

1.0 FAKE LINE

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3.0 FAKE LINE

4.0 FAKE LINE

5.0 EFFECTIVENESS AND FEASIBILITY, ENVIRONMENTAL CONSEQUENCES, AND INCIDENTAL TAKE ASSESSMENT FOR HCP ALTERNATIVES

5.1 ALTERNATIVE 1: PROPOSED (PREFERRED) ACTION

The preferred alternative for the HCP includes instream flows and non-flow habitat enhancement to benefit steelhead and red-legged frogs. The alternative, presented in Section 4.1, includes the following instream flow schedule for steelhead:

- Spawning and egg incubation flows between January 1 – April 30: release 6 cubic feet per second (cfs) if December 31 reservoir storage is greater than 30,000 AF. If reservoir storage is less than 30,000 AF, but greater than 25,000 AF, release 3 cfs or the average inflow over the previous 14 days, whichever is less. If reservoir storage is less than 25,000 AF, the Technical Committee would be consulted to establish instream flow releases;
- Steelhead passage and attraction flows between February 1 through April 30: consecutive five (5) day release of 20 cfs each month if reservoir storage is greater than 30,000 AF. If possible, passage flow releases would coincide with increased streamflow from runoff within the watershed. To the extent that naturally occurring streamflow at Lopez Dam (e.g., reservoir spill) meets the 20 cfs passage criteria, no additional releases would be required from Lopez Reservoir to meet requirements of an individual passage event. Releases from Lopez Reservoir may be required to supplement naturally occurring flows, both in magnitude and duration, to achieve the passage criteria;
- Juvenile steelhead rearing flows between May 1 to June 30 and September 1 to December 31: release 3 cfs if April 30 reservoir storage is greater than 30,000 AF. If reservoir storage is less than 30,000 AF, but greater than 25,000 AF, release 3 cfs or a flow equal to average inflow over the previous 14 days, whichever is less. If reservoir storage is less than 25,000 AF, the Technical Committee would be consulted to establish instream flow releases;
- Juvenile steelhead rearing flows between July 1 to August 31: release reservoir inflow or 3 cfs, whichever is greater.
- Manage reductions in reservoir releases below 100 cfs in accordance with an established ramping rate schedule;
- Manage increases in reservoir releases, to the extent practical, at a ramping rate not to exceed 10 cfs/hr to protect red-legged frogs.

The alternative also includes removal of the Arroyo Grande stream gage to improve adult and juvenile steelhead passage. In addition, a Conservation Account would be established to allocate funds each year to non-flow habitat enhancement projects, including improvements in passage at the low-flow road crossing and/or culvert road crossing at Cecchetti Road, spawning gravel augmentation and/or cleaning, construction of instream structures to improve habitat quality and availability for juvenile steelhead rearing and adult spawning, and securing environmental easements and right-of-way agreements along the Arroyo Grande Creek for channel maintenance in accordance with BMPs and habitat improvements. The Conservation

Account would also provide allocations to improve habitat quality and availability for red-legged frogs, including construction and operation of several instream and/or offstream pools, and the potential for dedicated management of the 37-acre terminal reservoir as wetland habitat. Stream maintenance and vegetation control along Arroyo Grande Creek by the District would be performed in accordance with Best Management Practices (BMPs) implemented through the HCP. A public education/awareness program would be implemented to provide information on habitat enhancement and opportunities for local landowners, public and private agencies and interested parties to contribute to habitat protection and improvement within Arroyo Grande Creek and watershed for red-legged frogs and steelhead.

5.1.1 Effectiveness and Feasibility

The instream flow component of the proposed alternative was evaluated using the reservoir storage and hydrologic model developed as part of this HCP (Section 3.3). The model uses hydrologic data over the period 1969 through 2000 to simulate instream flow releases and resulting storage within Lopez Reservoir under baseline operating conditions and under the instream flow schedule in the proposed alternative. Baseline conditions assume no increase in agricultural demand (downstream releases). The baseline conditions further assume that municipal water delivery from Lopez Reservoir will remain at the contracted amount of 4,530 AF per year. Furthermore, baseline conditions assume no instream flow release requirements for fisheries.

Hydrologic modeling (Figure 5-1) of the instream flow schedule in the proposed alternative identified impacts to reservoir storage and water supplies. Under the assumed instream flow schedule, operated conjunctively with other downstream water demands from the Lopez Project, minimum storage levels within Lopez Reservoir would be approximately 12,600 AF under the HCP, therefore (1) Lopez Reservoir can meet municipal, agricultural, and environmental demands outlined in the proposed alternative throughout the 1969-2000 hydrologic period used in these analyses; (2) implementation of the proposed alternative instream flow schedule would impact reservoir storage and delay reservoir recharge to maximum levels, as compared to baseline conditions; and (3) minimum storage levels (12,600 AF) meet the operating criterion used in this HCP of a minimum 9,000 AF reservoir storage level (4,000 AF minimum pool, and 5,000 AF reserve storage). Therefore, implementation of the proposed instream flow schedule is feasible.

Although the alternative met the minimum reservoir storage criterion, and therefore was determined to be operationally feasible, results of the hydrologic model (Figure 5-1) showed that the HCP alternative would result in lower reservoir storage in many years when compared to current operations. The reduced storage would contribute to potential effects including (1) a reduction in the frequency and magnitude of reservoir spill; (2) reductions in water supply and supply reliability during drought; (3) adverse impacts on recreational boating on Lopez Reservoir (e.g., adverse affects on launch ramps and marina facilities resulting from lower lake levels, potential exposure of snags and other obstacles, reduced surface area and water depths, etc.);

Figure 5-1

(4) reduced habitat for warm-water fish species that support recreational angling within the reservoir; and (5) effects (both beneficial and adverse) on wildlife habitat and vegetation around the reservoir. Additional discussion of these potential adverse effects and identification of potential mitigation actions are presented in Appendix C.

Removal of the existing Arroyo Grande Creek stream gage is feasible. Access to the site would be difficult, adding to the cost of the facility removal and channel rehabilitation, but would not make it infeasible. Removal of the stream gage would eliminate an existing passage impediment and would provide better benefit to steelhead passage than other alternatives (e.g., a fish ladder).

Funding for the HCP Conservation Account by the District would be accomplished through incremental charges on Lopez Project water rates. The District would administer Conservation Account funds, with allocation recommendations by the Technical Committee, as discussed in Section 6. Funding of the account and allocation of funds for non-flow habitat enhancement is feasible for inclusion as part of the proposed alternative.

The feasibility of specific non-flow habitat enhancement projects has not been determined. In many cases habitat enhancement would be constructed in areas currently under private ownership. The District would need to secure environmental easements and right-of-way to selected project sites to construct and maintain habitat enhancement features. In addition, project-specific environmental documentation, permitting, and other approvals would be required before individual habitat enhancement projects may be implemented. The feasibility of individual habitat enhancement projects to improve conditions for steelhead or red-legged frogs would need to be determined on a project-specific basis.

Implementation of BMPs for stream maintenance and vegetation control is feasible. BMPs would be provided to state and federal resource agencies for review and comment prior to implementation as part of this HCP. Implementation of BMPs can be accomplished immediately after approval within the flood control channel, but would require right-of-way agreements for access to private lands.

Implementation of the public education/awareness program is feasible. The District would develop information and administer the public education/awareness program. Similar programs developed in other watersheds can serve as models for the Arroyo Grande Creek HCP education program. The public education/awareness program offers opportunities for the District and other interested parties (e.g., Salmon Enhancement Program) to work in partnership and forms a basis for securing additional funding for habitat enhancement projects that benefit fish and wildlife within the County.

Although various elements of the proposed alternative conservation strategy would result in impacts associated with reduced reservoir storage and water supply availability, temporary impacts associated with construction and maintenance of non-flow instream habitat enhancement projects and impacts to water rates charged by the District for water deliveries, the elements of the proposed alternative are considered to be feasible for implementation as part of this HCP.

5.1.2 Environmental Consequences

The proposed alternative was designed to provide environmental benefits and enhanced habitat conditions for steelhead and red-legged frogs within Arroyo Grande Creek and watershed above recent historical baseline conditions (beginning in 1969 with completion and operation of Lopez Dam).

The proposed instream flow schedule will improve habitat quality and availability for migration of adult and juvenile steelhead, steelhead spawning and egg incubation, and juvenile rearing. A comparison of simulated baseline instream flows, and the instream flows estimated under the proposed alternative (Figure 5-2), shows the magnitude of flow augmentation within the creek. Increased instream flows, as shown in Figure 5-2, would improve habitat quality and availability for various lifestages of steelhead inhabiting Arroyo Grande Creek.

Frequency exceedence analyses for historical flows within Arroyo Grande Creek (as measured at the Arroyo Grande Creek stream gage), and corresponding instream flows under the proposed alternative (Figure 5-3) show the frequency and magnitude of flow augmentation resulting under this proposal. Reservoir releases under the proposed alternative would increase in instream flows over historical conditions over the range of flows from approximately 1-15 cfs. The frequency of exceedence of higher flows (greater than 20 cfs) would be similar under the proposed alternative and historical conditions (Figure 5-3). The increase in instream flows providing habitat for steelhead spawning, egg incubation, and juvenile rearing and increased flows for steelhead passage, would improve habitat conditions within Arroyo Grande Creek and be consistent with the objective of promoting recovery of steelhead.

Although not modeled, the change in Lopez Reservoir operations to include a ramping rate schedule for flow reductions below 100 cfs as part of the proposed alternative would reduce the risk of stranding steelhead within the creek.

Habitat mapping within Arroyo Grande Creek identified several passage impediments, including the Arroyo Grande stream gage (Figure 3-3). Removal of the stream gage and other passage improvements will facilitate adult steelhead migration upstream over a wider range of instream flows than under current conditions. Improving migration within the creek corridor is an environmental benefit of the proposed alternative.

Surveys also identified existing habitat conditions (e.g., spawning gravel quality and availability, availability of deeper pool habitat and cover for juvenile rearing), as factors affecting population abundance of steelhead within the creek. Non-flow habitat enhancement features have been identified to improve habitat quality and availability for steelhead and red-legged frogs. Construction of non-flow habitat enhancement projects would cause temporary (localized) environmental consequences from increased turbidity and suspended sediment. Timing of construction to coincide with low-flow summer periods combined with construction practices to reduce disruption of habitat and water quality impacts will minimize environmental consequences.

The BMPs would minimize adverse environmental consequences from stream maintenance and vegetation control by the District for the Lopez Project within Arroyo Grande Creek excluding the downstream flood control channel. Measures to improve habitat quality

Figure 5-2

Figure 5-3

within the creek (e.g., preservation of large woody debris, boulders, rootwads, etc.) can be integrated into creek maintenance to meet the District objectives for water supply conveyance and flood channel capacity, while also improving instream habitats that provide cover for juvenile steelhead and red-legged frogs.

Education of local landowners about enhancing habitat along the creek for steelhead and red-legged frogs will provide environmental benefits on privately held land and help the District secure environmental easements and right-of-way agreements to implement non-flow project elements as part of the HCP. Public education and awareness will broaden support for habitat enhancement along Arroyo Grande Creek and watershed among various stakeholders and interest groups (e.g., CDFG, NOAA Fisheries, USFWS, and Salmon Enhancement Project, etc.), and provide a collaborative foundation for developing applications for grants.

Results of recent surveys, conducted as part of this HCP, provide a basis for evaluating specific impacts to sensitive species and habitat areas around the periphery of Lopez Reservoir as a consequence of increased water level fluctuations and storage resulting from HCP actions. The effects of reservoir water level fluctuations, that occur with and without implementation of HCP actions (Figure 5-1), vary in magnitude based on hydrologic conditions affecting reservoir storage. Potential impacts and/or benefits to sensitive species habitat associated with water level fluctuations would vary depending on the magnitude and duration of reduced reservoir storage, site-specific topography, existing habitat conditions, and other factors. Results of the reservoir survey suggested that fluctuations in storage would likely benefit red-legged frog habitat at some sites, but may have little or no beneficial effect at other locations. Changes in habitat conditions around the reservoir periphery, as a function of various reservoir fluctuation conditions, were not quantitatively modeled. Actual effects on habitat quality and availability for red-legged frog and other species will vary based on future hydrologic conditions within the watershed over the period encompassed by the HCP.

No long-term adverse environmental consequences to sensitive or protected plant or other wildlife species would be expected to result from implementation of instream flow or non-flow project elements. As part of the planning and design of non-flow actions, site-specific surveys would be required to identify potential impacts to sensitive species and habitats within and immediately adjacent to Arroyo Grande Creek, and to develop appropriate avoidance and mitigation actions. Short-term, construction-related impacts may occur (e.g., disturbance and increased turbidity resulting from removal of the Arroyo Creek stream gage, etc.) that would need to be identified and avoidance/mitigation measures implemented on a project specific basis.

None of the known cultural resource sites along Arroyo Grande Creek would be adversely affected by increased flows identified in the proposed alternative (Section 3.10). Many of the known cultural resource and archeological sites along the drainage have been impacted or destroyed altogether by development in the area. Historic (pre-Lopez Dam) streamflows and floods would have damaged cultural resources in or near the floodplain along the creek corridor. Anticipated flows and fluctuations as part of the proposed alternative would have a less than significant impact on cultural resources (See Appendix C).

Site-specific cultural resource surveys may be required for environmental documentation and permitting for non-flow projects implemented as part of this HCP. If cultural resources are encountered, activities will be halted or modified to allow an archeologist to assess the resource.

Prehistoric archeological site indicators include chert and obsidian tools, tool manufacturer waste flakes, grinding implements such as mortars and pestles, and darkened soil containing aboriginal dietary debris such as bone fragments and shellfish remains. Historic site indicators include ceramics, glass, wood, bone, and metal remains.

If human remains are found in locations other than a dedicated cemetery, disturbance of the site or any nearby area suspected to overlie adjacent remains, would be halted until the San Luis Obispo County Coroner is notified and an appropriate course of action is determined. The County Coroner, upon recognizing remains of Native American origin, must contact the Native American Heritage Commission within 24 hours. To avoid adverse impacts of construction or maintenance activities associated with non-flow elements of this HCP, construction personnel would be instructed on the potential for discovery of cultural or human remains, and the need for timely reporting of such finds.

Additional environmental consequences associated with the proposed alternative include impacts to environmental conditions within Lopez Lake. As shown in Figure 5-1, the proposed alternative instream flow schedule will affect water storage within the reservoir and beneficial uses of the reservoir and water supplies. For example, lowered reservoir elevations could impact recreational boating and water skiing within the reservoir. Reduced reservoir surface elevation may affect spawning by warm water fish supporting local recreational angling (e.g., by dewatering nests) or adversely impact habitat for fish species within the reservoir. Extending boat ramps to accommodate lower water surface elevations or increasing availability of structural habitat in the reservoir at lower elevations for warm water fish may be required to mitigate environmental consequences associated with the proposed HCP alternative.

5.1.3 Incidental Take Assessment

Operation of Lopez Dam flow releases to Arroyo Grande Creek, and non-flow habitat enhancement implemented by this HCP may cause incidental take of steelhead and/or red-legged frogs. The District operations and maintenance practices for the Lopez Project and the conservation strategy outlined in this HCP are identified as covered activities for incidental take of either steelhead or red-legged frogs. The Endangered Species Act includes Section 9 prohibitions against unauthorized incidental take of protected species. As part of this HCP, incidental take authorization would be issued by NOAA Fisheries and USFWS for covered activities. The estimated frequency and magnitude of incidental take of steelhead and red-legged frogs, associated with covered activities under this HCP, are summarized in Table 5-1.

5.2 ALTERNATIVE 2: INSTREAM FLOW

Alternative 2 considered enhancing instream habitat within Arroyo Grande Creek exclusively through instream flows (Alternative 2; Section 4.2). The instream flow alternative assumed future agricultural demand would be the same as historical demand (e.g., no increase in

Table 5-1 (5 pages)

Table 5-1 – page 2

Table 5-1 (page 3)

Table 5-1 (page 4)

Table 5-1 (page 5)

releases from Lopez Reservoir to meet downstream agricultural demand above recent historical baseline conditions). It was also assumed that municipal water delivery in the future would remain at a constant amount of 4,530 acre-feet per year. The instream flows to support steelhead habitat within Arroyo Grande Creek under this alternative were:

- Continuous releases from Lopez Dam of 7 cfs year-round independent of water-year type or inflows to Lake Lopez;
- Between January 1 and April 30, releases from Lopez Dam for steelhead passage 20 cfs or greater for seven consecutive days in January, February, March, and April; and
- 500 AF held in storage within Lopez Reservoir, used for steelhead migration between January 1 and April 30 (adaptive management) each year when reservoir storage on December 31 is greater than 35,000 AF.

The alternative instream flow schedule was evaluated to determine operational feasibility based on Lopez Reservoir storage. Operational modeling compared reservoir storage under simulated operational conditions (between 1969 and 2000) for the baseline operational strategy (see Section 3.3) and for the instream flow alternative. Figure 5-4 shows that the instream flow alternative caused the reservoir to reach minimum pool (depleting all water within the reservoir available for release) in two of the years simulated. It was concluded that the instream flow alternative would not be feasible. As discussed in Section 4.1, the criterion used to evaluate operational feasibility of instream flow alternatives for the HCP was to not deplete reservoir storage below 9,000 AF (4,000 AF minimum pool, and 5,000 AF reserve storage), over the 1969-2000 hydrologic period. As discussed in Section 4.1, the minimum reservoir storage criterion (9000 AF) represents both the minimum storage required under the current Davis-Grunsky contract between the State and District, and a minimum reservation to meet municipal and agricultural demand under prolonged drought conditions that may be more severe than those represented in the 1969-2000 hydrologic record used in these analyses. The reduction in reservoir storage to minimum pool under the alternative would result in the District not meeting contractual demand for municipal water supplies and agreements for agricultural supplies, but would also result in curtailment of instream flow releases from the reservoir and associated impacts (e.g., dewatering part or all of Arroyo Grande Creek downstream of the dam) to steelhead, red-legged frogs, and other fish and wildlife. These severe conditions would not meet the goals and objectives of this HCP. Based on these results, it was concluded that the alternative is not feasible. Because the instream flow alternative did not meet the operational criterion for reservoir storage or water supply and biological objectives of the HCP, no further consideration was given to the instream flow alternative.

5.3 ALTERNATIVE 3: NON-FLOW PHYSICAL ACTIONS

The non-flow alternative (Alternative 3: Section 4.3) was developed to provide habitat benefits to steelhead and red-legged frog exclusively through non-flow physical actions. The alternative would enhance habitat within Arroyo Grande Creek and watershed through physical

Figure 5-4

habitat enhancement measures, including channel modifications within the upper reach of Arroyo Grande Creek (creating a separate channel bypassing the gravel pit area and extending downstream to the vicinity of the dam access road). An alternative physical solution to exclude steelhead access to the gravel pits would be to install a passage barrier near the DWR mitigation site.

In addition, a variety of non-flow habitat enhancement measures would be implemented within Arroyo Grande Creek, including spawning gravel augmentation and/or cleaning, physical structures to improve habitat for juvenile rearing steelhead, construction of backwater pools and off-channel ponds to provide habitat for red-legged frogs and riparian planting along environmental easements. Passage improvements at the Arroyo Grande stream gage (e.g., construction of a fish ladder) and at other passage impediments within the creek (e.g., low-flow road crossing, culverts at Cecchetti Road and Biddle Park), would also be included in the non-flow measures. The non-flow alternative would not modify reservoir operations or instream flow releases to Arroyo Grande Creek.

The feasibility of the full array of non-flow habitat enhancement measures would depend on obtaining environmental easements and right-of-way agreements for access to private lands. For example, construction of a bypass channel to convey creek flow around the gravel pits would require an extensive environmental easement and right of way on private lands and disruption of existing wetland habitat. Access would be required on a long-term basis since the bypass channel could be altered, requiring maintenance and repair, by high flood flows and spill at the dam. The willingness of private landowners to enter into long-term environmental easements and right-of-way agreements with the District to provide access for habitat enhancement projects within Arroyo Grande Creek, and costs of obtaining the environmental easements, has not been determined.

Construction of a fish passage barrier near the DWR mitigation site (between Biddle Park and the dam access road) to exclude steelhead from areas of less suitable habitat (e.g., large pools in the gravel pit area, and the area near the DWR mitigation site where flow depletions increase the risk of redd dewatering and/or steelhead stranding), would eliminate approximately 6,500 feet of Arroyo Grande Creek corridor from use by steelhead. The area upstream of the exclusion barrier could, however, be further developed and managed as habitat for red-legged frogs and other wildlife.

Construction maintenance of non-flow habitat enhancement projects would result in localized temporary increases in turbidity and suspended sediment load within the creek. Adverse environmental consequences associated with construction and maintenance would be minimized by construction during low-flow summer periods, use of pre-washed gravels for spawning gravel enhancement projects, and other construction methods (e.g., temporary flow bypasses, bank erosion protection, etc.) applicable for habitat improvement projects.

Financing for the non-flow alternative would be provided through incremental rate increases for the District water supply deliveries. The District would administer the Conservation Account, with recommendations for allocations provided by the Technical Committee. Funding and administration of the non-flow alternative is considered to be feasible.

The non-flow alternative would avoid adverse environmental consequences from changes in reservoir storage elevations that would be comparable, under this alternative, with historical

baseline conditions. By avoiding additional releases from the reservoir for instream flow for steelhead, reservoir storage elevations would be maintained at higher levels (Figure 5-1), minimizing adverse consequences on water supply availability, recreational use of Lopez Lake for boating, water skiing, and recreational angling.

The non-flow alternative is technically feasible but benefits to steelhead are not as great as those associated with the combined instream flow and non-flow actions in the proposed alternative (Section 5.1). By providing increased instream flows under the proposed alternative, combined with non-flow habitat enhancement, the total area of improved steelhead habitat under the proposed alternative would be greater than the habitat provided under the non-flow alternative. Since the benefits to red-legged frogs primarily result from non-flow actions (e.g., development of off-stream ponds), environmental benefits to red-legged frogs would be generally comparable between the proposed alternative and the non-flow alternative.

5.4 ALTERNATIVE 4: STEELHEAD HATCHERY

Alternative 4 includes a steelhead hatchery at Lopez Dam (Alternative 4; Section 4.4). Historically, a trout hatchery was operated at the dam, using water from Lopez Reservoir. Under Alternative 4, a steelhead hatchery would be constructed, including adult holding ponds, egg taking facilities, egg incubation facilities, and raceways for juvenile rearing. Adult steelhead returning to Arroyo Grande Creek would be collected in the hatchery for spawning and subsequent juvenile rearing. Steelhead fry and/or smolts would be released from the hatchery into Arroyo Grande Creek, and allowed to migrate downstream to the ocean. Design, construction, and operation of a steelhead hatchery downstream of Lopez Dam is technically feasible.

Although operation of the steelhead hatchery would produce juvenile steelhead, and presumably support a returning population of adult steelhead, the hatchery operation would not result in environmental benefit or habitat enhancement within Arroyo Grande Creek. The steelhead hatchery would provide no benefit to red-legged frogs or their habitat, or benefits for steelhead and other fish species spawning and rearing within the creek. Steelhead spawning and rearing within Arroyo Grande Creek would continue to be susceptible to incidental take as a result of the District water supply operations and releases from Lopez Reservoir. No additional protections or habitat enhancement would be provided to red-legged frogs.

There are genetic implications of salmonid hatchery operations, particularly within watersheds such as Arroyo Grande Creek where selection of adult brood stock would be extremely limited, and hatchery propagation practices have a greater effect on genetic selection. Furthermore, insufficient numbers of adult steelhead may return to Arroyo Grande Creek in a number of years to support hatchery operations, so broodstock and/or eggs would need to be imported to the hatchery from other watersheds.

A steelhead hatchery would not improve habitat within Arroyo Grande Creek or minimize adverse impacts to wild populations of steelhead or red-legged frogs. In addition, artificial propagation of protected fish and wildlife species is generally inconsistent with policies and directives of state and federal resource agencies.

As a result of these concerns, a steelhead hatchery was not recommended as the preferred alternative for this HCP. The steelhead hatchery would not provide environmental benefits greater than those for the proposed alternative.

5.5 ALTERNATIVE 5: PASSAGE UPSTREAM OF LOPEZ DAM

Providing for up- and downstream passage of steelhead at Lopez Dam was considered as an alternative (Alternative 5; Section 4.5) through either (1) construction of a fish ladder; or (2) operation of a steelhead trap-and-truck operation. Lopez Dam is 166 feet high (dam crest to downstream toe height). This is approximately twice the height of the highest operating fish ladder in California, an 85-foot elevation ladder at San Clemente Dam on the Carmel River that has encountered operating difficulties. Assuming a 10 percent slope to the fish ladder, the facility would be approximately 1,660 feet (0.3 miles) in length. No fish ladder of comparable size has been identified, and there are concerns regarding the performance of such a ladder in successfully providing passage for adult and juvenile steelhead.

In the unlikely event that a ladder at Lopez Dam could provide upstream passage for adult steelhead, concern exists regarding the lack of suitable habitat for juvenile rearing in upstream portions of the watershed, and expected high levels of mortality for juvenile steelhead emigrating downstream through Lopez Lake. Warm water predatory fish species in Lopez Lake, such as large- and small-mouth bass, would prey on emigrating steelhead.

Because of the lack of proven success in operating a fish ladder of a size comparable to that required at Lopez Dam, and anticipated high levels of predation on juvenile steelhead emigrating through the reservoir, a fish ladder at Lopez Dam would not provide environmental benefits to steelhead greater than those identified for the proposed alternative. Furthermore, a fish ladder at Lopez Dam would provide no benefit to red-legged frogs, and may result in adverse impacts due to increased movement of warm water predatory fish species from the reservoir downstream into Arroyo Grande Creek, providing potential habitat for red-legged frogs. As a result, construction and operation of a fish ladder at Lopez Dam is not recommended for inclusion in this HCP.

A trap-and-truck operation for steelhead involves collection of adult steelhead within Arroyo Grande Creek for transport upstream and release into the watershed above Lopez Lake. Trapping and trucking of adult steelhead results in stress, increased susceptibility to disease, and trapping- or handling-related mortality. As with the fish ladder alternative, concerns exist regarding habitat for steelhead spawning and juvenile rearing within the upper portions of the Arroyo Grande Creek watershed, and the subsequent mortality of juvenile steelhead during downstream migration through the reservoir. Adult and juvenile emigrating steelhead would have to be trapped prior to entering Lake Lopez during their downstream migration, and subsequently trucked to a release location downstream in Arroyo Grande Creek, or would have to rely on reservoir spill events for downstream migration. Trapping and trucking of juvenile and adult downstream migrating steelhead would contribute to additional stress, increased susceptibility to disease, and handling and transport mortality. Allowing adult and juvenile steelhead to migrate downstream over the dam spillway during spill events would also result in substantial stress and potentially significant mortality to emigrating steelhead as a result of the height of the dam, and the configuration of the existing spillway. In addition, a trap-and-truck operation would provide no habitat benefits within Arroyo Grande Creek for steelhead, red-legged frogs, or other fish and wildlife species. As a result of these biological concerns the trap-and-truck operation has not been recommended as a conservation action in this HCP.

5.6 ALTERNATIVE 6: PARTICIPATE IN REGIONAL 10(A)(1)(B) PERMIT

Participation in a regional habitat conservation planning effort was considered as an alternative (Alternative 6; Section 4.6). Participation by the District in a regional HCP would require a substantially longer time to implement and would not achieve short-term benefits of the proposed alternative. Modifications to instream flow for migration, spawning and egg incubation, and juvenile rearing of steelhead would be delayed for an undetermined period until the regional HCP was implemented. Habitat enhancement activities for steelhead and red-legged frogs would be delayed, resulting in an incremental increase in environmental impacts when compared with the proposed alternative. Implementation of the preferred alternative presented in this HCP would be expected to be compatible and complementary to actions undertaken as part of a broader regional HCP planning effort.

5.7 ALTERNATIVE 7: NO ACTION ALTERNATIVE

The No-Action Alternative (Alternative 7; Section 4.7) would avoid temporary, localized impacts associated with removal of the Arroyo Grande stream gage and construction activity at other locations and modifications to instream habitat to benefit steelhead and red-legged frogs. The No-Action Alternative would continue to threaten incidental take of steelhead and red-legged frogs as a result of District operations and maintenance of Lopez Dam and the Arroyo Grande flood control channel and releases to Arroyo Grande Creek, resulting in exposure of District and staff to significant civil and criminal penalties. Environmental conditions under the No-Action Alternative would detract from species recovery efforts and would not achieve the basic project goal of providing improved environmental conditions. Avoiding the risk of incidental take for non-authorized (covered) activities by the District would result in additional operating constraints limiting the availability and reliability of water supplies within the service area. Impacts to steelhead, red-legged frogs and other fish and wildlife resources under the No-Action Alternative would be greater than under the proposed alternative.

The primary benefits to red-legged frogs of maintaining the existing conditions (No Action Alternative) would be inhibiting the reproductive success of bullfrogs by drying out the lower portions of the creek. Other alternatives that sustain year-round flows would promote bullfrog populations. It is uncertain whether mitigation measures to offset this favorable condition for bullfrogs would be effective.