

Protection and Minimization Measures as Described in the Biological Assessment

The following protection and minimization measures, as they apply to a particular project, shall be incorporated into the project descriptions for individual projects authorized under this programmatic fisheries restoration project (Program).

A. General Protection Measures

1. Work shall not begin until the U.S. Army Corps of Engineers (Corps) has notified the permittee that the requirements of the Endangered Species Act (ESA) have been satisfied and that the activity is authorized.
2. The general construction season will be from June 15 to October 15. Restoration, construction, fish relocation, and dewatering activities within any wetted and/or flowing creek channel shall only occur within this window. As such, all non-revegetation-associated earthmoving activities will be complete by October 15. Revegetation outside of the active channel may continue beyond October 15 until November 15, if necessary. Limited earthmoving associated with preparation of the site for revegetation may occur within the October 15 - November 15 timeframe, but only as necessary for revegetation efforts. Work beyond this time frame may be authorized following consultation with and approval of the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG) on an individual project basis, provided it could be completed prior to the first significant rainfall event (rainfall event > two inches).
3. Prior to construction, each contractor will be provided with the specific protective measures to be followed during implementation of the project. In addition, a qualified biologist will provide the construction crew with information on the listed 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.
4. All adverse aquatic impacts, including temporary impacts, must proceed through a sequencing of impact reduction: avoidance, reduction in size of impact, and compensation (mitigation). Mitigation may be proposed to compensate for the adverse impacts to water 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.
5. Construction within 200 feet of established riparian vegetation or other bird nesting habitats shall be avoided during the migratory bird nesting season (February 15 - August 1), to avoid damage or disturbance to nests. If construction must occur during this period, a qualified biologist or individual approved by CDFG will conduct a pre-construction survey for bird nests or nesting activity in the project area. If any active nests or nesting behaviors are found (for native species), an exclusion zone of 75 feet shall be established to protect nesting birds (200 ft for raptors) and maintained until birds have fledged or nest is abandoned. If any listed or

sensitive bird species are identified, CDFG will be notified prior to further action. Take of active bird nests is prohibited under this Program.

6. 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 manufacturer's specifications.

7. Herbicides may be applied to control established stands of non-native species including, but not limited to, vinca, ivy, and broom. Herbicides must be applied to those species according to the registered label conditions. Herbicides must be applied directly to plants and may not be spread upon any water. Herbicides will be tinted with a biodegradable dye to facilitate visual control of the spray.

8. Rock used for bank stabilization or to anchor large woody debris (LWD) structures, shall be large and heavy enough to remain stationary under the 100-year median January or February flow event (which ever is greater).

9. If the thalweg of the stream has been altered due to construction activities, efforts will be undertaken to reestablish it to its original configuration. (*Note: Projects that may include activities such the use of willow baffles which may alter the thalweg are allowed under the Program.*)

B. Requirements for Fish Relocation and Dewatering Activities

1. 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 or helicopters, or installing boulder clusters. Adherence to these general guidelines will minimize potential impacts for projects that do require dewatering of a stream/creek:

- a. In those specific cases where it is deemed necessary to work in a flowing stream/creek, the work area shall be isolated and all the flowing water shall be temporarily diverted around the work site to maintain downstream flows during construction. Dewatering will likely not be necessary for most LWD enhancement activities.
- b. Exclude fish from reentering the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. The bottom of the seine must be completely secured to the channel bed to prevent fish from reentering the work area prior to dewatering. Exclusion screening must be placed in areas of low water velocity to minimize fish impingement. Screens must be checked periodically and cleaned of debris to permit free flow of water. 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.

- c. 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*). The project applicant shall bypass stream flow around the work area and concurrently maintain the stream flow to channel below the construction site.
- d. Coordinate project site dewatering with a qualified biologist to perform fish and amphibian relocation activities. The qualified biologist(s) will possess a valid State of California Scientific Collection Permit as issued by CDFG and will be familiar with the life history and identification of listed salmonids and listed amphibians within the action area.
- e. 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.
- f. Minimize the length of the dewatered stream channel and duration of dewatering. A maximum of 300 feet (ft) may be dewatered under the Program. Exceeding the 300 ft limit will disqualify the project from inclusion in the Program.
- g. 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 or turbidity. Visqueen shall be placed over sandbags used for construction of cofferdams to minimize water seepage into the construction areas. The visqueen 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.
- h. Downstream flows adequate to prevent stranding will be maintained at all times during dewatering activities.
- i. 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. All accumulated debris shall be removed by the contractor or project applicant.
- j. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the summer baseflow.
- k. 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

adhere to NMFS' *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997a). Check intake periodically for impingement of fish or amphibians.

- l. When pumping is necessary to dewater a work site temporary siltation basin are required to ensure sediment does not re-enter the wetted channel. Screens on pumps will adhere to NMFS' *Fish Screening Criteria for Anadromous Salmonids* (NMFS 1997a).
- m. 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.

C. General Conditions for all Fish Capture and Relocation Activities

Fish relocation and dewatering activities shall only occur between June 15 and October 15 of each year.

1. Overview

All seining, electrofishing, and relocation activities shall be performed by a qualified fisheries biologist. The qualified fisheries biologist shall capture and relocate listed salmonids prior to construction of the water diversion structures (*e.g.*, cofferdams). The qualified fisheries biologist shall document the number of salmonids observed in the affected area, the number and species of salmonids relocated, and the date and time of collection and relocation. The qualified fisheries biologist shall have a minimum of three years field experience in the identification and capture of salmonids, including juvenile salmonids, considered in the biological opinion. 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 deep pools, fish may be concentrated by pumping-down the pool and then seining or dipnetting fish.
- b. Notify NMFS two weeks prior to capture and relocation of salmonids to provide NMFS an opportunity to attend (call Jonathan Ambrose at 707-575-6091 or via email at jonathan.ambrose@noaa.gov).
- 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. In many instances, additional fish will be captured that eluded the previous day's efforts.
- d. During dewatering, a fisheries biologist will remain at the project work site to net and rescue any additional fish that may have become stranded throughout the dewatering process.

- e. In regions of California with high summer water temperatures, perform relocation activities during morning periods.
- f. Prior to capturing fish, determine the most appropriate release location(s). Consider the following when selecting release site(s):
 - i. similar water temperature as capture location;
 - ii. ample habitat availability prior to release of captured fish; and
 - iii. low likelihood of fish reentering work site or becoming impinged on exclusion net or screen.
- g. Periodically measure air and water temperatures. Cease activities when measured water temperatures exceed 17.8 degree Celsius (°C) (or 18.4°C in areas where coho salmon are not present). Temperatures will be continuously measured at the head-of-riffle tail-of-pool interface during relocation activities.

2. Electrofishing Guidelines

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

- a. All electrofishing will be conducted according to NMFS' *Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act*, June 2000.
- b. The backpack electrofisher shall be set as follows when capturing fish:

Voltage setting on the electrofisher shall not exceed 300 volts.

	<u>Initial</u>	<u>Maximum</u>
Voltage:	100 Volts	300 Volts
Duration:	500 μs (microseconds)	5 ms (milliseconds)
Frequency:	30 Hertz	70 Hertz;

- c. A minimum of three passes with the electrofisher shall be utilized to ensure maximum capture probability of salmonids within the area proposed for dewatering.
- d. No electrofishing shall occur if water conductivity is greater than 350 microSiemens per centimeter (μS/cm) or when instream water temperatures exceed 17.8° C (or 18.4° C in areas where coho salmon are not present). Water temperatures shall be measured at the pool/riffle interface. Only direct current (DC) shall be used.
- e. A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and other aquatic vertebrates.

3. Seining Guidelines

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

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

4. Guidelines for Relocation of Salmonids

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

- a. Fish shall not be overcrowded into buckets; allowing approximately six cubic inches per 0+ individual and more for larger/older fish.
- b. Every effort shall be made not to mix (including use of separate containers) 0+ (young of the year) salmonids with larger salmonids, or other potential predators, which may consume the smaller salmonids. Have at least two containers and segregate 0+ fish from larger age-classes. Place larger amphibians, such as Pacific-giant salamanders (*Dicamptodon ensatus*), in container with larger fish.
- c. Salmonid predators, such as sculpins (*Cottus sp.*) and Pacific-giant salamanders, 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 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 to not concentrate them in one area.
- d. 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 and with available instream cover (undercut banks, complex LWD features).
- e. All captured salmonids will be processed and released prior to conducting a subsequent electrofishing or seining pass.
- f. All native captured fish will be allowed to recover from electrofishing before being returned to the stream.

- g. Minimize handling of salmonids. However, when handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear DEET-based insect repellants during relocation activities.
- h. 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.
- i. Place a non-mercury 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 CDFG and NMFS, fish shall be immediately released.
- j. If instream temperatures exceed authorized temperature limits, capture and relocation will cease.
- k. In areas where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations.
- l. 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.
- m. If more than three percent of the steelhead and Southern Oregon/Northern California Coast (SONCC) Evolutionary Significant Unit (ESU) coho salmon, or one percent of CCC ESU coho captured are killed or injured, the project permittee shall contact NMFS' biologist Jonathan Ambrose by phone immediately at (707) 575-6091. If Mr. Ambrose cannot be reached, the Santa Rosa NMFS Office will be contacted at Federal Relay 1-866-327-8877 ([707] 578-8555). The purpose of the contact is to review the activities resulting in the lethal take and to determine if additional protective measures are required. All steelhead and coho mortalities must be retained, placed in an appropriately sized whirl-pak or zip-lock 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.

D. Measures to Minimize and Avoid Disturbance from Instream Construction

Measures to minimize and avoid disturbance associated with instream habitat restoration construction activities are presented below:

1. If the stream channel is seasonally dry between June 15 and October 15, construction will occur during this dry period.
2. Debris, soil, silt, 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 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.

3. Where feasible, the construction shall occur from the bank, or on a temporary pad underlain with filter fabric.

4. No mechanized equipment (with internal combustion engines), including internal combustion handtools, will enter wetted channels.

5. Use of heavy equipment (in dewatered channels) 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 be minimally disturbed if outside of the project's scope.

6. Hydraulic fluids in mechanical equipment working within the stream channel shall not contain organophosphate esters. Vegetable-based hydraulic fluids are preferred.

7. 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).

8. Areas for fuel storage, refueling, and servicing of construction equipment must be located in an upland location.

9. 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.

10. 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, fittings, 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.

11. Oil absorbent and spill containment materials shall be located on site when mechanical equipment is in operation within 100 feet of the proposed watercourse crossings. If a spill occurs, (1) no additional work shall occur in-channel until the mechanical equipment is inspected

by the contractor, and the leak has been repaired, (2) the spill has been contained, and (3) CDFG and NMFS are contacted and have evaluated the impacts of the spill.

E. Measures to Minimize Degradation of Water Quality

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

1. General Erosion Control during Construction

- a. Isolate the construction area from flowing water until project materials are installed and erosion protection is in place except as provided in Section B. Most large woody debris projects will not require dewatering.
- b. Effective erosion control measures shall be in place at all times during construction. Do not start construction until all temporary erosion 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 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 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.
- c. 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 12 centimeters (cm) and only sterile, weed free straw shall be utilized. Catch basins shall be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.
- d. 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. Silt fences or other detention methods shall be installed as close as possible to culvert outlets to reduce the amount of sediment entering aquatic systems.
- e. The contractor/project applicant is required to inspect and repair/maintain all erosion control practices prior to and after any significant 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.

2. Post Construction Erosion Control

- a. 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 seven days.
- b. All bare and/or disturbed slopes (> 10 ft x 10 ft of bare mineral soil) will be treated with erosion control measures such as hay bales, netting, fiber rolls, native mulch/slash, and hydroseed as permanent erosion control measures.
- c. 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.
- d. When seeding is used as an erosion control measure, only native seed will be used.
- e. Sterile, weed-free straw, free of exotic weeds, is required when hay bales are used as an erosion control measure.

3. Guidelines for Temporary Stockpiling

- a. 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 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. 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.
- b. 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.

F. Minimizing Potential for Adverse Effects Due to Scour

- 1. When needed, utilize instream grade control structures to control channel scour, sediment routing, and headwall cutting.
- 2. If a pipe or structure that empties into a stream is installed, an energy dissipater shall be installed to reduce bed and bank scour.
- 3. The toe of rock slope protection shall be placed below bed scour to ensure stability.

H. 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 this Program that result in disturbance to riparian vegetation are also described below.

1. Minimizing Disturbance

- a. Retain as many trees and brush as feasible, emphasizing shade producing and bank stabilizing trees and brush.
- b. Use project designs and access points that minimize riparian disturbance without affecting less stable areas, which may increase the risk of channel instability.
- c. Prior to construction, determine locations and equipment access points that minimize riparian disturbance. Avoid entering unstable areas.
- d. Decompact disturbed soils at project completion as the heavy equipment exits the construction area. At the completion of the project, soil compaction that is not an integral element of the design of a crossing shall be decompacted.
- e. If riparian vegetation is to be removed with chainsaws, consider using saws that operate with vegetable-based bar oil.

2. Revegetation and Success Criteria

- a. Any stream bank area left barren of vegetation as a result of the implementation or maintenance of the restoration practices shall be restored to a natural state by seeding, replanting, or other agreed upon means (including natural recruitment) with native trees, shrubs, and/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.
- b. 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 comprised of a diverse community structure (plantings shall include both woody and herbaceous species).
- c. 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 80 percent (%) survival of plantings or 80% 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 three 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 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.

I. Measures to Minimize Impacts to Non-Surfaced Roads in Project Area

Upon the completion of restoration activities, non-surfaced roads within the riparian zone used for 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 CDFG Restoration Manual entitled “*Upslope Assessment and Restoration Practices*”. The following are some of the methods that may be applied to non-surfaced roads impacted by project activities implemented under this Program:

1. 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.
2. Maximum distance for waterbreaks shall not exceed the following standards: (a) for road or trail gradients less than 10%: 100 ft; (b) for road or trail gradients 11-25%: 75 ft; (c) for road or trail gradients 26-50%: 50 ft; (d) for road or trail gradients greater than 50%: 50 ft. Depending on site specific conditions, more frequent intervals may be required to prevent road surface rilling and erosion.
3. 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.
4. 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.
5. The maintenance period for waterbreaks and any other erosion control facilities shall occur after every major storm event for the first year after installation.
6. 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 or in steep areas where rolling dips are not practical.
7. After the first year of installation, erosion control facilities shall be inspected prior to the winter period (October 15) after the first major storm event, and prior to the end of the winter period (May 15).
8. The 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.

9. No berms are allowed on the outside of the road edge.
10. No herbicides shall be used on vegetation on inside ditches.

J. Requirements for New Fish Ladders and Fishways

1. New fish ladders/fishways shall be checked (and maintained as necessary) at least two times per week to ensure the pools are free of excess sediment or debris that may impair passage for the life of the ladder.
2. If the fish ladder/fishways becomes damaged or ineffective the project applicant shall, as soon as reasonably possible, repair any damage or modify the ladder (in consultation with NMFS and CDFG engineers/fish passage specialists).
3. Fish ladders/fishways will be checked prior to the adult migration season. All debris and sediment will be removed to ensure the ladder is fully functional according to fish passage design criteria.
4. The final design must be reviewed and approved by a NMFS/CDFG engineers/fish passage specialist. The design must address the following:
 - a. species of salmonids present in the river system, as well as magnitude and timing of adult migration;
 - b. probable access route to the barrier, including areas where fish will congregate below the obstruction;
 - c. extent of spawning and nursery areas and potential salmonid production from both above and below the obstruction;
 - d. type and quantity of anticipated transportable debris;
 - e. frequency, duration, timing, and magnitude of anticipated flows, especially extreme high and low flows; and
 - f. location of other barriers in the stream system, and their possible effects to distribution of salmonids.
5. The ladder shall not exceed 30 feet in height.
6. A maintenance plan for the ladder/fishway must be reviewed and approved by NMFS/CDFG engineers/fish passage specialists and NOAA RC.
7. Adequate access to the ladder/fishway to facilitate necessary maintenance activities during winter high flows and summer low flow periods must be included in the design.

8. Flow patterns must be stable, with no water surges.
9. Flows in and near the ladder/fishway entrance should be sufficient to attract fish at all water levels.
10. Minimum height between pools in fish ladders shall not exceed six inches.
11. New ladders shall be constructed to provide passage conditions suitable for year round bidirectional, adult and juvenile salmonid movement.
12. A debris deflector should be incorporated at the flow intake.
13. The upstream exit must allow fish to easily reach secure resting habitat.
14. Fishways/ladders must be deep enough for the largest known fish in the system.

K. Summer Dam Abutment Removal

1. Summer dam removal will require design review and approval from a NMFS and/or CDFG fish passage specialist prior to project authorization and design review by a qualified geomorphologist.
2. Sediment composition and quantity, and effects of sediment transport must be evaluated by a qualified geomorphologist for all summer dam removal projects.
3. Summer dams with > 400 cubic yards of accumulated sediment behind dam sills are not permitted under the Program.