

INSTRUCTIONS

- Read through the Programmatic Biological Opinion (BO) to determine if the project fits under the described activities.
- Fill out an [online application for the Army Corps of Engineers](http://www.spk.usace.army.mil/Missions/Regulatory/), if necessary. <http://www.spk.usace.army.mil/Missions/Regulatory/>
- Fill out the application below.
- Review the list of specific “Minimization and Mitigation measures” on the last pages of this application.
- Sign and date the application.
- Attach a map of the project site, project site photos, a dewatering plan, and any other documents as necessary, then submit the completed form to the NOAA Restoration Center by e-mailing it to ruth.goodfield@noaa.gov.

General Information

Applicant Name	<input type="text"/>					
Landowner Name	<input type="text"/>					
Project Name	<input type="text"/>					
Project Location	<input type="text"/>					
Project Start Date	<input type="text"/>	Stream	<input type="text"/>	Latitude	<input type="text"/>	
Project End Date	<input type="text"/>	Watershed	<input type="text"/>	Longitude	<input type="text"/>	

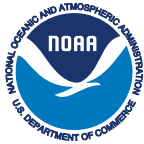
Project Description

- How is your project expected to fit under the Programmatic BO?
- ☐ This project is applying for / has received funding from the NOAA Restoration Center and/or U.S.F.W.S.
- ☐ This project is expected to require / has received a permit from the U.S. Army Corps of Engineers.

- Which salmonid species are present at your project site?
- ☐ Southern Green Sturgeon
- ☐ Sacramento River Winter-run Chinook Salmon
- ☐ Central Valley Spring-run Chinook Salmon
- ☐ California Central Valley Steelhead

What is the current problem addressed by this project? What is the context of this issue in the watershed?

What solution are you proposing? What are the goals, objectives, and proposed benefits of your project?



PROJECT INFORMATION (continued)

Please indicate the type(s) of techniques your project is likely to involve.

Check all that apply.

- | | |
|---|---|
| <input type="checkbox"/> Bioengineering and/or riparian habitat restoration | <input type="checkbox"/> Development of off-stream water supply |
| <input type="checkbox"/> Upslope watershed restoration | <input type="checkbox"/> Creation of tailwater collection pond(s) |
| <input type="checkbox"/> Instream habitat structures and/or improvements | <input type="checkbox"/> Construction/use of water storage tank(s) |
| <input type="checkbox"/> Barrier modification for fish passage improvement | <input type="checkbox"/> Construction/use of piping ditch(es) |
| <input type="checkbox"/> Removal of small dam(s), permanent and/or flashboard | <input type="checkbox"/> Installation of fish screen(s) |
| <input type="checkbox"/> Creation of off-channel/side-channel habitat | <input type="checkbox"/> Use of headgate(s)/water measuring device(s) |

In which Central Valley 'management unit' (section 1.3.4, Table 1-1) is the project located?.....

Will construction occur within the 'instream work window' for the appropriate management unit?.....

Will native trees >16 inches dbh and 20 feet high with cavities, trees with nests, or trees > 48 inches dbh be removed ?

Will dewatering and/or fish relocation be required?

Will mechanized equipment be working in the stream channel or within 25 feet of a wetted channel?

Does the project involve additional activities not described in the Program Activities section (1.3.5) in the PA?
If so, please explain.

Please describe the specific construction elements of your project, including dimensions, timing, equipment used, and any staging area / access roads needed.

What minimization and avoidance measures are already planned as a part of this project?

Please attach photos and a map of the project site.

Attach photos separately. Pre-project photos should be taken from the four cardinal directions and from established locations for comparison to post-project photos. Post-project photo documentation will be required of all approved projects.



Additional Information Required for Specific Project Activities

Upslope Restoration

- Will all stream crossing removals in fish bearing streams be more than 800 feet (stream distance) apart, or removals in a non-fish-bearing stream more than 500 feet apart?

Dewatering / Fish Relocation

- Will more than 1000 feet of stream need to be dewatered?
- Please describe your planned methods for temporarily dewatering the stream, and how they will meet the Guidelines for Dewatering in the Biological Opinion.

- Will fish relocation likely be necessary?
- If so, please describe your fish removal and relocation plan and how it will meet the *General Conditions for Fish Capture and Relocation Activities, Electrofishing Guidelines, Seining Guidelines, and Guidelines for Relocation of Salmonids* [Sections 1.3.4, 1.3.6] in the Biological Opinion.

Off-Channel and/or Side-Channel Habitat

- Will the project involve a flashboard dam, a head gate, or other mechanical structure?
- Will the resulting ponds be used as a point of water diversion?
- Please attach descriptions of the following as separate files:
 - How the project will consider water supply, including channel / overland flow, and groundwater;
 - Water quantity and reliability, risk of channel change, and channel and hydraulic grade.
- Please explain how your project will meet the protection measures for off-channel / side-channel projects as identified in the Biological Opinion (Section 1.3.6.).

Barrier Modification for Fish Passage Improvement

- Does the proposed project meet CDFW fish passage criteria?
- Please explain.

- Please attach your project designs as a separate file.



ADDITIONAL INFORMATION REQUIRED FOR SPECIFIC PROJECT ACTIVITIES (continued)

Removal of Small Dams

- Does the proposed project meet CDFW fish passage criteria?
- Please explain.
- Is the structure 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?
- Was the structure designed to have an impounding capacity of less than 50 acre-feet?
- Will the project form a natural grade/shape upstream, naturally or with excavation?
- Is the project site located downstream of potential contamination sources such as current or historical lumber or paper mills, industrial sites, or intensive agricultural production?
- Is there risk of significant loss or degradation of downstream spawning or rearing areas from potential sediment deposition resulting from the project?
- Please explain how your project will meet the protection measures for small dam removal projects as identified in the Biological Opinion (Section 1.3.6).
- Please attach your project designs as a separate file.

Water Conservation

- To aid us in verifying compliance with applicable water rights, please attach the following as separate files:
 - A copy of the small domestic use or livestock stockpond registration, appropriate water right, or a statement of riparian water use registered with the State Water Resources Control Board.
 - Any additional associated permitting that may have been required (e.g. Lake or Streambed Alteration Agreement, CA Environmental Quality [CEQA] analysis, etc.).
 - Diversion records (riparian and appropriate) both upstream and downstream of the project site.
 - The household / property water conservation plan (low flow shower heads, toilets, etc.).
 - A document detailing the estimated stream gradient and substrate, as well as what method(s) will be used to accurately measure the diversion rate.
- What are the proposed dates of diversion? From to
- What is the proposed rate of diversion (in cfs)?
- What is the estimated water use / storage needed for this project (in gallons/year)?



ADDITIONAL INFORMATION REQUIRED FOR SPECIFIC PROJECT ACTIVITIES (continued)

Development of Off-stream Water Supply

- Please explain how your project will meet the protection measures for alternative off-stream supply projects as identified in the Biological Opinion (Section II.C.7.b.).

Creation of Tailwater Collection Ponds

- Please explain how your project will meet the protection measures for projects that create tailwater collection ponds, as identified in the Biological Opinion (Section II.C.8.b.).

Construction / Use of Water Storage Tanks

- Is the landowner / water rights holder willing to enter into a forbearance agreement for at least 10 years
- What are the proposed dates of forbearance? From to
- What is the estimated water need for the forbearance period (in gallons/year)?
- Please explain how your project will meet the protection measures for projects that construct or use water storage tanks, as identified in the Biological Opinion (Section 1.3.6).

Construction / Use of Piping Ditches

- Has a Petition for Instream Flow Dedication (California Water Code §1707, 1991) been filed?
- If yes, please attach a copy of the Petition for Instream Flow Dedication as a separate file.
If no, has any other progress been made towards instream dedication? Please explain.

- Please explain how your project will meet the protection measures for piping ditch projects as identified in the Biological Opinion (Section 1.3.6).



ADDITIONAL INFORMATION REQUIRED FOR SPECIFIC PROJECT ACTIVITIES (continued)

Use of Fish Screens

- Will the fish screen comply with NMFS screening criteria / CDFW screening criteria?
- Please explain.

- Please explain how your project will meet the protection measures for projects that involve fish screens, as identified in the Biological Opinion (Section 1.3.6).

- Please attach a copy of your project designs / documentation of compliance as a separate file.

Use of Headgates / Water Measuring Devices

- Please explain how your project will meet the protection measures for projects involving headgates / water measuring devices, as identified in the Biological Opinion (Section 1.3.6).

- Please provide instream and ditch/pump hydraulic calculations showing there is sufficient head to divert maximum diversion flow and bypass flow at minimum stream flow considering head losses at flow measurement devices, fish screens, pipes, open ditches, and/or headgates. Please attach a separate file.

Signature



MINIMIZATION MEASURES

General Protection Measures

- Work shall not begin until (a) the Corps and/or NOAA RC has notified the applicant to the Program that the requirements of the Endangered Species Act (ESA) have been satisfied and that the activity is authorized and (b) all other necessary permits and authorizations are finalized.
- The general construction season shall be from June 15 to October 31. Restoration, construction, fish relocation, and dewatering within any wetted or flowing stream channel shall only occur within this period. Revegetation outside of the active channel may continue beyond October 31, if necessary.
- Prior to construction, any contractor shall be provided with the specific protective measures to be followed during implementation of the project. In addition, a qualified biologist shall provide the construction crew with information on the listed species and State Fully Protected Species in the project area, the protection afforded the species by the ESA, and guidance on those specific protection measures that must be implemented as part of the project.
- All activities that are likely to result in negative aquatic effects, including temporary effects, shall proceed through a sequencing of effect reduction: avoidance, reduction in magnitude of effect, and compensation (mitigation). Mitigation may be proposed to compensate for negative effects to waters of the United States. Mitigation shall generally be in kind, with no net loss of waters of the United States on a per project basis.
- Mitigation work shall proceed in advance or concurrently with project construction.
- Poured concrete shall be excluded from the wetted channel for a period of 30 days after it is poured. During that time the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter a live stream. Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturers specifications.
- If the thalweg of the stream has been altered due to construction activities, efforts shall be undertaken to reestablish it to its original configuration.

Measures to Minimize Degradation of Water Quality

General erosion control during construction:

- When appropriate, isolate the construction area from flowing water until project materials are installed and erosion protection is in place.
- Effective erosion control measures shall be in place at all times during construction. Do not start construction until all temporary control devices (e.g., straw bales with sterile, weed free straw, silt fences) are in place down slope or downstream of project site within the riparian area. The devices shall be properly installed at all locations 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 detaining sediment-laden water on site. If continued erosion is likely to occur after construction is complete, 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 reptiles (especially snakes) and amphibians.
- 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 sterile and weed free, staked and dug into the ground 12 cm. Catch basins shall be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.
- Sediment-laden water created by construction activity shall be filtered before it leaves the settling pond or enters the stream network or an aquatic resource area.
- The contractor/applicant to the Program is required to inspect, maintain or repair all erosion control devices 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.

Guidelines for temporary stockpiling:

- 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 a location where material will be deposited. Establish locations to deposit spoils well away from watercourses with the potential to deliver sediment



MINIMIZATION MEASURES (continued)

Measures to Minimize Degradation of Water Quality (continued)

into streams supporting, or historically supporting populations of listed 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 soil.

- 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.

Minimizing potential for scour:

- When needed, utilize instream grade control structures to control channel scour, sediment routing, and headwall cutting.
- For relief culverts or structures, if a 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 in fish bearing streams.
- The toe of rock slope protection used for streambank stabilization shall be placed below the bed scour depth to ensure stability.

Post-construction erosion control:

- Immediately after project completion and before close of seasonal work window, stabilize all exposed soil with erosion control measures such as 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 after construction. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles (especially snakes) and amphibians.
- All bare and/or disturbed slopes (more than 100 square feet of bare mineral soil) will be treated with erosion control measures such as hay bales, netting, fiber rolls, and hydroseed as permanent erosion control measures.
- Where straw, mulch, or slash is used as erosion control on bare mineral soil, the minimum coverage shall be 95 percent with a minimum depth of two inches.
- When seeding is used as an erosion control measure, only seeds from native plant species will be used. Sterile (without seeds), weed-free straw, free of exotic weeds, is required when hay or hay bales are used as erosion control measures.

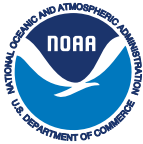
Measures to Minimize Loss or Disturbance of Riparian Vegetation

Minimizing disturbance:

- Retain as many trees and as much understory brush as feasible, emphasizing shade-producing and bank-stabilizing trees and brush.
- Prior to construction, determine locations and equipment access points that minimize riparian disturbance. Avoid entering unstable areas. Use project designs and access points that minimize riparian disturbance without affecting less stable areas, which may increase the risk of channel instability.
- Minimize soil compaction by using equipment with a greater reach or that exerts less pressure per square inch on the ground than other equipment, resulting in less overall area disturbed or less compaction of disturbed areas.
- If vegetation will be removed with chainsaws, consider using saws that operate with vegetable-based bar oil.
- Decompact disturbed soils at project completion as the heavy equipment exits the construction area.

Revegetation and success criteria:

- 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, planting, or other means with native trees, shrubs, or grasses prior to November 15 of the project year.
- Barren areas shall typically be planted with a combination of willow stakes, native shrubs and trees and/or erosion control grass mixes.
- 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 of the state where the project is located, and comprise a diverse community structure (plantings shall include both woody and herbaceous species).



MINIMIZATION MEASURES (continued)

Measures to Minimize Loss or Disturbance of Riparian Vegetation (continued)

- 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 five years to document success. Success is defined as 70 percent survival of plantings or 70 percent ground cover for broadcast planting of seed after a period of three 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 five years, the vegetation has not successfully been reestablished, the project applicant to the Program will be responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve the revegetation requirements. If success is not achieved within the first five years, the project applicant will need to prepare a follow-up report in an additional five years. This requirement will proceed in five year increments until success is achieved.
- All plastic exclusion netting placed around plantings will be removed after three years.

Measures to Minimize Disturbance from Instream Construction

- If the stream channel is seasonally dry between June 15 and October 31, construction will only occur during this dry period.
- 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 project related activities, shall be prevented from contaminating the soil or entering waters of the United States. 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 salmonid predators will be properly contained, removed from the work site, and disposed of daily.
- Where feasible, construction shall occur from the bank, or on a temporary pad underlain with filter fabric.
- 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.
- All mechanized equipment working in the stream channel or within 25 feet of a wetted channel shall have a double containment system for diesel and oil fluids. Hydraulic fluids in mechanical equipment working within the stream channel shall not contain organophosphate esters. Vegetable based hydraulic fluids are preferred.
- 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).
- Areas for fuel storage, refueling, and servicing of construction equipment must be located upland.
- 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 a stream channel or adjacent wetlands.
- 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 mechanical equipment shall be inspected on a daily basis to ensure there are 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.
- 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) CDFW and NOAA RC are contacted and have evaluated the impacts of the spill.



MINIMIZATION MEASURES (continued)

Measures to Minimize Impacts to Roads

- Upon the completion of restoration activities, roads within the riparian zone damaged by the permitted activity shall be weather proofed according to measures as described in Handbook for Forest and Ranch Roads by Weaver and Hagans (1994) of Pacific Watershed Associates and in Part X of the CDFW Manual entitled *Upslope Assessment and Restoration Practices*. The following are some of the methods that may be applied to roads impacted by project activities implemented under this Program.
- Establish waterbreaks (e.g., waterbars and rolling dips) on all seasonal roads, skid trails, paths, and fire breaks by October 15. Do not remove waterbreaks until May 15.
- Maximum distance between waterbreaks shall not exceed the following standards: (1) 100 feet for road or trail gradients less than 10 percent slope; (2) 75 feet for road or trail gradients from 11 to 25 percent; (3) 50 feet for road or trail gradients from 26 to 50 percent slope; and (4) 50 feet for road or trail gradients greater than 50 percent slope.
- Depending on site-specific conditions more frequent intervals may be required to prevent road surface rilling and erosion.
- 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.
- Waterbreaks shall be cut diagonally a minimum of six inches into the firm roadbed, skid trail, or firebreak surface and shall have a continuous firm embankment of at least six inches in height immediately adjacent to the lower edge of the waterbreak cut.
- The maintenance period for waterbreaks and any other erosion control facilities shall occur after every major storm event for the first year after installation.
- 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.
- After the first year of installation, erosion control facilities shall be inspected for failure prior to the winter period (October 15) after the first major storm event, and prior to the end of the winter period (May 15). If the erosion controls have failed, additional erosion control elements will be installed to the project site.
- Applicant will establish locations to deposit spoils well away from watercourses with the potential to deliver sediment into streams supporting, or historically supporting populations of listed salmonids. Spoils shall be contoured to disperse runoff and stabilized with mulch and (native) vegetation.
- No berms are allowed on the outside of the road edge.
- No herbicides shall be used on vegetation on inside ditches.

Requirements for Fish Relocation and Dewatering Activities

Guidelines for dewatering:

- In cases where it is deemed necessary to work in flowing water, the work area shall be isolated and all flowing water shall be temporarily diverted around the work site to maintain downstream flows during construction.
- Exclude fish from occupying 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 one eighth inch diameter. The bottom of a seine must be completely secured to the channel bed.
- Screens must be checked twice daily and cleaned of debris to permit free flow of water.
- Block nets shall be placed and maintained throughout the dewatering 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 do not enter the areas proposed for dewatering between passes with the electrofisher or seine.
- 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 all fish capture and relocation activities).
- Coordinate project site dewatering with a qualified biologist to perform fish and amphibian relocation activities. The qualified biologist(s) must possess a valid state of California Scientific Collection Permit as issued by CDFG, must be familiar with the life history and identification of listed salmonids and listed amphibians within the action area, and must be experienced with fish capture and handling. Check with your local CDFG biologist for assistance.



MINIMIZATION MEASURES (continued)

Requirements for Fish Relocation and Dewatering Activities (continued)

- Prior to dewatering a construction site, qualified individuals will capture and relocate fish and amphibians to avoid direct mortality and minimize adverse effects. This is especially important if listed species are present within the project site.
- Minimize the length of the dewatered stream channel and duration of dewatering, to the extent practicable.
- Any temporary dam or other artificial obstruction constructed shall only be built from materials such as sandbags or clean gravel which will cause little or no siltation.
- Visqueen shall be placed over sandbags used for construction of cofferdams construction to minimize water seepage into the construction areas. Visqueen shall be firmly anchored to the streambed to minimize water seepage. Cofferdams and stream diversion systems shall remain in place and fully functional throughout the construction period.
- If coffer dams with bypass pipes are installed, debris racks will be placed at the bypass inlet. Bypass pipes will be monitored a minimum of twice per day, seven days per week. All accumulated debris shall be removed.
- Bypass pipes will be sized to accommodate, at a minimum, twice the summer baseflow.
- 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 1/8 inch mesh to prevent potential entrainment of fish or amphibians that failed to be removed. Check intake periodically for impingement of fish or amphibians.
- 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 operations to enter or be placed where they could enter a wetted channel. Projects will adhere to *NMFS Southwest Region Fish Screening Criteria for Salmonids* (NMFS 1997a).
- Discharge sediment-laden water from construction area to an upland location or settling pond where it will not drain sediment-laden water back to the stream channel.
- When construction is complete, the 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 probability of fish stranding as the area upstream becomes dewatered.

General conditions for all fish capture and relocation activities:

- Fish relocation and dewatering activities shall only occur between June 15 and October 31 of each year.
- All seining, electrofishing, and relocation activities shall be performed by a qualified fisheries biologist, who shall capture and relocate listed salmonids prior to construction of the water diversion structures (e.g., cofferdams). The biologist shall note the number of salmonids observed in the affected area, the number and species of salmonids relocated, where they were relocated to, and the date and time of collection and relocation. The biologist shall have a minimum of three years field experience in the identification and capture of salmonids, including juvenile salmonids, considered in this biological opinion. The biologist will adhere to the following requirements for capture and transport of salmonids:
 - Determine the most efficient means for capturing fish (i.e., seining, dip netting, trapping, electrofishing). 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 dipnetting fish.
 - Notify NMFS one week prior to capture/relocation of salmonids to provide an opportunity to monitor.
 - 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. In many instances, additional fish will be captured that eluded the previous day's efforts.
 - In streams with high water temperature, perform relocation activities during morning periods.
 - Prior to capturing fish, determine the most appropriate release location(s). Consider the following when selecting release site(s): (a) Similar water temperature as capture location; (b) Ample habitat for captured fish; (c) Low likelihood of fish reentering work site or becoming impinged on exclusion net or screen; (d) Fish must be released in a nearby location within the same HUC 8 watershed.



MINIMIZATION MEASURES (continued)

Requirements for Fish Relocation and Dewatering Activities (continued)

- Periodically measure air and water temperatures. Cease activities when water temperatures exceed 17.8 °C. Temperatures will be measured at the head of riffle tail of pool interface.
- Submit reports of fish relocation activities to CDFG and NOAA in a timely fashion.

Electrofishing Guideline

- All electrofishing will be conducted by properly trained personnel, and according to *NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act* (NMFS 2000).
- The backpack electrofisher shall be set as follows when capturing fish:
 - Voltage setting on the electrofisher shall not exceed 300 volts.
 - Voltage: 100 Volts (initial), 300 Volt (max)
 - Duration: 500 microseconds (initial), 5 milliseconds (max)
 - Frequency: 30 Hertz (initial), 70 Hertz (max)
- A minimum of three passes with the electrofisher shall be conducted to ensure maximum capture probability of salmonids within the area proposed for dewatering.
- No electrofishing shall occur if water conductivity is greater than 350 microSiemens per centimeter ($\mu\text{S}/\text{cm}$) or when instream water temperatures exceed 17.8 C. Water temperatures shall be measured at the pool/riffle interface. Direct current (DC) used.
- A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and aquatic vertebrates.

Seining Guidelines:

- A minimum of three passes with the seine shall be utilized to ensure maximum capture probability of 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.

Guidelines for Relocation of Salmonids:

- Salmonid fish shall not be overcrowded into buckets; allowing approximately 6 cubic inches per young-of-the-year (0+) individual and more for larger fish.
- Every effort shall be made not to mix 0+ salmonids with larger salmonids, or other potential predators. Have at least two containers and segregate 0+ fish from larger age classes.
- Place larger amphibians, such as Pacific giant salamanders, in container with larger fish.
- Salmonid predators, such as sculpins (*Cottus sp.*) and Pacific-giant salamanders (*Dicamptodon ensatus*) collected shall be relocated so as to not concentrate them in one area. Particular emphasis shall be placed on avoiding relocation of sculpins and Pacific-giant salamanders into the steelhead and coho salmon relocation pools. To minimize predation on salmonids, these species shall be distributed throughout the wetted portion of the stream so as not to concentrate them in one area.
- 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.
- All captured salmonids will be processed and released prior to conducting a subsequent pass.
- All native captured fish will be allowed to recover from electrofishing before being returned to the stream.
- Minimize handling of salmonids. When handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear DEET based insect repellents.
- 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.
- 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 18°C, fish shall be released and rescue operations ceased.
- Where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations.



MINIMIZATION MEASURES (continued)

- Visually identify species and estimate year-classes of fishes at time of release. Record the number of fish captured. Avoid anesthetizing or measuring fish.
- If more than three percent of the steelhead, Chinook salmon, or coho salmon captured are killed or injured, the project lead shall contact NMFS PRD and CDFW. The purpose of the contact is to allow the agencies a courtesy review of activities resulting in take and to determine if additional protective measures are required. All steelhead, chinook salmon, and coho salmon mortalities must be retained, placed in an appropriately sized whirl-pak or zip-lock bag, labeled with 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.

Barrier Modification for Fish Passage

- Projects will follow guidelines set out in the California Department of Fish and Wildlife's *Salmonid Stream Habitat Restoration Manual, Part XII (Fish Passage Design and Implementation)*, as applicable.

Removal of Small Dams (Permanent/Flashboard)

- The potential for channel degradation shall be determined using a longitudinal profile of the stream channel thalweg for at least 20 channel widths upstream and downstream of the structure and long enough to establish the natural channel grade, whichever is farther (as described in the CDFW Manual).
- A minimum of five cross-sections (one downstream of the structure, three roughly evenly spaced through the reservoir area upstream of the structure, and one upstream of the reservoir area outside of the influence of the structure) shall be used to characterize the channel morphology and quantify the stored sediment.
- Sediment characterization within the reservoir and within a reference reach of a similar channel shall be used to determine the proportion of coarse sediment (>2mm) in the reservoir area and the target sediment composition.
- A habitat typing survey (CDFW Manual Part III, Habitat Inventory Methods) shall be used to map and quantify all downstream spawning areas that may be affected by sediment released by removal of the water control structure.
- 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 coffer dams, removing aquatic species located 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 removed. All disturbed areas will be re-vegetated with native grasses, trees, or shrubs.
- All dewatering efforts associated with small dam removal will be implemented as described in *Requirements for Fish Relocation and Dewatering Activities*.

Creation of Off-Channel or Side-Channel Habitat

- Any equipment work within a stream channel shall be performed in isolation from the flowing stream. If there is any flow when work is done, coffer dams shall be constructed upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. Coffers may be constructed from a variety of materials and methods, for example clean river gravel or sand bags, and may be sealed with sheet plastic. Foreign materials such as sand bags and any sheet plastic shall be removed from the stream upon project completion. In some cases, clean river gravel may be left in the stream, but the coffer dams must be breached to return stream flow to its natural channel.
- If it is necessary to divert flow around the work site, either by pump or by gravity flow, the suction end of the intake pipe shall be fitted with a fish screen that meets CDFW and NMFS (NMFS 1997a) criteria to prevent entrainment or impingement of small fish. Any turbid water pumped from the work site shall be disposed of in an upland location where it will not drain directly into any stream channel, or treated via settling pond to filter suspended materials before flowing back into the stream.



MINIMIZATION MEASURES (continued)

Development of Off-stream Water Supply

- Only projects with existing diversions compliant with water laws will be considered. Flow measuring device installation and maintenance may be required for purposes of accurately measuring and managing pumping rate or bypass conditions set forth in this document or in the water right or special use permit.
- All pump intakes will be screened in accordance with NMFS Southwest Region *Fish Screening Criteria for Salmonids* (NMFS 1997a).
- Stockwater ponds and wells will be located at least 100 feet from the edge of the active channel and are not likely to cause stranding of juvenile salmonids during flood events.

Tailwater Collection Ponds

- Tailwater collection ponds that do not incorporate return channels to the creek will be located at least 100 feet from the edge of the active channel.

Construction / Use of Water Storage Tanks

- Water storage tank projects will be required to enter into a forbearance agreement for at least 10 years. The low flow threshold, measured in cubic feet per second (cfs) season of diversion and season of storage, will be determined in collaboration with CDFW and NOAA RC on a site by site basis.
- Water storage capacity for the water diversion forbearance period must be of sufficient capacity to provide for all water needs during that time period.
- Water conservation projects that include water storage tanks and a forbearance agreement for the purpose of storing winter and early spring water for summer and fall use require registration of water use pursuant to California Water Code § 1228.3, and require consultation with CDFW.
- Diversions to fill storage facilities during the winter and spring months shall be made pursuant to a Small Domestic Use Appropriation (SDU) filed with the State Water Resources Control Board (SWRCB).

Construction / Use of Piping Ditches

- Only water conservation piping projects that result in a decrease in the diversion rate with a permitted instream dedication of the water saved are included in the Program.
- Landowners will enter an agreement with NOAA RC or the Corps stating that they will maintain the pipe for at least 10 years.

Installation of Fish Screens

- All flows will be diverted around work areas as described in the *Requirements for Fish Relocation and Dewatering Activities*.
- If fish removal is required, BMPs will be implemented as described in the *Requirements for Fish Relocation and Dewatering Activities*.
- Riparian disturbance will be minimized as described in the *Measures to Minimize Loss or Disturbance of Riparian Vegetation*.

Use of Headgates / Water Measuring Devices

- Measuring devices must be approved by DWR for watersheds with DWR water master service. Otherwise, measuring devices must conform to the Bureau of Reclamation Water Measurement Manual (BOR 2001).
- Design drawings must show structural dimensions in plan, elevation, longitudinal profile, and cross-sectional views along with important component details.
- All flows will be diverted around work areas as described in the *Requirements for Fish Relocation and Dewatering Activities*.
- If fish removal is required, BMPs will be implemented as described in the *Requirements for Fish Relocation and Dewatering Activities*.
- Riparian disturbance will be minimized as described in the *Measures to Minimize Loss or Disturbance of Riparian Vegetation*.