CHAPTER 7
MAINTAINING THE BRIDGES

The main purpose of this manual is to maintain a high level of water quality while maintaining our county roads, bridges, and other county facilities. Due to their close proximity to streams, bridges have a high potential to discharge pollutants directly into aquatic habitat. Special care should be taken while cleaning, maintaining, repairing, and controlling vegetation on county bridges.

The goals of this chapter are:

- Maintain public safety and open roads for the traveling public
- Prevent or minimize delivery of sediment and chemicals to streams
- Protect aquatic and riparian habitat

7-A Bridge Maintenance

7-B Bridge Repair & Drift Removal

7-A BRIDGE MAINTENANCE

Introduction:

Bridge maintenance includes cleaning and other routine maintenance activities such as painting, patching, and vegetation control. During any of these maintenance activities, attempt to keep all substances out of the water by blocking drains, capturing debris, and transporting the waste to a safe storage site.

7-A-1 Bridge Cleaning and Maintenance

7-A-2 Bridge Vegetation Management

BRIDGE CLEANING AND MAINTENANCE 7-A-1

Description: Maintenance and replacement of bridge structures includes washing, painting, scraping and patching of curbs, rails, deck joints, on wood, concrete and steel bridge components. Cleaning is done with hand and power tools, such as a high-pressure wash. Washing removes water-soluble surface contaminants, existing coatings, rust and oil and grease and care must be taken with the disposal of washwater and debris. Of special concern is the complete containment of existing paint residue containing lead, which is a toxic heavy metal pollutant that accumulates in animal tissues. Bridge repainting tends to be needed mostly in coastal areas where salt air causes corrosion of the steel surfaces when paint is not maintained. Severely corroded areas of a bridge will need abrasive spot blasting and priming before painting.

Environmental Concerns:

- Discharge of the following materials into the stream or storm water drainage system: epoxies, lead-based paint, metal grindings, concrete grindings and cuttings, expansion joint filler, concrete mix water, and concrete rinse water.
- Impacts on bats, swallows and other protected species, especially during nesting season.

Best Management Practices:

1. Take adequate measures in maintenance activities to ensure that paint and other hazardous material do not enter waters of the State or the riparian area.

2. Keep non-hazardous materials and debris from falling from the structure into the water or the riparian area. Remove any material that falls into the water in the least destructive way possible, or leave in place if this would be less destructive to fisheries habitat, according to CDFG biologist. Coordinate with CDFG biologist for presence of listed salmonids or their redds below bridge locations.

3. Temporarily block deck drains over streams and scuppers over streams when pressure washing, sandblasting, or scraping structures, to route water off deck and into a safe collection facility. Allow no washed material to be deposited in riparian area. Stage the operation to capture and collect as much debris as possible. Transport the waste back to a Maintenance facility or approved storage site.

4. Remove large debris from bridge decks with sweeper or shovel. Scrape other material by hand before being collected or removed, prior to pressure washing.

5. Develop practices to eliminate drainage systems that drain directly to streams where physically and economically possible.

6. Collect broken or damaged treated bridge pier fender posts and bring them back to a Maintenance facility. Dispose of the posts according to approved waste disposal practices.

7. Coordinate with CDFG on the appropriate timing for performing bridge cleaning or maintenance with regard to bats and swallows. Seek and apply approved methods, such as netting and other measures, to preclude future nesting on the bridge.

8. Follow these guidelines for bridge washing:
   a) Perform during high water event or when turbidity induced by bridge cleaning is not detectable ¼ mile downstream.
   b) Use cold-water pressure washing to prevent the removal of lead-based paint.
   c) Do not use any soaps or detergents.
   d) Place a tarp containment system under the working platform and sidewalk to capture any paint chips, dirt, lead-contaminated cleaning debris, and pressure washing water.
   e) Contain and dispose of filtered wash water and all cleaning debris off site.
   f) To avoid harming swallows and bats using the bridge for habitat:
      i) Avoid washing tight areas (e.g. cracks, crevices) where bats may be present.
      ii) If bats are observed, cease washing operations.
      iii) If birds are building nests, laying eggs, or tending young, no washing will occur.
      iv) Consider adding netting to the bridge to keep swallows from building nests.
      v) If any of the above criteria cannot be met, the local CDFG office must be contacted and the individual bridge will be discussed.

9. Follow these guidelines for bridge painting:
   a. Transport paint and materials to and from work sites in containers with positive locking lids. Secure paint containers to the transport vehicle using approved methods (e.g., Ropes and straps). When using conventional spray equipment, monitor weather and wind direction to ensure that paint is not entering drain inlets, the storm water drainage system, or watercourses.
   b. Do not transfer or load paint near drain inlets, the storm water drainage system, riparian areas, or watercourses.
   c. Use canvas or plastic tarps under the work area to capture excess paint or paint chips. Transfer material captured by the canvas or tarps into a waste container for disposal at a maintenance facility.
   d. Collect all paint equipment wash water and return it to a maintenance facility. If possible, dispose of the equipment washwater in waste water evaporation trays at the facility. After the liquid evaporates, dispose of the remaining paint solids according to approved waste disposal procedures.
   e. If waste water evaporation trays are not available, consult the County Hazmat manager for proper disposal.
   f. Develop an emergency spill management plan for each bridge painting project. See: 8-C Accident Clean-up

Permits Possibly Needed:

- Waste discharge permit for potential discharge of paint (especially if lead-based) and other hazardous materials may be required by RWQCB. Report of Waste Discharge must first be

submitted to Regional Board. Before beginning project, a Water Pollution Control Plan must be submitted describing the BMPs to be used.

- Storm Water Management Plan and Storm Water Permit (3/03) may be require BMPs.
- Maintenance of an existing bridge facility is categorically exempt from CEQA (14 CCR Section 15301).
- Notify CDFG about any potential waste discharge, salmonid habitat, and bat and swallow issues.
- Swallow species most often found on bridges are not listed ESA or CESA species but are protected under the Migratory Bird Treaty Act, which makes it unlawful to "take" the bird or its nest or eggs. Consult with US Fish and Wildlife Service. Violators may be fined up to $10,000, and may face up to 6 months imprisonment for misdemeanor violations of the Act.

BRIDGE VEGETATION MANAGEMENT 7-A-2

Description: This topic includes vegetation management around existing bridges. The primary purpose of bridge vegetation management is to maintain sight distance. Bridge vegetation management must also maintain access to the bridge structure for structure maintenance, fire safety, and to maintain the integrity of the structure.

Environmental Concerns:

- Excessive removal of riparian trees could affect stream habitat
- Excessive removal of vegetation could cause soil erosion, leading to discharge of sediment into stream or storm water discharge system.
- Noise may disturb bats and/or nesting swallows.

Best Management Practices:

1. Normally remove only brush to 20 feet on either side and under all maintained bridges for access or repair. (In some instances, road access under or adjacent to the structure will be outside the 20 foot buffer).

2. Remove only the amount of brush necessary to perform the activity.

3. When removing mature trees (over 12-inch diameter) in riparian areas, replant two native or appropriate seedling/cuttings for every tree removed. Ensure that the replanted trees will not pose future threat to County structures. Leave downed trees in the riparian area for large woody debris (LWD) recruitment into the stream channel.

4. Ensure no herbicide spraying or runoff of spray occurs on bridge and related structures located over streams or adjacent to riparian areas or wetlands.

Permits Possibly Needed:

- Comply with County Tree Ordinance

7-B BRIDGE REPAIR & DRIFT REMOVAL

Introduction:

Bridge repair and drift removal both entail work within active flowing streams. Any in-water work requires pre-project coordination with CDFG and RWQCB except in the case of an emergency. It is essential that temporary or permanent impacts, such as removal of large woody debris or the addition of riprap, will not have adverse effects on riparian habitat.

7-B-1 Bridge Repair

7-B-2 Drift Removal

BRIDGE REPAIR 7-B-1

Description: This activity includes repair of bridges and large culverts (over six feet diameter). In-water bridge repair can include repair or replacement of riprap, drainage features, and catch basins and replacement of structural members. Bridge structural repairs that require in-water work will be coordinated with permitting agencies to minimize impacts. In-water work may include permanent impacts, such as placing riprap, or temporary impacts, such as installing falsework or stream access.

Environmental Concerns:

- Discharge of sediment, debris, concrete, paint, or chemicals into the stream or storm water drainage system
- Damage to or loss of riparian vegetation from excessive riprap, disposal of refuse material, or heavy equipment
- Impacts on bats, swallows, and other protected species

Best Management Practices:

1. Consider use of bioengineering solutions in bridge repair work that requires installation of riprap, where practicable. "Practicable" use areas includes areas unshaded by bridge elements, above the full bank stage where success is probable and safety of the bridge structure is assured, and where the flow capacity is not diminished.

2. Ensure that the active flowing stream will not come into contact with fresh, plastic concrete. Where and when necessary, divert water away from concrete work areas during structural repairs of bridges and culverts as noted in #7 below. (SEE: 4-F Temporary Stream Diversions)

3. When repairing drainage features, make every attempt (within the engineering solution) to incorporate fish passage solutions and enhancements, such as adding streambed roughness (by adding cobble), in coordination with CDFG.

4. Perform any in-water work within time frames negotiated with the agencies.

5. Place all refuse material above the bank outside of the 100 year flood plain and away from waterways, riparian areas and wetlands. Dispose of material in locations and manners identified in the local disposal plan. (See also: 5-A Spoil Disposal)

6. Provide stable, appropriate concrete truck chute clean-out area and require the contractor to use it to keep material from being deposited in watercourses and riparian areas. (See: 3-B-1 Surface Work – BMPs for Concrete Mixing on Site)

7. Use cofferdams or other water diversion structures for structural repairs as appropriate. Do not place during spawning and egg incubation stages of local salmonids unless an emergency (See: 8-A Emergency Maintenance) . Use during the dry season and only after the area has

been cleared of residing fish species. (See: 4-F Temporary Stream Diversions and Appendix B-8)

8. Contain saw chips where feasible.

9. Avoid use of creosote or "Penta" treated wood for permanent structures.

10. Minimize impacts to riparian vegetation and replace disturbed areas with native plants. (See: Chapter 12-D Sources of Materials; Appendix B-4.5 Planting & B-4.8 Seeding)

11. If existing bridge has a non-erodible sill, check with CDFG to see if fish passage (adult or juvenile) is a problem. If passage is a problem and the sill is avoidable, seek to remove sill or replace with a bridge designed to function without a sill. If a non-erodible sill is unavoidable, provide a suitable fish passage structure. Channel instability may require the fish structure to be monitored and adjusted as channel conditions change. (See: Appendix B-6 Fish Ladders)

12. Seek to have temporary bridge structures (such as Big R, or Bailey bridges) available within the county that could be used to temporarily replace a washed-out bridge in an emergency. (See: 8-A Emergency Maintenance)

Permits Possibly Needed:

- DFG 1601 Streambed Alteration Agreement for in channel work and work that could "result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake".
- CWA 404 permit for work within "waters of the U.S." from US Army Corps of Engineers (COE).
- CWA 401 Water Quality Certification permit or Waiver (if 404 permit required) from RWQCB.
- Replacement bridges designed using federal funds must meet requirements recommended by FHWA and Caltrans to avoid significant impacts to the environment and flood risk (23 CFR Ch.1, 650.103)
- Emergencies: Pre-project permits are not required before emergency bridge repair work can begin. However, agencies must be notified within 14 days after the repair project has begun. (SEE: Chapter 8 – Working with Emergencies)

DRIFT REMOVAL 7-B-2

Description: Drift removal involves either using boats to maneuver the drift, hydraulic tongs to reach over the side of structure and dislodge the material, or pulling the drift from the side of the bridge (bank) and cutting it into pieces.

Environmental Concerns:

- Reduction of instream habitat quality due to removal of excessive large woody debris (LWD) from stream system.
- Damage to or loss of riparian vegetation by removal equipment.

Best Management Practices:

1. Cut material only when necessary and turn drift to allow it to flow through and under the structure, where doing so would not endanger any other crossing structures downstream.

2. Repair and restore riparian areas temporarily impacted by machinery during drift removal. Long-term access for drift removal will be coordinated with CDFG. (See: Appendix B-4 Erosion Control)

3. Perform all work within the flowing channel of any aquatic system during the appropriate in-water work window for that system, or as negotiated with CDFG (except when there is imminent danger to life, limb, or structure).

4. Minimize channel disturbance by using, where possible, specialized equipment, such as a crane with clam shell bucket to remove debris.

Permits Possibly Needed:

- CDFG 1601 Streambed Alteration Agreement if the project may "substantially change the bed, channel, or bank of any river, stream or lake".

- Emergencies: Pre-project permits are not required before emergency work can begin. However, agencies must be notified within 14 days after the repair project has begun. (SEE: Chapter 8 – Working with Emergencies)