Salmon and Steelhead in Your Creek: Restoration and Management of Anadromous Fish in Bay Area Watersheds

Presentation Summaries
(in order of appearance)

Gary Stern, National Marine Fisheries Service

Steelhead as Threatened Species: The Status of the Central Coast Evolutionarily Significant Unit

Under the federal Endangered Species Act (ESA), a "species" is defined to include "any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." To assist NMFS apply this definition of "species to Pacific salmon stocks, an interim policy established the use of "evolutionarily significant unit (ESU) of the biological species. A population must satisfy two criteria to be considered an ESU: (1) it must be reproductively isolated from other conspecific population units; and (2) it must represent an important component in the evolutionary legacy of the biological species.

The listing of steelhead as "threatened" in the California Central Coast resulted from a petition filed in February 1994. In response to the petition, NMFS conducted a West Coast-wide status review to identify all steelhead ESU's in Washington, Oregon, Idaho and California. There were two tiers to the review: (1) regional expertise was used to determine the status of all streams with regard to steelhead; and (2) a biological review team was assembled to review the regional team's data. Evidence used in this process included data on precipitation, annual hydrographs, monthly peak flows, water temperatures, native freshwater fauna, major vegetation types, ocean upwelling, and smolt and adult out-migration (i.e., size, age and time of migration).

Steelhead within San Francisco Bay tributaries are included in the Central California Coast ESU. Currently, abundance is at about 15% of the abundance of the 1960's. Hatchery fish from Big Creek (Northern Santa Cruz) are considered part of the ESU but are not listed, while fish from Warm Springs hatchery are not considered part of the ESU since the eggs were brought from Washington and Oregon. Rainbow trout above the reservoirs on San Lorenzo and Alameda Creeks are genetically closer to the steelhead below the reservoirs than to other nearby stocks.

Several factors are used to evaluate the level of risk to an ESU and decide if it should be listed under the ESA. These factors include abundance, spatial and temporal differences, historical numbers, carrying capacity of the habitat areas, human and natural impacts, threats to population integrity and recent events. Central California Coast steelhead are listed as threatened. Along with a listing, NMFS is required to designate critical habitat at the time of listing or within 12 months. Critical habitat is not necessarily all of an organism's habitat but the portion that is essential to the survival of the species. In determining critical habitat, NMFS looks at habitat requirements such as space, shelter, food, riparian vegetation, passage, substrate, and water velocity, temperature, quantity and quality. Indian tribal lands are exempt from the critical habitat designation.

Section 7 of the ESA provides for the review of federal actions by NMFS and Fish and Wildlife Service to ensure federal actions are not likely to jeopardize the continued existence of listed species. ESA Section 4(d) allows promulgation of special regulations that provide for the conservation of threatened species. NMFS has published a 4(d) rule that allows local governments to achieve assurance that their activities are compatible with conservation of listed species. (Section 9 of the ESA defines take as: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt such actions.) Under the July 2000 4(d) rule, there are 13 exemptions from take regulations including habitat restoration, on-going scientific research, rescue and salvage actions, fish management, joint tribal/state plans, routine road maintenance and others.

Dr. Jennifer Nielsen, U.S. Geological Survey

DNA Sleuthing in Urban Streams: Using molecular genetics to identify native Steelhead

Salmon are an interesting organism that has developed strategies to exist even in highly urbanized settings. This talk addresses how genetics can be used to inform us about those strategies.

Genetics was originally applied to fisheries issues for extraction purposes as opposed to conservation. From the 1960's to the present, genetics applications in fisheries have evolved to include:

- hatchery broodstock development;
- genetic stock identification;
- molecular phylogeography;
- hybrid analysis;
- conservation genetics; and
- ESA listing for salmon.

Genetics provides two primary tools for use in analyzing Evolutionarily Significant Units (ESU). The first tool, mitochondrial DNA, is based on the matriarchal lineage and has given us a picture of how salmonid populations diverged since the Pleistocene when they were confined to glacial refugia. The second tool, microsatellite DNA, reflects “recent” molecular diversity. This tool has been used to highlight the highly polymorphic nature of salmonids and test hypotheses related to ESU's.

There are several common misconceptions regarding genetics in general including:

- What genetic features represent natural selection versus what are neutral genetic markers
- Different Temporal and Spatial Scales
- Genes as Objects vs. Genes as Tools: society will have to decide how to apply genetics in problem-solving
- Belief there’s a gene for everything: some characteristics are not explained by genes

One of the big questions we are attempting to answer is: Are genetic patterns the result of ancient divergence among refugia or recent gene flow? Mitochondrial DNA techniques showed a cline of genotypes in Eastern Pacific steelhead that led to the listing of steelhead in the Southern California ESU. Samples from the Ventura River, from various locations on the California coast held at the California Academy of Sciences, and from other sources also helped illustrate the distribution pattern of West Coast steelhead. The analysis showed that the fish populations from which the samples came were different and led to my belief that there were glacial refugia in the Gulf of California and the Bering Sea during the Pleistocene.

Our studies in Alaska have yielded several interesting results. First, we see four life histories among rainbow trout in our study area. Since no genetic divergence is detected between the different morphs, we believe that life history divergence precedes genetic diversity. The picture we have is one where identical genes can lead to different life histories within the same population due to varying environmental conditions. Even siblings may adopt different life history strategies resulting from environmental cues that changed during the period between the emergence of two individuals from the gravels. Future efforts should lead to an ecosystem-based understanding of life history structure and provide for a diversity of watershed and ocean habitats that salmonids can use.

In closing, I offer the following observations. First, the old models are wrong; we are not creating fish only for harvest. We need to create a multitude of habitat opportunities that fish can occupy. Next, what we know about salmonid life history and salmonid genetics are not in opposition. Life history models should be refocused to accept human interaction with the landscape. Finally, local adaptation is important at the ESU scale. We need to retain geographic identity or ESU status for stocks based on broad biogeographic structure.

Mr. Gordon Becker, Center for Ecosystem Management and Restoration

An Overview of Steelhead and Salmon in Bay Area Watersheds

Steelhead stand out among the anadromous salmonids for their ability to utilize many of the highly-varied habitats encountered in the San Francisco Bay Area. Differences in topography, geology and climate across the region provide for a wide variety of microhabitats that have been effectively exploited by steelhead. The species is known for its ability to tolerate relatively high water temperatures particularly where food supply is good, and to take advantage of altered conditions such as those created when dam releases provide "artificial" summer habitat through flow augmentation.

Robert Leidy of the U.S. Environmental Protection Agency has sampled fish throughout the Estuary in order to augment historical records and determine relative abundance and current status of steelhead and coho and chinook salmon in streams tributary to the Estuary. Historical records were reviewed to provide information concerning past distribution of these species. This project is not yet complete, and results discussed here should be considered preliminary and should not be cited.

Steelhead runs are believed to have occurred in 38 Estuary watersheds historically and now are found in 24 of these drainages. Existing runs may or may not be self-sustaining populations within specific catchments. Some populations may contribute to runs in neighbouring watersheds. Causes of decline may include water diversion, migration barriers, urbanization, harvest, land use practices, natural factors, and others.

Coho salmon runs were definitely present in Estuary streams historically but apparently are now extinct. Coho typically used perennial streams with headwaters in the redwood forest zone (like in Marin County, San Leandro Creek and Strawberry Creek in Berkeley, Alameda County). The species largely disappeared from Estuary streams by the 1970's, and the last confirmed collection of coho is from 1981 in Marin County. Chinook salmon runs are more widely-distributed in Bay streams now than historically. Chinook range expansion in the Bay Area coincides with Central Valley hatchery production and efforts to transport juvenile fish around diversion-affected portions of the Delta. The National Marine Fisheries Service is working to determine which Estuary chinook runs, if any, are native rather than hatchery-derived.

Implementing steelhead restoration projects will involve prioritising watersheds to receive limited resources. Evaluation criteria include: presence of a viable salmon population, ability to mimic the natural variability of the hydrologic regime, level of modification of floodplains by cultural processes, alteration of spatial structure of instream habitat, degree of alteration of landscape hydrologic connectivity and others.

Dr. Jerry Smith, San Jose State University

South Bay Streams: Coyote Creek, San Francisquito Creek, Stevens Creek, Guadalupe River

Just as a rainfall and vegetation gradient exists from north to south in California, there is also an east-west gradient. Thus we should expect adaptations in the fish populations in this direction across the Bay Area corresponding to environmental differences. The fish discussed here belong to several communities: cold trout community above some kind of barrier and warm steelhead or trout community based on augmented streamflows.

In general, in Santa Clara County the streets outnumber the streams. There are small mountain habitats, but big urban areas dominate. Saratoga Creek has a stretch that goes dry in most years and has drop structures on the channel. Thus, anadromous fish typically can only pass during a major storm. Getting fish out may be still more difficult. Smolts traditionally go out during April and May. Saratoga Creek is dry then so you will never get a smolt out. Upstream of the town of Saratoga, though, there is an abundance of rainbow trout. These rainbow trout are known to be native because their genes were studied, but there is little hope of restoring steelhead because they will not get out of the system.

San Francisquito Creek does have steelhead habitat and only a short reach necessary to get smolts to the ocean. Depending on annual hydrology, fish passage opportunities may be more or less available. Work is being done to remove barriers that prevent fish from getting up into the system, and sections of Los Trancos Creek and San Francisquito Creek offer potential habitat. Removal of Searsville Dam would create more potential habitat in the upper, reasonably-wet

watershed. Downstream from the dam is a tributary called Bear Creek that also offers some steelhead habitat. On this system as well, efforts are underway to mitigate passage barriers. Overall, barriers can probably be mitigated but the watershed is quite dry, limiting its potential.

Stevens Creek has rainbow trout in the upper watershed and some steelhead in middle portions. The genetics of fish in the system have been analyzed and indicate that the difficulty steelhead face in accessing the watershed has kept their runs from "swamping" the resident population genotype. Dams in the area are operated without requirements for fish flows, but summer releases have improved conditions for salmonids. The system still faces problems from passage barriers. This system demonstrates the ability of trout to utilize summer flows from dam releases. Rainbow trout in these situations move to fast water where food is plentiful. In general, rainbows can adapt to a large range of temperature conditions is sufficient food is available.

The Guadalupe River watershed is similar in many ways. Reservoirs control flows in the system and have led to good conditions for salmonids. Also, it is relatively easy to get smolts out of this watershed due to the amount of water in the system. Problems faced here include unfavorable winter flood hydrology that can lead to destruction of spawning habitat. Barriers also exist but have been the subject of extensive mitigation efforts. Currently, passage exists for in-migrants to areas where sufficient flows are available to maintain fish in the summer. Flood control areas in the lower watershed continue to limit the habitat potential. Chinook salmon now spawn regularly in the system. It is likely that chinook did not occur historically here, as the lower portion of the Guadalupe River probably went dry in most years.

The Coyote Creek watershed, and the Alum Rock Park tributary in particular, offers steelhead habitat. Altered hydrology now warms the stream flows, leading to less desirable conditions for steelhead. Coyote Valley development also threatens water quality and recharge in the area, as well as steelhead habitat areas. Penitencia Creek is another steelhead resource in the Coyote Creek watershed, though smolt out-migration problems may be keeping the trout population in resident status.

Mr. Bill Cox, California Department of Fish and Game

North Bay Streams: Marin, Sonoma, and Napa County Creeks

Although both steelhead and coho salmon are threatened (under the Endangered Species Act), coho are the truly fussy species that are more likely "endangered" in that they are now limited to a few stream systems. Steelheads are more tolerant of adverse conditions. I refer to coho's habitat requirements as the three "D's": Deep, Dark and Dense, to which we can also add cold. These "D's" refer to deep pools, dark conditions from shading and dense structure in the stream. Steelhead like these same conditions, but have not been chased out of their historic range by human changes as much as coho. What have we done to cause the demise or near demise of coho and steelhead? It is easy to point a finger at logging, vineyards, urban development and cattle. The main culprit for decline will vary geographically. Overall, however, the are two most important causes of decline: people and roads.

In Marin County, the anadromous fisheries resources may be summarized as follows:
Old Mill Creek. Steelhead are found here, and two coho were also seen at one time. The watershed is intensely developed with houses close to the stream. The system is largely shaded with Redwood and Douglas Fir canopy.
Corte Madera Creek. This creek is intensely developed, and much of its length is channelized. It has a relatively warm climate and warm water.
Novato Creek. Some steelhead were found here recently, but they were unusually large and may have been due to a fishing derby.
Miller Creek. This creek has a small steelhead run. The watershed is not as developed as others in the county, but it has minimal riparian vegetation.
Ignacio Creek. This creek may host some small steelhead runs in some years.
San Antonio Creek. This creek is tributary to the Petaluma River. It is relatively wild looking, with lots of dairy cattle and a relatively dry summer appearance. It has low potential to offer steelhead habitat.

In Sonoma County, the following resources are present:
Adobe Creek. This creek has some steelhead, but its lower reaches are low gradient and warm. Portions of the creek offer some of the Petaluma River drainage's best potential steelhead habitat.
Lynch Creek. Lynch Creek is mostly urban, though steelhead have been found here. A dam may be blocking good habitat.
Petaluma River. This water body should more accurately be called "Petaluma Dead End Slough." The watershed is highly developed.
Willow Brook. This is potential steelhead habitat area.
Sonoma Creek. Most of Sonoma Creek is warm-water habitat and a warm-water fish assemblage, but the area near Glen Ellen has some good steelhead habitat. Tributaries to Sonoma Creek typically carry huge sediment loads coming off Sonoma Mountain. The following tributaries are notable:
Agua Caliente Creek. Although not as moist as west-side streams, the creek hosts a small steelhead population. Calabazas and Stuart Creeks also offer some habitat.
Yulupa Creek. This creek is believed to have steelhead in it.
Sugar Loaf Ridge State Park. The park has a resident rainbow trout population above a waterfall and offers the overall best habitat in the area, particularly due to good shading.

The Napa River watershed is similar to Sonoma Creek's in that there is generally some steelhead nursery habitat, but overall one finds a warm-water type environment.
Huichica Creek. This is one of the Napa River tributaries with a small steelhead population.

Solano County has anadromous salmonid resources are described below:
Wooden Valley Creek. Steelhead have been reported in this creek.
Suisun Creek. Lake Curry releases to Suisun Creek, which hosts steelhead. Since large volume releases are not possible from the dam, flows issues decrease habitat value in this system.
Green Valley Creek. This system is known to support steelhead.

In summary, streams in the region that drain the west side of the watersheds are more heavily forested and offer the most potential salmon and steelhead habitat. These should probably

receive the greater expenditure of restoration resources. East side streams are warmer and of lesser value to salmonids.

Mr. Peter Alexander, East Bay Regional Park District

East Bay Streams: Alameda Creek, Redwood Creek, Walnut Creek, Wildcat Creek

Rainbow trout native to Redwood Creek (Alameda County) are native landlocked steelhead, and were used to re-populate Walnut Creek. Redwood Creek was altered by the creation of Lake Chabot in the 1870's and upper San Lorenzo Reservoir in the 1920's. These reservoirs actually protected resident trout populations from fishing and non-native fish contamination. Now, the activity that most threatens trout, California newt and other aquatic organisms is increased park usage by dogs and people. Crib walls and plantings have been installed to stabilize banks, and EBRPD staff has worked to decrease in-stream uses. Population monitoring in the East branch indicates a trout population that is highly variable. Water supply is the main element affecting population numbers.

There are two native stream fishes in Wildcat Creek: three spined stickleback and rainbow trout/steelhead (placed there in 1983 from Redwood Creek). The upper two-thirds of the watershed is largely undeveloped and the Alvarado park section was restored in 1990. The bed composition of Wildcat Creek is highly variable, with fish managing to spawn even in areas of largely bedrock substrate. The lower section of Wildcat Creek is severely altered, and fish use artificial structures like shopping carts for shelter. The creek includes many culverts that impede migration and are complete barriers at some points of the year. Highly erosive soils in the watershed have helped preserve habitat by limiting development. In Alvarado Park, water impoundments, silted-in dams and historic stone walls were affecting habitat. EBRPD policy was to maintain the stone walls, and restoration has proceeded keeping them in place. Additional challenges are posed by an Army Corps of Engineers project consisting of 100 yards of concrete channel with a largely non-functional fish ladder.

Walnut Creek represents a creek with great potential and good flows hindered by a highly urbanized lower portion. Much of the creek has been channelized and denuded for flood control without thought to fish habitat. There are remnant trout populations in Bolinger Canyon.

Alameda Creek is the poster child of creek restoration in the Bay Area. Its watershed is the largest in the East Bay, with a large percentage in “natural” condition and hosting many native aquatic and terrestrial species. These include California roach, hitch, Sacramento sucker, prickly sculpin, Sacramento pike minnow, Pacific lamprey, rainbow trout/steelhead, California red-legged frog, foothill yellow-legged frog and others. Flood control and water diversion structures are often barriers which make prime spawning habitat inaccessible. Spring flows for out-migration now may not occur due to diversions for municipal use. Dam removals and modifications are being planned to allow for migration. Also, the Alameda Creek Diversion Dam blocks eight miles of prime habitat. Possible future alterations to Calaveras Dam may provide the opportunity to provide improved fish passage and habitat.

Mr. Dennis McEwan, California Department of Fish and Game

Population Biology and Ecological Restoration of Coastal Steelhead

Some life history and population biology concepts are useful in planning for steelhead recovery and are reviewed here. First, California steelhead persist in highly variable environments. The fact that steelhead historically occurred as far south as Baja California suggests that California populations have evolved adaptations that allow them to persist in highly variable environments, including higher temperatures environments. Also, steelhead utilize intermittent streams for spawning and rearing, but these streams are generally not recognized by management agencies as important steelhead habitat.

Rainbow trout population structure can be polymorphic. In a single breeding population, progeny can exhibit a different life history than parents, and this has been documented by otolith microchemistry analysis and direct observations. It is common to see large steelhead females spawning with much smaller resident trout males. Rainbow trout can exhibit a range of life histories (resident, potamodromous, estuarine, coastal, anadromous) and all may be present in a single stream.

Steelhead populations may be structured as a metapopulation with two types of subpopulations: (1) source populations, which are large, robust populations inhabiting large areas; and (2) sink populations which are smaller, inhabit smaller streams, and persist for shorter periods of time due to their vulnerability to such factors as drought, fire, floods, etc.

Finally, the concepts of extinction and repopulation may be used to guide restoration. Ecological restoration should improve physical and biological processes, habitat functions, and linkages to allow necessary expression of ecological and evolutionary heritage. In the past, we have relied too heavily on hatcheries and individual instream structures for restoration. The next phase should focus on restoring ecosystem processes, functions and linkages. Because of their location at the margin of the range, California steelhead have a tremendous resiliency to environmental variation and perturbation. However, this resiliency is absolutely contingent upon them having access to upper reaches and tributaries, and reestablishing access through dam removal or modification, and fishway construction should be the highest priority in recovery planning.

In summary:

- steelhead's use of ephemeral or impermanent habitat buffers the extinction risk
- polymorphic population structure increases the likelihood of population persistence in highly variable environments where habitat conditions may not allow emigration to the ocean on a regular basis
- recovery must focus on re-establishing linkages within populations by restoring access to upper watershed reaches

Mr. Miles Croom, National Marine Fisheries Service

Developing a Recovery Plan for Central California Steelhead

Steelhead recovery for listed ESU's proceeds as follows:
1) determine listing status;
2) designate critical habitat;
3) issue 4(d) regulations;
4) commence interagency consultations for federal (and federally-funded) projects under Section 7 of the ESA;
5) determine take permitting provision in accordance with Sections 4, 7, and 10 of the ESA;
6) enforce regulations and permits in accordance with Sections 9 and 11 of the ESA; and
7) develop recovery plans as set forth in Section 4 of the ESA.

Recovery Plans are developed along the following guidelines:
1) determine limiting factors;
2) set recovery (de-listing) goals;
3) identify actions to achieve goals; and
4) estimate time and cost to carry out actions.

Recovery is intended to produce a viable salmonid population (VSP), or a population that faces a negligible risk of extinction over the next 100 years. Parameters used in evaluating the populations include abundance, productivity, spatial structure, and diversity. Recovery efforts are directed to producing properly functioning habitat conditions (PFC). These include sustained natural habitat forming processes needed for long-term survival and recovery of listed salmonids. Examples are riparian vegetation, community succession, channel bedload transport, precipitation and run-off patterns, channel migrations and formations. Indicators can be measurable or descriptive, and must use the best available science, and be site specific and dynamic. Restoration activities may not impair habitat that is in good shape or further degrade marginal habitat.

The recovery planning process is conducted in two phases: (1) science/technical teams come up with delisting criteria; and (2) implementation strategies are developed. With regard to steelhead, conservation efforts have been on-going with agencies and NGO's. The future of NMFS steelhead recovery efforts will involve:
1) formal recovery planning;
2) increasing staff to implement plans;
3) accepting non-NMFS protocols to facilitate restoration efforts;
4) developing guidelines for instream flow, fish passage and fish screening; and
5) working with willing partners to change human activities to allow for recovery.

Kallie Kull, FishNet 4C

Life with 4(d): Local government planning and operations with threatened anadromous fish

The Fishery Network of Central California Coastal Counties was inspired by Mendocino Supervisor Charles Peterson. It has six member counties: Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, and Monterey. The alliance existed before the 4(d) rule came into effect for the CCCSH ESU in September of 2000. They soon realized that they needed to be proactive in dealing with all the regulations associated with the rule.

FishNet called UC Berkeley in for a third party environmental audit of the effects of county land use policies and management practices. The audit identified activities that affect salmonids, investigated county policies for possible gaps in protecting salmon habitat, included a field assessment of management practices, and recommended improvements. The types of activities identified for the FishNet counties that may affect coho and steelhead include stream crossing modifications, road management, storm water management, spoils storage, landslide repair, and stream restoration projects. Riparian setbacks for development were also investigated for effectiveness in protecting habitat.

One of the program results is strengthening of permit enforcement, particularly in regards to erosion control. Another is requiring landowners to conform to current building requirements relating to drainages as a condition of permits to modify existing structures. Fish passage improvements are a nearly universal application of the program.

FishNet 4C's goals for the future are as follows: 1) identifying the distribution of coho and steelhead; 2) extending coastal zone protection to interior areas where feasible; 3) protecting riparian buffer areas, including setting up conservation easements; 4) improving implementation of county ordinances and codes; 5) promoting alternative designs and improving bank stabilization practices; 6) better grading and erosion control and enforcement, including decreasing wintertime grading; 7) supporting watershed groups; 8) decomissioning roads; 9) reducing harm from lagoon breaching; 10) providing standards for road maintenance; 11) where feasible, reducing harm from emergency programs; 12) working to better spoils storage practices; 13) applying standards to channel management; and 14) inventorying and mitigating migration barriers.

Recent Sonoma County actions of note include conducting culvert assessment, working on written roads standards, and moving toward adopting a grading ordinance. Marin County is going through a General Plan update, participating in written roads standards, working through the Open Space District on improving "bad actor" roads, and trying to improve conditions regarding septic systems. San Mateo County is very active in the roads standards project, has developed a planning checklist for projects potentially affecting anadromous fish streams, is developing a pilot program for riparian buffers for the county's east side and is in the process of assessing culverts for passage impacts.

FishNet 4C received the 2001 Environmental and Economic Leadership award from the Governor of California for its innovative approaches.

Mr. Scott Akin, Santa Clara Valley Water District

The Evolution of Anadromous Fish Management at the Santa Clara Valley Water District

The Santa Clara Valley Water District is among the five largest water providers in the state. It was originally established to provide recharge for basin groundwater for agriculture, and its mission was later expanded to include flood control. Recently, stream stewardship became one of SCVWD's functions. There are over 800 stream channel miles within SCVWD jurisdiction, and the district owns and operates 10 surface water reservoirs.

For the first 50 or so years of the district's existence, it conducted business with little consideration for environmental concerns. The turning point came in 1995, when the district performed a maintenance operation involving discontinuing flows in the Guadalupe River. The operation resulted in a suit by the attorney general and a court order to re-evaluate district policies. A 1996 water rights challenge and regulatory agency pressure further advanced the evolution of SCVWD's environmental thinking, as well as environmental review for downtown flood control and in-stream recharge.

Under the leadership of a new general manager, the district polled people in its service area and discovered public interest in the environment and willingness to pay for projects to protect it. SCWVD eventually began to work collaboratively with those who had traditionally been foes. The Fish and Aquatic Habitat Collaborative Effort (FAHCE) resulted from these efforts. FAHCE includes dispute resolution, and analysis of watershed-wide limiting factors and district and non-district impacts on anadromous fish. FAHCE uses good science to develop fish management policies. The district is also involved in the Guadalupe River Flood Control Collaborative. SCVWD is now undertaking monitoring, restoration and remediation projects throughout its service area.

The major changes that SCVWD made in changing its orientation were:
- reorganization based on a watershed focus;
- amendment of the enabling legislation to include stewardship of aquatic resources; and
- use of environment and land-use summits.

The district's long-term goals are to:
- manage resources on a watershed-level;
- develop integrated fish management plans for all watersheds that have anadromous fish; and
- conduct regular monitoring and utilize adaptive management.

Environmental protection is now part of SCVWD's mission as stated in the Board Ends:
- Watersheds, streams and natural resources are protected and when appropriate enhanced or restored.
- Healthy creek and bay ecosystems are protected, enhanced or restored as determined by the Board.