native plant material revetments, willow wall and rootwad revetments, bank laybacks, brush mattresses, natural fiber rolls, and exclusionary fencing. These projects must improve salmonid habitat through increased stream shading that will lower stream temperatures, increased future LWD recruitment and invertebrate production, and increased instream habitat complexity. Riparian habitat restoration projects will aid in the restoration of riparian habitat by increasing the number of plants and plant groupings, and could include the following types of projects: natural native plant regeneration, bank laybacks, inset floodplains, livestock exclusionary fencing, bioengineering, removal of non-native trees (*e.g.*, eucalyptus trees) and revegetation projects. Reducing excessive fine instream sediment will improve fish habitat and fish survival by increasing fish embryo and alevin survival in spawning gravels, reducing injury to juvenile steelhead from high concentrations of suspended sediment, and minimizing the loss, or reduction in size, of pools from excess sediment deposition. Improved instream habitat complexity will help to ensure that failing stream banks do not result in continued loss of the in-channel habitat complexity needed by salmonids.

Part XI of the CDFW Manual, *Riparian Habitat Restoration*, contains some examples of these techniques. Some guidelines for stream bank restoration techniques are described in Part VII of the CDFW Manual, *Project Implementation*. Implementing these project types may require the use of heavy equipment. Depending upon complexity of the project after it is reviewed by RC technical

monitor, a NMFS or CDFW engineer may be given the opportunity to review and comment on all project designs and decide level of review.

Proposed use of boulders must be limited in scope and quantity to the minimum necessary to stabilize the slope and protect it from expected stream flows during storm events. Boulder structures must be part of a larger restoration design with the primary purpose of providing habitat improvements, and must include a riparian revegetation plan. Bridge abutments and other structural improvements installed in the restoration design of fish passage projects may require additional boulder and rock bank stabilization. This Program is not meant to cover projects that are merely protecting private property with bank erosion issues.

2.2.4 UPSLOPE WATERSHED RESTORATION

Upslope watershed restoration projects will reduce excessive delivery of sediment to salmonid streams. Part X of the CDFW Manual, *Upslope Assessment and Restoration Practices*, describes methods for identifying and assessing erosion problems, evaluating appropriate treatments, and implementing erosion control treatments in salmonid watersheds. Road-related upslope watershed restoration projects include: road decommissioning, road upgrading, and storm proofing roads. Implementation of these types of projects may require the use of heavy equipment.

2.3 PROGRAM ACTIVITIES NOT DESCRIBED IN THE CDFW MANUAL

2.3.1 REMOVAL OF SMALL DAMS (PERMANENT, FLASHBOARD AND OTHER SEASONAL-TYPE)

Dam removal is conducted to restore fisheries access to historic habitat for spawning and rearing and to improve long-term habitat quality and proper stream geomorphology. Types of eligible small dams include permanent, flashboard types, earthen and seasonal dams with the characteristics listed below.

Definition of a small dam is defined by the California Division of Dam Safety as any artificial barrier that is either: a) less than 25 feet in height from the natural bed of the stream or watercourse at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier to the maximum possible water storage elevation, or b) designed to have an impounding capacity of less than 50 acre-feet. This Program activity only includes small dam (as defined above) removal projects that will form a channel at natural grade and shape upstream of the dam, either naturally or through excavation, in order to minimize negative effects on downstream habitat. Dam removal projects will: 1) have a small volume of sediment available for release (relevant to the size of the stream channel, that when released by storm flows, will have minimal effects on downstream habitat (verified by qualified engineer and reviewed by either CDFW or NMFS engineers), or 2) be designed to remove sediment trapped by the dam down to the elevation of the target thalweg, including design channel and floodplain dimensions. This can be accomplished by estimating the natural thalweg using an adequate longitudinal profile (see CDFW Manual Part XII Fish Passage Design and Implementation) and designing a new channel that provides the same hydraulic conditions and habitat for listed fish as the historical, pre-dam channel.

Methods of restoring the channel: Implementing small dam removal projects may require the use of heavy equipment (*e.g.*, self-propelled logging yarders, mechanical excavators, backhoes, *etc.*). Some small dam removals can be accomplished with hand tools, such as jackhammers. One of two

methods will be used to restore the channel in a small dam removal project: Natural channel evolution or “stream simulation” design. The conditions under which each of these methods may be used are as follows:

Natural channel evolution: The natural channel evolution approach to restoring a channel bed consists of removing all hardened portions (by hand efforts or heavy equipment) of a dam and allowing the stream’s natural flows to naturally shape the channel through the project reach over time. This method shall only be used in the following situations: 1) risks are minimal to any of the downstream habitats and the aquatic organisms inhabiting them (based upon the amount and size gradation of the material being stored above the dam) if all of the sediment upstream of the dam is released during a single storm event; 2) the project reach has sufficient space and can be allowed to naturally adjust based upon any land constraints with minimal risk to riparian habit; 3) project implementation should follow procedures that have been documented as having been successfully performed elsewhere under similar circumstances; and 4) notching the dam in increments after periodic storm events in order to reduce the amount of sediment being released during any individual storm event shall not be permitted unless project funding is sufficient to allow the dam to be completely removed within the proposed project timeframe.

Stream simulation: Stream simulation design relies upon trying to duplicate the morphological conditions observed within a natural reference reach throughout the project reach. Stream simulation designs should be used in situations where excessive sediment releases pose a threat to downstream habitat and organisms. Specifically, the sediment upstream of the dam will be physically removed and the channel through the excavated reach will be designed using stream simulation. Stream simulation designs shall be conducted in accordance with known stream restoration and fish passage guidance documents. This specifically includes: 1) the identification of a suitable reference reach; 2) quantification of the average cross-sectional shape, bank full width, bed and bank sediment grain size distributions, and the geomorphic features of the channel (*e.g.*, pool-riffle sequences, meander lengths, step pools, *etc.*); and 3) reproducing the geomorphic features found within the reference reach in the project reach.

2.3.2 CREATION OF OFF-CHANNEL/SIDE-CHANNEL HABITAT FEATURES

Floodplain habitats such as wetlands, sloughs, and off-channel features are important habitat areas for salmonids, particularly during winter months, providing velocity refugia during high winter flow events and improving growth and survival of rearing juveniles. Although projects to increase off-channel and side-channel habitats are relatively new to California, many such projects have been built in western Washington and Canada. Estuarine restoration projects may include off-channel and side-channel habitat components that can provide rearing habitat for salmonids.

Historically, off-channel habitats were much more prevalent in the estuaries and lower reaches of California streams. Much of this off-channel habitat has been lost due to development such as road construction, urbanization, agriculture and associated fill (especially for Highways 1 and 101), rail line construction and associated fill, and other anthropogenic activities. Habitat complexity and ecological function have either been degraded or lost.

The type of side-channel or off-channel features proposed for inclusion under the proposed approach:

- Reconnection of abandoned side-channel or pond habitats to restore fish access.
- Connection of adjacent ponds, remnants from aggregate excavation.
- Reconnection of oxbow lakes on floodplains that have been isolated from the meandering channel by river management actions, or channel incision.
- New side-channel or off-channel habitat features that create self-sustaining channels that will be maintained through natural processes.
- Increasing the hydrologic connection between floodplains and or wetlands to main channels.

Projects that require the installation of a flashboard dam, head gate or other mechanical structure will not be considered. Off-channel ponds constructed under this programmatic consultation will not be used as a point of water diversion. Use of logs or boulders as stationary water level control structures will be allowed.

Projects that enhance or create off-channel/side-channel areas will provide important rearing areas and velocity refugia for salmonids. These restoration projects may include: removal or breaching of levees and dikes, channel and pond excavation, constructing wood or rock tailwater control structures, beaver dam analogues and construction of large woody material and rock boulder habitat features. Implementation of these types of projects may require the use of heavy equipment and construction of temporary access roads.

Information regarding consideration of water supply (channel flow/overland flow/ groundwater), water quality, and water source reliability; risk of channel change; as well as channel and hydraulic grade must be provided by project proponent for a possible NMFS or CDFW engineer to review. Project design and data must include characterizations such as those listed in Section 5.1.2, Side-Channel/Off-Channel Habitat Restoration, in the Washington Department of Fish and Wildlife's 2004 Stream Habitat Restoration Guidelines (Saldi-Caromile *et al.* 2004) and Chapter 6: Beaver Dam Analogues from the US Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Portland State University, US Forest Service 2015 Beaver Restoration Guidebook, (Pollock *et al.* 2015).

2.3.3 WATER CONSERVATION PROJECTS

Water conservation projects are intended to increase local stream flow, and thus available stream rearing habitat. In addition, increased stream flow may increase spawning and rearing habitat, improve or reconnect upstream and downstream migration corridors, improve access to habitat, decrease water temperatures and increase dissolved oxygen and nutrient transport. Specific techniques for water conservation projects may include: developing an alternative off-stream water supply (installation/modification of wells and ponds); creating tail water collection ponds; improving infrastructure; installing water storage tanks; installing infiltration galleries, piping ditches and/or re-profiling ditches; and installing head gates and water measuring devices. Implementation of these types of projects may require the placement of infrastructure (head gates, pumps and piping) in or adjacent to the stream to provide alternative water intake facilities. Water conservation projects proposed under the Program will not create fish passage barriers. Mechanized equipment may be

used to install the water conservation infrastructure, but hand labor will be utilized when possible. Pumping activities will not take more than 10% of the wetted channel at a time and will not strand salmonids. All instream pumps associated with tank projects will be screened in accordance with CDFW/NMFS screening criteria. All water conservation projects will require diverters to verify compliance with California state water rights.

a. Developing Alternative Off-stream Water Supply

Many landowners use off-stream reservoirs or ponds for agricultural uses to store water used for animals (e.g. dairies or pastures for grazing), vineyards or farms. These are often reservoirs that are filled by wells. The proposed Program will cover ponds and also cover water lines, watering troughs, and other physical components used to provide groundwater to livestock, vineyards, farms and other uses.

b. Water Storage Tanks

Creating off-channel water storage infrastructure will reduce the need for diversions during the low-flow season (late spring, summer and fall). These tanks could either be filled through rainwater catchment or by pumping surface or groundwater flow. Under this programmatic consultation, all water storage tank projects will be required to have a forbearance agreement for at least 15 years, which will provide temporal and quantitative assurances for pumping activities. The exact low-flow threshold for this programmatic consultation will be determined in collaboration with RC and NMFS hydrologists on a site-by-site basis.

c. Installation of water measuring devices

Water measuring devices include stream gauges and staff plates. While installation of stream gauges and staff plates typically only requires hand tools (e.g., shovels to bury inlet pipes, etc.), installation or replacement can require minor site excavation. Heavy equipment from the top-of-bank is typically used for excavation of the site. Any work areas will be hydrologically isolated from fish bearing streams. If the gauge is located within or near flood-prone areas, typically rock or other “armoring” is installed to protect the gauge from scour and debris damage.

2.4 PROTECTION MEASURES

Habitat restoration projects authorized by the Program that are described in the CDFW Manual will be designed and implemented following the techniques and minimization measures presented in the CDFW Manual in order to maximize the benefits of each project while minimizing potential short-term, adverse impacts to salmonids, other aquatic and terrestrial species, and stream and riparian habitat.

Additional avoidance and minimization measures will be necessary for all projects in order to reduce the potential for ancillary impacts to both salmonids and other riparian and aquatic species and their habitats. The following protection measures, as they apply to a particular project, shall be incorporated into the project descriptions for individual projects authorized under the proposed Program.

a. General Protection Measures for All Project Types:

1. Work shall not begin until a) the RC and/or Corps has notified the permittee that the requirements of the ESA and CWA have been satisfied and that the activity is authorized and b) all other necessary permits and authorizations are finalized.
2. The general construction season shall be from June 15 to October 31. Restoration, construction, fish relocation and dewatering activities within any wetted or flowing stream channel shall occur only within this period. If precipitation sufficient to produce runoff is forecast to occur while construction is underway, work will cease and erosion control measures will be put in place sufficient to prevent significant sediment runoff from occurring. Exceptions regarding the construction season will be considered on a case-by-case basis only if justified and if measurable precipitation sufficient to produce runoff is not forecast to occur during any of the above activities, and if approved by the RC, Corps, and NMFS. Revegetation activities including limited soil preparation outside the active channel may occur beyond October 31 if necessary to better ensure successful plant establishment during the onset of winter precipitation.
3. Prior to construction, the land manager and each contractor shall be provided with the specific protective measures to be followed during implementation of the project by the project proponent or lead biologist. In addition, a qualified biologist shall provide the construction crew with information on all listed species (including state-listed and state fully protected species) in the project area, the protection afforded the species by ESA and California Endangered Species Act (CESA), and guidance on those specific protection measures that must be implemented as part of the project.
4. Select herbicides such as *Imazipyr* may be applied to control established stands of non-native plant species. Herbicides must be applied to those species according to the registered label conditions. Herbicides must be applied directly to plants (painted or sponges) and may not be sprayed or spread upon any water. Herbicide shall be tinted with a biodegradable dye to facilitate visual control of the spray. NMFS will approve any herbicides before use. Additionally, NMFS has recently completed several consultations with the US Environmental Protection Agency (EPA) for certain herbicides. These biological opinions include RPAs that are intended to avoid and minimize adverse impacts to listed species when herbicides are applied. The protective measures identified in the RPAs must be incorporated into future labeling detailing herbicide use, or their registration for use on some crops and weeds will be cancelled by the EPA. All application instructions on the labels are requirements under the EPA, and are therefore required to be implemented under federal law when applying these herbicides.
5. Until any RPA required measures are identified on the label, the measures from the appropriate RPA, as well as proven BMPs, will be relied on for the Program in addition to current label requirements.
6. If the thalweg of the stream has been altered due to construction activities, efforts shall be undertaken to reestablish it to its original configuration. (Note: Projects that include activities

such as the use of willow baffles that may alter the thalweg are allowed under the proposed Program.)

2.4.1 REQUIREMENTS FOR FISH RELOCATION AND DEWATERING ACTIVITIES

A. GUIDELINES FOR DEWATERING:

Project activities authorized under the Program may require fish relocation and/or dewatering activities. Dewatering may not be appropriate for some projects that will result in only minor input of sediment, such as placing logs with hand crews, installing boulder clusters or felling of trees. Dewatering can result in the temporary loss of aquatic habitat, and the stranding, displacement, or crushing of fish and amphibian species. Increased turbidity may occur from disturbance of the channel bed. The following general guidelines will minimize potential impacts for projects that do require dewatering of a stream/creek.

1. In those specific cases where it is deemed necessary to dewater a work site that is located in aquatic habitat, the work area shall be isolated and all the flowing water upstream of the work site shall be temporarily diverted around the work site to maintain downstream flows during construction. Prior to dewatering, determine the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates (as described more fully below under *General Conditions for Fish Capture and Relocation*).
2. Fish will be excluded from reentering the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. Mesh will be no greater than 1/8-inch diameter. The bottom of the seine must be completely secured to the channel bed to prevent fish from reentering the work area. Exclusion screening must be placed in areas of low water velocity to minimize fish impingement. Upstream and downstream screens must be checked daily (prior to, during, and after instream activities) and cleaned of debris to permit free flow of water. Block nets shall be placed and maintained throughout the construction period at the upper and lower extent of the areas where fish will be removed. Block net mesh shall be sized to ensure salmonids upstream or downstream does not enter the areas proposed for dewatering between passes with the electro-fisher or seine.
3. Coordinate project site dewatering with a qualified biologist to perform fish and amphibian relocation activities. The qualified biologist(s) will possess all valid state and federal permits needed for fish relocation and will be familiar with the life history and identification of salmonids, state-listed fish, and listed amphibians within the action area.
4. Prior to dewatering a construction site, qualified individuals will capture and relocate fish and amphibians to avoid direct mortality and minimize take. This is especially important if listed species are present within the project site.
5. Bypass stream flow around the work area, but maintain the stream flow to channel below the construction site.
6. Minimize the length of the dewatered stream channel and duration of dewatering.

7. Any temporary dam or other artificial obstruction constructed shall only be built from materials such as sandbags or clean gravel that will cause little or no siltation. Impenetrable material shall be placed over sandbags used for construction of cofferdams construction to minimize water seepage into the construction areas. The impenetrable material shall be firmly anchored to the streambed to minimize water seepage. Cofferdams and the stream diversion systems shall remain in place and fully functional throughout the construction period.
8. When cofferdams with bypass pipes are installed, debris racks will be placed at the bypass pipe inlet. Bypass pipes will be monitored a minimum of two times per day, seven days a week, during the construction period. The contractor or project applicant shall remove all accumulated debris.
9. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the existing summer baseflow.
10. The work area may need to be periodically pumped dry of seepage. Place pumps in flat areas, well away from the stream channel. Secure pumps by tying off to a tree or stake in place to prevent movement by vibration. Refuel in an area well away from the stream channel and place fuel absorbent mats under pump while refueling. Pump intakes shall be covered with appropriate sized screening material to prevent potential entrainment of fish or amphibians that failed to be removed. Check intake periodically for impingement of fish or amphibians.
11. If pumping is necessary to dewater the work site, procedures for pumped water shall include requiring a temporary siltation basin for treatment of all water prior to entering any waterway and not allowing oil or other greasy substances originating from the contractor or project applicants operations to enter or be placed where they could enter a wetted channel. Projects will adhere to currently approved CDFW and NMFS *Fish Screening Criteria* (NMFS 2011).
12. Discharge wastewater from construction area to an upland location where it will not drain sediment-laden water back to the stream channel.
13. When construction is completed, the flow diversion structure shall be removed as soon as possible in a manner that will allow flow to resume with the least disturbance to the substrate. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour. This will minimize the risk of beaching and stranding of fish as the area upstream becomes dewatered.

B. GENERAL CONDITIONS FOR ALL FISH CAPTURE AND RELOCATION ACTIVITIES:

1. Fish relocation and dewatering activities shall only occur between June 15 and October 31 of each year. If precipitation sufficient to produce runoff is forecast to occur while construction is underway, work will cease and erosion control measures will be put in place sufficient to prevent significant sediment runoff from occurring. Exceptions on the fish relocation/dewatering time period will be considered on a case-by-case basis only if justified and if precipitation sufficient to produce runoff is not forecast to occur during any of the above activities, and if approved by the RC, Corps and NMFS. If the channel is expected to be

seasonally dry during this period, construction should be scheduled so that fish relocation and dewatering are not necessary.

2. A qualified fisheries biologist shall perform all seining, electrofishing, and fish relocation activities. The qualified fisheries biologist shall capture and relocate salmonids and other native fish prior to construction of the water diversion structures (*e.g.*, cofferdams). The qualified fisheries biologist shall note the number of salmonids observed in the affected area, the number of salmonids relocated, and the date and time of collection and relocation. The qualified fisheries biologist shall have a minimum of three years of field experience in the identification and capture of salmonids, including juvenile salmonids. The qualified biologist will adhere to the following requirements for capture and transport of salmonids:
 - a) Determine the most efficient means for capturing fish. Complex stream habitat generally requires the use of electrofishing equipment, whereas in outlet pools, fish may be concentrated by pumping down the pool and then seining or dip netting fish.
 - b) Notify the RC one week prior to capture and relocation of salmonids to provide RC or NMFS staff an opportunity to attend.
 - c) Initial fish relocation efforts will be conducted several days prior to the start of construction. This provides the fisheries biologist an opportunity to return to the work area and perform additional electrofishing passes immediately prior to construction if there is water in the isolated construction area. In these instances, additional fish could be captured that eluded the previous day's efforts. If water is left in the construction area, dissolved oxygen levels sufficient for salmonid survival must be maintained.
 - d) At project sites with high summer water temperatures, perform relocation activities during morning periods.
 - e) Prior to capturing fish, determine the most appropriate release location(s). Consider the following when selecting release site(s):
 - Similar water temperature as capture location
 - Ample habitat for captured fish
 - Low likelihood of fish reentering work site or becoming impinged on exclusion net or screen.
 - f) Periodically measure air and water temperatures and monitor captured fish. Temperatures will be measured at the head of riffle tail of pool interface. Cease activities if health of fish is compromised owing to high water temperatures, or if mortality exceeds three percent of captured salmonids.

C. ELECTROFISHING GUIDELINES:

The following methods shall be used if fish are relocated via electrofishing:

1. All electrofishing will be conducted according to NMFS' *Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act* (NMFS 2000).

- The backpack electro-fisher shall be set as follows when capturing fish. Voltage setting on the electro-fisher shall not exceed 300 volts.

Settings	Initial	Maximum
Voltage	100 Volts	300 Volts
Duration	500 μ s (microseconds)	5 ms (milliseconds)
Frequency	30 Hertz	30 Hertz

- A minimum of three passes with the electro-fisher shall be utilized to ensure maximum capture probability of salmonids within the area proposed for dewatering.
- Water temperature, dissolved oxygen, and conductivity shall be recorded in an electrofishing log book, along with electrofishing settings.
- A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and other aquatic vertebrates.

D. SEINING GUIDELINES:

The following methods shall be used if fish are removed with seines.

- A minimum of three passes with the seine shall be utilized to ensure maximum capture probability of all salmonids within the area.
- All captured fish shall be processed and released prior to each subsequent pass with the seine.
- The seine mesh shall be adequately sized to ensure fish are not gilled during capture and relocation activities.

E. GUIDELINES FOR RELOCATION OF SALMONIDS:

The following methods shall be used during relocation activities associated with either method of capture (electrofishing or seining):

- Fish shall not be overcrowded into buckets, allowing no more than 150 0+ fish (approximately six cubic inches per 0+ individuals) per 5 gallon bucket and fewer individuals per bucket for larger/older fish.
- Every effort shall be made not to mix 0+ salmonids with larger steelhead, or other potential predators, that may consume the smaller salmonids. Have at least two containers and segregate young-of-year (0+) fish from larger age-classes. Place larger amphibians in the container with larger fish.
- Salmonid predators, including other fishes and amphibians, collected and relocated during electrofishing or seining activities shall not be relocated so as to concentrate them in one area. Particular emphasis shall be placed on avoiding relocation of predators into the salmonid relocation pools. To minimize predation of salmonids, these species shall be

distributed throughout the wetted portion of the stream to avoid concentrating them in one area.

4. All captured salmonids shall be relocated, preferably upstream, of the proposed construction project and placed in suitable habitat. Captured fish shall be placed into a pool, preferably with a depth of greater than two feet with available instream cover.
5. All captured salmonids will be processed and released prior to conducting a subsequent electrofishing or seining pass.
6. All native captured fish will be allowed to recover from electrofishing before being returned to the stream.
7. Minimize handling of salmonids. However, when handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear insect repellants containing the chemical N,N-Diethyl-meta-toluamide (DEET).
8. Temporarily hold fish in cool, shaded, aerated water in a container with a lid. Provide aeration with a battery-powered external bubbler. Protect fish from jostling and noise and do not remove fish from this container until time of release.
9. Place a thermometer in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds those allowed by CDFW and NMFS, fish shall be released and rescue operations ceased.
10. In areas where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations.
11. Visually identify species and estimate year-classes of fish at time of release. Count and record the number of fish captured. Avoid anesthetizing or measuring fish. Also identify hatchery (clipped adipose fin) and wild fish.
12. If more than 3 percent of the salmonids captured are killed or injured, the project permittee shall contact the RC (currently Joe Pecharich (707) 575-6095 or at joe.pecharich@noaa.gov). The RC will then contact NMFS within 24 hours.
13. 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 must be retained, placed in an appropriately sized, zip-sealed bag, labeled with the date and time of collection, fork length, location of capture, and frozen as soon as possible. Frozen samples must be retained until specific instructions are provided by NMFS.

2.4.2 MEASURES TO MINIMIZE DISTURBANCE FROM INSTREAM CONSTRUCTION

Measures to minimize disturbance associated with instream habitat restoration construction activities are presented below. Measures are excerpted from *Measures to Minimize Disturbance from Construction*, on page IX-50 of the CDFW Manual:

- a. Construction will occur between June 15 and October 31. Revegetation activities, including soil preparation, may extend beyond October 31, if necessary, to better ensure successful plant

establishment during the onset of winter precipitation. If precipitation greater than one inch is forecast during the June 15 – October 31 work window, the RC must be notified, implementation work must stop, and erosion control BMP's must be implemented. Extensions of this work window will be considered on a case-by-case basis only if justified and if precipitation sufficient to produce runoff is not forecast to occur during any of the above activities, the effects of this action are not outside the effects analyzed in the BA, and if approved by the RC, Corps and NMFS.

- b. Debris, soil, silt, excessive bark, rubbish, creosote-treated wood, raw cement/ concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from projected related activities, shall be prevented from contaminating the soil and/or entering the waters of the State. Any of these materials, placed within or where they may enter a stream or lake, by the applicant or any party working under contract, or with permission of the applicant, shall be removed immediately. During project activities, all trash that may attract potential predators of salmonids will be properly contained, removed from the work site, and disposed of daily.
- c. Where feasible, the construction shall occur from the bank, or on a temporary pad underlain with filter fabric.
- d. No heavy equipment will enter wetted channels.
- e. Use of heavy equipment shall be avoided in a channel bottom with rocky or cobbled substrate. If access to the work site requires crossing a rocky or cobbled substrate, a rubber tire loader/backhoe is the preferred vehicle. Only after this option has been determined infeasible will the use of tracked vehicles be considered. The amount of time this equipment is stationed, working, or traveling within the creek bed shall be minimized. When heavy equipment is used, woody debris and vegetation on banks and in the channel shall not be disturbed if outside of the project's scope.
- f. The use or storage of petroleum-powered equipment shall be accomplished in a manner to prevent the potential release of petroleum materials into waters of the state (Fish and Game Code 5650).
- g. Areas for fuel storage, refueling, and servicing of construction equipment must be located in an upland location.
- h. Prior to use, clean all equipment to remove external oil, grease, dirt, or mud. Wash sites must be located in upland locations so wash water does not flow into the stream channel or adjacent wetlands.
- i. All construction equipment must be in good working condition, showing no signs of fuel or oil leaks. Prior to construction, all mechanical equipment shall be thoroughly inspected and evaluated for the potential of fluid leakage. All questionable motor oil, coolant, transmission fluid, and hydraulic fluid hoses, fitting, and seals shall be replaced. The contractor shall document in writing all hoses, fittings, and seals replaced and shall keep this documentation until the completion of operations. All mechanical equipment shall be inspected on a daily basis to ensure

there is no motor oil, transmission fluid, hydraulic fluid, or coolant leaks. All leaks shall be repaired in the equipment staging area or other suitable location prior to resumption of construction activity.

- j. Oil absorbent and spill containment materials shall be located on site when mechanical equipment is in operation with 100 feet of the proposed watercourse crossings. If a spill occurs, no additional work shall commence in-channel until (1) the mechanical equipment is inspected by the contractor, and the leak has been repaired, (2) the spill has been contained, and (3) NMFS and CDFW are contacted and have evaluated the impacts of the spill.

2.4.3 MEASURES TO MINIMIZE DEGRADATION OF WATER QUALITY

Construction or maintenance activities for the projects proposed under this Program may result in temporary increases in turbidity levels in the stream. In general, these activities must not result in significant, or long term increases in turbidity levels beyond the naturally occurring, background conditions. The following measures shall be implemented to reduce the potential for impacts to water quality during and post-construction:

a. General Erosion Control during Construction:

1. When appropriate, isolate the construction area from flowing water until project materials are installed and erosion protection is in place.
2. Effective erosion control measures shall be in place at all times during construction. Do not start construction until all temporary control devices (straw bales with sterile, weed free straw, silt fences, *etc.*) are in place downslope or downstream of project site within the riparian area. The devices shall be properly installed at all location where the likelihood of sediment input exists. These devices shall be in place during and after construction activities for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and of detaining sediment-laden water on site. If continued erosion is likely to occur after construction is completed, then appropriate erosion prevention measures shall be implemented and maintained until erosion has subsided. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain, fish, reptiles or amphibians.
3. Sediment shall be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they shall be staked and dug into the ground to a minimum depth of 12 cm, and only sterile, weed-free straw shall be utilized.
4. Sediment-laden water created by construction activity shall be filtered before it leaves the right-of-way or enters the stream network or an aquatic resource area.
5. The contractor/project applicant is required to inspect and repair/maintain all practices prior to and after any storm event, at 24-hour intervals during extended storm events, and a minimum of every two weeks until all erosion control measures have been completed.

b. Guidelines for Temporary Stockpiling:

1. Minimize temporary stockpiling of material. Stockpile excavated material in areas where it cannot enter the stream channel. Prior to start of construction; determine if such sites are available at or near the project location. If nearby sites are unavailable, determine location where material will be deposited. Establish locations to deposit spoils well away from watercourses with the potential to delivery sediment into the stream network draining into current salmonid habitat, or historically supporting populations of salmonids. Spoils shall be contoured to disperse runoff and stabilized with mulch and (native) vegetation. Use devices such as plastic sheeting held down with rocks or sandbags over stockpiles, silt fences, or berms of hay bales, to minimize movement of exposed or stockpiled soils.
2. If feasible, conserve topsoil for reuse at project location or use in other areas. End-haul spoils away from watercourses as soon as possible to minimize potential sediment delivery.

c. Minimizing Potential for Scour:

1. When needed, utilize instream boulder grade control structures to control channel scour, sediment routing, and headwall cutting.
2. For relief culverts or structures, if a pipe or structure that empties into a stream is installed, an energy dissipater shall be installed to reduce bed and bank scour. This does not apply to culverts installed in fish-bearing tributaries.
3. The toe of rock slope protection used for streambank stabilization shall be placed below bed scour to ensure stability.

d. Post-Construction Erosion Control:

1. Immediately after project completion and before close of seasonal work window, stabilize all exposed soil with mulch, seeding, and/or placement of erosion control blankets. Remove all artificial erosion control devices after the project area has fully stabilized. All exposed soil present in and around the project site shall be stabilized within 7 days. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles and amphibians.
2. All bare and/or disturbed slopes (larger than 10' x 10' of bare mineral soil) will be treated with erosion control methods such as straw mulching, netting, fiber rolls, and hydro-seed as permanent erosion control measures.
3. Where straw, mulch, or slash is used as erosion control on bare mineral soil, the minimum coverage shall be 95% with a minimum depth of two inches.
4. When seeding is used as an erosion control measure, only natives will be used. Sterile (without seeds), weed-free straw, free of exotic weeds, is required when hay bales are used as an erosion control measure.

2.4.4 MEASURES TO MINIMIZE LOSS OR DISTURBANCE OF RIPARIAN VEGETATION

Measures to minimize loss or disturbance to riparian vegetation are described below. The revegetation and success criteria that will be adhered to for projects implemented under the proposed Program that result in disturbance to riparian vegetation are also described below.

a. Minimizing Disturbance:

1. Retain as many trees and shrubs as feasible, emphasizing shade-producing and bank-stabilizing trees and brush.
2. Prior to construction, determine locations and equipment access points that minimize riparian disturbance. Pre-existing access points shall be used whenever possible. Avoid entering unstable areas, which may increase the risk of channel instability.
3. Minimize soil compaction by using equipment with a greater reach or that exerts less pressure per square inch on the ground, resulting in less overall area disturbed or less compaction of disturbed areas.
4. If riparian vegetation is to be removed with chainsaws, consider using saws currently available that operate with vegetable-based bar oil.

b. Revegetation and Success Criteria:

1. Any stream bank area left barren of vegetation as a result of the implementation or maintenance of the practices shall be restored to a natural state by seeding, replanting, or other agreed upon means with native trees, shrubs, and/or grasses. Barren areas shall typically be planted with a combination of willow stakes, native shrubs and trees and/or erosion control grass mixes.
2. Native plant species shall be used for revegetation of disturbed and compacted areas. The species used shall be specific to the project vicinity or the region where the project is located, and comprise a diverse community structure (plantings shall include both woody and herbaceous species).
3. For projects where re-vegetation is implemented to compensate for riparian vegetation impacted by project construction, a re-vegetation monitoring report will be required after 2 years to document success. Success is defined as 80% survival of plantings or 80% ground cover for broadcast planting of seed after a period of 2 years. If revegetation efforts will be passive (*i.e.*, natural regeneration), success will be defined as total cover of woody and herbaceous material equal to or greater than pre-project conditions. If at the end of 2 years, the vegetation has not successfully been re-established, the applicant will be responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. If success is not achieved within the first 2 years, the project applicant will need to prepare a follow-up report in an additional year's time.
4. All plastic exclusion netting placed around plantings will be removed and recycled after 3 years, or earlier if appropriate.

2.4.5 MEASURES TO MINIMIZE IMPACTS FROM ROAD-RELATED RESTORATION PROJECTS

Road modification, repair and decommissioning activities are considered to be one project regardless of the number of individual work sites or the different techniques employed at each site.

Upon the completion of restoration activities, roads within the riparian zone affected by construction activities shall be weather proofed according to measures described in the *Handbook for Forest and*

Ranch Roads by Weaver and Hagans (1994, revised 2014) of Pacific Watershed Associates and in Part X of the CDFW Manual, "*Upslope Assessment and Restoration Practices*." Following are some of the methods that may be applied to non-surfaced roads impacted by project activities implemented under the proposed Program:

- a. Establish waterbreaks (*e.g.*, waterbars and rolling dips) on all seasonal roads, skid trails, paths, and firebreaks by November 30. Do not remove waterbreaks until May 15.
- b. Maximum distance for waterbreaks shall not exceed the following standards; (1) for road or trail gradients less than 10%: 100 feet; (2) for road or trail gradients 11-25%: 75 feet; (3) for road or trail gradients 26% or greater: 50 feet. Depending on site-specific conditions, more frequent intervals may be required to prevent road surface erosion.
- c. Locate waterbreaks to allow water to be discharged onto some form of vegetative cover, slash, rocks, or less erodible material. Do not discharge waterbreaks onto unconsolidated fill.
- d. Waterbreaks shall be cut diagonally a minimum of 6 inches into the firm roadbed, skid trail, or firebreak surface and shall have a continuous firm embankment of at least 6 inches in height immediately adjacent to the lower edge of the waterbreak cut.
- e. The maintenance period for waterbreaks and any other erosion control facilities shall occur after every major storm event for the first year after installation.
- f. Rolling-dips are preferred over waterbars. Waterbars shall only be used on unsurfaced roads where winter use (including use by bikes, horses, and hikers) will not occur.
- g. After the first year of installation, erosion control facilities shall be inspected prior to the beginning of the winter period (October 31), after the first major storm event, and prior to the end of the winter period (May 15).
- h. Applicant will establish locations to deposit spoils well away from watercourses with the potential to delivery sediment into streams supporting, or historically supporting populations of salmonids. Spoils shall be contoured to disperse runoff and stabilized with mulch and (native) vegetation.
- i. No berms are allowed on the outside of the road edge.
- j. No herbicides shall be used on vegetation on inside ditches.

2.4.6 MEASURES TO MINIMIZE IMPACTS FROM SMALL DAM REMOVAL

- a. Projects will be deemed ineligible for the Program if: 1) sediments stored behind dam have a reasonable potential to contain environmental contaminants [dioxins, chlorinated pesticides, polychlorinated biphenyls (PCBs), or mercury] beyond the freshwater probable effect levels (PELs) summarized in the NOAA Office of Response and Restoration's Screening Quick Reference Table guidelines, or 2) the risk of significant loss or degradation of downstream spawning or rearing areas by sediment deposition is considered by RC and NMFS or CDFW engineers to be such that the project requires more detailed analysis. Sites shall be considered to have a reasonable potential to contain contaminants of concern if they are downstream of historical contamination sources such as lumber or paper mills, industrial sites, or intensive agricultural production going back several decades (since chlorinated

pesticides were legal to purchase and use). In these cases, preliminary sediment sampling is advisable.

- b. All construction will take place out of the wetted channel either by implementing the project from the bank and out of the channel or by constructing cofferdams, relocating aquatic species found within the project reach, and dewatering the channel. No more than 250 linear feet (125 feet on each side of the channel) of riparian vegetation will be disturbed for project access. All disturbed areas will be re-vegetated with native grasses, trees, or shrubs appropriate for the site.
- c. Project applicants are required to provide project designs to RC technical monitors prior to project approval and implementation. A NMFS or CDFW engineer will be given the chance to review and comment on all project designs and decide level of review. Data requirements and analysis to be provided with dam removal project design should attempt to meet NMFS 2011 Anadromous Salmonid Passage Facility Design (NMFS 2011 Guidelines). If proposed project designs do not meet the NMFS 2011 Guidelines, a variance may be explored and granted at the discretion of RC and NMFS engineers if there is a clear benefit to fish passage. Applicants will be required to complete the NOAA RC Programmatic Approach Post-project Construction Monitoring Form that includes regionally appropriate fish passage criteria for fish passage projects, and which have been incorporated into the data needs described below. The form is available at: <https://fisheries.noaa.gov/national/habitat-conservation/environment-compliance-office-habitat-conservation>.

d. Data and Analysis Requirements:

Minimal and Potential Data Needs: Listed below are the minimal and potential data needs for conducting any small dam removal project. However, site specific conditions may require additional information beyond what is identified here to adequately evaluate a small dam removal project. Similarly, unanticipated complications in a project such as the need to use a roughened channel and/or other fish passage techniques to pass fish over buried infrastructure (*e.g.*, gas, water, and sewer lines) will require additional data. The minimal data needed to conduct simpler small dam projects along with the potential data needs for more complex projects is listed in the project description section above.

1) Minimal Data Needs:

- A) A clear statement of the fish passage objectives of the project. Objectives shall be explicitly stated for any small dam removal project (*e.g.*, to improve fish passage, improve sediment continuity and downstream spawning habitat, and/or to provide passage meeting specific fish passage guidelines).
- B) A clear statement and justification for the project's method of restoring the channel along with a sediment management plan.
- C) The proposed time-frame for dam and sediment removal along with the time expected for channel equilibrium to occur at the project site. Include anticipated and actual start and end dates of project.

- D) The distance and location of nearest upstream grade control feature (natural or anthropogenic).
- E) An estimate of depth and volume of sediment stored above the dam. Evidence that the amount of sediment to be released above the dam is relatively small and unlikely to significantly affect downstream spawning, rearing, and/or over-summering habitats. The estimate should be determined with a minimum of five cross-sections - one downstream of the structure, three through the reservoir area upstream of the structure, and one upstream of the reservoir area outside of the influence of the structure - to characterize the channel morphology and quantify the stored sediment.
- F) Detailed information on project/reference reach including:
1. Location of project/reference reach.
 2. Channel width (baseline and target range in feet): Should be determined by taking three measurements of active channel at the dam and immediately upstream and downstream of the dam.
 3. Any existing geomorphic features present and that will be incorporated into the channel (*e.g.* pools, riffles, runs, step-pools, *etc.*).
 4. Overall channel slope (% baseline and target): determined by taking a longitudinal profile throughout the project reach upstream and downstream to the extent of dam influence on the channel slope.
 5. Maximum channel slope: determined through the site before and after the project using pre-project and as-built (post-project) longitudinal profiles.
 6. Photographs of pre and post project conditions, illustrating implementation of the dam removal, upstream sediment deposit/reservoir, and channel morphology upstream and downstream of the proposed project reach.
 7. Maximum jump height (baseline and target range in inches): using the pre-project and/or as built longitudinal profile to determine the maximum height a fish would have to jump to migrate through the site.
 8. A longitudinal profile of the stream channel thalweg for at least 20 channel widths upstream and downstream (pre and post project) of the structure or of a sufficient distance to establish the natural channel grade, whichever is greater, shall be used to determine the potential for channel degradation (as described in the CDFW Manual).
 9. The number of stream miles opened by each project should be estimated before implementation and verified after project completion. The following sources may be used to verify the number of upstream miles made accessible as a result of the project: exiting aerial photos and maps of the project watershed, local or regional barrier databases, existing staff or local expert knowledge of project watershed, and/or field verification (in cases where there is permission to access the stream).

10. A survey of any downstream spawning areas that may be negatively affected by sediment released by removal of the dam.

11. Presence/absence of salmonids:

Pre-implementation: Use one of the following survey techniques defined in California Coastal Salmonid Population Monitoring: Strategy, Design, and Methods (Adams *et al.* 2011) to identify and report presence/absence for either adults or juveniles upstream of the project site. Describe the survey techniques used to determine presence/absence status of salmonids. If a pre-implementation survey is not possible, report whether the barrier is a known full barrier or partial barrier for salmonids. Describe any pre-project data that is available. If no recent, biological information is available, include surrogate information (*e.g.* most recent observation of species above barrier, description of "completeness" of barrier, *etc.*).

Post-implementation: If the pre-implementation status was determined to be "absent," use one of the survey techniques to identify and report presence/absence following implementation. If pre-project upstream status was determined to be "present" (*e.g.* partial barriers), report any change in presence/absence following implementation if possible. In this case, the post-implementation result may be "continued presence." Describe the methodology used to determine presence/absence for the target fish species. Frequency /duration of sampling: The timing and frequency should correlate with the life history of the target fish species. At a minimum, if landowner access is allowed, this parameter should be monitored one time following implementation, and if funding and landowner access allows, would preferably be monitored on an annual or seasonal basis. Monitoring for this measure is likely to yield meaningful results in the first 3 years after project implementation, although in some situations it may be valuable to monitor for the first 5 years. Optional monitoring: for partial barriers or projects where the pre-implementation fish presence/absence status was identified as "present," the proportional change in the number of adults or juveniles due to project implementation may be measured.

2) Potential data needs for more complex projects:

NMFS engineers and/or the RC lead may request additional information from more complex projects to include:

- A) Hydraulic modeling immediately upstream and downstream of the project site, and throughout the project reach.
- B) Sediment modeling immediately upstream and downstream of the project site, and throughout the reach of the stream in which the project is located, including: Sediment grain size distribution within the dam depositional area and the sediment grain size distributions of the channel bed material within the equilibrium reaches upstream and downstream of the dam; recurrence interval of the discharge needed to mobilize the sediment particles and any established vegetation within the sediment deposit upstream of the dam that is to be removed; and bed and bank grain size distributions.

- C) Detailed geomorphic assessment of the watershed and/or stream reach.
 - D) Detailed hydrologic analysis of the watershed and how it will drive the geomorphic conditions within the watershed before and after dam removal.
 - E) A detailed assessment of the habitat conditions within the watershed and/or upstream and downstream of the reach of the stream in which the project is located.
- e. Two conditions that may preclude a project from eligibility for coverage under the Program are: 1) if sediments stored behind dam have a reasonable potential to contain environmental contaminants (may include but not limited to: dioxins, chlorinated pesticides, polychlorinated biphenyls (PCBs), or mercury) beyond the freshwater probable effect levels (PELs) summarized in the NOAA Screening Quick Reference Table guidelines or 2) if the risk of significant loss or degradation of downstream spawning or rearing areas by sediment deposition is considered to be such that the project requires more detailed analysis. Sites should be considered to have a reasonable potential to contain contaminants of concern if they are downstream of historical contamination sources such as industrial sites, or sites where intensive agricultural production going back several decades occurred (since chlorinated pesticides were legal to purchase and use for many years). In these cases, preliminary sediment sampling is advisable for a project to be considered for coverage under the proposed Program.

2.5 LIMITATIONS ON SIZE AND FOOTPRINT OF PROJECTS

Adverse impacts that may result from construction activities authorized under this programmatic consultation would occur on a localized scale. In order to further minimize the potential for short-term adverse impacts, the following limitations apply to individual projects:

- *Limits on stream crossing projects:*
 1. Any stream crossing removals in a salmonid bearing stream must be 1500 feet apart.
 2. Crossings in a non-fish bearing stream must be 100 feet apart.
- *Maximum length of stream dewatered per project:* 1,000 linear feet
- *Maximum upslope disturbance (raw dirt, tree removal, canopy cover reduction):*
 1. The disturbance footprint for a project's staging areas may not exceed a total of 1 acre.
 2. Native trees with defects, large snags > 16 in. diameter at breast height (dbh) and 20 ft. high, cavities, leaning toward the stream channel, nests, late seral characteristics, or > 48 in. dbh will be retained. In limited cases removal will be permitted if trees/snags occur in the way of providing fish passage. No removal will occur without a site visit and written approval from the RC.
 3. Downed trees (logs) > 24 in. dbh and 10 ft. long will be retained on upslope sites or used for instream habitat improvement projects.

2.6 SPECIFIC REQUIREMENTS FOR OFF-CHANNEL HABITAT PROJECTS

Restoring off-channel habitat features is a relatively new restoration technique in California and the lessons learned through monitoring these features will provide valuable information for adaptive

management and future projects. All off-channel habitat projects included in this Program will require an additional level of physical and biological monitoring. Project applicants will collect the following information with assistance from qualified consulting biologists, and submit the information to the RC and Corps:

1. Pre- and post-project photo monitoring data (per CDFW Manual guidelines);
2. Project Description:
 - a. Project problem statement
 - b. Project goals and objectives, *etc.*
 - c. Watershed context
 - d. Description of the type of off-channel feature and restoration techniques utilized
 - e. Project dimensions
 - f. Description of outlet control feature (if present)
 - g. If dewatering of the work site will be necessary, description of temporary dewatering methods including qualified individual who will be onsite to transport protected steelhead
 - h. Construction start and end dates
 - i. Materials to be used
 - j. When vegetation will be affected as a result of the project (including removal and replacement), provide a visual assessment of dominant native shrubs and trees, approximate species diversity, and approximate acreage
 - k. Description of existing site conditions and explanation of how proposed activities improve or maintain these conditions for salmonids, within the range of natural variability expected at the site
 - l. Description of key habitat elements (*i.e.*, temperature; type: pool, riffle, flatwater; estimate of instream shelter and shelter components; water depth; dominant substrate type, *etc.*) for salmonids in the project area
 - m. Pre- and post-construction (after winter flow event) information on the elevation of the inlet and outlet structure relative to the 2-year flood event
 - n. A description of if and when the off-channel feature became disconnected from the main channel. This will require checking the project site daily when the off-channel feature is becoming disconnected from the main channel.
 - o. A description of any stranded fish observed. If salmonids are stranded, the applicant will contact NMFS and RC staff immediately to determine if a fish rescue action is necessary. CDFW may also be contacted and provided with fish rescue information and/or mortalities by species.

2.7 PROJECT REVIEW

The following summarizes the anticipated process for reviewing individual project applications for consideration and authorization under the Program and the process by which projects will be administered:

2.7.1 SUBMITTAL OF PROJECT APPLICATIONS TO BE CONSIDERED FOR AUTHORIZATION UNDER THE PROGRAM

- a. Many applications for salmonid habitat restoration work consistent with approved project types discussed below and included in the Program, will receive technical assistance and approval from, the RC's Community-based Restoration Program. Projects funded by various other sources must receive section 404 or section 10 permits from the Corps, and must meet all the requirements and limitations described in the Program any other measures such as terms and conditions provided in this consultation.
- b. The RC website will include contact information that enables project proponents to coordinate directly with RC staff. The RC website will also include a link to the Corps-San Francisco District Regulatory Division's website, which provides instructions for the Corps' section 404 application requirements and forms for this Program (Note: The RC will coordinate closely with the Corps to ensure that it has received the project application for the appropriate section 404 permit).

2.7.2 TIMELINE FOR SUBMITTALS/REVIEW

Project applications will be submitted to both the RC and the Corps – San Francisco District throughout the year and distributed to/by RC and Corps staff for review and approval.

2.7.3 SUBMITTAL REQUIREMENTS

Project applicants seeking authorization under the Program must submit sufficient information about their project to allow the Corps and RC to determine whether or not the project qualifies. The following information will be collected by the project applicants with assistance from qualified consulting biologists and other specialized personnel. Project applicants will submit the following information either to the Corps (as part of their application for a Corps permit) or the RC (for RC-funded projects). Applicants will be responsible for obtaining any other necessary permits or authorizations from appropriate agencies before the start of project, as stated in section 2.4 *Protection Measures*, page 10. The following information is to be submitted on the attached programmatic application form.

- a. Pre-project photo monitoring data (per CDFW guidelines);
- b. Project description:
 1. Project problem statement;
 2. Project goals and objectives, *etc.*;
 3. Watershed context;
 4. Description of the type of project and restoration techniques utilized (culvert replacement, instream habitat improvements, *etc.*);
 5. Project dimensions;

6. Description of construction activities anticipated (types of equipment, timing, staging areas or access roads required):
7. If dewatering of the work site will be necessary, description of temporary dewatering methods, including qualified individual who will be onsite to capture and transport protect salmonids;
8. Construction start and end dates; start and end dates for salmonid relocation;
9. Estimated number of creek crossings and type of vehicle:
10. Materials to be used;
11. When vegetation will be affected as a result of the project, (including removal and replacement), provide a visual assessment of dominant native shrubs and trees, approximate species diversity, and approximate acreage;
12. Description of existing site conditions and explanation of how proposed activities improve or maintain these conditions for salmonids within expected natural variability;
13. Description of key habitat elements (*i.e.*, temperature; type: pool, riffle, flatwater; estimate of instream shelter and shelter components; water depth; dominant substrate type, *etc.*) for salmonids in the project area.
14. Description of applicable minimization and avoidance measures incorporated into the project (as described in section 2.4 *Protection Measures*, starting on page 17.
15. A proposed monitoring plan for the project describing how the applicant will ensure compliance with the applicable monitoring requirements described in this Program (photo monitoring, revegetation, *etc.*), including the source of funding for implementation of the monitoring plan.
16. A checklist the applicant must sign, verifying that the applicant agrees to adhere to all project conditions and protection measures during project design and implementation.

2.8 AUTHORIZATION OF PROJECTS AND FIELD CHECKS

RC and Corps staff will utilize a pre-established checklist (called the "Application Checklist for Inclusion in the RC Santa Rosa Office Programmatic Approach") in reviewing submitted projects to determine whether the project meets the parameters of the Program. Field visits may be necessary before projects are authorized for inclusion under the Program.

Prior to the Corps or RC's approval/authorization under the Program, the Corps or the RC will contact the appropriate NMFS NCCO Branch Chief to confirm that a project should be included in the Program. Contact will typically be by email and will include the information submitted and the response of NMFS and/or CDFW fish passage engineers. RC will assume a project qualifies for inclusion if it has not heard from NMFS within 2 weeks as to whether or not the project should be included in the Program. However, if the project is a stream crossing, dam removal, off-channel habitat feature, or any other fish passage project needing engineering review, RC will not move forward with the project until NMFS has finished engineering review or indicated via email that

additional review is not needed. The transmittal and response emails will be maintained in each project file by RC and or the Corps.

With the Corps' and RC's approval (and all other necessary approvals and permits obtained), authorized projects are then implemented by the applicants, incorporating all guidelines, protection measures, and additional required conditions (described in *Section 2.4 Protection Measures*).

2.9 POST-CONSTRUCTION IMPLEMENTATION MONITORING AND REPORTING

Qualifying applicants will be required to carry out all post-construction implementation monitoring for projects authorized under the Program. This will include photo-documentation (using standardized guidelines for photo-documentation consistent with the pre-construction monitoring requirements); as-built designs on engineered projects; evidence that required avoidance, minimization, and mitigation measures were implemented; and information about number (and species) of fish captured and relocated, and any fish injury or mortality that resulted from the project. This information will be submitted by each applicant to the RC for data assembly. Applicants will be required to use the *NOAA RC Programmatic Approach Post-Project Construction Monitoring Form*, which will be given to applicants along with approval of the project.

2.9.1 MONITORING AND REPORTING REQUIREMENTS

All applicants will utilize standard post-construction monitoring protocols developed under the lead of CDFW. These are the same monitoring protocols CDFW follows in implementing its Fisheries Restoration Grant Program. Current instructions used by CDFW are available online at: http://ftp.dfg.ca.gov/Public/FRGP/Qualitative_Monitoring_Forms/. In addition, applicants will utilize NMFS' September 2001 (or most recent update) Guidelines for Salmonid Passage at Stream Crossings for post-construction evaluation and long-term maintenance and assessment protocols. Applicants will also be required to fill out *the NOAA RC Programmatic Approach Post-Project Construction Monitoring Form*, which will be given to applicants by the Corps or the RC when approving their project.

a. Post-construction Monitoring and Reporting Requirements:

Implementation monitoring will be conducted for all projects implemented under the proposed Program. Following construction, project applicants must submit a post-construction implementation report to the RC and the Corps. Implementation reports shall include project as-built plans and photo documentation of project implementation taken before, during, and after construction, utilizing CDFW photo monitoring protocols. For fish relocation activities, the report should include: all fisheries data collected by a qualified fisheries biologist, including the number of any salmonids killed or injured during the proposed action; the number and size (in millimeters) of any salmonids captured and removed; and any unforeseen effects of the proposed action on salmonids.

3. REFERENCES

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