



CHAPTER 18

BIOLOGICAL RESOURCES

Introduction

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Impacts and Mitigation Measures of the 2015 Plan Alternatives

CHAPTER 18 BIOLOGICAL RESOURCES

INTRODUCTION

This chapter assesses the impacts of the proposed recommended project on the biological resources of the Santa Clara River, the river's floodplain, and the proposed expansion sites at the VWRP. Since the perennial reach of the Santa Clara River downstream from the VWRP's outfall has the greatest potential of being impacted by future changes in effluent discharge levels, this chapter focuses mainly on the biological resources of this downstream reach.

Such an analysis must incorporate the determinations made in the hydrology and water quality chapters (Chapters 16 and 17, respectively) before arriving at any conclusions regarding impacts on the fisheries and other aquatic species of the Santa Clara River. As with the hydrological analysis, multiple flow scenarios were evaluated since discharge to the river is expected to change over time as new users connect to the SCVJSS and as the demand for reuse increases. Due to the minor nature of the proposed upgrades at the SWRP and VWRP (refer to Chapters 7 and 8), discussion of the existing conditions at the SWRP is not included in this chapter, and only the potential impacts to biological resources associated with the construction and operation of these upgrades are addressed.

SETTING

Regulatory Setting

Riparian Habitats and Wetlands

Riparian habitats are recognized throughout California as important natural communities due to their limited extent compared to historical distributions, their importance to dependent plant and wildlife species, and the threats facing remaining occurrences. The value and current status of riparian

habitats qualify them as sensitive natural communities.

Some riparian areas along the Santa Clara River may qualify as wetlands and other waters of the United States under Section 404 of the Clean Water Act (33 CFR 328.3 and 328.4, 40 CFR 230.3). Waters of the United States is the encompassing term for areas under federal jurisdiction pursuant to Section 404 of the Clean Water Act. Waters of the United States are divided into wetlands and other waters of the United States.

Wetlands are defined as *areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions* (33 CFR 328.3[b], 40 CFR 230.3). To be considered a wetland subject to jurisdiction under Section 404 of the Clean Water Act, the wetland must support indicators for hydrophytic vegetation, hydric soil, and wetland hydrology.

Other waters of the United States are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface-water features that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (33 CFR 328.4).

The U.S. Army Corps of Engineers has jurisdiction over wetlands and other waters of the United States affected by dredge or fill activities. Additionally, under Section 10 of the Rivers and Harbors Act of 1899, a permit is required from the Corps for work in navigable waters, defined as those waters that are *subject to ebb and flow of the tide and/or presently, historically, or potentially used for foreign or interstate commerce*.

The protection of riparian resources is supported by numerous environmental regulatory agencies. Riparian areas near the VWRP expansion site would not, however, be considered wetlands subject to Corps jurisdiction under Section 404 of the Clean Water Act because they lack wetland hydrology, as evidenced by distance from and elevation above the active channel and the occurrence of perennial and annual upland plant species in the understory. The riparian area may qualify as other waters of the United States if the area floods every other year, on average, for a long duration during the growing season. However, it appears that the riparian habitat near the VWRP project site floods less frequently than every other year. Therefore, the riparian habitat probably does not qualify as other waters of the United States. The Department of Fish and Game may consider the riparian habitat in the vicinity of the VWRP to fall within its definition of a wetland; DFG typically maintains a policy of *no net loss* of wetland habitat (California Fish and Game Commission, 1987).

Definition of Special-Status Species

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts or other regulations, or species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are species in the following categories:

- Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (61 FR 40: 7596-7613, February 28, 1996).
- Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 CCR 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines, Section 15380).
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.).
- Plants considered by the California Native Plant Society (CNPS) to be *rare, threatened, or endangered in California* (Lists 1B and 2 in Skinner and Pavlik, 1994).
- Plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in Skinner and Pavlik, 1994), which may be included as special-status species on the basis of local significance or recent biological information.
- Species listed as sensitive by the local U.S. Forest Service region (Forest Service Manual 2670) or U.S. Bureau of Land Management resource area.
- Animal species of special concern to DFG (Remsen, 1978 [birds], Williams, 1986 [mammals], and Jennings and Hayes, 1994 [amphibians and reptiles]).
- Animals fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

County of Los Angeles General Plan

The 1988 County of Los Angeles General Plan includes policy to protect the significant ecological areas within the county. The VWRP is located adjacent to the Santa Clara River, which is listed as an SEA (No. 23). Appendix A of the County General Plan's Land Use element includes the following

design criteria for proposed development within a designated SEA:

- The development should be designed to be highly compatible with biotic resources present, including the setting aside of appropriate and sufficient undisturbed areas.
- The development should be designed so that wildlife movement corridors (migratory paths) are left in a natural and undisturbed state.
- The development should retain sufficient natural vegetative cover and/or open spaces to buffer critical resource areas from the proposed use.

The *Santa Clarita Valley Area Plan*, originally adopted in 1984 and updated in 1990, is a component of the County General Plan. The *Santa Clarita Valley Area Plan* states that the following uses are compatible within an SEA as long as the uses include conditions imposed as necessary to ensure protection of identified ecological resources:

- Where no alternative site or alignment is feasible, public and semi-public uses essential to the maintenance of public health, safety, and welfare.

Regional Setting

The following sections describe the diverse biological communities characterizing the Santa Clara River system, including fisheries resources, riparian habitats, and wildlife species. This chapter generally focuses on those biological communities found in the upper Santa Clara River system, near the SWRP and VWRP. However, a more complete list of plants and wildlife species found along the river is provided in Table E-1 of Appendix E.

Fisheries Resources

Resident fish between the SWRP and the Los Angeles/Ventura County line are mostly warm-water

tolerant species. Figure 18-1 shows the habitat ranges of special-status fish found in the upper Santa Clara River.

Special-Status Fish

- *Unarmored Threespine Stickleback*: The unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), a subspecies of the freshwater threespine stickleback (*Gasterosteus aculeatus*), is a state- and federal-listed endangered species. The unarmored threespine stickleback, which is native to the Santa Clara River, is found in the waters near the SWRP and VWRP and has a range extending from the headwaters of the river to approximately five miles below the VWRP. However, a portion of the population of this subspecies is found well upstream of the SWRP in Soledad Canyon.

In general, the threespine stickleback is not a strong swimmer and prefers quiet water or backwater pools with aquatic vegetation. The stickleback is typically found where temperatures are below 74°F. Since it is a visual feeder, feeding primarily on benthic organisms or those that live on aquatic plants, the stickleback requires clear, non-turbid waters. Schooling behavior, which allows for improved feeding efficiency, is common except during breeding season (Moyle, 1976).

Spawning occurs primarily in spring and summer between April and July. However, some spawning occurs year round. Males establish their territory and then construct a nest among the vegetation. The life span of the threespine stickleback is generally one year, although some may survive two to three years (Moyle, 1976).

- *Santa Ana Sucker*: The Santa Ana sucker (*Catostomus santaanae*) is proposed to be

listed as endangered under the ESA (61 FR 36021, July 9, 1996). It typically inhabits shallow, narrow streams and rivers, but is often found in pools of wider rivers. The Santa Ana sucker prefers clear water with temperatures below 72°F. It can survive in turbid water but does not typically reproduce in such water (Swift, 1996). The Santa Ana sucker feeds primarily on algae and detritus scraped from rocks. Gravel, cobble, and sand are the preferred substrate types.

Spawning takes place in the spring and summer, between April and July. Fecundity is very high, which, in conjunction with a protracted spawning period, allows the fish to quickly repopulate a stream after a severe flood event.

It is believed that the Santa Ana sucker is non-native to the Santa Clara River (Moyle, 1976). As water temperature increases, the Santa Ana sucker often migrates out of the Santa Clara River and into the cooler tributaries. The Santa Ana sucker may hybridize with the Owens sucker when it occurs in the same area. However, the Owens sucker does not occur in the project area.

- *Arroyo Chub*: The arroyo chub (*Gila orcutti*), a small minnow that is found in the Santa Clara River, is identified as a federal species of concern and a California species of special concern. The habitat of the arroyo chub includes the reaches of the river where the SWRP and VWRP discharge reclaimed water. It is indigenous to the Santa Clara River and has adapted to variable water temperatures. The arroyo chub typically inhabits slow-moving water with mud or sand bottoms and feeds on algae and other plants, as well as small invertebrates. Pool habitat is used for

spawning during March and April (Moyle, 1976).

- *Steelhead Trout*: The steelhead trout (*Oncorhynchus mykiss*) is a federal species of concern and a member of a Southern California evolutionary significant unit (ESU) found in the Santa Clara River. It is also proposed for listing as a federally endangered species (61 FR 41541, August 9, 1996). Steelhead trout are classified as anadromous since adults typically migrate from the ocean to spawn in the upper reaches of rivers and streams. Juveniles live for a year or more in cold water reaches before returning to the ocean, where they grow to sexual maturity.

Sespe Creek is the only portion of the Santa Clara watershed used by steelhead trout as spawning and nursery habitat (DFG, 1985). The confluence of the river with Sespe Creek is approximately 20 miles downstream of the VWRP. The Santa Clara River appears to be used only as a migratory pathway to Sespe Creek. The migratory pattern of the steelhead trout depends strongly on rainfall and streamflow. Migration up the river occurs between November and June, peaking in January and February. Spawning takes place between January and June, peaking in February and March.

The steelhead trout that migrate from the ocean along the Santa Clara River to Sespe Creek are not directly affected by discharge from the SWRP and VWRP since this migration occurs downstream of the Ventura County gap in perennial flow.

Other Fish

- *Partially-Armored Threespine Stickleback*: Another subspecies of the freshwater three-

spine stickleback is the partially-armored stickleback (*Gasterosteus aculeatus microcephalus*). The non-listed partially-armored subspecies is native to the lower reaches of the Santa Clara River, downstream of the Ventura County gap in perennial flow (where the surface water percolates down through the coarse bed materials and into the Piru Groundwater Basin).

This gap in perennial flow, which is approximately 15 miles long during a normal year and approximately 9 miles long during a year of unusually high precipitation, prevents hybridization between the downstream partially-armored and upstream unarmored forms of the stickleback. Should these subspecies appear together, mixing of the gene pool would occur, resulting in mostly partially-armored offspring. Such hybridization would cause a loss of genetic integrity of the endangered unarmored subspecies.

High floodflows can connect the perennial sections of the river, and the potential for subspecies interaction exists. However, the loss of unarmored subspecies would require a complete mixing with the partially-armored subspecies. This could occur only if a substantial number of partially-armored stickleback were able to swim 15 miles upstream during a flood event, above where the water normally flows underground, and successfully spawn with the unarmored subspecies over a period of years.

- *Mosquitofish:* Mosquitofish (*Gambusia affinis*) are widely distributed throughout the United States and were introduced to the Santa Clara River to control mosquito populations. Mosquitofish are capable of surviving extreme conditions and may live in water as warm as 99°F. They live near the surface where the

oxygen concentration is high, and tend to school near the edges of vegetation patches. Mosquitofish may compete for food with other species in the river, including the unarmored threespine stickleback.

Riparian Habitats

Six riparian communities are found along the Santa Clara River from I-5 to the Los Angeles/Ventura County line: active channel, freshwater marsh, mule fat scrub, southern cottonwood/willow riparian forest, southern willow riparian woodland, and southern willow scrub. These communities and their characteristic plant and wildlife species are described below. Figures 18-2A through 18-2D depict the biological communities found from the Los Angeles/Ventura County line to I-5 that could be affected by the proposed changes in effluent flows. The information used to compile this section is primarily based on the *Santa Clara River Enhancement and Management Plan Study* (Santa Clara River PSC, 1996) and Holland, 1986. A complete list of the Santa Clara River species is published by the Santa Clara River Project Steering Committee (1996).

Active Channel

The active channel corresponds to the low-flow channel of the Santa Clara River and its associated recently deposited sandbars. The channel is regularly flooded and scoured by seasonal flows, inhibiting the growth of substantial vegetation. Early seral vegetation may colonize the active channel briefly following seasonal flows as floodwaters recede or during short periods of stability. Typical plant species include narrow-leaved willow, mule fat, cottonwoods, and giant cane.

The active channel provides important habitat for aquatic and semi-aquatic wildlife species. The aquatic habitat provides nesting sites and rearing

habitat for amphibians, including western toads and Pacific treefrogs. Herons, egrets, and shorebirds forage for amphibians, fish, and invertebrates.

Freshwater Marsh

Freshwater marsh is found along segments of the river characterized by relatively quiet, ponded, or slow-moving waters. This community is dominated by herbaceous perennials adapted to extended periods of inundation, such as broad-leaved cattail, bulrush, sedge, and rush. Other common plant species include yerba mansa, dwarf nettle, hoary nettle, cocklebur, and celery. Along the Santa Clara River, freshwater marsh occupies relatively small patches, often as stringers along the river's shoreline and in narrow swales at the base of low depositional mounds.

Freshwater marsh provides important habitat for aquatic and semi-aquatic wildlife species. The marsh habitat provides nesting sites and rearing habitat for amphibians, including western toads and Pacific treefrogs. Herons, egrets, and shorebirds forage for amphibians, fish, and invertebrates.

Mule Fat Scrub

Mule fat scrub is an early seral community maintained by frequent flooding and is most often found immediately adjacent to the active channel. The dominant plant species is mule fat. Other associated species include narrow-leaved willow, giant cane, and tamarisk. A few large patches of mule fat scrub were mapped as present along the Santa Clara River (Santa Clara River Project Steering Committee, 1996). Lack of frequent flooding promotes the succession of this community to willow- and cottonwood-dominated stands.

Mule fat scrub along the Santa Clara River provides high-quality habitat for shrub-dependent wildlife, such as downy woodpeckers, song sparrows, rufous-sided towhees, bushtits, and Bewick's wrens. Other wildlife species, such as garter snakes, treefrogs, and pond turtles use this habitat for cover and foraging habitat.

Southern Cottonwood/Willow Riparian Forest

Southern cottonwood/willow riparian forest is a moderately dense, multilayered community dominated by Fremont cottonwood and red willow. Mule fat, arrow weed, and a variety of willows are also found in the shrubby understory. Other associated plant species include black cottonwood, blackberry, California bay, hoary nettle, mugwort, and wild grape. Extensive patches of southern cottonwood/willow riparian forest are found in the area of the Los Angeles/Ventura County line, just downstream of the point of rising groundwater. Smaller patches of this community are scattered along the length of the Santa Clara River upstream of this region.

The southern cottonwood/willow riparian forest provides high-quality foraging and breeding habitat and cover for many resident and migratory wildlife species. Several raptors, including turkey vultures, red-tailed hawks, red-shouldered hawks, and American kestrels, forage in the cottonwoods. Many other wildlife species have been observed among cottonwoods, including American crows, common ravens, northern flickers, and Nuttall's woodpeckers.

Southern Willow Riparian Woodland

Southern willow riparian woodland is characterized by dense to open stands of mature willow trees that develop after 15 to 20 years. Dominant willow species include red willow and

arroyo willow. Scattered Fremont cottonwood, black cottonwood, and western sycamore also characterize this community. The understory is comprised of shrubby willows, such as narrow-leaved willow and arroyo willow, and herbs such as mule fat. Patches of southern willow riparian woodland are found along the entire length of the Santa Clara River with notable expanses occurring from near the mouth of the river to just upstream of Highway 1.

Southern willow riparian woodland along the Santa Clara River provides high-quality foraging and breeding habitat as well as cover for riparian-dependent and other wildlife species. Wildlife species observed include downy woodpeckers, song sparrows, bushtits, and northern flickers. Other wildlife species expected in this habitat include red-shouldered hawks, Nuttall's woodpeckers, American kestrels, garter snakes, and treefrogs.

Southern Willow Scrub

Southern willow scrub is dominated by thickets of one or more willow species, including arroyo willow, red willow, and narrow-leaved willow. Mule fat is often found as a co-dominant in this community. Little understory exists because of the dense vegetative shrub cover. Young trees of willow, Fremont cottonwood, or western sycamore grow in this community. Southern willow scrub is prevalent along the length of the Santa Clara River and is usually found close to the active channel. Establishment typically occurs along the low-flow line of recently deposited or scoured banks and gravel bars where bare areas have been created and a moist subsurface provides a water source during the growing season for seedlings.

Southern willow scrub along the Santa Clara River provides high-quality habitat for shrub-dependent wildlife, such as downy woodpeckers, song sparrows, rufous-sided towhees, bushtits, and Bewick's wrens. Other wildlife species, such as garter snakes, treefrogs, and pond turtles use this habitat for cover and foraging habitat.

Special-Status Plants

- *Slender-Horned Spineflower*: This species is federally and state listed as endangered. This plant is an annual herb in the buckwheat (*Polygonaceae*) family. It is found in Los Angeles, Riverside, and San Bernardino Counties. Many historical occurrences have been lost to urbanization, and remaining occurrences are threatened by development, vehicular activity, flood control projects, and a proposed reservoir. The closest recorded location was in 1937 in Mint Canyon, north of Solemint; the species could not be relocated after searches in 1979 (DFG, 1996). Slender-horned spineflower blooms from April to June.
- *Nevin's Barberrry*: This species is state listed as endangered and is a candidate for federal listing as threatened or endangered. Nevin's barberry is an evergreen shrub that is known to grow in Los Angeles, Riverside, and San Diego Counties. Remaining occurrences of Nevin's barberry are threatened by development and road maintenance. Scrub within the floodplain of the Santa Clara River represents potential habitat for Nevin's barberry, especially in Los Angeles County. The species was recorded as occurring in San Francisquito Canyon near its confluence with the Santa Clara River in 1965 but could not be found during a 1987 field visit (DFG, 1996). Nevin's barberry blooms from March to April.

No potential habitat exists for special-status plants at the VWRP expansion site. The disturbed nature and dominance by weedy forbs in the ruderal habitat that covers most of the project site preclude the occurrence of special-status plants. Additionally, there are no known special-status plants in the area that have potential to grow in southern cottonwood/willow riparian forest.

Terrestrial Wildlife

The riparian communities along the Santa Clara River provide habitat for a wide variety of wildlife species. These species include invertebrates, amphibians, reptiles, birds, and mammals. Table E-2 of Appendix E contains a complete list of special-status wildlife species that are known to occur, or that have the potential to occur, along the Santa Clara River.

Special-Status Wildlife

Twenty-eight special-status wildlife species have potential to inhabit the area along the Santa Clara River from Saugus to the mouth of the river. Eight threatened or endangered species have been found along the Santa Clara River: the arroyo southwestern toad, western snowy plover, California least tern, western yellow-billed cuckoo, southwestern willow flycatcher (individuals have been observed, but no confirmed nesting), bank swallow, least Bell's vireo, and Belding's savannah sparrow. The California red-legged frog, a federally-threatened species and state species of special concern, has not been recorded along the Santa Clara River, but potential habitat exists along the river and its tributaries. Twenty other special-status wildlife species (California fully protected species, California species of special concern, and federal species of concern) could also be present along the Santa Clara River: the sandy beach tiger beetle,

southwestern pond turtle, California horned lizard, San Diego horned lizard, coastal western whiptail, silvery legless lizard, coast patch-nosed snake, two-striped garter snake, south coast garter snake, western least bittern, white-tailed kite, northern harrier, Cooper's hawk, elegant tern, loggerhead shrike, California yellow warbler, Southern California saltmarsh shrew, greater western mastiff bat, Townsend's big-eared bat, and southern marsh harvest mouse.

No threatened or endangered wildlife species have been observed at the VWRP expansion site, although marginal-quality habitat (disturbed riparian forest) is found on a small portion of the site. The Least Bell's vireo, southwestern willow flycatcher, and western yellow-billed cuckoo could inhabit the area adjacent to the VWRP project site. No suitable habitat exists for other threatened or endangered wildlife species.

Marginal-quality habitat exists at the VWRP expansion site for other special-status wildlife species. The coastal western whiptail, California horned lizard, and San Diego horned lizard could inhabit the ruderal areas. Marginal-quality habitat also exists at the project site for the Cooper's hawk, loggerhead shrike, California yellow warbler, greater western mastiff bat, and Townsend's big-eared bat, but none of these species have been observed.

IMPACTS AND MITIGATION MEASURES OF THE 2015 PLAN ALTERNATIVES

Methodology and Assumptions for Impact Analysis

The methodology used to assess potential impacts on biological resources along the Santa Clara River included a review of relevant published literature and unpublished reports describing resources in the area,

a search of DFG's Natural Diversity Data Base (NDDDB), and a reconnaissance-level survey of the project area.

The Santa Clara River Enhancement and Management Plan Study (Santa Clara River PSC, 1996) was used to obtain a comprehensive overview of the biological resources present along the Santa Clara River. Biologists reviewed biological inventories and least Bell's vireo survey reports for the VWRP expansion site and adjacent areas. San Marino Environmental Associates conducted a wildlife inventory and habitat evaluation for the least Bell's vireo, southwestern willow flycatcher, and yellow warbler in October 1991 and surveyed for the same species on March 29 and 30 and April 3 and 4, 1993 (San Marino Environmental Associates, 1991 and 1993). In accordance with USFWS's least Bell's vireo survey protocol, Sapphos Environmental conducted eight least Bell's vireo surveys and surveyed for southwestern willow flycatcher and yellow warbler during April 1995 and June 1995 (Sapphos Environmental, 1995).

On August 7 and 8, 1996, reconnaissance field surveys were conducted by Jones & Stokes Associates staff, including a fisheries biologist, hydrologist, wildlife biologist, and botanist. The surveys were carried out on the Santa Clara River from the SWRP downstream to the mouth of the river. Fisheries surveys involved visual observations of the physical stream structure, quality of riparian vegetation, and fish resources.

On August 30, 1996, a follow-up survey was conducted by a fisheries biologist from Jones & Stokes Associates and Drs. Jonathan Baskin and Thomas Haglund from San Marino Environmental Associates to identify fish species present at and downstream of the SWRP and VWRP. Seine hauls were conducted to check for the presence or absence of fish species and their relative abundance. Water temperatures were also measured at each sample site.

Table 18-1 lists the sampling locations, the temperatures at each station, and the fish species found. Figure 18-1 shows the locations at which various fish species were identified with respect to the SWRP and VWRP.

Immediately below the SWRP and VWRP outfalls, primarily mosquitofish were captured using spot seining. Unarmored threespine stickleback, arroyo chub, and Santa Ana sucker were common to very abundant from just downstream of the McBean Parkway overcrossing to immediately upstream of the VWRP outfall. An unarmored threespine stickleback was observed 150 feet downstream of the VWRP outfall, however this fish was found on the side of the channel dominated by natural surface flow, not effluent. Seining was not conducted farther downstream, since the presence of unarmored threespine stickleback, arroyo chub, and Santa Ana sucker in this reach has already been established through previous surveys conducted by San Marino Environmental Associates.

Identification of biological impacts and determination of their respective significance was based on the hydrological and water quality impact analyses presented in Chapters 16 and 17, respectively, as well as on the following assumptions:

- Potential impacts of effluent discharge to biological resources will be limited to aquatic habitat and active channel, freshwater marsh, mule fat scrub, and southern willow scrub riparian habitats that are associated with the active low-flow channel from the SWRP outfall downstream to the point of percolation, approximately one mile downstream of the Los Angeles/Ventura County line.
- The quality of effluent discharged from the WRPs will remain the same for most constituents (dissolved oxygen, temperature, pH, conductivity, trace metals, etc.) because a similar treatment

**Table 18-1
SANTA CLARA RIVER FISH SPECIES VISUALLY OBSERVED OR SAMPLED**

DATE	TEMPERATURE (°F) ^a	LOCATION	FISH SPECIES OBSERVED/CAPTURED AND RELATIVE ABUNDANCE ^b
8/7/96	70	Highway 23 bridge near Fillmore	Partially-armored threespine stickleback - A Arroyo chub - VA Sucker (sp. unknown) - C
8/30/96	79	150 ft. downstream of the VWRP outfall, south bank	Mosquitofish - C Unarmored threespine stickleback - R
8/30/96	85	150 ft. downstream of the VWRP outfall, north bank	None
8/30/96	83	5 ft. downstream of the VWRP outfall	Mosquitofish - R
8/30/96	77	3 ft. upstream of the VWRP outfall	Unarmored threespine stickleback - VA Mosquitofish - VA Arroyo chub - A
8/30/96	71	Approximately 300 ft. downstream of McBean Parkway	Unarmored threespine stickleback - A Mosquitofish - VA Arroyo chub - A Santa Ana sucker - C
8/30/96	81	Approximately 600 ft. upstream of McBean Parkway	Mosquitofish - VA 1 stickleback (visual obs. by Haglund)
8/30/96	82	50 ft. downstream of the SWRP outfall	Mosquitofish - VA Arroyo chub - R

Notes: a) Ambient temperatures were approximately 75-95°F and 80-95°F on August 7 and August 30, respectively.
 b) Relative abundance defined as:
 R = rare
 C = common
 A = abundant
 VA = very abundant

process would be in place, and influent constituents concentrations would not vary significantly.

- Concentrations of ammonia in the effluent will decrease in the future with the inclusion of a nitrification-denitrification process as part of the recommended project.

Criteria for Determining Significance

This analysis assumes that the proposed project will have a substantial effect on biological resources if it results in any of the following:

- Any direct losses of individuals or habitats occupied by state- or federally-listed threatened or endangered species.
- A substantial loss of habitat available at the project site for state species of special concern, species that are candidates for listing under the ESA, and species listed by the CNPS as rare, threatened, or endangered.
- A substantial loss of a common natural community and an associated wildlife habitat.
- Fragmentation or isolation of significant wildlife habitats (e.g., riparian and wetland communities) or creation of a barrier to wildlife movement.

- A substantial increase of invasive species of plants or animals or the creation of a barrier to the normal replenishment of existing native species.
- A substantial adverse effect on important native communities (wetland and riparian communities).
- A conflict with federal, state, or city policies, such as those regarding wetland and riparian communities.
- A direct or indirect reduction in the growth, survival, or reproductive success of individuals of species listed or proposed for listing as threatened or endangered under the ESA or Cal-ESA.
- A direct or indirect reduction in the growth, survival, or reproductive success of substantial portions of federal candidate species; state-listed endangered, threatened, or special-concern species; or regionally important commercial or game species.
- A substantial reduction in the quality and quantity of important habitat for fish species or their prey species.

Analysis of Six Discharge Scenarios

The Santa Clara River supports a relatively large diversity of wildlife species. Riparian vegetation has a high habitat value for wildlife and many special-status wildlife species. Riparian vegetation also provides input of nutrients and other materials, which support aquatic organisms, and shade that prevents the heating of the river.

To analyze the biological effects of the proposed project, six flow scenarios were analyzed. This was necessary, since the actual level of future discharge to the Santa Clara River is unknown. Future discharge levels are dependent on population growth and reuse of reclaimed water. The rationale for developing each discharge scenarios is described in Chapter 16, Hydrology. Chapter 16 also includes water budgets

that were used to estimate the maximum depth, width, and mean channel velocity; effects on shallow groundwater; and quantity of aquatic habitats. The flow scenario analysis of Chapter 16 and the water quality analysis of Chapter 17 were used to determine the extent and quality of the habitats associated with the low-flow channel of the Santa Clara River.

The following sections describe the habitat conditions that would occur under each discharge scenario. For comparative purposes, the Existing Discharge Scenario is described first.

Existing Discharge Scenario

Under the Existing Discharge Scenario (SWRP: 5.7 mgd, VWRP: 9.3 mgd), the study area has perennial surface flow, maintained in part by SWRP and VWRP discharges. The WRP discharges maintain a near constant and higher groundwater level in the Alluvial Aquifer of the Eastern Groundwater Basin near the VWRP, causing the perennial reach to extend farther upstream than under historic conditions.

Under the Existing Discharge Scenario, the river corridor can be characterized by the following habitat types: aquatic, active channel riparian, and southern willow scrub riparian.

Aquatic habitat is defined by the limits of the live flow. During summer months, the river is approximately 8 feet wide and 8 inches deep above the VWRP discharge and 15 feet wide and 16 inches deep below the discharge. During the month of maximum flow, the river is approximately 30 feet wide and 2.5 feet deep above the confluence with Castaic Creek. Downstream of Castaic Creek, the river is approximately 40 feet wide and 3 feet deep.

Under existing conditions, sufficient aquatic habitat exists for self-sustaining populations of several fish species in the upper reaches of the Santa Clara River.

A gap in perennial flow between 9 and 15 miles long exists, preventing hybridization of the two subspecies of stickleback.

Existing treatment processes at the SWRP and VWRP do not include nitrification-denitrification.

The active channel, freshwater marsh, mule fat scrub, southern cottonwood/willow riparian forest, southern willow riparian woodland, and southern willow scrub occur as previously described in §*Riparian Habitats*.

No Discharge Scenario

Under the No Discharge Scenario (SWRP: 0.0 mgd, VWRP: 0.0 mgd), there would be significantly less surface water and aquatic habitat than under the Existing Discharge Scenario. The No Discharge Scenario represents the conditions that existed prior to the discharge of effluent from the SWRP and VWRP. On average, during the summer months there would be no flow between the SWRP and VWRP or between the VWRP and Castaic Creek, resulting in a loss of several miles of perennial aquatic habitat currently used by the unarmored threespine stickleback, Santa Ana sucker, and arroyo chub. Downstream of the confluence of Castaic Creek flows would remain perennial; however, the quantity of aquatic habitat would be about one-third the size of the current habitat. The resulting channel would be approximately 6 to 7 feet wide and 6 inches deep compared to the current channel width of 15 to 17 feet and depth of 16 inches. Because of the large inflow from Castaic Creek and rising groundwater there would be only a minor reduction in channel size and quantity of aquatic habitat during winter months when compared to the Existing Discharge Scenario. Although the water budgets show that there would be no flow under average conditions during the summer in these subreaches, the VWRP is located near the upper limits of the historic reach of rising groundwater. It is likely that there would be surface water and available aquatic habitat in some years,

depending on the climatic cycle and the groundwater levels in the alluvial aquifer. The gap of perennial flow would remain, preventing hybridization of the two subspecies of stickleback. The water quality would reflect the natural water characteristics as well as land uses within the basin.

The active channel riparian habitats, corresponding to the low-flow channel and recently deposited sandbars, would be somewhat larger in extent because of the reduction in aquatic habitat. However, dieback of early seral vegetation would occur earlier in the growing season. Southern willow scrub habitat would be somewhat smaller in extent because there would be reduced levels of shallow groundwater to provide a water source during the growing season. There would also be a reduction in mule fat scrub as well as loss of freshwater marsh habitat. There would be less impact to southern cottonwood/willow riparian forest and southern willow riparian woodland since the roots of the larger plants would still be within the subsurface saturated zone.

Reduced Discharge Scenario

Under the Reduced Discharge Scenario (SWRP: 5.0 mgd, VWRP: 4.6 mgd), habitats within the SWRP to VWRP subreach would be essentially the same as under the Existing Discharge Scenario. During summer months, the downstream subreaches aquatic habitat would be perennial but somewhat smaller than under the Existing Discharge Scenario. The channel width would be approximately 13 percent narrower and 15 percent shallower (3 feet and 3 inches, respectively). The gap in perennial flow would remain, preventing hybridization of the two subspecies of stickleback.

Since any significant amount of reuse would most likely occur well after the implementation of the proposed project, nitrification-denitrification is assumed under the Reduced Discharge Scenario. Consequently, the levels of ammonia being released

to the river would be reduced substantially, thereby providing an overall benefit to fish and other aquatic species.

The Reduced Discharge Scenario would result in a slight decrease in flows in the river during the dry season. Since substantial flows would still remain, no significant change to active channel, freshwater marsh, mule fat scrub, southern cottonwood/willow riparian forest, southern willow riparian woodland, and southern willow scrub would occur.

Permitted Discharge Scenario

Under the Permitted Discharge Scenario (SWRP: 6.5 mgd, VWRP: 12.6 mgd), the aquatic habitat in the SWRP to VWRP subreach would be somewhat larger than that under the Existing Discharge Scenario. The channel width would increase by 10 percent and the depth by 14 percent (approximately 1 foot and 1 inch, respectively). The downstream subreaches would also increase in depth and width, becoming approximately 15 percent wider and 15 percent deeper (3 feet and 3 inches, respectively) than under the Existing Discharge Scenario. Overall, the habitat for the special-status fish species might slightly increase. The increase in flow, however, would not be large enough to close the gap of perennial flow, and, therefore, hybridization of the two subspecies of stickleback would not occur.

Under the Permitted Discharge Scenario, it is assumed that treatment processes at the SWRP and VWRP would not include nitrification-denitrification.

As compared to the Existing Discharge Scenario, the extent of active channel riparian habitat would be smaller in order to accommodate the slightly larger low-flow channel. There may also be a slight increase in freshwater marsh habitat. Other riparian communities would remain similar in extent.

Recommended Project Discharge Scenario

Under the Recommended Project Discharge Scenario (SWRP: 6.5 mgd, VWRP: 27.6 mgd), aquatic and riparian habitats in the SWRP to VWRP subreach would be the same as under the Permitted Discharge Scenario. Aquatic habitat in the downstream subreaches would increase in depth and width, compared to the Permitted Discharge Scenario. The channel width would be approximately 46 percent wider and 46 percent deeper (7 feet and 7 inches, respectively) than under the Existing Discharge Scenario, potentially resulting in an increase in habitat for the unarmored threespine stickleback, Santa Ana sucker, and arroyo chub if an increase in channel braiding occurs. The increase in flow, however, would not be large enough to close the gap in perennial flow, and hybridization of the two subspecies of stickleback would not occur.

Nitrification-denitrification at the SWRP and VWRP is included under the Recommended Project Discharge Scenario. Consequently, the levels of ammonia being released into the Santa Clara River would be substantially reduced, thereby providing a benefit to fish and other aquatic species.

The active channel riparian habitat would be somewhat reduced in order to accommodate the larger low-flow channel. There would also be a slight increase in freshwater marsh habitat. Other riparian communities would remain similar in extent to that of the Existing Discharge Scenario.

Cumulative Discharge Scenario

Under the Cumulative Discharge Scenario (SWRP: 6.5 mgd, VWRP: 27.6 mgd, Newhall Ranch WRP: 5.0 mgd), the flow regime and channel size during summer months would be similar to the Recommended Project Discharge Scenario in the SWRP to VWRP and VWRP to Castaic Creek subreaches. From Castaic Creek to the gap in

perennial flow, the channel width would increase by 53 percent and the channel depth would increase by 35 percent (approximately 9 feet and 7 inches, respectively) from the Existing Discharge Scenario dimensions, potentially resulting in an increase in habitat for the special-status fish species. The increase in flow would not be large enough to close the gap in perennial flow, and hybridization of the two subspecies of stickleback would not occur.

Since nitrification-denitrification at the SWRP and VWRP is included under the Cumulative Discharge Scenario, the levels of ammonia being released into the river would be significantly reduced, resulting in a benefit to fish and other aquatic species.

The riparian habitats would remain similar to those of Recommended Project Scenario since the flows are assumed to only increase slightly under the Cumulative Discharge Scenario.

The Recommended Project

This section discusses the impacts of the construction and operation of the recommended project. The discussion for operational impacts addresses the potential range of discharges from the Reduced Discharge Scenario to the Recommended Project Discharge Scenario. The Cumulative Discharge Scenario is also addressed as required by CEQA. However, the No Discharge Scenario has been eliminated from further analysis because of its inherent adverse impact on the hydrology and biological resources of the Santa Clara River system, downstream of the WRPs. (Additional information regarding the impact of the No Discharge Scenario is provided in Chapter 16, Hydrology.)

VWRP Expansion Construction Impacts

Impact: *Potential for Loss of Riparian Vegetation and Wildlife Habitat at the VWRP.* The Stage V

expansion will occur within the footprint of existing VWRP facilities. Most of the Stage VI expansion will occur on a site that is adjacent to and directly north of existing VWRP facilities (referred to as the north parcel). The majority of this area is on a high terrace above the Santa Clara River floodplain that is dominated by disturbed ruderal habitat. The remainder of the north parcel is on a low terrace and is dominated by an old stand of southern cottonwood/willow riparian forest.

Southern cottonwood/willow riparian forest occupies a low terrace above the active floodplain and therefore has developed an understory primarily of non-native grasses. The overstory is dominated by old-growth Fremont cottonwood trees, and the understory consists of ripgut brome, wild oat, Jimson weed, horehound, and occasional blue elderberries. Small patches of big sagebrush scrub are found interspersed in this community, primarily along the fence line that delineates the north parcel's western boundary. This community covers approximately 1 acre on the north parcel, of which 0.6 acre is within a conservation area.

The southern cottonwood/willow riparian forest has high value for wildlife, especially wildlife associated with mature trees. Wildlife species observed foraging or roosting in the cottonwoods include the red-shouldered hawk, American kestrel, American crow, and Nuttall's woodpecker. Because the cottonwood forests lacked a shrub layer, no shrub-dependent wildlife species were observed.

Construction activities related to the proposed recommended project would result in the direct loss of approximately 0.4 acre of southern cottonwood/willow riparian forest. This impacted area is outside a conservation easement previously granted to DFG by Districts Nos. 26 and 32 to protect the southern cottonwood/willow riparian forest. Additionally, because the riparian vegetation that will

be affected is found on the upper slope and is part of a wider band of southern cottonwood/willow riparian forest, potential exists for disturbance of this habitat type outside of the development footprint.

Because of the high values for wildlife habitat provided by riparian habitats and because of statewide losses of this habitat, the southern cottonwood/willow riparian habitat at the VWRP site is considered a sensitive biological resource locally, regionally, and statewide. Furthermore, some riparian areas may be regarded as wetlands by DFG, which has a policy of no net loss of wetland habitat (California Fish and Game Commission, 1987). For these reasons, the loss of riparian vegetation and wildlife habitat is considered a significant impact on biological resources.

Mitigation Measure 18-1: *Replacement of Lost Cottonwoods at a 3:1 Ratio.* Cottonwoods will be planted between the proposed retaining wall along the north parcel of the VWRP and the Santa Clara River within six months after construction of the retaining wall.

Mitigation Measure 18-2: *Revegetation of Riparian Areas Disturbed by Construction.* Districts Nos. 26 and 32 have already preserved much of the cottonwood/willow riparian habitat through the establishment of a conservation easement granted to DFG. Any loss or disturbance of riparian habitat will be outside of this easement. Loss and disturbance of riparian habitat will be minimized by restricting access during construction activities to the area that will be directly affected and by reducing the probability of erosion on the slopes and subsequent sedimentation in the riparian habitat below. Riparian areas disturbed by construction will be revegetated within six months of the completion of the proposed recommended project.

Impact: *Potential for Loss of Ruderal Area at the VWRP.* Ruderal habitat is found on the high terrace

and occupies 2.4 acres, the majority of the expansion site. This area has undergone frequent disturbance in the past and, as a result, is dominated by weedy, non-native forbs and grasses. Common plant species include Russian thistle, prickly lettuce, wild mustard, riggut brome, and tree tobacco. Piles of concrete and rubble and numerous dirt roads are found throughout the ruderal habitat.

This portion of the expansion site has low wildlife value because of the minimal cover, the dominance of non-native forbs and grasses, and compacted soil. During the field survey, only regionally and locally common wildlife species were observed, including western fence lizards, mourning doves, American crows, California towhees, lesser goldfinches, house finches, and house sparrows. Approximately 2.4 acres of ruderal areas would be disturbed by construction activities. This impact is considered less than significant because ruderal areas are dominated by non-native, invasive plant species and do not support any special-status species.

Mitigation: No mitigation is required.

Impact: *Potential for Loss of Foraging Habitat and Disturbance to Least Bell's Vireos, Southwestern Willow Flycatchers, and Western Yellow-Billed Cuckoos at the VWRP.* Although several recent records exist of least Bell's vireos from the Santa Clara River, including several singing males near Piru and one from San Francisquito Canyon, this species has not been observed during protocol-level field surveys at the VWRP or in the immediate area. Southwestern willow flycatchers and western yellow-billed cuckoos also have not been observed during intensive field surveys. This may be because of the lack of understory shrubs and small trees from stream scouring by previous floods. Construction is unlikely to adversely affect individual least Bell's vireos, southwestern willow flycatchers, and western yellow-billed cuckoos. Migrating or foraging Bell's vireos,

willow flycatchers, and yellow-billed cuckoos could pass through the site, or these birds could nest outside the project area. A minor amount (0.4 acre) of riparian vegetation would be removed by construction of the project. Although this vegetation could be used by migrating vireos, willow flycatchers, and cuckoos for foraging, any effects on these individuals would be temporary and limited to minor harassment; therefore, this impact is considered less than significant.

Mitigation: No mitigation is required.

Impact: *Potential for Impacts on Other Special-Status Wildlife Species at the VWRP.* Because of the past disturbances and habitat degradation at the project site, no other special-status wildlife species are expected to inhabit the project site. Therefore, this potential impact is considered less than significant.

Mitigation: No mitigation is required.

VWRP Expansion Operations Impacts

Impact: *Potential for Loss of Established Riparian Vegetation and Wildlife Habitat from Prolonged Inundation.* The anoxic conditions created by prolonged inundation can stress the metabolic processes of riparian plants, causing a loss of vigor or mortality. However, the limited increase in the width of the live stream that would be experienced under the Recommended Project Discharge Scenario or even the Cumulative Discharge Scenario would not be sufficient to create these adverse conditions. In fact, the limited increase in the width of the live stream could result in an increase in vegetation along the low-flow line and may be beneficial. The growth of riparian plants would improve due to slightly higher groundwater levels that provide the water needed to sustain newly established vegetation. The Reduced Discharge Scenario would also have no effect on the

riparian vegetation. This impact is considered less than significant because no reduction in the amount of riparian vegetation and riparian wildlife habitat will result.

Mitigation: No mitigation is required.

Impact: *Potential for Loss of Established Riparian Vegetation and Wildlife Habitat from Scouring.* Scouring during catastrophic flood flows is a natural part of the riparian ecosystem. Scouring removes riparian vegetation and wildlife habitat and introduces gross changes in channel capacity and morphology, in effect “resetting” riparian succession near the river channel. If the velocity of effluent flows down the Santa Clara River were high enough, such flows could also remove riparian vegetation. The hydrology analysis indicates that average velocity under low-flow conditions might increase slightly with the Recommended Project Discharge Scenario and Cumulative Discharge Scenario but would be much lower than velocities that commonly occur during winter runoff events and would not scour vegetation. This is considered less than significant because no loss of riparian vegetation and wildlife habitat will result from this process. Reduction of flow during low flows is not expected to impact riparian vegetation, because adequate flow will remain to maintain riparian habitat.

Mitigation: No mitigation is required.

Impact: *Potential for Reduction in Reproductive Success of Riparian Vegetation.* Successful plant regeneration requires germination, establishment, and survival. For riparian plants, these three processes depend on the timing and duration of fluvial events, water-holding capacity of the substrate, nutrient content of the substrate, and relative elevation of substrate surface with respect to the low-flow channel. The timing and duration of fluvial events are factors that could be affected by the proposed

discharges. After winter floodwaters recede in late spring and early summer, fresh alluvium is deposited on channel banks and the floodplain. The extent of flooding during spring flows is important because it has a strong effect on the dispersal and distribution of riparian trees and shrubs that release seed in spring, most of which will not germinate or survive the first growing season. The floodwater recession and deposition of sediment fines (e.g., silts and clays) coincide with seed dispersal and the period of germination for most of the dominant tree and shrub species on the Santa Clara River.

Establishment of woody riparian species, including cottonwoods and willows, typically occurs along the low-flow line of recently deposited or scoured banks and gravel bars where bare areas have been created and a moist subsurface provides a water source during the growing season for seedlings. Cottonwoods and willows release seed relatively rapidly; the seeds have a short seed viability and must have immediate contact with moist soil in order to germinate.

The hydrological analysis (Chapter 16) indicates that the effluent discharges for the Recommended Project Discharge Scenario and Cumulative Discharge Scenario would not have a detectable effect on peak flood flows. Because the duration of peak flows would not be increased, the germination and establishment cycles of the riparian plant species would not be affected. Additionally, increasing the flow under the cumulative discharge alternative would result in only a 4- to 6-foot increase in the width of the live stream during non-peak flow periods. The habitat where this inundation would occur consists primarily of sand and gravel deposits of the active channel highly suitable for early successional riparian habitat. Thus, the amount of shoreline area suitable for early succession plants would not change appreciably. Instead, the shoreline would shift two to three feet farther from the centerline of the low-flow channel. This impact is

considered less than significant because substantial losses of riparian vegetation and wildlife habitat would not occur.

Under the Reduced Discharge Scenario, there will be a moderate reduction in current flows. This reduction in flows is not expected to affect riparian vegetation and a less than significant impact is anticipated.

Mitigation: No mitigation is required.

Impact: *Potential for Reduction in Special-Status Plant Species.* Special-status plant species would not be affected by the proposed changes in effluent discharge. Two special-status plants are found in the riparian habitats associated with the upper Santa Clara River: the slender-horned spineflower and Nevin's barberry. Since both of these special-status plants grow in the drier, outer zones of the riparian system, they would not experience any changes in hydrology associated with the proposed effluent discharges. This impact is considered less than significant.

Mitigation: No mitigation is required.

Impact: *Potential for Water Quality Impacts on Riparian Vegetation.* An increase in effluent discharge from expanded operations at the VWRP could result in the river taking on greater characteristics of the treated effluent during low-flow periods. Because the VWRP produces tertiary effluent that meets water quality standards similar to those established for drinking water, an increase in discharge is not expected to cause substantial effects on the growth or vigor of riparian vegetation. This impact is considered less than significant.

Mitigation: No mitigation is required.

Impact: *Potential for Loss of Riparian Special-Status Wildlife Species.* Because the riparian

vegetation would not be substantially affected by changes in effluent discharge rates, special-status wildlife species that occupy the riparian zone would not be adversely affected. These species include the arroyo southwestern toad, California red-legged frog, western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, southwestern pond turtle, coast patched-nosed snake, two-striped garter snake, south coast garter snake, and California yellow warbler. This impact is considered less than significant because no substantial impacts would occur on riparian special-status wildlife species.

Mitigation: No mitigation is required.

Impact: *Potential for Water Quality Impacts on Aquatic Special-Status Wildlife Species.* Increased discharge of effluent would result in the river water quality becoming more characteristic of the discharged effluent during low-flow months. Water quality could adversely affect the reproduction and survival of three special-status aquatic wildlife species, including the arroyo southwestern toad, California red-legged frog, and southwestern pond turtle. Water quality degradation could substantially reduce hatching success of arroyo toad or red-legged frog young and increase mortality or survivability of tadpoles, which could lead to local population reductions of these species. Tadpoles, however, are produced in the spring where natural streamflow would have greater influence on water quality. Pond turtle young could be affected by chronic ammonia toxicity. The proposed project includes the addition of nitrification-denitrification that would substantially reduce the levels of ammonia. Furthermore, dissolved oxygen concentrations would not be reduced, water temperatures would not be substantially increased, and turbidity and chlorine levels should remain low, since the proposed treatment facilities are similar to those currently in use. Therefore, potential water quality impacts on the

arroyo toad, red-legged frog, and pond turtle are considered less than significant.

Mitigation: No mitigation is required.

Impact: *Potential for Hybridization of Special-Status Fish Species.* A gap in perennial flow separates the populations of unarmored threespine stickleback and the partially-armored threespine stickleback. During most months, the gap begins approximately one mile downstream of the Los Angeles/Ventura County line and extends about 15 miles downstream. In very wet years, this gap may be reduced to nine miles. Under historic and existing conditions the gap is only closed during flood flows when velocities are relatively high. During flood events most resident fish seek cover to avoid being washed downstream. It is unlikely stickleback would be moving upstream during a flood event because they are not strong swimmers. The gap in perennial flow would need to be closed for a substantial period of time during a low flow period to allow upstream migration and possible hybridization. If hybridization occurred, the gene pool for the endangered subspecies could be lost.

The hydrological analysis performed for this project (Chapter 16) addresses the potential for increased effluent discharge scenarios to close the gap or to prolong the closure of the gap for an extended period of time. The hydrologic analysis found that under the Cumulative Discharge Scenario, total WRP discharges to the river would be approximately 60 cfs (39.1 mgd), which is less than one percent of the highest recorded daily mean flow of 7,900 cfs (5,100 mgd) (March 2, 1983) and less than 0.10 percent of the largest instantaneous flow of 68,800 cfs (45,000 mgd) recorded on January 25, 1969. Because the VWRP and SWRP discharges would not contribute measurably to normal flood flows that are required to close the gap in perennial

flow, discharges associated with the project would not contribute to hybridization of special-status fish species. Therefore, the impact is considered less than significant for all scenarios.

There would be no effect on the Santa Ana sucker or arroyo chub for all scenarios considered because both species are found above and below the gap in perennial flow. No effect to steelhead trout would result, because steelhead runs occur within the Santa Clara River and Sespe Creek downstream of the gap in perennial flow.

Mitigation: No mitigation is required.

Impact: *Potential for Loss of Physical Habitat Associated with Flow Regime.* Increasing discharge of effluent during low-flow periods could potentially change the overall habitat quality, from a physical perspective. The hydrologic analysis has shown that the Recommended Project Discharge Scenario would result in an increase in mean channel width of approximately 46 percent (7 feet), maximum depth of 46 percent (7 inches), and mean channel velocity of 29 percent (0.5 fps). Even though the flow would be substantially wider, deeper, and faster than that occurring previously during low flow periods, a similar quantity of edge habitat would remain. Pool habitat would deepen and faster and deeper mid channel habitat would be created. Because there would be no loss of edge habitat and pool habitat that are preferred by the stickleback and sucker, respectively, there would be a less than significant impact on these fish species.

The Reduced Discharge Scenario would slightly reduce summer flows associated with treated effluent discharge. This change would not substantially reduce the physical habitat for the species and, therefore, would result in a less than significant impact.

Mitigation: No mitigation is required.

Impact: *Potential for Water Quality Impacts on Fisheries.* Increased discharge from the VWRP would result in the river water quality becoming more characteristic of that of the effluent. Water quality impacts are described in detail in Chapter 17. However potential water quality concerns related to fisheries habitat are reviewed below.

In all flow scenarios analyzed, the river water quality mirrors the quality of the discharged treated effluent during low flow conditions. Therefore, the water quality discussion reflects all flow scenarios.

■ *Ammonia:* Ammonia is found in effluent from the VWRP. The most toxic form of ammonia is non-ionized ammonia, or NH_3 . Ammonia has both acute and chronic effects on fish. Fish do not appear to have the ability to detect or avoid toxic concentrations in the water (Baird and Hamilton, 1991). As a result, fish gills, the point of contact, can be rapidly affected by toxic levels of ammonia. Exposure to concentrations of ammonia that are not acutely toxic may result in chronic effects. The chronic effects of ammonia to the fish and other aquatic species are not well known. However limited data show that the chronic effects of ammonia are manifested by reduced growth rates, damaged organs and gills, increased cardiac output and respiration, loss of equilibrium, reduced hatching success, and a predisposition to bacterial gill disease (Colt et al, 1979; EPA, 1986).

The potential exists that a major catastrophic event such as an earthquake could result in the release of untreated or partially treated effluent that has a concentration of ammonia that is acutely toxic. Fish with prior contact to ammonia seem to have an increased tolerance to acute concentrations of ammonia. Therefore, these fish may be more

tolerant of short-term, high concentrations of ammonia, which could occur under a catastrophic event (Russo et al, 1988). Although an emergency release could result in a significant adverse impact, the recommended project would not substantially increase the risk or probability of occurrence compared to the existing conditions.

The RWQCB's Basin Plan has both 1-hour and 4-day receiving water limits for ammonia, which vary with both temperature and pH. Currently the discharge from the VWRP regularly exceeds the 4-day limit but does not exceed the 1-hour limit. The RWQCB has given the Districts until mid-2003 to either meet the Basin Plan's receiving water limits for ammonia or obtain site-specific limits based on ammonia toxicity studies. Preliminary toxicity studies conducted by the Districts using EPA-specified, surrogate fish species in ambient river water have indicated a likely toxic effect due to the presence of ammonia in the effluent. Consequently, the modification of existing facilities to include nitrification-denitrification at the VWRP has been included as part of the recommended project (see Chapter 7, Summary of the Recommended Project, for the details of the nitrification-denitrification process).

Because the recommended project includes the addition of nitrification-denitrification to the proposed facilities at the VWRP, a substantial reduction in the levels of ammonia being released into the Santa Clara River would result. Therefore, this is considered a beneficial impact.

- *Temperature:* As the temperature of water increases, its capacity to retain dissolved oxygen decreases. This may, in turn, increase the toxicity of ammonia. Furthermore, although the Santa Clara River contains warm water-tolerant species and cool water species that have adapted to the conditions of the Santa Clara River, the tempera-

ture of the effluent may exceed the optimal level for the resident fish in later summer months. Fish may respond to less than optimal conditions by moving to a more suitable habitat, if available. However, when a significant portion of a river has high temperatures, the ability of fish to avoid these conditions is reduced, leading to stress, which, in turn, may reduce the fish's growth, survival, or reproductive success.

The Chapter 17 water quality analysis, which was based on six years of monthly receiving water and effluent monitoring, determined that during most months, effluent temperatures are typically higher than those of the receiving water. However, the effluent temperatures during the early summer months are approximately the same or even lower than that of the receiving water. The water quality analysis projected that the recommended project would result in a maximum increase in average daily receiving water temperature of approximately 0.5°F from March through October. During November through February the average daily receiving water temperature would be increased by 2.5°F to a maximum of 72°F, which is within the range of temperatures preferred by special-status fish species.

Therefore, the recommended project would result in only a slight and temporary decrease in habitat suitability immediately downstream of the discharge point during the summer months. Furthermore, the receiving water temperature objectives set forth by the RWQCB's Basin Plan would continue to be met. Consequently, this impact is considered less than significant.

- *Dissolved Oxygen:* The water quality objectives specified in the RWQCB's Basin Plan require that effluent not depress dissolved oxygen concentrations below 5.0 mg/l in order to protect the beneficial uses of the Santa Clara River. VWRP

receiving water monitoring data indicate that monthly average dissolved oxygen concentrations vary between 5.9 mg/l and 8.0 mg/l, which is above the discharge limits and the physiological threshold for most warm water fish species.

The expanded facilities would utilize a treatment process similar to that of the existing facilities (with the exception of the nitrification-denitrification upgrade). It is, therefore, likely that the future effluent would have a similar dissolved oxygen concentration as that of the existing effluent, and the Basin Plan's dissolved oxygen water quality objective would continue to be met. Since the recommended project would maintain the current dissolved oxygen levels, thereby resulting in no threat to fish populations, this impact is considered less than significant.

- *Turbidity:* Increased turbidity may affect the feeding success of visual feeders such as the stickleback. A higher level of discharge could directly increase turbidity levels in the receiving water if the effluent itself has a high turbidity level. Effluent monitoring data from the VWRP indicate that the turbidity of the effluent has consistently been between 1.0 and 2.0 NTUs, thereby meeting the NPDES permit limit. This limit is intended to preserve the beneficial uses of the river, which include warm water and endangered species habitats. Because the recommended project would include the same treatment process that is currently utilized at the VWRP, it is anticipated that a similar level of turbidity would exist in the future effluent (Chapter 17).

A higher level of discharge could also indirectly increase the turbidity of the receiving water by mobilizing riverbed materials. Since the increase in level of discharge would occur gradually over time, it is unlikely that bed materials would be mobilized. As described in Chapter 16, the active

channel is reformed on an annual basis by flood flows and would expand to accommodate increases in base flow.

Therefore, since it is unlikely that the project would increase turbidity or adversely affect visual-feeding fish, this impact is considered less than significant.

- *Chlorine:* Chlorine has a profound toxic effect on fisheries and other aquatic species. Dechlorination is currently part of the VWRP treatment process and will be part of the recommended project. Water quality reporting data from the VWRP indicate that residual chlorine levels have been maintained at levels below the 0.1 mg/l objective specified in the RWQCB's Basin Plan to protect beneficial uses of the river.

The potential exists that a major catastrophic event such as an earthquake could result in the release of untreated or partially treated effluent. In that event, the Districts may be required to release effluent that has not been dechlorinated. Although an emergency release could result in a significant adverse impact, the recommended project would not substantially increase the risk or probability of occurrence compared to the existing conditions.

It is unlikely that the project would increase residual chlorine levels or adversely affect aquatic habitats. Therefore, this impact is considered less than significant.

The Santa Clara River provides habitat for a variety of fish species, including the special-status unarmored threespine stickleback, Santa Ana sucker, and arroyo chub. The recommended project will have a beneficial impact on fisheries due to a reduction in effluent ammonia levels. The water quality impacts on fisheries in terms of temperature, dissolved oxygen, turbidity, and chlorine are considered less than significant.

Mitigation: No mitigation is required.

SWRP and VWRP Upgrade Construction Impacts

Impact: *Potential for Impacts on Riparian Vegetation, Special-Status Plants, and Special-Status Wildlife Species.* The proposed upgrades at the SWRP and VWRP are minor in nature and would occur within the footprint of existing facilities. There is no riparian vegetation, special-status plant or wildlife species located in the vicinity of the facilities to be upgraded at either the SWRP or VWRP. Therefore, this impact is less than significant.

Mitigation: No mitigation is required.

SWRP and VWRP Upgrade Operations Impacts

Impact: *Potential for Impacts on Special-Status Plant, Wildlife, and Fish Species.* The proposed upgrades would lower the ammonia concentrations of the treated effluent discharged from the SWRP and VWRP, thereby improving the receiving water quality. Special-status plants with potential to exist along the upper Santa Clara River include the slender-horned spineflower and Nevin's barberry. Since both of these plants grow in the drier, outer zone of the river system, neither would be impacted by changes in water quality. Riparian habitats provide ideal habitats for many special-status wildlife species. Because the riparian vegetation would not be adversely affected by the improved water quality, special-status wildlife species that occupy the riparian zone would not be adversely affected. Special-status fish species include the unarmored threespine stickleback, Santa Ana sucker, and arroyo chub. Since preliminary results of ongoing toxicity tests suggest that high ammonia levels may adversely affect these fish species, a reduction in ammonia through nitrification-denitrification would be beneficial. Therefore, the operations impacts

associated with the proposed upgrades at the SWRP and VWRP are considered less than significant in terms of special-status plant and wildlife species and beneficial in terms of special-status fish species.

Mitigation: No mitigation is required.

Biosolids Disposal and Reuse Impacts

Impact: *Potential for Adverse Effects on Biological Resources at Future Disposal and Reuse Sites.* Expansion of the VWRP would lead to a proportional increase in the quantity of biosolids that must be managed. However, the Districts will continue its policy of using only those sites that are properly permitted and for which all site-specific impacts, including adverse effects on biological resources, have been addressed as required by federal, state, and local regulations. Therefore, this impact is considered less than significant.

Mitigation: No mitigation is required.

No Project Alternative

Under the No Project Alternative, discharge to the Santa Clara River from the WRPs of the SCVJSS could be increased to the permitted treatment capacity of 19.1 mgd. The hydrological analysis in Chapter 16 indicates that a total discharge of 19.1 mgd would increase the river's width and depth by approximately 1 foot and 1 inch, respectively. However, increased discharge could be offset by increased reuse. Regardless, hydrological impacts to the biological resources of the Santa Clara River system are considered less than significant.

The water quality analysis in Chapter 17 concluded that existing effluent ammonia concentrations may be of concern with regard to potential chronic and toxic effects on the fish species populating the reach of river downstream of the SWRP and VWRP outfalls.