Swimming Upstream: Restoring the Rivers and Streams of Coastal Southern California for Southern Steelhead and other Fishes

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Prepared for the Southern California Steelhead Recovery Coalition

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American Whitewater Association, California Trout, Center for Biological Diversity, Clean Up Rincon Effluent, Conception Coast Project, Ecology Center for Southern California, Endangered Habitats League, Environmental Defense Center, Friends of the Los Angeles River, Friends of the River, Friends of the Santa Clara River, Friends of the Ventura River, Heal the Bay, Keep the Sespe Wild Committee, Mailbu Resouces Conservation District, National Audubon Society (Buena Vista Chapter), National Audubon Society (Palomar Chapter), Natural Resources Defense Council, Pacific Coast Federation of Fishermen's Association, San Diego Trout, Santa Barbara SEA, Santa Monica Mountains Conservancy, Sierra Club (Angeles Chapter), Sierra Club (San Diego Chapter), Sierra Pacific Fly Fishers, Surfrider Foundation, Surfrider Foundation (Ventura Chapter), The Audubon Center, Trout Unlimited and Wilderness Fly Fishers

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PART I. EXECUTIVE SUMMARY

Southern California is home to the southernmost extant populations of steelhead rainbow trout. These fish possess unique adaptations, represent an important part of the state's anadromous resources, and serve as vital indicators of the overall health of the aquatic ecosystems of Southern California coastal watersheds. Until the listing of southern steelhead as an endangered species under the Federal Endangered Species Act (ESA), scant attention had been paid to these unique and magnificent fish. While renewed attention has been focused on the almost forgotten populations, there continues to persist an imbalance in the effort being made to restore California anadromous fish heritage. The Southern California Steelhead Recovery Coalition (SCSRC) has been created as a vehicle to mobilize the interests, energies, and political will of the Southern California community on behalf of these resources. As part of this effort, the SCSRC has identified steelhead as the key to restoring the full range of fish fauna of Southern California aquatic systems and their watersheds, and identified basic priorities in accomplishing these goals. These include: focusing on restoring fish passage to historic spawning and rearing areas, addressing watershed wide degradation of aquatic ecosystems, and ensuring adequate representation of Southern California interests in all state and federal programs designed to address the recovery of steelhead in California.

PART II. INTRODUCTION

Rivers and streams have often been described as the "arteries and capillaries of the earth," providing the pathways for water and nutrients essential for all life. Indeed, healthy "riparian ecosystems nourish and sustain the most complex and important food chains in nature, distributing nutrients, carrying off waste, pulsing with life. They are the breeding grounds, the nurseries, and the habitat for a bewildering variety of species, and they are the natural systems most vulnerable to the destructive impacts of human development." (Bolling, 1994) Rivers and streams maintained in their wild state not only sustain complex ecosystems, they also provide valuable fisheries, recreation opportunities, urban amenities, natural flood protection mechanisms, and spectacular beauty. (Bolling, 1994)

Despite their many values, the rivers and streams of California have been under siege for over a century, and the many species they support have been greatly diminished or driven to extinction as a result. Perhaps the most spectacular example of the destruction of California's aquatic systems is the Los Angeles River which, from its beginnings in the suburbs of the San Fernando Valley to its mouth at the Pacific Ocean, is almost entirely lined with 50 miles of concrete. Geographer, Blake Gumprecht in the first comprehensive history of the

Los Angels River, described the river's features before they were all but obliterated by the vast urban sprawl which has blighted much of Southern California:

Three centuries ago, the river meandered this way and that through a dense forest of willow and sycamore, elderberry and wild grape. Its overflow filled vast marshlands that were home to myriad waterfowl and small animals. Steelhead trout spawned in the river, and grizzly bears roamed its shores in search of food. So lush was this landscape and so unusual was it in the dry country that the river was a focus of settlement long before the first white man set foot in the area.

In the artificial landscape that is contemporary Los Angeles, where even the palm trees have been imported, perhaps nothing symbolizes the role of human beings in changing the face of the earth more than the exploitation and transformation of the Los Angeles River.

Recently, efforts to restore wild salmon runs in the Pacific northwest have captured public attention. In an effort to support this process, the Sierra Club has conducted a public education campaign for four “Rules for Recovery.” These four rules, known by the acronym W.I.L.D., focus on Watershed protection, maintenance of In-stream flows, enforcement of Laws such as the Endangered Species Act and the California Forest Practices Act, and Dam removal and modification.

This report focuses on the rivers and streams of Southern California (from the Santa Maria River in Santa Barbara County to the Santa Margarita River in San Diego County), and the endangered and threatened fish species these waterways support throughout their ancestral range. While reports of salmon in Southern California are anecdotal, we do have well documented runs of steelhead, an anadromous trout which is a member of the salmonid family. Southern California also supports several other species of unique native freshwater fish deserving protection.

In Southern California as a whole, biologists have historically identified 38 native freshwater taxa of fish, and 23 brackish or estuarine species which depend on low-salinity water for at least part of their life. (Swift, et.al., 1993) According to Camm Swift and his colleagues, “all of the native freshwater... species are extirpated or severely reduced in numbers within their native range.” and some of the brackish or estuarine species are “also extinct or much reduced in range.” (Swift, et.al., 1993) And most of the native species of the Colorado River drainages (of California) declined severely or were extirpated many years ago. (Swift, et.al., 1993)

There are also many non-native species of fish which have been introduced to Southern California, often with damaging results for native fauna. Swift, et.al. estimate roughly 100 non-native or introduced fish species in Southern California. The list breaks down as follows: white sturgeon, wakasagi, northern pike,

cutthroat trout, golden trout, silver or coho salmon, chinook salmon, kokanee salmon, brown trout, brook trout, american shad, threadfin shad, shortfinned eel, mexican tetra, goldfish, common carp, grass carp, lahontan tui chub, california roach, sacramento squawfish, hitch, blackfish, splittail, golden shiner, red shiner, fathead minnow, california sucker, bigmouth buffalo, channel catfish, oriental weatherfish, inland silverside, rainwater swordtail, southern platyfish, variable platyfish, striped bass, white bass, bigscale logperch, yellow perch, walleye, sacramento perch, largemouth bass, smallmouth bass, redeye bass, spotted bass, green sunfish, bluegill, pumpkinseed, redear, warmouth, white crappie, black crappie, orangemouth corvina, bairdella, yellofin goby, chameleon goby, blue tilapia, Mozambique tilapia, redbelly tilapia, tule perch, interior prickly sculpin. "About 25 additional freshwater fish have been placed in southern California waters, caught once, and never seen again. Additional species documented include 28 marine and freshwater fishes introduced into the Salton Sea, 16 freshwater fishes taken from bait dealers along the lower Colorado River, and aquarium species captured once near fish farms or in warm springs. These bring the total number of introductions to at least 100 and probably more for Southern California..." (Swift, et.al., 1993)

In an essay published before her death, Writer Elna Bakker identified 11 distinct bioregions in California.[1] (Bakker, E. 1994) The region covered in this report corresponds roughly to the South Coast bioregion, which includes all or most of Los Angeles and Orange Counties, the southern and eastern portions of Ventura County, the coastal half of San Diego County, and portions of Riverside and San Bernardino Counties (primarily in so far as the headwaters of coastal rivers occur in the mountainous areas of those counties). However, this report also includes rivers and streams found in northern Ventura County and Santa Barbara County.

1. The 11 bioregions identified were the North Coast/Klamath, Modoc, Sacramento Valley, Northern Sierra, Bay Area/Delta, Southern Sierra, San Joaquin Valley, South-Central Coast, Mojave Desert, South Coast, and Colorado Desert.

PART III. THE ENDANGERED AND THREATENED FISHES OF COASTAL SOUTHERN CALIFORNIA.

1. Overview:

Swift, et.al., list 38 taxa of freshwater fish which have been identified historically in Southern California. Of these, many have been extirpated. Table 1 lists only the nine freshwater fish that are identified as maintaining populations in the coastal drainages of Southern California south of Santa Barbara County, and ignores inland desert fishes. Of these nine fishes, additional information has been reported here on the Southern Steelhead, the Santa Ana sucker, and the tidewater goby.

Table 1: Status of Freshwater Fishes of Coastal Southern California

Fish	Status
Southern Steelhead and rainbow trout	Southern Steelhead and native rainbow trout comprise a single, interbreeding population. Native rainbow trout are not only the same taxon as southern steelhead, but are part of the same population in streams where they occur with steelhead. Historically, steelhead populations existed south to mid-Baja California. Today Steelhead have nearly the same distribution as the Pacific Lamprey in Southern California. South of Pt. Conception the following streams have records: Gaviota, Mission, and Atascadero Creeks, Ventura and Santa Clara Rivers, and Mulholland, Big Sycamore, Malibu and Topanga Canyon streams. Historically, fish also entered streams farther south, including Los Angeles, San Gabriel, Santa Margarita, San Luis Rey, San Diego and Tijuana Rivers, and San Onofre and San Mateo Creeks. Recently, steelhead have again been reported in San Mateo Creek.[a] It is listed as Endangered under the federal Endangered Species Act.
Pacific Lamprey	Still maintains runs in parts of the Santa Maria and Santa Ynez Rivers, parts of the Ventura River, the Sespe Creek portion of the Santa Clara River drainage, and the lower, unimpounded reach of Malibu Creek. Its habitat requirements are similar to those of steelhead.
Arroyo Chub	It is common at three localities within its native range, namely the Santa Margarita River and its tributary, De Luz Creek, in Trabuco Creek below O'Neill Park, in San Juan Creek and Malibu Creek. It is present but scarce in Big Tujunga Canyon, Pacoima Creek above Pacoima Reservoir, and in the Sepulveda Flood Control Basin, Los Angeles River drainage, upper San Gabriel River drainage, and middle Santa Ana River tributaries between Riverside and the Orange Co. line. Native populations have become reduced enough to deserve close monitoring to maintain or improve their status.
Santa Ana Speckled Dace	One of the rarest native freshwater fish in coastal Southern California. It is abundant only in the lower parts of the East, North, and West Forks of the San Gabriel River. Small populations existed in Fish Canyon (a small tributary of the San Gabriel River), and Lytle, Cajon, City, Strawberry, Mill, and Silverado Creeks, tributaries of the Santa Ana River system. Fish could not be found in 1990-1992 in Big Tujunga and Santiago Creeks despite thorough search.

Table 1: Status of Freshwater Fishes of Coastal Southern California

Santa Ana Sucker	Native populations still exist in the East, North, and West forks of the San Gabriel River, and in the lower Santa Ana River from about Mt. Roubidoux downstream to a few miles below Imperial Highway. In Southern California the Santa Ana sucker is distributed very much like the Santa Ana Speckled Dace, but in larger streams. It formerly was native in the uplands and lowlands of the Los Angeles Basin streams, now it is restricted to the uplands of the Los Angeles and San Gabriel systems, and conversely to the lowlands of the Santa Ana system. Fish became very rare in the Big Tujunga drainage in 1900-1992 and may soon be extirpated from the Los Angeles River drainage. Large introduced populations occur in the Santa Clara River. In the Sespe Creek area some hybridization with dusky suckers occurs. Genetic contamination does not extend to the isolated Soledad Canyon area upstream. This area is a possible refuge for Santa Ana suckers since it is becoming rare in its native range. It has been proposed for listing as threatened under the federal ESA.
Partially Armored Threespine Stickle-back	This subspecies appears to be widespread north of Point Conception, but to the south has been declining rapidly in recent years. Many local populations no longer exist, and it is possible many of these are gone permanently. The fish is found in the Ventura River, Santa Clara River, Calleguas Creek, San Juan Creek, San Mateo Creek, Santa Margarita River, San Luis Rey River, and four localities in northern Baja California. South of the Los Angeles Basin, the only recent records are from Trabuco Creek, in and below O'Neill Park, upper San Juan Creek near the mouths of Hot Spring and Cold Spring canyons; upper reaches of Bell Canyon on Starr Ranch (all in the San Juan Creek drainage); and from the South Fork of the San Jacinto River below Lake Hemet in San Diego County.
Unarmored Threespine Stickle-back	Originally widespread in the Los Angeles basin, but is now restricted to a 14 km stretch of the Soledad Canyon portion of the Upper Santa Clara River and upper San Francisquito Canyon. State and Federally endangered.
Tidewater goby	Found in the Ventura and Santa Clara Rivers, Malibu Creek (reestablished, 1991) San Onofre Creek, Las Pulgas Canyon, and Santa Margarita River. In Sept. 1992, a few were seen in Cockleburr Canyon, a site that lacked them on many previous visits since 1980. Only 14 localities exist south of Point Conception. Tidewater gobies have disappeared from many localities and rarely recolonize, and are a listed endangered species under the federal ESA.

a. See "Fish Find has Experts Jumping," *San Diego Tribune*, March 10, 1999.

2. Southern Steelhead (*Oncorhynchus mykiss irideus*):

Steelhead, members of the Salmonid family, are rainbow trout with a life cycle similar to that of a salmon. They are an anadromous species: born and reared in freshwater streams, as juveniles they migrate to estuaries, adjust to saltwater, and then migrate to the ocean to mature into adults. After spending one to three years foraging on the food sources of the Pacific, large adult steelhead, some reaching 20 pounds, they generally return to their home streams – some to the very pools of their birth – driven upstream by the instinct to reproduce. Unlike salmon, steelhead do not necessarily die after spawning and may make the spawning journey more than once. And, unlike juvenile salmon that typically migrate to the ocean after just a few months of freshwater rearing, juvenile steelhead reside in coastal streams from one to three years. As such, steelhead

use all segments of a river or stream system to complete the freshwater phase of their life-history: estuaries to acclimate to salinity changes, the middle reaches of the main stem to reach tributaries, and headwaters tributaries to spawn and rear. Steelhead require cool, clean water year-round to sustain themselves. (McEwan and Jackson. 1996, and California Trout, 1996) In addition, they need cool, clean well-oxygenated water flowing over clean gravel to breed and develop. Under natural conditions, these habitat requirements - especially suitable water temperatures - occurred primarily in the headwater tributaries, which is why adult steelhead migrate higher into a river system to spawn than do other anadromous fish species.

Interruption of the water regime through water extraction, introduction of silt from erosion due to road building or other hillside construction activities which destroy steelhead spawning beds and smothers developing eggs, and blockage of fish passage as a result of dams, have all contributed the decline of Southern California steelhead,. In addition, dams and water management activities often restrict steelhead spawning and rearing to lower elevation stream reaches where summer water temperature is often too high for juvenile rearing.

The southern steelhead has been chosen as the focus of our campaign to restore the river and stream ecosystems of Southern California. It is the most charismatic of our Southern California fish, because of its size, strength, and steel-blue coloring. It is especially valued by anglers for its beauty and speed. Most importantly, however, because the steelhead inhabits an entire river ecosystem, and requires clean, cool water year-round, it makes an excellent “indicator species” of the Southern California aquatic ecosystems (and related watersheds). If we have healthy runs of steelhead, we almost certainly have healthy rivers and streams.

However, the steelhead is also a hardy species. Their habitat once extended from Alaska down to northern Baja California. In California, most steelhead spawn from December through April, often making their way past normally dry sections of rivers, small streams, and tributaries during the winter rainstorms that increase in-stream flows. This ability to migrate, spawn, hatch, rear, and mature in subsequently hydrologically isolated and marginal aquatic environments until the next storm event re-establishes a migration corridor between the inland and marine environment makes the steelhead uniquely able to exist in the southern extent of their range.

The Santa Ynez River, near Solvang, was once considered to have the highest population of steelhead in Southern California. In fact, in 1944 the California Department of Fish and Game (DFG) found approximately 1 million juvenile steelhead trapped in a drying portion of the river. Today, the number of adult steelhead in the Santa Ynez is probably less than 100. Today the steelhead's range is sometimes thought to extend no farther south than Malibu Creek, where a silt-choked Rindge Dam blocks steelhead from migrating upstream. However,

recent discoveries of steelhead in San Mateo Creek, on the border of Orange and San Diego Counties, has confirmed the ability of the steelhead to repopulate areas of its historic range significantly south of Malibu Creek, where steam conditions improve either because of man-made habitat modifications, or as in the case of San Mateo Creek, because of natural habitat improvements such as increased rainfall and run-off.[1]

Unfortunately, if the steelhead is an excellent indicator species, like the proverbial canary-in-a-coal-mine, then it is telling us that our rivers and streams are in serious trouble. Statewide, steelhead populations have declined by over 90% since the 1950s and the Southern California population has declined by 99% since the turn of the century. In addition, they have been extirpated from at least 23 streams and their historic range has been significantly reduced. (Titus R.G. et al.,1994)

When Europeans came to California, the situation for the steelhead began to deteriorate. Impassable barriers like dams cut off the headwaters where steelhead like to spawn and rear their young. Gold-mining in the Central Valley watersheds, logging in the North Coasts forest, and agricultural and residential development in Southern California filled streams with sediments which destroyed steelhead spawning beds and smothered developing eggs. Pollution from municipal and industrial waste discharges robbed the fish of clean water. Coastal estuaries were drained or filled in, taking away important rearing habitat and the transition zone where steelhead make the physiological transition between salt and freshwater. According to the National Marine Fisheries Service (NMFS), twenty-three stocks of steelhead trout have become extinct this century, and another 43 (including the southern steelhead) face a moderate to high risk of extinction. The most pervasive reasons: habitat loss and degradation.[2]

Inaccessibility due to impassable barriers is the primary reason for the decline of southern steelhead. (Titus R.G. et al.,1994) Table 2 below is a listing of streams with barriers that block or impede access for steelhead.

1. The “reappearance” of steelhead in San Mateo Creek may be a repopulation but a lack of consistent monitoring may have overlooked or assumed the steelhead had vacated the stream.

2. Much of this information has been compiled from a Nov. 30, 1998 L.A. Times article, “Extinction of Special Fish May Hit a Snag,” by Steve Hymon, and from the *Steelhead Restoration and Management Plan for California* by Dennis McEwan and Terry Jackson.

Table 2: Migration Barriers to Southern California Steelhead

County River/Stream	Dam/Barrier	County
Santa Ynez	Bradbury Dam	Santa Barbara
Santa Ynez Barbara	Gibraltar Dam	Santa Barbara
Santa Ynez Barbara	Juncal Dam	Santa Barbara
Gaviota Creek	Road stabilization structures	Santa Barbara
Mission and San Jose creeks	Debris dams and impassable flood control channels	Santa Barbara
Gaviota Creek south to Ventura River	Numerous Hwy 101 culverts	Santa Barbara & Ventura
Santa Paula Creek	Harvey Dam	Ventura
Ventura River	Casitas Dam	Ventura
Ventura River	Robles Dam	Ventura
Ventura River	Matilija Dam	Ventura
Santa Clara River	Santa Felcia Dam	Ventura
Santa Clara River	Vern Freeman Diversion	Ventura
Calleguas Creek	Road stabilization structures	Ventura
Malibu Creek	Rindge Dam	Los Angeles
Arroyo Sequit Creek	Un-named dam	Los Angeles
Arroyo Sequit Creek south to Topanga Creek	Numerous Hwy 101 culverts	Los Angeles
San Juan Creek	Road crossings	Orange
Santa Margarita River	Road crossings	San Diego
Sweetwater, Palo Verde and Loveland dams	Sweetwater River	San Diego
Otay River	Upper & Lower Otay dams	San Diego
San Diego River	San Vicente, El Capitan, Helix and Cuyamaca dams	San Diego
Pauma Creek	Road Crossing	San Diego
San Luis Rey River	Henshaw Dam	San Diego
San Dieguito River	Sutherland and Hodges dams	San Diego
San Mateo Creek	Road Crossing	San Diego
Tijuana River	Moreno and Barrett dams	San Diego

In several Southern California streams such as Matilija Creek and the Santa Ynez River, in Santa Barbara and Ventura counties, wild rainbow trout are stranded upstream behind the silted-up Matilija Dam, or above the series of Santa Ynez River dams. Geneticists tell us that these fish are indistinguishable

from steelhead found below the dams. (Nielsen, Jennifer L. et al. 1994, and Nielsen, Jennifer L. 1996)

Because of its hardiness, and its ability to re-colonize, the reservoir of fish in the marine environment, many biologists and ecologists express a guarded optimism that the southern steelhead will not be lost. The 1999 return of steelhead to San Mateo Creek and the Santa Ynez River provides evidence that they will return, if habitat conditions are restored. These distinct steelhead have survived this long, they note, and there is still good spawning and rearing habitat left in Southern California watersheds, particularly in the relatively protected Los Padres, Angeles and Cleveland National Forests. "Those fish went to places you would never believe there were fish," said Forest Service biologist Sara Chubb. "There seems to be something inherently bred in their genetics that makes them want to go further, to keep repopulating." [1]

The problem, however, is that steelhead often cannot get to the habitat. As an example, Solstice Creek is a small perennial stream on National Park Service land flowing from the Santa Monica Mountains to Malibu. However, a culvert under Pacific Coast Highway prevents steelhead from reaching it. In Matilija Creek, in Ventura County, wild rainbow trout are stuck upstream behind the silted-up Matilija Dam. What would happen if their path were again clear? After 50 years, would they show anadromy and run to the sea? Sespe Creek, north of Fillmore in Ventura County, is the last major free-flowing stream in Southern California. Steelhead once migrated 80 miles up the Santa Clara River and Sespe Creek system. Today, most of the creek lies within a federally protected Wilderness and Wild and Scenic River area. However, fish have difficulty reaching the Sespe because it drains into the Santa Clara River, which suffers from dewatering, waste discharges, fish passage impediments, and historic gravel mining operations.

These are only three instances among many in Southern California where access has been denied to historically important steelhead spawning and rearing areas in headwater areas. Still, there is good reason to believe that if we take action to remove dams, check water pollution, and rectify land use abuses in watersheds, the steelhead will return to their historic spawning grounds.

1. Quoted in 11/30/98 *Los Angeles Times* story, "Extinction of Special Fish May Hit a Snag," by Steve Hymon.

3. The Santa Ana Sucker: (*Catostomus Santaanae*):

The Santa Ana sucker has large thick lips and a small mouth used to "vacuum" algae and invertebrates from stream beds. It is about 6 inches long and has a dark, blotchy back and silvery underside. The Santa Ana sucker inhabits small, shallow streams and is most abundant where the water is cool, clean and clear."[1]

On January 26, 1999 the U.S. Fish and Wildlife Service proposed the Santa Ana sucker for threatened status under the federal ESA. The petition to list the sucker was filed by the Earth Justice Legal Defense Fund on behalf of a coalition of groups. The fish has a historic range that roughly corresponds to the Los Angeles metropolitan area, but has been extirpated from 75% of its historic range.

Common as recently as the 1970s, the Santa Ana sucker is now found in only four Southern California locations. According to the US Fish and Wildlife Service, small isolated populations of the sucker occur in the San Gabriel River, the Santa Ana River, and the Big Tujunga Creek. An introduced population also occurs in the Santa Clara River drainage system in Ventura and Los Angeles counties. All four rivers have dams that isolate and fragment the remaining populations, and "likely have resulted in some populations being excluded from suitable spawning and rearing tributaries."[2]

Much of the remaining range of the Santa Ana sucker is imminently threatened by urban encroachment, introduction of exotic predators and competitors, degraded water quality, other anthropogenic factors (e.g. human recreation, dam operations), and/or small populations and associated genetic concerns.[3]

A U.S. Fish & Wildlife press release also identifies water diversions, channelization, and concrete lining of streams, as well as erosion, debris torrents, and pollution as causes degrading or destroying Santa Ana sucker habitat. "Because the species is very fertile and tolerates a broad range of habitats, its decline indicates the severity of the impacts."[4]

Further, according to the Fish and Wildlife Service proposed listing rule, the Seven Oaks Dam, "now under construction upstream from the present range of the Santa Ana sucker, in the Santa Ana River, will prevent further upstream movement of the fish and further isolate the Santa Ana sucker populations from

1. From U.S. Fish and Wildlife Service Fact Sheet issued to accompany announcement of proposed ESA listing of Santa Ana Sucker as threatened.
2. From rule proposing threatened status for Santa Ana Sucker, *Federal Register*, Vol. 64, No. 16, p. 3917.
3. From U.S. Fish & Wildlife Service Fact Sheet issued to accompany announcement of proposed ESA listing of sucker as threatened.
4. News Release 99-02, dated January 26, 1999, quoting Fish & Wildlife Service Pacific Regional Director Anne Badgley.

their native range in the headwaters of the system." The Center for Biological Diversity has filed a lawsuit against the Army Corps of Engineers over the impacts of the nearly completed Seven Oaks Dam on endangered species in the Santa Ana River.

4. Tidewater Goby: (*Eucyclogobius newberryi*)

The tidewater goby is a small grey-brown fish with dusky fins, found in the brackish waters of California's coastal estuaries, wetlands and lagoons. The tidewater goby is the only known species in its genus, Eucyclogobious, and is endemic to California. The goby is a short-lived species, with a majority of individual completing their life cycle within one year. Successful recruitment is dependent on an adequate amount of spawning habitat and a suitable salinity regime during the reproductive and rearing period. Spawning is most common from spring to mid-summer when most California estuaries are naturally closed to the ocean and exhibit low-salinity brackish water conditions. The tidewater goby spend its entire life-cycle within the estuary, though there are records of fish moving sever miles upstream in some low gradient streams.

Historically, tidewater gobies could be found from the mouth of the Smith River, Del Norte County, near the Oregon Boarder, to as far south as San Diego County. Tidewater gobies are uniquely adapted to coastal lagoons and to the uppermost brackish zones of larger estuaries and are entirely dependent upon these habitats for their survival. Populations of tidewater gobies have suffered decline mirroring the degradation of California's coastal wetlands. It has been estimated that approximately 75-90% of the original estuarine wetland acreage of California has been lost since 1850. Of the 110 sites from which tidewater gobies shave bee historically reported, many no longer support tidewater goby populations. In response to this population decline, the tidewater goby was listed as an endangered species in 1994. Some of the factors most responsible for the decline in tidewater goby populations are the encroachment of development, channelization of coastal streams, diversion of surface flows, groundwater extraction, importation of point and non-point sources of pollution (including sedimentation), and the introduction of exotic species of plants and fishes. Remaining habitat is threatened by a wide variety of on-going habitat modifications, including artificial breaching of sand and cobble berms which seasonally form at the mouth of most estuaries and create the necessary brackish water conditions. Artificial breaching, particularly during the spring and summer, and fall months, causes rapid fluctuations in water salinity levels, as well as in the amount of suitable habitats.

The classification of tidewater goby as a federally endangered species has focused attention on California estuaries, particularly often overlooking small estuaries at the mouths of coastal streams.[1] As one of the few species in California that is restricted to low salinity brackish water habitat, the tidewater goby indicator species component of the estuarine community. The tidewater goby's

decline can be an important indication of the general and ecological functioning of California remaining estuaries.

5. Unarmored and Partially Armored Three Spine Stickleback: (*Casterosteus spp.*)

The three spine stickleback is a small freshwater fish which was once widely distributed throughout Southern California. Because it has occupied a variety of habitats, it has diversified into a number of distinct sub-species, and sub-populations. The partially armored three spine stickleback is widespread north of Point Conception, but the south has been declining rapidly due to habitat degradation and loss, and the introduction of introduced predatory exotic species as well as inter-breeding with introduced populations from different drainages.

The unarmored three spine stickleback was original widespread and abundant in the Los Angels Basin. Currently, it is restricted to a 12 mile section of Soledad Canyon of the Upper Santa Clara River (Ventura County) and upper San Francisquito Canyon (Los Angeles County). There is also an isolated, introduced populations outside of the historic range in San Felipe Creek in San Diego County. The unarmored stickleback has been subjected to the same threats as the partially armored sub-species, and illustrates the vulnerability of the native fish fauna of Southern California.

The recovery of three spine unarmored stickleback (listed as endangered under state and federal Endangered Species Acts) has focused primarily on protecting the existing population in Soledad Canyon, and again illustrates the need for more pro-active, aggressive recovery efforts for the endangered fish fauna of Southern California.

PART IV. Problems Affecting Southern Steelhead and the Environment

1. Fish Passage Impeded by Barriers

In 1996 the California Department of Fish and Game produced an excellent summary of both the status of, as well as the challenges facing steelhead restoration through the state. The DFG's *Steelhead Restoration and Management Plan for California* (Plan) emphasizes the urgency and priority the state should direct towards southern steelhead: (McEwan and Jackson. 1996)

1. Unfortunately, in 1999 the United States Department of Interior announced its intention to remove the tidewater goby from the endangered species list. Available scientific evidence clearly indicates that the tidewater goby still remains vulnerable to extinction and that delisting the species is premature.

> *"Southern steelhead stocks are the most jeopardized of all of California's steelhead populations; numbers have declined drastically in nearly all southern streams."* (McEwan and Jackson. 1996) (emphasis added)

> *"South coast management focus will be on recovering these stocks from impending extinction and this will be the highest priority for DFG steelhead management."* (McEwan and Jackson. 1996) (emphasis added)

Both the DFG and experts have determined that the single greatest limiting factor holding hostage the recovery of southern steelhead is the network of regional dams and other fish passage barriers. According to Dr. Robert Titus,

> *"...the results reflect the fact that steelhead are no longer able to reach important upstream reproduction and nursery areas in most of the major coastal drainages south of the San Francisco Bay (e.g. the Salinas, Carmel, Santa Maria, Santa Ynez, Ventura, Santa Clara, Los Angeles, San Gabriel, Santa Ana, San Diego, and Tijuana river drainages, among others)."* (Titus R.G. et al, 1994)

The DFG's Plan lists the major steelhead passage problems which must be overcome to recover Southern California steelhead. For example, the vast majority of ancestral spawning and rearing habitat on the Ventura River exists above two dams, the Robles Diversion and Matilija Dam. Before these were built in 1959 and 1948 respectively, 2,500 adult steelhead were thought to be produced by the excellent aquatic ecosystems of the Ventura River and its prime tributary, Matilija Creek. (Casitas Municipal Water District, et al. 1998)

Table 3: Southern California Steelhead Passage Issues (McEwan and Jackson 1996)

Watershed	Project	Plan Page
Santa Ynez River	Fish passage at Bradbury Dam	197
Ventura River	Fishway at Robles Diversion	203
Ventura River	Fishway or dismantle Matilija Dam	204
Malibu Creek	Dismantle Rindge Dam	209
Santa Barbara Coast	Fish passage at PCH and Rincon Creek	200
Santa Barbara Coast	Fish passage at Gaviota Creek	200

2. Agency Planning and Staffing

Until the listing of southern steelhead as endangered under the ESA, little attention (including staffing and capital improvement restoration projects) was given to the Southern California region. As a result, there is a notable shortage of biologist with anadromous fish training or experience to address the myriad instances of illegal take of fish, as well as loss or degradation of habitat. The DFG Restoration and Management Plan identified a number of restoration and management actions, but does not identify staffing or funding level to accom-

plish these actions. (See additional discussion below) It is therefore imperative that the Department prepare a staffing/organizational chart, and create a report of annual implementation costs to address many of the other actions detailed in the plan. Given the DFG's current limited staff resources on the South Coast developing a comprehensive set of strategies and strategic staffing position may not be possible at this juncture.

To avoid lost time, we would request the Department develop cost estimates for the following management actions, including staffing and operational/support:

Table 4: DFG Management Actions (McEwan and Jackson. 1996)

Watershed	Project	Plan Page
South of Los Angeles	Habitat assessment on waters south of LA[a]	210
South of Los Angeles	Restoration potential waters south of LA	210
Malibu Creek	Available habitat	209
Santa Clara River	Santa Paula Creek habitat assessment	206
Santa Clara River	Vern Freeman monitoring to verify facility	206
Ventura River	Habitat assessment for Coyote & San Antonio Creeks	204
Santa Barbara Coast	Assess PCH stream crossing for fish passage	201
Santa Ynez River	Seek water releases from Bradbury Dam	197

a. Habitat assessment would also include instream flow assessments on all southern rivers subject to licensed water diversions.

While estimating these project costs is the initial step in the implementation process, a number of projects and issues await more direct DFG attention.

Santa Barbara County

A. Upcoming water rights hearing on the Santa Ynez River

DFG is currently involved with cooperative studies, but at a low level and no personnel are dedicated full time to this important issue.

B. Fish passage in Gaviota Creek

Some preliminary work to modify road stabilization structures has been done, but the project is currently dead. No DFG personnel are currently working on this.

C. Fish passage on Mission Creek

Project needs to be initiated, currently no DFG personnel are involved.

Ventura County

A. Robles Diversion Dam Fish Ladder and Fish Screens Project

Project is currently underway. DFG personnel from Sacramento are working on this as they have time, as is the local biologist, along with their many other duties. No DFG personnel are dedicated to this full-time.

B. Matilija Dam removal

DFG is currently involved, but at a very low level and no personnel are dedicated full time. The project suffers from lack of involvement by DFG.

C. Instream flow study of theVentura River

D. Project needs to be initiated, currently no DFG personnel are involved.

E. Vern Freeman fish ladder assessment

F. It is unknown whether this multi-million dollar fish ladder, which is located downstream of all steelhead habitat in this system, is able to pass adult steelhead. No DFG personnel are currently involved in this and the project needs to be initiated.

G. Harvey Dam fish Ladder (underway)

DFG engineers and local biologist are adequately involved in this.

Los Angeles County

A. Fish passage on Arroyo Sequit and other Santa Monica Mountains streams

Project needs to be initiated, currently no DFG personnel are involved.

B. Rindge Dam removal

DFG was involved in this, but currently no staff is working on this. Project is apparently stalled due to lack of involvement by affected agencies. Project needs to be re-initiated, currently no DFG personnel are involved.

Orange County

A. Fish passage evaluation on San Juan Creek

Project needs to be initiated, currently no DFG personnel are involved.

B. The six foot vertical drop on the concrete bridge abutment on Trabuco Creek, where it passes under I-5.

Project needs to be initiated, currently no DFG personnel are involved

San Diego County

A. Habitat assessment and fish population monitoring on San Mateo Creek

This project has taken on much importance with the discovery of steelhead in San Mateo Creek this year. However, monitoring by the DFG local biologist, who has many other duties, is opportunistic and non-intensive. A study plan needs to be developed and a more standardized and intensive monitoring protocol needs to be implemented. This would probably occupy a single biologist at least half-time.

B. Fish passage evaluation on the Santa Margarita River

Project needs to be initiated, currently no DFG personnel are involved

Regional

A. Fish population monitoring on coastal streams south of the L.A. basin.

Project needs to be initiated, currently no DFG personnel are involved. Southern extent of steelhead populations is often reported as Malibu Creek. However, no population monitoring is currently taking place anywhere south of Malibu Creek, with the exception of a low-level effort in San Mateo Creek, so steelhead usage of these streams is unknown. Given that this is an important ESA issue, intensive monitoring of these streams needs to be initiated.

B. Assessment/feasibility of captive breeding/rearing on the Ventura River, Santa Paula Creek, and other southern California streams.

Project needs to be initiated, currently no DFG personnel are involved. With the implementation and completion of several fish ladder projects, it is possible that captive breeding/rearing may need to be implemented to reestablish steelhead populations in newly accessible habitat. DFG needs to begin an assessment of this and a feasibility/cost analysis if captive breeding/rearing is deemed appropriate. This would probably occupy a single biologist at least half-time.

C. Upcoming Federal Energy Regulatory Commission relicensing issues

DFG personnel are involved on a case-by-case basis, however, no one is dedicated full-time to this for Southern California.

The DFG is involved in several southern steelhead issues, but with the exception of one or two issues, not at the level that they need to be. DFG staff working on these issues are located in Sacramento or are Regional biologists that have many other duties besides southern steelhead restoration and protection. The sheer magnitude of the tasks described in the above table requires that DFG dedicate at least two biologists to work full time on southern steelhead issues. Given their public trust mandate, DFG should be the lead agency on all of these issues.

In addition to the DFG, NMFS should be much more involved in biological studies and monitoring, given their ESA responsibilities. Currently, NMFS staff in Long Beach have been focused almost exclusively on permitting issues, and virtually nothing has been done for protection, recovery, or research. NMFS should involve their fishery scientists located at the Southwest Region Fisheries Science Center in Tiburon, California in monitoring and research on southern steelhead. We believe that their efforts and scientific expertise, working cooperatively with the DFG, would greatly assist in providing baseline biological

information and answering some of the more pertinent questions about the status of the populations.

To strengthen relationships with the public, we encourage the DFG (and other agencies) to seek public/private partnerships as a means to maximize public trust benefits, including efforts for improved public access to local waters for monitoring purposes.

3. Political Indifference

There is a growing public concern over the health of California's salmon and steelhead populations. Yet a review of the current political landscape -- and actions -- to recover Southern California steelhead cause us concern.

- No new state steelhead biologists have been hired for the Southern California region even though the California Department of Fish and Game has declared the Southern California steelhead the most important population to restore.
- No Southern California steelhead advocate has been appointed to serve on the California Advisory Committee on Salmon and Steelhead Trout, which advised the DFG Director and the Legislature on steelhead recovery needs, priorities and programs.
- No Southern California legislative official advocating steelhead recovery is appointed to the Joint Committee on Fisheries and Aquaculture, which plays a crucial role in insure proper funding, policy, and program implementation occurs in the annual state budgeting cycle.
- Of the $37 million dedicated by the DFG to salmon and steelhead restoration, less then $1 million (2.5%) has been spent in Southern California.
- $43 Million in state salmon and steelhead funds are largely being directed toward Northern California salmon and steelhead recovery, with little being spent in Southern California for this purpose.
- Of the $6.7 million in federal money budgeted for steelhead and salmon programs in California, the national Marine Fisheries Service has dedicated less the 4 percent for southern steelhead.
- $20 Million in the federal "Pacific Coast Salmon Recovery" funds are being divided by state legislation, but as much as 90% of these funds will be used in Northern California.
- No coordinated efforts to elevate public awareness or to create a centralized information sharing system has been created by government, organizations or individuals.
- The Resources Agency has announced a new major program to create a coastal anadromous restoration program, but all meetings to date have occurred in Northern California.
- No legislation is proposed to resolve these inequities.

- No regional system has been established by like-minded groups or individuals concerned about the fate of steelhead to share information, expertise, talent, joint litigation or political support.
- No collective efforts have been organized to seek individual project funding support for grassroots efforts, group coordination, research, coalition building or any other mutually beneficial efforts.

4. Inadequate Administration Of the Esa Protective Measures

The listing of the southern steelhead as an endangered species under the federal Endangered Species Act was only the first step along the way to the ultimate goal of delisting. The listing also call for the identification of "critical habitat" necessary for the recovery of the species, and the development of a recovery plan to guide recovery actions. To date, the National Marine Fisheries Services has done neither.

Currently, ESA protections only extend south to Malibu Creek, despite documentation of steelhead adults and juvenile steelhead in streams south of Malibu Creek, such as in Topanga and San Mateo Creeks. Due to water diversions, barriers, and urbanization, these fish are even more endangered than those north of Malibu Creek. We are committed to seeing that NMFS acts responsibly in their promulgation of the ESA to protect these populations throughout their historical range.

While a rule for designating critical habitat has been proposed and has be circulated for comment, no decision has yet been made on the adoption of a final rule. Further, the proposed rule excludes virtually all of the original historical spawning and rearing grounds above existing fish passage barriers, and therefore ignores the single most important cause of the decline of steelhead in Southern California. Neither has the National Marine Fisheries Service initiated the development of a recovery planning process to guide recovery efforts.

Additionally, the southern boundary of the Southern California Evolutionarily Significant Unit (ESU) has been arbitrary and artificially limited to the Malibu Creek drainage, despite historic records of steelhead distribution south of Malibu, and the recently documented presence of juvenile steelhead in San Mateo Creek (San Diego County).

The Southern California Steelhead Recovery Coalition believes it is prudent to assign a high priority to recovery efforts on southern steelhead. For one thing, the vast majority of the state's populous reside in this region. Finalization of the critical habitat rule (including extension of the critical habitat to include prime spawning and rearing habitats above existing impassable barriers), extension of the southern ESU boundary to include coastal watersheds and streams south through San Diego County, and the active development recovery plans will be essential to the restoration of steelhead in Southern California.

PART V. RECOMMENDATIONS FOR RIVER & STREAM RESTORATION & STEELHEAD RECOVERY

The Southern California Steelhead Recovery Coalition recognizes the importance of the state and federal recovery efforts in other regions of California. Accordingly, we are calling for development of a "new and improved" mission for the Department of Fish and Game, the National Marine Fisheries Service, and government in general, to expand their present role to encompass new vision consistent with biological reality which meets the needs of the whole state in the 21st century.

Fortunately for Steelhead, California has passed its assessment phase. From a state government perspective, the February 1996 authorization of the *Steelhead Restoration and Management Plan for California* has provided leadership to move the focus from assessment to planning and implementation. From a federal perspective, the August 1997 listing of Southern California steelhead, under the Endangered Species Act, means a shift from diagnosis to restoration actions. We are certain government's role as trustee should not be diluted by engaging in more assessment, but meaningful recovery efforts instead. Such an aggressive approach will not only focus state and federal agencies in California, but advance ecologically and economically important steelhead biodiversity of the state.

On this basis, the Southern California Steelhead Recovery Coalition proposes the following ten-point plan of action:

1. A representative of the Southern California Steelhead Recovery Coalition should be immediately granted a position on the California Advisory Committee on Salmon and Steelhead Trout.
2. The Joint Committee on Fisheries and Aquaculture should include a member familiar with and committed to the needs of Southern California steelhead recovery.
3. The Secretary of Resources should act immediately to include Southern California in the agency's new major effort to create a coastal anadromous restoration program.
4. The DFG should initiate a budget change proposal to hire two biologists in Southern California who will be dedicated to the recovery of the region's steelhead.
5. The National Marine Fisheries Service and the California Department of Fish and Game should jointly produce a prioritized and coordinated Southern California steelhead recovery program. Both agencies should be committed to fund the recommendations of this program. In addition, NMFS should involve their Southwest Science Center scientific staff in working cooperatively with the DFG on monitoring, research, and recovery planning.

6. Effort to increase steelhead passage above existing dams needs urgent attention. Both Matilija and Rindge dams should be acknowledged for what they are -- public nuisances -- and dismantled.
7. The National Marine Fisheries Service must shift its efforts from reactionary to proactive. The agency should simultaneously reconsider its initial critical habitat decision neglecting historic spawning and rearing habitat above dams and barriers throughout Southern California and it should take immediate action to expand the boundaries of Southern California steelhead to include San Mateo Creek and other southerly coastal waters.
8. The National Marine Fisheries Service should take appropriate action to provide ESA protection for all native rainbow trout in anadromous waters.
9. The Southern California Steelhead Recovery Coalition should continue to emerge as a regional body advocating recovery.
10. Public awareness and education should become an important function of the Southern California Steelhead Recovery Coalition. Every effort should be made to initiate a speaker's bureau, Web page and other means of disseminating information to the public, government and media.

Selected References

There is a growing literature on the freshwater aquatic resources of Southern California, and the approaches to riverine and watershed restoration and management. The selected references below include not only those used directly in preparing this report, but contain extensive bibliographic references which provide further guides to the issues addressed here.

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