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# SECTION 6: FISHERIES AND WILDLIFE PROTECTION AND ENHANCEMENT GUIDELINES

## 6.1 INTRODUCTION

As discussed in the previous chapters, the San Francisquito Creek Bank Stabilization and Revegetation Master Plan is aimed at providing guidelines for reducing the level of bank erosion and failure along the lower reaches of the creek while also restoring the riparian corridor to consist of a more native plant assemblage. While the overall project is expected to have a net beneficial impact on the fish and wildlife species associated with San Francisquito Creek, any type of construction within a channel or its adjacent riparian corridor, even if aimed at restoring degraded habitats, inherently involves potentially significant direct and/or indirect impacts to fish and wildlife species.

Section 5 described general restoration concepts for revegetation planning during and after stabilization treatments, with the stipulation that detailed revegetation direction is developed for each site. Similarly, this chapter discusses general protection measures intended to minimize the potential for such impacts during the implementation of individual bank stabilization and revegetation projects, as well as guidelines on how to possibly improve aquatic habitat conditions within the creek. It should be understood that these guidelines will also need to be further refined as any individual project proceeds through the environmental review and permitting stages.

There are numerous biological and botanical resources associated with the creek, and many of them have been accorded special status by state or federal resource managers. The term “special status” indicates some level of concern for an organism’s survival, and of these a number have been listed as threatened or endangered under the state or federal endangered species acts. A compilation of all special status species both directly and indirectly potentially affected can be quite extensive, especially when downstream (i.e. Bay edge) species are concerned. Table 6A represents the kind of comprehensive list of species which must be addressed in the environmental documentation for a project. For most projects, and for most of these species, there will be a conclusion of a less-than significant effect.

As a practical matter, the individual landowner or public entity undertaking bank stabilization concentrates on avoiding harm to species both known to be present in the immediate area *and* protected by endangered species laws. This is because the issuance of a permit requires that the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS) concur that no adverse impacts will result to listed species. This section will therefore largely limit recommendations to known listed fish and wildlife species in the creek (steelhead and California red-legged frog), with the assumption that mitigation for other

species will be covered by programmatic or individual documents prepared under the California Environmental Quality Act (CEQA).

The protection and enhancement guidelines discussed below are not directly linked to the bank stabilization and revegetation recommendations made in the previous chapters. Rather, this discussion is focused on a range of pre- or post stabilization conditions that may require the use of protective measures or warrant the incorporation of certain aquatic enhancement techniques. References are made, where appropriate, to the stabilization recommendations described in Section 4 to aid future individual project designers in choosing an appropriate method of protecting and/or enhancing aquatic habitat within the project reach.

Table 6A. Special status species of wildlife that could occur within the San Francisquito Creek project area of impact.

Common Name	Scientific Name	Status Federal/State	General Habitat
<b><u>Mammals</u></b>			
Greater western mastiff bat	<i>Eumops perotis californicus</i>	SS/CSC	Crevices and openings in woodlands, buildings, caves and cliffs.
Pacific western big-eared bat	<i>Plecotus townsendii townsendii</i>	SS/CSC	Crevices and openings in woodlands, buildings, caves and cliffs.
Saltmarsh harvest mouse	<i>Reithrodontomys raviventris</i>	FE/CE	Occurs in saline emergent wetlands of San Francisco Bay and tributaries. Pickleweed is the primary habitat.
Saltmarsh wandering shrew	<i>Sorex vagrans halicoetes</i>	SS/CSC	Occurs in saline emergent wetlands of San Francisco Bay and tributaries. Pickleweed is the primary habitat.
<b><u>Birds</u></b>			
Cooper's hawk	<i>Accipiter cooperi</i>	- /CSC	Nests in hardwood and conifer habitats.
Sharp-shinned hawk	<i>Accipiter striatus</i>	- /CSC	Nests in hardwoods and conifers or coastal scrub habitats.
Tricolored blackbird	<i>Agelaius tricolor</i>	SS/CSC	Nests in emergent plants or thickets adjacent to freshwater source.
Golden eagle	<i>Aquila chrysaetos</i>	BEPA/CSC	Requires large, open foraging habitats near hilly or windy areas.
Short eared owl	<i>Asio flammeus</i>	- /CSC	Marshes and low-lying area
Ferruginous hawk	<i>Buteo regalis</i>	SS/CSC	Winters in grasslands. Does not breed in California.

Table 6A (continued). Special status species of wildlife that could occur within the San Francisquito Creek project area of impact.

Common Name	Scientific Name	Status Federal/State	General Habitat
Northern harrier	<i>Circus cyaneus</i>	- /CSC	Nests in scrubby vegetation on edges of marshes.
Yellow warbler	<i>Dendroica petechia brewsteri</i>	- /CSC	Nests in riparian woodlands.
White-tailed kite	<i>Elanus leucurus</i>	- /CSC	Nests in dense topped trees in vicinity of marshes and grasslands.
Prairie falcon	<i>Falco mexicanus</i>	- /CSC	Nests in cliffs and forages over grasslands.
Saltmarsh common yellowthroat	<i>Geothlypis trichas sinuosa</i>	SS/CSC	Nests in fresh and salt water marshes with thick, continuous cover down to water.
Loggerhead shrike	<i>Lanius ludovicianus</i>	SS/CSC	Nests in shrubs and trees associated with open fields and woodlands.
California black rail	<i>Laterallus jamaicensis coturniculus</i>	FSC/CT	Nests and forages in salt water marshes transversed by tidal sloughs.
Long-billed curlew	<i>Numenius americanus</i>	- /CSC	Nests near water in prairies and grassy meadows.
Double crested cormorant	<i>Phalacrocorax auritus</i>	- /CSC (rookery sites)	Colonial nester along the coast on sequestered islets or other areas.
California clapper rail	<i>Rallus longirostris obsoletus</i>	FE/CE	Nests and forages in salt water marshes transversed by tidal sloughs.

**STATUS CODES:**

Federal Status

- FE = Species in danger of extinction throughout all or significant portion of its range (Mandatory).
- FT = Species likely to become endangered within foreseeable future throughout all or significant portion of its range (Mandatory).
- PE = Species proposed endangered (Mandatory)
- FC = Candidate information now available indicates that listing may be appropriate with supporting data currently on file (Discretionary).
- SS = Former category 2 candidates for listing as threatened or endangered. Now unofficially considered federal sensitive species (Discretionary).
- BEPA = Bald Eagle Protection Act (1940) (50 CFR 22) (Mandatory, with limitations).

California State Status

- CE = State listed as endangered. Species whose continued existence in California is jeopardized (Mandatory).
- CT = State listed as threatened. Species, although not presently threatened with extinction, is likely to become endangered in the foreseeable future (Mandatory).
- CR = State listed as rare. Plant species, although not presently threatened with extinction, may become endangered in the foreseeable future (Mandatory, with limitations).
- CSC = California species of special concern. This is a management designation used to track animal species with declining breeding populations in California (Discretionary).
- CP = Fully Protected by the State of California under Sections 3511 and 4700 of the Fish and Game Code (Mandatory, with limitations).

SOURCES: CNDDDB, 2000; USFWS, 1993; Environmental Science Associates, 1998.

*Table 6A (continued). Special status species of wildlife that could occur within the San Francisquito Creek project area of impact.*

## 6.2 FISHERIES PROTECTION GUIDELINES

### 6.2.1 DESIGN CONSIDERATIONS

The removal of non-native vegetation according to the “Vegetation Only” treatment described in Section 4 will need to be designed cautiously (e.g., staggered over several seasons) so as not to result in a large-scale reduction of channel shading. In areas where revegetation is recommended and the danger of greatly reducing the water transport capacity of the channel is low, some plantings should also be placed along the face of the slope and close to the wetted channel so as to increase the amount of shading and vegetative debris for the stream.

Terracing stream banks (“Terrace” treatment) is a highly effective method of increasing channel capacity without adversely impacting aquatic habitats within the channel. However, terracing should not extend beyond the toe of the bank so as not to alter the width or shape of the existing channel. Riparian vegetation should be planted on all terraces, including the one closest to the water line, to increase shading, leaf litter, and the penetration of root wads into the normal-flow channel. This stabilization alternative is also expected to have beneficial impacts on aquatic habitats in itself and no further instream enhancements are recommended.

The use of log crib walls (“Vegetated Walls” treatment) is highly preferable to the installation of vertical concrete retaining walls and gabion baskets. Vertical concrete retaining walls do not provide any habitat, aquatic or riparian, and create excessive water velocities downstream. Gabion baskets (wire mesh cages filled with rock and set into the stream bank) eventually deteriorate and require repair. Log crib walls, in contrast, are designed to temporarily (10-15 years) stabilize the banks, giving the newly planted riparian vegetation an opportunity to become established. The logs eventually deteriorate, leaving a natural bank stabilized by roots. Cover structures can be easily incorporated into the design of the crib wall (see Figure 6A).

Regrading stream banks to achieve a less steep angle and replanting native riparian vegetation (the “Regrade and Replant” treatment) is a preferred stabilization alternative with regards to aquatic habitat as it avoids the use of unnatural permanent structures. Shallower banks allow for the establishment of a more natural riparian zone. Stabilizing the banks with the roots of riparian vegetation also allows for naturally undercut banks, which provide important steelhead habitat without compromising the integrity of the bank. Thus, this stabilization alternative will have beneficial impacts on aquatic habitats in itself and no further protective measures are recommended.

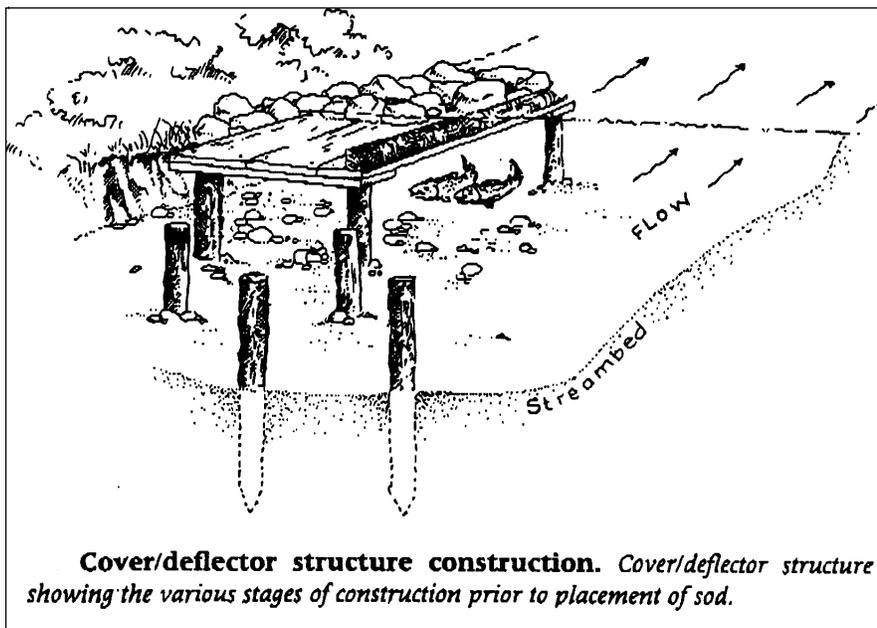


Figure 6A. A typical cover/deflector construction (Source: Hunter, 1991).

## 6.2.2 CONSTRUCTION-RELATED IMPACTS TO BE AVOIDED OR MITIGATED

The construction of any bank stabilization, revegetation, or instream restoration will have to be conducted in a manner consistent with standard protection measures and Best Management Practices typically applied to projects involving work in and around streams (see for example *Manual of Standards for Erosion and Sediment Control Measures*, Association of Bay Area Governments and *California Storm Water Best Management Practice Handbook- Construction Activity*, Stormwater Quality Task Force). While the following list of measures is intended to give an overview of the types of practices that may be necessary to minimize the potential for construction-related impacts, not all will be applicable to each individual project and in some cases measures other than the ones presented may be more appropriate. A final set of measures will have to be determined during the final environmental review stage for each project, and site specific biological surveys may also have to be conducted in order to ensure a clear understanding of the local resources to be protected (see Section 4.0, below). In the interim, these measures should be considered general guidelines.

- All construction within the channel should be conducted during the period April 15 to October 15 when stream flows are low or absent to avoid impacts such as direct death of fish and other aquatic organisms, excessive siltation, and other form of water contamination.
- If work sites require dewatering, the intake screens should be

- screened with a maximum mesh size of 5 millimeters.
- Exclusionary fencing may be necessary around work sites known to be within the range of sensitive species.
  - Best Management Practices identified by the appropriate Regional Water Quality Control Board should be implemented.
  - The number and size of access routes, staging areas, and total area of activity should be limited to the minimum necessary to achieve the project goal.
  - The removal of existing riparian vegetation should exclude trees with raptor nests. Such trees may potentially be removed during the non-breeding season.

### 6.3. FISHERIES ENHANCEMENT GUIDELINES

Physical conditions within stream channels can be modified to improve or increase particular habitats and the overall mix of habitat types for salmonids. It may not be necessary for any individual landowner to attempt to improve conditions—if well designed, there may be no impacts from a stabilization project and no need to consider enhancement projects as a way to offset them. However, proponents of larger scale efforts may wish to consider enhancements as a way to expedite permitting.

The value of an enhancement depends on the correct identification of critical stream habitat needs affecting the species in question. In the case of San Francisquito Creek, the species is usually the federally listed steelhead and the critical habitat within the proposed project reach is most commonly considered to be a migratory corridor (Johnson, pers. comm.). Thus only improvement structures that will protect or enhance steelhead passage and resting areas will be addressed in this section.

While the following discussion will recommend potential instream habitat improvement structures that could be implemented in conjunction with the bank stabilization and revegetation treatment alternatives discussed earlier, decisions about the appropriate type, location, and installation of improvements will need to be made during the final design phases of individual stabilization projects. Site specific analyses that will need to be conducted prior to the installation of any improvement structure include their potential impacts on stream-flow parameters (volumes and velocities), passage of bankfull flows, and bedload and debris transport.

There is a second and equally important *caveat* to habitat improvement structures. The San Francisquito Creek project may achieve bank stabilization and revegetation in a discontinuous manner, i.e., whenever individual property owners decide to conduct a specific project along their land. This may raise questions about the condition of the adjacent and downstream banks at the time of project initiation. For example, an instream structure may help to concentrate flows and therefore increase

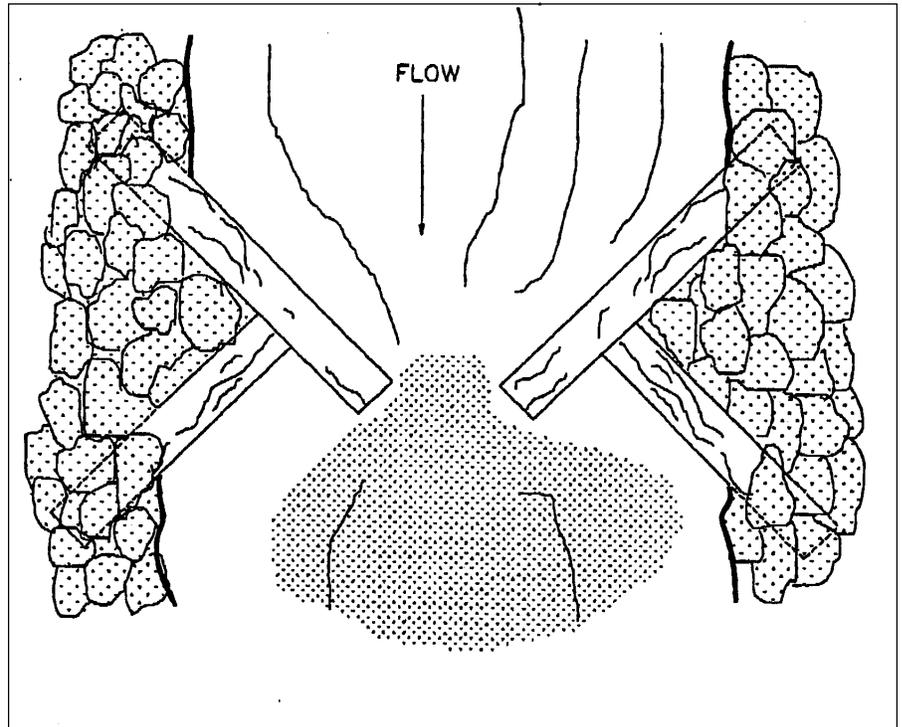
water velocity and/or depth, which may be an appropriate restoration feature at the site of a planned stabilization project. However, if a severely unstable bank on the opposite side of the channel has not yet received any treatment, the structure may exacerbate scouring and erosion along that bank. This concern will likely be resolved when more comprehensive implementation/mitigation procedures are in place (in a CEQA document for the Plan or in a Regional General Permit).

As discussed in the existing conditions report, San Francisquito Creek is a deeply incised channel (although there is evidence that the channel has recently aggraded to some degree) with a very narrow riparian corridor. The actual instream portion of the creek is fairly undisturbed and currently functions relatively effectively as a migratory corridor for steelhead. There is a general consensus that the primary existing conditions suboptimal for steelhead are (1) the existence of several migration barriers (blocking smolt out-migration during late spring), (2) a lack of shading, and (3) a lack of a well-defined low-flow channel through some reaches (Anderson, 1995; Johnson, pers. comm.; Launer, pers. comm.; Roper, pers. comm.)

The migration barriers (Condition 1) at the Palo Alto grade stabilization structure near El Camino Real and the rubble/concrete structure near 1849 Woodland Avenue currently present the most significant adverse habitat condition for steelhead. The possibility of removal of these structures is currently being pursued by CRMP but is not directly related to this Master Plan. Alleviating the lack of stream shading (Condition 2) is one of the primary goals of the revegetation component of this Master Plan, as reflected by the recommendation discussed in the previous chapters. The lack of a well-defined low-flow channel (Condition 3) may be remedied in certain areas through the installation of “wing deflectors” (see Figure 6B). Single, opposing, or alternating log wing deflectors are commonly used in shallow channel reaches where they help to concentrate low late-spring and summer flows into a more narrow and deeper channel, thus facilitating steelhead smolt migrating to the ocean. The low profile of wing deflectors typically allows high flows to pass over without significantly impeding water transport.

Stabilizing the toe of the channel with large rocks or other materials is generally considered to be counterproductive to the establishment of aquatic habitats as it does not allow for bank undercut or other natural variations in bank structure. Areas in which stabilization recommendations include armoring the toe of the slope (the “Riprap Toe” treatment), or stabilizing the majority of the bank (the “Vegetated Riprap” and the “Vegetated Wall” treatments) may be suitable for installing cover structures (Figure 6A) adjacent to the rehabilitated bank stabilization in order to mitigate for the potential loss of undercut banks.

Figure 6B. Opposing log wing deflector.



Cover structures typically consist of posts driven into the substrate, planks placed on top of the posts, and sod containing native riparian grasses placed onto the planks. These structures emulate undercut banks and provide fish with thermal refugia as well as escape from predation. The sod gives the structure a natural appearance. Instream restoration methods such as the placement of large boulders or boulder/log combinations that help to create scour pools, resting areas, and cover may also be appropriate in areas where banks are armored. Another option is to construct the proposed enforcement such that it would protrude into the channel at the normal water line and angle back towards the bank below the water (i.e., with a nose profile). As discussed under the structural variations that are feasible for the “Riprap Toe” treatment, extending the rocks into the channel would emulate a rock outcrop and provide valuable cover and resting areas for steelhead. This would allow fish to seek cover under the structure.

Areas where local erosion hotspots are proposed to be fixed along existing bank protection features that appear otherwise stable (the “Repair Protection” treatment) may not present optimal enhancement opportunities. Modifying channel characteristics along such reaches may further compromise the integrity of bank protections that area already prone to erosion but are not recommended for complete replacement.

Stream reaches where bank stability and riparian habitat are sound enough to leave untreated (“No Action”) may be appropriate areas for

the installation of wing deflectors, primarily because the threat of causing significant changes to the channel is minimal in these areas. Although reaches that do not require any bank stabilization projects are unlikely to generate any instream habitat improvement work, these sites may present opportunities for mitigating projects conducted in other reaches where impacts to aquatic habitat are unavoidable.

## 6.4. WILDLIFE PROTECTION GUIDELINES

### 6.4.1. DESIGN CONSIDERATIONS

As with the fisheries concerns expressed above, terrestrial wildlife such as nesting birds could be adversely affected by the removal of non-native vegetation (the “Vegetation Only” treatment). Design which staggers removal over several seasons will help to mitigate for these species as well. In general, project activities should not be allowed to reduce canopy cover (the amount of shade in an area at midday) more than 50% during any project year. Vegetation structure is also a concern. Maintenance of 4” diameter limbs is considered important by CDFG as cover and nesting substrate. Although some removal of trees and large limbs is inevitable, selection of large planting stock (e.g., 15-gallon as opposed to 5-gallon planting stock) should be considered to return shading and structure to pre-project conditions as soon as possible.

### 6.4.2. CONSTRUCTION-RELATED IMPACTS TO BE AVOIDED OR MITIGATED

As discussed above, there are many special status terrestrial species, and as many as six listed species, which may be considered in project planning, CEQA review, and permitting for stabilization or revegetation projects. For most San Francisquito efforts in the near future, agency attention will likely focus on the California red-legged frog. The species was listed in 1996, is a well-known creek resident, and is directly and indirectly vulnerable to project actions, either through direct mortality or the disturbance or displacement of the animal which may affect its survival. The following measures are recommended to avoid or minimize the potential for impacts to California red-legged frog during bank stabilization and revegetation treatments. These measures are adapted from the USFWS Biological Opinion for California red-legged frog issued on January 26, 1999. They would serve to avoid unnecessary harassment of other special status wildlife species as well, such as western pond turtle. Measures like these will likely be part of individual permit documents. Other measures may be made part of more general, project-wide permits secured on behalf of individual landowners.

- The creekside construction boundary should be fenced to prohibit the movement of frogs into or out of the construction area and to control creek siltation and disturbance to riparian habitat. At no time during construction should vegetation be removed or disturbance occur

- beyond the fenced construction boundary.
- During project activities, all trash that may attract predators should be properly contained, removed from the work site and disposed of regularly. Following construction, all trash and construction debris should be removed from work areas.
  - All fueling and maintenance of vehicles and other equipment and staging areas should occur at least 20 meters (approximately 65 feet) from the creek. Prior to the onset of work, all workers should be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
  - During dewatering, intakes should be completely screened with wire mesh not larger than five millimeters (mm) to prevent California red-legged frogs from entering the pump system. Water should be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow should be removed in a manner that allows flow to resume with the least disturbance to the substrate.

In addition, in some situations (and where practicable in the field), an amphibian exclosure fence may be installed in the creek channel both upstream and downstream of construction activities.

## 6.5 REFERENCES

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