BEFORE THE STATE WATER RESOURCES CONTROL BOARD

In the Matter of the State Water Resources Control Board (State Water Board) Hearing to Determine whether to Adopt a Draft Cease & Desist Order against California American Water Regarding its Diversion of Water from the Carmel River in Monterey County under Order WR 95-10	)	Hearing Date: July 23 - 25, 2008 Carmel River in Monterey County

EXHIBIT MPWMD-DF11

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

MPWMD Staff Note Regarding Recommended Spending Priorities for Restoration of the Steelhead Resource in the Carmel River Watershed dated March 19, 2007

ITEM: ACTION ITEMS

19. CONSIDER APPROVAL OF RECOMMENDED SPENDING PRIORITIES FOR RESTORATION OF THE STEELHEAD RESOURCE IN THE CARMEL RIVER WATERSHED

Meeting Date:	**March 19, 2007**	**Budgeted:**	**N/A**
From:	**David A. Berger, General Manager**	**Program/ Line Item No.:**	**N/A N/A**
Prepared By:	**Darby Fuerst**	**Cost Estimate:**	**N/A**

General Counsel Approval: N/A
Committee Recommendation: N/A
CEQA Compliance: N/A

SUMMARY: In its October 2006 Strategic Plan, the Monterey Peninsula Water Management District (District or MPWMD) Board requested that staff "merge and prioritize" lists of proposed restoration projects in the Carmel River Watershed so that the District would have a position on spending priorities. The Board also requested that the District's Carmel River Advisory Committee (CRAC) review the recommended spending priorities. The merged list of proposed steelhead restoration projects is included as **Exhibit 19-A**. The recommendations are based on lists of proposed steelhead restoration projects developed by the National Marine Fisheries Service (NMFS) and the Carmel River Watershed Conservancy (CRWC) in November 2005 and October 2006, respectively. Note that the NMFS is part of the National Oceanic and Atmospheric Administration (NOAA). The CRAC reviewed and approved the MPWMD staff proposed list of recommendations at their regular meeting on February 8, 2007.

RECOMMENDATION: The Board should consider and approve the spending priorities for restoration of the steelhead resource in the Carmel River Watershed recommended by staff. District staff's ranking of the proposed restoration projects is shown in the first column of **Exhibit 19-A** under the heading "MPWMD Rank". If approved, the recommendations would represent the District's position on spending priorities for restoration of the steelhead resource in the Carmel River Watershed.

BACKGROUND AND DISCUSSION:

NMFS Proposed Restoration Projects: **Exhibit 19-A** includes the nine proposed restoration projects that were developed as part of a workshop conducted by NMFS in November 2005. Participants at the workshop included staff from NMFS, California American Water (CAW), Carmel River Steelhead Association (CRSA), CRWC, and the District. Representatives from the California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and the Sierra Club were invited, but were unable to attend. **Exhibit 19-B** is a summary of the workshop results that was prepared by NMFS and includes detailed descriptions of each of the proposed restoration projects. As indicated in **Exhibit 19-B**, the goal of the workshop was to produce a list of "potential mitigation projects that would improve the survival of steelhead in the Carmel River" in the interim period before a long-term water supply project is constructed.

2006 NOAA Settlement Agreement: The proposed projects that were identified at the November 2005 workshop would be funded by CAW under a settlement agreement with NOAA that was executed on June 29, 2006. As part of the settlement agreement, CAW agreed to provide funding to improve habitat conditions for, and production of, South Central California Coast (SCCC) steelhead and otherwise aid in the recovery of SCCC in the Carmel River Watershed. As agreed, CAW would provide an initial lump sum of $3,500,000 and an additional $1,100,000 each year until 2013, or until CAW complies with State Water Resources Control Board (SWRCB) Order No. WR 95-10, whichever occurs first. Under the agreement, NOAA shall, "at its sole discretion, select and prioritize the projects to be funded with the money supplied by CAW. NOAA shall consult with CAW on all projects funded under the Agreement". A copy of the 2006 settlement agreement between CAW and NOAA is included as **Exhibit 19-C**.

Based on discussions with NMFS staff, it is District staff's understanding that, although the settlement agreement was accepted and signed by NMFS and CAW on June 29, 2006, CAW has not provided any payments to NMFS to date. NMFS staff in the Santa Rosa Area Office have indicated that CAW and NMFS attorneys are presently negotiating implementation of the settlement agreement.

Exhibit 19-A shows the ranking that the participants at the NMFS workshop assigned to each of the proposed restoration projects in the second column under "NMFS Rank". As part of the workshop, the participants developed eight criteria for ranking the proposed restoration projects. These criteria included:

- Greatest and most immediate benefits to steelhead
- Correlation to CAW water withdrawals, both direct and indirect
- Addresses limiting factors in the watershed
- Cost versus benefits
- Direct benefit to increased steelhead population size
- Ability to produce large juveniles and smolts
- Time to implement
- Contribution toward knowledge for recovery plan

The estimated cost and time to implement the proposed restoration projects shown in **Exhibit 19-A** were taken from **Exhibit 19-B**. Note that some of the costs are one-time costs and some of the costs are annual costs or costs per structure. Similarly, some of the time estimates are per structure.

CRWC Proposed Restoration Projects: **Exhibit 19-A** also shows proposed restoration projects or actions from the CRWC 2006 Action Plan that complement the proposed projects developed in the NMFS workshop. These actions are shown in the fourth column under "CRWC Action Plan Item". The *2006 Action Plan Revision* was prepared in October 2006 by Tamara Doan of the Coastal Watershed Council and Monica Hunter of the Planning and Conservation League Foundation with guidance and assistance from the CRWC Technical Advisory Committee (TAC). The proposed actions in the *2006 Action Plan Revision* were originally developed as part of the 2002 *Carmel River Watershed Assessment and Action Plan* and are summarized in matrix form in **Exhibit 19-D**. Note that this matrix includes eight categories of actions, i.e., cross-cut, flows, groundwater, habitat, public safety, public outreach and education, sediment, monitoring, in addition to a steelhead category.

As shown in **Exhibit 19-D**, the matrix includes details of each proposed action, the problems that each action addresses, benefits from the action, lead organization or agency, key partners,

estimated cost, permits required, potential funding, TAC ranking within each category, and the watershed area or tributary in which each action would be focused. As indicated above, each CRWC action that is shown on **Exhibit 19-A** was selected from the *2006 Action Plan Revision* because it is consistent with and supports, in part or whole, the associated restoration project proposed by the NMFS workshop participants. For example, the CRWC action MON-1 that is shown with the NMFS Lagoon Reverse Osmosis Project calls for "develop an adaptive management program for water quality in the lagoon, including installing an automated water quality monitoring station in the lagoon; coordinating with Carmel Area Wastewater District (CAWD) for discharge of tertiary water into the lagoon ...".

MPWMD Recommended Spending Priorities: Based on the information and criteria developed by the NMFS workshop group and the information and rankings developed by the CRWC and its TAC, District staff merged the two lists of proposed restoration projects and ranked the projects based on spending priority. District's staff ranking of the projects is shown in the first column of **Exhibit 19-A** under the "MPWMD Rank" heading. District staff's rankings are similar to the NMFS rankings and differ only in the middle group.

Based on the assumption that the funding for the proposed projects would be provided by CAW for steelhead restoration under the 2006 settlement agreement with NMFS, District staff focused on restoration projects that would benefit the steelhead resource in the Carmel River Watershed in the next seven years, i.e., 2006 through 2013, and that could be funded. District staff believes that additional flow in the Carmel River during dry periods provides the greatest overall benefit to the steelhead resource. However, the cost for certain projects that would increase dry season flows, such as dredging Los Padres Reservoir would exceed the amount of funding available under the settlement agreement.

Lastly, it should be noted that the *2006 CRWC Action Plan* included four actions or groups of actions that did not complement the restoration projects proposed by the NMFS workshop participants. Although these actions were not listed by the NMFS workshop participants, District staff believes that these actions are important. These actions include, in rank order, SH-4, 5 and 9, SH-2, SH-3, and SH-1. Details of these actions are provided in **Exhibit 19-D**.

IMPACT TO STAFF/RESOURCES: There are no direct impacts to District staff or resources from approving the recommended spending priorities for restoration of the Carmel River steelhead resources at this time. However, it is anticipated that District staff will continue to expend oversight time and effort while tracking the progress of this process in the future.

EXHIBITS

19-A Recommended Spending Priorities for Restoration of the Carmel River Steelhead Resource, March 2007.

19-B Potential Mitigation Project Resulting from Mitigation Workshop, November 18, 2005, prepared by NMFS staff.

19-C 2006 Settlement Agreement between California American Water Company and the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, June 29, 2006.

19-D Carmel River Watershed Assessment & Action Plan, 2006 Action Plan Revision, October 9, 2006, prepared for the Carmel River Watershed Conservancy by Tamara Doan, Coastal Watershed Council, and Monica Hunter, Planning and Conservation League Foundation.

EXHIL 19-A

Recommended Spending Priorities for Restoration of the Carmel River Steelhead Resource
March 2007

MPWMD Rank	NMFS Rank	Proposed Restoration Projects	CRWC Action Plan Item	Estimated Cost	Estimated Time
1	1	Lagoon Reverse Osmosis Water Project	MON-1	$50,000	1 to 3 years
2	2	Sleepy Hollow Steelhead Rearing Facility Water Intake Upgrade	---	$570,000	1 to 2 years
3	5	Old Carmel River Dam Removal	SH-5	$300,000 to $500,000	---
4	6	Sediment/Gravel Injection	HAB-1; SH-7	$60,000 to $100,000 per year	1 year
5	4	Carmel River Enhancement - Mainstem, tributaries, and lagoon	HAB-3, 4, and 6; SED -1	$10,000 to $30,000 per habitat structure	1 year per structure
6	3	Los Padres Dam Fish Passage	SH-6 and 8	---	up to 5 years
7	7	Los Padres Reservoir Sediment and Organic Debris Removal	FLOWS-2 and 3	$25,635,000	---
8	8	Natural Broodstock Program	---	$60,000 to $100,000 per year	3 years
9	9	Barrier Beach Sediment Budget Analysis	---	$125,000	1 year

Notes:
1. The proposed mitigation projects were developed at a workshop on November 18, 2005, that was conducted by the National Marine Fisheries Service (NMFS) and included representatives from California American Water (CAW), Monterey Peninsula Water Management District (MPWMD), Carmel River Steelhead Association (CRSA) and the Carmel River Watershed Conservancy (CRWC). Representatives from California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and the Sierra Club were invited, but unable to attend.
2. The "CRWC Action Plan" items refer to actions originally described in the 2002 *Carmel River Watershed Assessment* developed by the CRWC and later ranked by the CRWC's Technical Advisory Committee in 2006. "MON, SH, HAB, SED, and FLOWS" refer to actions related to monitoring, steelhead, habitat, sediment, and flow, respectively. Each of the CRWC actions listed is consistent with the associated NMFS proposed mitigation project.

EXHIBIT 19-B

Potential Mitigation Projects Resulting from Mitigation Workshop, November 18, 2005

Background

In response to ongoing illegal take of steelhead, Amanda Wheeland of NOAA General Counsel, requested the California American Water Company (Cal-Am) fund potential mitigation projects on the Carmel River to improve habitat conditions for steelhead until a long-term water supply project is constructed, *e.g.*, a desalination plant. Cal-Am asked to meet with National Marine Fisheries Service (NMFS) to discuss this issue, and as an outcome of this meeting, NMFS agreed to conduct a Mitigation Workshop, which took place on November 18, 2005. In attendance were Cal-Am, NMFS, Monterey Peninsula Water Management District (MPWMD), and members from the Carmel River Steelhead Association and the Carmel River Watershed Conservancy, all local agencies and groups knowledgeable in Carmel River steelhead issues. California Department of Fish and Game, US Fish and Wildlife Service, and the Sierra Club were invited but unable to attend. The goal of the workshop was to produce a list of potential mitigation projects that would improve the survival of steelhead in the Carmel River in this interim period before a water project is constructed.

Condition of the Carmel River

Historically, the Carmel River was one of the most productive steelhead rivers along the California Coast. The watershed encompasses 255 square-miles in the Santa Lucia Mountain range. In the upper watershed, the river and its tributaries flow in deep, steep-sided canyons. For its last 15 miles, the river flows across the relatively flat Carmel Valley floor to the Pacific Ocean.

In the lower river, there are a number of wells, which pump water from the underflow of the Carmel River. Cal-Am operates 21 of these wells and is the largest holder of water rights on the river. Cal-Am has a legal water right for 3,376 acre-feet (AF) and illegally diverts an additional 10,730 AF from the Carmel River. The State Division of Water Rights has ordered Cal-Am to find an alternate source for this illegal amount (Order No. WR 95-10). Additional wells are operated privately under much smaller water rights. Of these additional wells, the State Division of Water Rights has identified 14 as major diverters who cumulatively divert up to 1,729 AF annually from the underflow of the Carmel River. As a result of these withdrawals, the Carmel River usually goes dry downstream of river mile (RM) 7 by July. On average, over the past 10 years, 121 fish per 100 feet have occupied the stretch of river that dries up. Extrapolating out this average density, excessive water withdrawals eliminate habitat for approximately 44,700 juvenile steelhead each year.

In 1990, MPWMD certified the Water Allocation Program Final Environmental Impact Report (EIR) which set water allocation limits for annual Cal-Am water production (Jones and Stokes 1998). The EIR included a mitigation program to mitigate for significant environmental impacts from Cal-Am's diversions. This mitigation plan

provides for: (1) expansion of the program to capture and transport smolts during spring; (2) prevention of stranding of early fall and winter juvenile migrants; (3) rescuing of juveniles downstream of Robles del Rio during summer; and (4) implementation of an experimental smolt transport program at Los Padres Dam (MPWMD 1999).

Under this program, the Sleepy Hollow Rearing Facility (SHRF) was constructed in 1997 to hold and rear juvenile steelhead rescued during the summer months when the lower reaches of the river become dry. The SHRF endured power-outages, predation by birds and fish, warm water conditions, and pump failure due to sediment uptake in the past few years. While Cal-Am is finding a new source of water, they continue to overdraft from the Carmel River, making the SHRF integral in ensuring steelhead survival. NMFS is working with MPWMD to establish a hatchery genetic management plan (HGMP) for the facility.

Each year, MPWMD and local volunteers rescue stranded steelhead as the lower 7 miles of the river dry up, transporting the rescued steelhead to the lagoon, upstream habitat, or the SHRF. Approximately 2% of rescued fish and 100% of unrescued fish die, resulting in lethal take associated with the drying river in addition to the non-lethal impacts to all steelhead rescued from those 7 miles.

Cal-Am is responsible for maintaining three dams along the Carmel River, the San Clemente (SCD), Los Padres (LPD), and Old Carmel River Dams (OCRD). SCD is 108 ft high, was completed in 1921, and was originally a year round water diversion but now is used for winter flow diversions. LPD, completed in 1949, is 148 ft high with a current reservoir capacity of approximately 1,425 AF and is located about 5 miles upstream of SCD. During the low flow season when LPD is not spilling, water is released downstream at a minimum rate of 5 cfs from the Los Padres Reservoir. OCRD, completed in 1883, is located about 1800 feet downstream of SCD, has no utility, but is shorter at 20 feet in height. A fish ladder on the south side of SCD was constructed when the dam was built. A trap and truck operation is used at LPD to pass fish over the dam. OCRD has a fish ladder on the south side that does not function well. A notch was cut in the north side of OCRD in an effort to increase fish passage, but the notch is too narrow and during high flows is a velocity barrier.

Below San Clemente Reservoir and Los Padres Reservoir, which capture sediment bedload, the river became incised and armored. Armoring is common downstream of dams and occurs as fine riverbed materials are washed out, leaving coarse materials that prevent further erosion of the riverbed (except during the largest floods). The process of incision and armoring below SCD continued until about 1940, when a new dynamic equilibrium was established. This incision increased the depth and speed of water flow and the rate of bank erosion; although erosion was limited by the growth of riparian vegetation along the newly cut banks (Jones and Stokes 1998). The increased development within the floodplains created a greater emphasis on flood protection and preventing bank erosion, resulting in the placement of hard structures such as rip-rap, concrete rubble, cement walls, and cars along about 40% of the lower river. The bank protection measures have further degraded the habitat value of much of the lower 18

miles of river.

Spawning gravels below SCD and LPD have been washed downstream with high flows but have not been replaced because the reservoirs trap the bedload from upstream. As the gravels are washed from the system, riffles are changed or eliminated, which reduces the production of food organisms for rearing steelhead. Gravels provide habitat for emergent fry, which initially move to shallow point bars and other depositional areas to grow. Since adult returns are about three percent of their historic amounts, spawning gravels are not likely limiting at this time, but they are significantly reduced so slight increases in adult returns would make them a limiting factor. The reduced amount of food provided by aquatic invertebrate production in gravels may be limiting steelhead growth and survival.

Over 90% of the average annual precipitation within the Carmel River watershed occurs between November and April, with January and February being the wettest months. In the rainy season, Los Padres Reservoir refills after being drained by minimum flows during the summer. Because of water withdrawals from the aquifer underlying the river, the lower mainstem of the river remains dry until there are sustained flows of approximately 400 cfs past the dams for several days.

Water withdrawals from the Carmel River cause two important delays to steelhead migration. First, fall migrating smolts living upstream would normally begin swimming downstream with the first rains of the fall. Ward *et al.* (1989) noted that the largest smolts migrate on average 10 days before the peak smolt migration. The largest smolts rearing in the upper Carmel River watershed have the best chance of ocean survival, but are delayed up to 6 weeks some years due to lack of water in Los Padres Reservoir and the in lower mainstem river. Second, the lagoon breach is delayed because the underflow of the river is refilled before the lagoon begins filling. Under natural conditions, the water table in the fall would be above the river bed or just below it, resulting in nearly instantaneous passage of fall flows to the lagoon. The delay in inflow to the lagoon and resulting delay in breaching depends on the size of the early fall storms.

The Carmel River lagoon is a naturally occurring lagoon and wetlands area located at the mouth of the Carmel River, where the river flows to the Pacific Ocean at Carmel Bay. Lagoons provide essential rearing habitat for juvenile steelhead along California's central coast. Smith (1996) estimated that the lagoon on Pescadero Creek, just north of the Carmel River, provided as much rearing productivity as 8 miles of upstream habitat. The lagoon functions best when inflows are sufficient to maintain the water quality in the lagoon. As a result of Cal-Am's illegal pumping upstream, there is very little inflow to the lagoon during the low flow season. When inflow to the lagoon is low, the water quality at the bottom of the lagoon is poor, forcing steelhead to live at the surface in the only non-lethal water available. The summer conditions in the lagoon result in increased predation, stress, mortality, reduced growth, and delayed mortality of steelhead.

Approximately 70% of Carmel River spawning and rearing habitat is located upstream of LPD, and approximately 90% above SCD (Snider 1983). Currently, about 55% of adult

steelhead spawn downstream of the dams, about 45% migrate over SCD, and only about 11 to 16% are transported above LPD. One reason for the altered utilization of the river could be upstream passage issues with the dams causing too much stress resulting in reduced survival or spawning success. Other reasons could be juvenile and kelt mortality caused by downstream migrations over three dams, delayed migrations, or delayed mortality caused by stress. Densities of steelhead rearing above Los Padres Reservoir were assessed by Kelley (1983) to be one-third that of comparable-sized rivers.

Many aspects of the Carmel River are functionally degraded and should be repaired in order for steelhead populations to reach their historic abundances. Steelhead rearing success may be negatively impacted by lack of food, lack of cool-water refugia and pools, lack of gravel and sediment, seasonal lack of water in parts of the river, lack of large woody debris (LWD), poor water quality in the river and the lagoon, unnatural breaching of the lagoon, predation, and hardened stream banks. Steelhead spawning success may be negatively impacted by the Allee effect (trouble finding a mate), lack of spawning gravels, impeded access to historic spawning areas, and lack of adult steelhead habitat. Migration of adult and juvenile steelhead is negatively impacted by dams, the seasonally dry river bed, lack of resting pools, inadequate fish passage facilities, and long stretches of homogenous habitat.

NMFS determined there are four broad, primary limiting factors that contribute to the decline of Carmel River steelhead more so than any other factors. The most important issue in the watershed is seasonal lack of water and flow in the river, caused by excessive pumping in the lower river, eliminating historically productive rearing habitat and critically impairing the lagoon water quality. The second biggest problem in the Carmel River watershed is the lagoon, due to lack of water inflow in the summer, again as a result of excessive water withdrawals. Under natural conditions, the lagoon provides excellent rearing habitat and higher densities of rearing steelhead than anywhere else in the river. Impaired fish passage, the third limiting factor, limits access to the best spawning and rearing habitat, which is located above LPD. The system as a whole is also fragmented by two other dams and a long stretch of dry river in the summer, eliminating connectivity between the reaches. Degraded habitat in the lower mainstem river, the fourth limiting factor, also limits the Carmel River steelhead population, since steelhead naturally move to mainstem habitats to grow larger in preparation for the adult portion of their lives. This section of river now is dry for several months of the year and when it is wet, has limited food supply, and the homogenous habitat provides minimal refuge from predators. The mitigation projects are ranked according to their potential to address these four primary limiting factors and increase steelhead populations most efficiently. Proposed projects that didn't meet these criteria are ranked at the bottom of the final list or were eliminated altogether.

Proposed Restoration Projects

1. Lagoon Reverse Osmosis Water Project

Proposal: Cal-Am's pumping operations dry the river upstream of the lagoon, confining steelhead to the area downstream of the Highway 1 Bridge and causing the lagoon water level to drop, the water quality to worsen, and leaving steelhead more stressed and more susceptible to predators. Between 8,000 and 25,000 juvenile steelhead rear in the Carmel River lagoon each year, but under natural conditions, steelhead would move between the lagoon and the lower mainstem Carmel River depending on where optimal habitat could be found. Mortality in the lagoon is currently unknown, but is expected to be the highest of any location in the Carmel River.

The Carmel Area Wastewater District recently proposed the second phase of their Salinity Management Project, which plans to use reverse osmosis to make water for use on seven golf courses on the Monterey Peninsula. This project would generate water as waste that could be allowed to flow into infiltration ponds, constructed upstream of the South Arm of the lagoon in the Odello West fields. The water should indirectly raise lagoon levels as it filters through the sand beneath the ponds and into the aquifer. The additional water will improve the water level of the Carmel River lagoon during the summer juvenile steelhead rearing phase.

Biological Response: After completion of this mitigation project, the Carmel River lagoon will receive water inflow of 1.5 AF per day (approximately 3 cfs) via groundwater seepage during summer low flow periods. When the inflow to the lagoon is sufficient to maintain good water quality, the Main Bay, South Arm, and North Arm provide habitat for steelhead and refuge from predators. It is reasonable to expect increased survival and smolt size, which will improve ocean survival and adult returns.

Funding Costs: This project would have a one-time estimated cost of approximately $50,000 for constructing ponds and a water delivery system to the ponds.

Conclusions: This project addresses three primary limiting factors: low flows in the river, fish passage, and lagoon water quality. The project is expected to result in increased growth and survival of many steelhead in the first year of its implementation. There is also the potential to relocate more rescued fish to the lagoon as opposed to other locations. This project is ranked as the top mitigation priority because it addresses three primary issues of concern, benefits many steelhead for little money, and will be ready to implement in the next two to three years.

2. Sleepy Hollow Steelhead Rearing Facility Water Intake Upgrade

Proposal: As Cal-Am pumps the lower river dry, MPWMD conducts steelhead rescues, transporting approximately 25,000 juvenile steelhead to the SHRF to be reared for approximately 6 months. The SHRF currently gets its water directly from the river via two submersible pumps, which could be damaged or destroyed if sediment enters through the water intake entrance. Turbidity in the Carmel River during high flows is enough to damage the pumps. Several years ago, the pumps failed due to sediment uptake so the facility was not used that year. Currently, to avoid the risk of sucking sediment into the pumps, all of the steelhead in the SHRF are released before high, turbid flows begin in

the late fall when parts of the river are sometimes still dry and disconnected from the lagoon. Releasing these fish in the fall creates competition for food and potentially space between the SHRF smolts and the resident smolts until the river is connected to the lagoon.

The proposed solution to this problem is to construct an underground, 80 square foot concrete settling basin, which will allow 98% of all sediment to settle out before pumping the water into the SHRF. This project will allow the SHRF to function in high flows so steelhead can be kept in the facility until the river is flowing to the lagoon. Access to the facility needs to be available year round, so the low water crossing to the facility will also need to be improved.

Biological Response: The MPWMD could release the smolts late in the season, when the lower river is completely rewetted so the SHRF smolts could emigrate directly to the ocean and avoid competition with resident smolts, increasing survival and fitness of all smolts.

This is viewed as a short-term solution, since, generally, there are problems associated with rearing facilities. The facility attempts to rear the steelhead in as natural a setting as possible, so they are similar to wild steelhead when they are released. However, there are extensive studies concerning the behavioral differences between wild steelhead and wild-origin steelhead raised in a hatchery environment (see Huntingford 2004 for overview). According to Huntingford (2004), steelhead produced in the wild, reared in facilities, and then released into the wild exhibit different feeding, anti-predator responses, aggression, and reproductive behavior than their counterparts rearing in the wild. Improvements at SHRF are needed to ensure survival and recovery until an alternate water supply is developed.

Funding Costs: Estimated costs for improvements would be a one-time cost of $570,000 for the settling basin and water intake, and additional costs for the water crossing improvement.

Conclusion: This project addresses three primary limiting factors: low flow in the river, fish passage, and degraded mainstem habitat. These limiting factors are addressed by producing large, healthy smolts rescued from low flows, which can be released late enough to pass unobstructed to the ocean, avoiding temporary residence in the degraded lower mainstem river. This project is considered the second most important project because it addresses three issues of concern, can benefit over 20,000 juvenile steelhead each year, only has a one-time cost associated with it, and can be implemented in the next year or two.

3. Los Padres Dam Fish Passage

Proposal: The habitat upstream of LPD provides approximately 70% of the spawning and rearing habitat in the Carmel River, but few adult steelhead make it to this area. When the dam was completed, the only upstream passage for steelhead was a short fish

ladder that led to a holding facility, where fish were trapped and then trucked over the top of the dam. Subsequently another ladder and trapping facility were constructed below the dam for upstream passage, along with a 9.5-inch by 36-inch notch in the spillway for downstream passage.

Passage at LPD is not adequate for up or down stream migration. Passage conditions need to be improved to increase the adult returns to spawning grounds above LPD. There is a need for: 1) an engineering study that could determine the best method to achieve both upstream and downstream passage; and 2) construction of a fish passage structure identified in the engineering study.

Biological Response: Building a passage facility for upstream and downstream migrating steelhead will allow adult steelhead to spawn in the mainstem and tributaries above LPD and increase the survival of kelts, smolts, and juveniles migrating downstream. This project would provide a long-term solution to a major problem on the Carmel River, increasing the overall Carmel River steelhead population.

Funding Costs: The cost of this will depend on the engineering study's cost determination for a facility that provides safe upstream and downstream passage.

Conclusion: This project addresses two primary limiting factors: fish passage and degraded mainstem habitat, since historically fish reared in the headwaters and migrated to the mainstem as smolts and pre-smolts to grow more before entering the lagoon. The increased returns above LPD would increase spawning, allowing for use of the rearing habitat above LPD, and resulting in a significant increase in the number of smolts produced. Improved downstream passage would increase smolt health and survival, increasing the numbers of adults able to return to the headwaters of the Carmel River in future generations. This project is considered important because it addresses two issues of concern and could benefit a large portion of the Carmel River steelhead population. The expense of upstream and downstream passage is expected to be considerable and could take up to five years to complete the project.

4. Carmel River Enhancement – Mainstem, tributaries, and lagoon

Proposal: Much of the problem between SCD and the mouth of the Carmel River is related to the sediment trapped behind both SCD and LPD, resulting in an armored streambed lacking structure and heterogeneity below the dams. The degraded rearing habitat impacts juvenile abundance; therefore, improvements in habitat quality should improve juvenile abundance and growth rate. Instream habitat structures would be constructed in areas that are armored, lacking pools, and/or recommended by a hydrologist or geomorphologist to increase juvenile steelhead rearing habitat and adult resting pools. The structures should be designed to withstand a 100-year flood event and to prevent bank erosion, while scouring or maintaining pools and creating spawning and rearing habitat.

Biological Responses: Large pools provide thermal refuge for steelhead during the

summer months (Matthews and Berg 1997) and the tailouts provide well sorted gravels for steelhead spawning and macroinvertebrate production. These structures have been monitored in other systems and have been shown to provide statistically significant increases of between 1.5 and 6 times more steelhead (Paulsen and Fisher 2005, Roni and Quinn 2001, Diez *et al.* 2000, Kiefer and Lockhart 1999, Bisson and Bilby 1998, Bilby and Bisson 1998, Espinosa and Lee 1991). Jones and Tonn (2004) analyzed longer reaches though, and found the instream structures may condense all fish in the reach into the optimal habitat, vacating the mediocre to poor habitat, but not increasing carrying capacity. Winter rearing habitat is plentiful in the Carmel River, so these structures will be intended to increase summer rearing success (Morgan and Hinojosa 1996).

Funding Costs: One-time estimated cost for permitting, engineering plans, and project monitoring of $10,000 to $30,000 per habitat structure.

Conclusions: This project addresses two primary limiting factors: degraded mainstem habitat and the lagoon condition. The potential for the instream structures to provide optimal habitat are well documented in past studies. Structures could be installed in the mainstem of the Carmel River and in the lagoon to create habitat and benefit both areas. Monitoring of structures should focus on overall change in steelhead densities within the reach, at the structures, and the change in the size of the steelhead in the reaches. Constructing instream structures ranks fourth in priority of mitigation work because it addresses two issues of concern, each structure is very inexpensive for the potential benefit to rearing fish, and the structures can be designed and built in one year.

5. Old Carmel River Dam Removal

Proposal: Currently, there is a small notch in the north side of the OCRD, but during high flows, the water flowing through the notch creates a flow barrier. The thickness of the dam makes it very difficult for steelhead to jump and swim over during high flows as well. If adult steelhead spend too much energy navigating the barriers, they may die without spawning or suffer reduced reproductive fitness. Juveniles and kelts also suffer delayed mortality and reduced growth as a result of navigating dams on their downstream migration (Budy *et al.* 2002). The survival of kelts is particularly beneficial to the overall steelhead population because they return and spawn again, basically doubling their reproductive contribution compared to one-time spawners.

As part of Cal-Am's SCD Seismic Safety Project EIS/EIR, Cal-Am has proposed to cut a larger notch in the OCRD. The mitigation proposal being considered here would completely remove the OCRD during the Seismic Safety Project rather than cutting a larger notch.

Biological Response: Removing the OCRD would result in a natural stream channel, reducing stress and potential delay of migration, resulting in less mortality and better health of upstream and downstream migrants.

Funding Costs: One-time cost for permitting, engineering, and demolition of the dam of

would be in the range of $300,000 to $500,000.

Conclusion: This project addresses two primary limiting factors: fish passage and mainstem habitat degradation. This project would benefit adult steelhead returning to spawn, which are relatively more important than individual juvenile steelhead to the population. This project is considered important because it will inexpensively benefit returning adults every year after the dam is removed.

6. Sediment/Gravel Injection

Proposal: In the past 80 years, San Clemente and Los Padres Reservoirs have trapped over 3,000 AF of sediment ranging from sands and silts to cobble and small boulders. Downstream of both dams, this has resulted in an armored stream channel and banks, degraded channels, and lack of invertebrate and fish habitat. The purpose of this project would be to dredge sediments and gravels from San Clemente Reservoir and/or Los Padres Reservoir and deposit the sediment into the river below each dam. The gravel would be placed along the edges of the river and in the plunge pool during low flows and would be distributed naturally during high flows to natural depositional areas.

Biological Response: Injecting 2 to 4 AF of gravels annually below each dam will increase the potential spawning habitat in the river (Wheaton *et al.* 2004) and will also increase macroinvertebrate production (Merz and Chan 2005, Death 2003, Bisson and Bilby 1998). Gravel injection projects have been studied in the past, revealing that spawning gravel enhancement projects result in significantly higher numbers of steelhead parr produced (Merz *et al.* 2004, Espinosa and Lee 1991).

Gravel injection and instream structure projects conducted coincidentally in streams lacking gravels and structure but not macroinvertebrates resulted in 1.5 to 6 times more juvenile steelhead than before enhancement (Keifer and Lockhart 1999, Espinosa and Lee 1991). The Carmel River is deficient in gravels, structures, and also macroinvertebrates. This project is expected to cause similar increases in steelhead density and may also increase their size since aquatic invertebrates are particularly important to California steelhead (Merz 2002). This project will increase steelhead populations if sufficient gravels are placed downstream of the dams.

Funding Costs: Estimated cost to inject 2 to 4 AF of gravel downstream of LPD and SCD approximately $60,000 to $100,000 annually. This could be conducted in conjunction with the dredging project for LPD, which would make both projects more cost effective.

Conclusion: This project addresses one issue of concern, which is mainstem habitat degradation. Monitoring of similar projects suggests that gravel injection is a good way to increase egg to juvenile survival and will increase macroinvertebrate production (McHenry *et al.* 1994). In the immediate future, gravel injections are more likely to provide benefits to juvenile fish by increasing macroinvertebrate production and in the more distant future the gravels will provide spawning habitat for adults. This is the sixth

ranked mitigation project because it addresses one issue of concern, benefiting many young-of-the-year steelhead, a moderate number of larger juveniles, and some adults for a moderate amount of money each year. The project could be implemented next year.

7. Los Padres Reservoir Sediment and Organic Debris Removal

Proposal: The Los Padres Reservoir provides minimum summer flows, releasing approximately 1,100 AF each year. Over the past 56 years, the reservoir has partially filled with sediment and debris, reducing the storage capacity from 3,030 AF to about 1,425 AF. The proposal for this project is to dredge Los Padres Reservoir to reclaim storage capacity, which would allow for higher summer releases keeping more water flowing farther downstream during the summer and fall.

Biological Response: This project would nearly double the volume of the reservoir, so 2,700 AF could be passed downstream during a summer. Allowing the Carmel River to flow farther downstream before going dry would protect steelhead and their critical habitat, eliminating the need for fish rescues in the area.

Funding Costs: One-time cost for permitting, engineering design and dredging. There may be a potential to sell aggregate to recover some costs. The most expensive sediment removal cost is estimated at $9.90/cubic yard (per MWH). If the reservoir were dredged of the approximately 1,605 AF of sediment that has entered since 1949, that would amount to 2,589,400 cubic yards of sediment. The cost of this removal would be $25,635,060. Some of the recovered sediment could also be used to supplement spawning gravels downstream of the dams, reducing the costs associated with hauling. There would also be the issue of finding a disposal site for the unused sediment, which could add costs to this project.

Conclusion: This project addresses two primary limiting factors: downstream habitat and flow in the river. This is an important project because it addresses two issues and protects several thousand juvenile steelhead each summer. The price of removing the sediment and the timeframe to begin the project cause this project to be ranked lower than those in front of it.

8. Natural Broodstock Program

Proposal: This proposal is a safety net in case of extreme drought years or in times of habitat destruction sufficient to prevent natural spawning (e.g. dam failure). During normal years, when adults can migrate to the river from the ocean, this project will not occur. The wild broodstock program would go into effect in the second year of a major drought, after one year of no passage between the river and the ocean. In the second year, the wild broodstock program would capture smolts throughout their downstream migration to gather as diverse a genetic pool as possible. The captured smolts will be raised in a saltwater tank at a location to be determined and once mature they would be released into either Carmel Bay, Carmel River lagoon, or into the river directly if drought has made entry from saltwater impossible.

The project will be part of the HGMP and a technical advisory committee (TAC) would determine the period, locations, and methods of capture. Fish that are hatched and reared in facilities before being released are at a competitive disadvantage to wild fish relative to feeding, antipredator response, aggression, and reproductive behavior (Huntingford 2004, Berejikian *et al.* 1996). Our goal is to retain wild fish without any hatchery or rearing facility influence, but we understand that without the wild broodstock program, extreme events could cause extirpation of *O. mykiss* genetics with a propensity for anadromy (Thrower *et al.* 2004).

Biological Response: This project will retain Carmel River steelhead genetics in the event of a drought or catastrophic event. In most years, the natural broodstock program will not be necessary, but a plan will be developed as part of the HGMP in case of a catastrophic drought.

Funding Costs: The broodstock program will have overhead costs associated with it. Volunteers would be used to operate the facility. Funds would be needed to cover the cost of the facility, food, collection device, *etc.* The overall cost for one year of operation is estimated at $60,000 to $100,000.

Conclusions: This project addresses one issue of concern, which is lack of flow. Major droughts threaten the existence of steelhead in this system. Preserving the unique genetic qualities of anadromy, run timing, and outmigration timing would be key components to this project. This project may be the only way to maintain a steelhead run in the Carmel River during emergency situations. This project ranks eighth on the list because it addresses one issue of concern during emergencies only. The cost will be fairly inexpensive for saving steelhead during droughts or catastrophes and it could be implemented in three years.

9. Barrier Beach Sediment Budget Analysis

Proposal: Over the past century, the barrier beach at the mouth of the Carmel River may have become narrower. The width of the barrier beach is critical to the health of the lagoon and the private properties nearby. If the beach is getting narrower, there are concerns that the lagoon may cease to function or may become a tidal inlet. This proposal would design a sediment transport analysis between upstream bedload and the marine environment to determine the long-term trends of sediment replenishment at the barrier beach.

Biological Response: The barrier beach at the mouth of the Carmel River is vital to maintaining a lagoon for rearing of smolts and juveniles throughout the year. Understanding the dynamics of sediment transport to the barrier beach will help determine methods to ensure the lagoon remains functional to support steelhead. Better knowledge of sediment transport from the river to the beach will lead to better management of the lagoon, the beach, and the surrounding property.

Funding Costs: Estimated one-time cost for the sediment transport analysis of approximately $125,000.

Conclusion: This project addresses one issue of concern, which is the condition of the lagoon. Funding the study would not directly benefit any fish, but the study would assist regulatory agencies in making decisions about lagoon management, which would benefit steelhead in the future. This project ranks ninth because it addresses one issue of concern but will not directly benefit any fish. The cost of the study is not very expensive and planning could begin next year.

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EXHIBIT 19-C

SETTLEMENT AGREEMENT

THIS SETTLEMENT AGREEMENT ("Agreement") is made by and between California American Water Company ("CAW") and the U.S. Department of Commerce, National Oceanic and Atmospheric Administration ("NOAA"). Throughout this Agreement, CAW and NOAA are collectively referred to as the "Parties."

Recitals

A. CAW is the owner and operator of the public drinking water system for the Monterey Peninsula, which serves approximately 40,000 customers. CAW is regulated by the California Public Utilities Commission ("CPUC") and is mandated by California law to serve potable water to its customers and to comply with federal and state safe drinking water laws and regulations, as well as the Federal Endangered Species Act. A major source of CAW's water supply is diversions from the Carmel Valley Aquifer. CAW is currently working to develop an alternative long-term water supply to replace a significant portion of that water supply.

B. CAW's operations on the Carmel River are regulated by a number of agencies pursuant to certain orders and agreements. State Water Resources Control Board Order 95-10 mandates that CAW find an alternative supply for 10,730 acre-feet ("AF") of water and, pending the implementation of an alternative water supply, limit its diversions from the Carmel Valley to 11,284.8 AF. Order 95-10 was amended in 2002 to incorporate certain provisions of the Conservation Agreement (described below) relating to additional limitations on CAW's diversions at San Clemente Dam and upstream wells during low flow periods. CAW's operation of Los Padres and San Clemente Dams is controlled by an annual agreement among CAW, the Monterey Peninsula Water Management District and the California Department of Fish & Game. CAW's operation of San Clemente Dam is further constrained by a mandate issued by the California Division of Safety of Dams ("DSOD") to institute interim safety measures that include lowering the water levels in the reservoir behind San Clemente Dam during the dry season (approximately seven months each year).

C. On September 18, 2001, NOAA and CAW entered into a Conservation Agreement ("Conservation Agreement"), which required CAW to implement certain measures to reduce the impact of its operations in the Carmel River on steelhead and their habitat.

D. The goals and objectives of the Conservation Agreement were as follows:

1. NMFS' goal and objective are to protect and conserve Steelhead in the Carmel River, including maximizing the Carmel River Basin's substantial contribution toward recovering this [S]outh [C]entral California Coast Steelhead ESU ["SCCC steelhead"] and to enforce the ESA [Endangered Species Act].

2. Cal-Am's [CAW's] goal and objective are to supply water in accordance with its CPUC Certificate in a manner that complies with the Federal ESA and other regulatory obligations.

E. The Conservation Agreement contained three tiers of activities. Tier I included short- and mid-term actions designed to conserve steelhead in the Carmel River. Tier II described the process to be followed to address DSOD's issues with San Clemente Dam and other mid-term measures designed to conserve steelhead in the Carmel River. Tier III described the process to be followed to address the long-term implementation of actions designed to meet the goals identified by the Parties in the Conservation Agreement.

F. Since September 2001, CAW has implemented all of the measures set forth in Phase I of Tier I of the Conservation Agreement. These measures include ceasing surface water diversions at San Clemente Dam during low flow periods, ceasing diversions from the Upper Carmel Valley Wells during low flow periods, and installing a booster station to move water from the lower Carmel Valley to the Upper Carmel Valley. In addition, as part of an overall effort to protect and enhance SCCC steelhead, CAW and its customers have paid for additional steelhead mitigation measures for many years. These measures, implemented by the Monterey Peninsula Water Management District, include annual fish rescues, the construction and operation of a rearing facility to hold rescued steelhead, monitoring of and improvements to the instream and riparian habitat, improvements to the Carmel River Lagoon, and monitoring fish numbers during migration, and have cost CAW's ratepayers over $28M to date.

G. Phase II of Tier I of the Conservation Agreement required CAW to maintain a continuous surface flow in the Carmel River as far downstream as possible in AQ3 (a defined area of the Carmel Valley Aquifer) by offsetting CAW water diversions in upstream sections of AQ3 with expanded diversion capability in AQ4, in the lowermost reaches of AQ3, and the Seaside aquifer storage and recovery ("ASR") expansion. Phase II required CAW to increase well capacity downstream of and including the San Carlos Well by 3.0 to 5.0 cfs. CAW retrofitted the Rancho Cañada Well and increased its capacity initially by 140%. The reconditioned well was put into service on March 31, 2003. At about the same time, the California Department of Health Services opined that extractions from the nearby San Carlos Well constitute groundwater under the influence of surface water. The San Carlos well was therefore taken out of service, as there is no means of providing surface water treatment at that location. This resulted in no net gain in pumping capacity in the lower aquifer.

H. The next step in Phase II of Tier I of the Conservation Agreement was to be the installation of a new well in the lower aquifer. Studies showed that any new well in the lower Carmel Valley would likely require surface water treatment and construction of a surface water treatment plant, which was estimated to cost approximately $5.5 million. In light of CAW's need to focus its financial and personnel resources on a long-term water supply project, rather than those interim measures in the Carmel River, the Parties agree that proceeding with the measures set forth in Phase II of Tier I would not be financially prudent.

I. NOAA asserts that additional mid-term measures are required to further reduce the impact of CAW's operations in the Carmel River on steelhead and their habitat pending CAW's development of a long-term water supply. CAW agrees that there are further interim measures that will benefit the steelhead.

AGREEMENT:

I. Continuation of Tier I Phase I Activities and Certain Tier I Phase II Activities:

Throughout the term of this Agreement, CAW shall continue to implement all of the measures described in Phase I of Tier I of the Conservation Agreement.

II. New Tier I Phase II Activities:

A. CAW shall provide funding for projects to improve habitat conditions for, and production of, SCCC steelhead and/or otherwise aid in the recovery of SCCC steelhead in the Carmel River Watershed. CAW shall provide an initial lump sum payment of Three Million Five Hundred Thousand Dollars ($3,500,000.00) within 60 days of the execution of this Settlement Agreement ("Agreement"). CAW will further provide the sum of One Million One Hundred Thousand Dollars ($1,100,000.00) on the first anniversary of the Agreement and again on each subsequent anniversary of the Agreement until it expires.

B. NOAA shall, at its sole discretion, select and prioritize the projects to be funded with the money supplied by CAW pursuant to paragraph II. A. NOAA shall consult with CAW on all projects funded under this Agreement.

C. The Parties recognize that any activity on or near the Carmel River can have potentially adverse effects on CAW's ability to serve potable water safe for public consumption. NOAA will not undertake any projects that will affect CAW's mandate under California law to serve potable water to its customers and to comply with federal and state safe drinking water laws and regulations.

III. Tier III Activities:

CAW has identified the CWP as its proposed project for a long-term water supply to replace 10,730 AF of water that CAW diverts from the Carmel Valley Aquifer, plus approximately 1,000 AF to protect against overdraft of the Seaside Basin. CAW will continue to diligently pursue the environmental review and required permits to design, build and operate the CWP. The current schedule contemplates having the CWP in operation by 2012 at the earliest. The parties recognize that the CWP will require extensive environmental review and permits from many federal, state and local agencies over which CAW has no control. CAW will keep NOAA informed of the CWP's schedule, progress, potential delays and the reasons therefore.

IV. NOAA's Cooperation with CAW and Other Agencies

The parties recognize that the CPUC is CAW's primary regulatory agency. CAW is obligated to serve its customers in a cost-effective manner. CAW must obtain CPUC permission to fund activities such as environmental mitigation, and the rates charged to CAW's customers must be approved by the CPUC. NOAA acknowledges that in CAW's role as a CPUC regulated water provider, that it has an obligation to serve its customers.

California American Water (CAW) is facing a plethora of permitting and regulatory issues related to CAW's quest to implement a replacement long-term water supply, to comply with the ESA and regulatory requirements of other federal and state agencies.

Cooperation, as used herein, means providing comments on a project or course of action by writing letters, appearing at public meetings and hearings to speak or give testimony, and meeting with other government agencies, consistent with NOAA's mission, policies, and its ESA responsibilities, and taking into account the limitations imposed by staff time and resources.

A. California Public Utilities Commission (CPUC)

1. NOAA will cooperate in CPUC proceedings related to approval of the Certificate of Public Convenience and Necessity for a replacement long-term water supply project by explaining the importance of the recovery of the SCCC steelhead and the habitat of the Carmel River, and the environmental benefits of a replacement long-term water supply compared to the environmental detriment of continuing the current water supply for the Monterey Peninsula.

2. NOAA will cooperate in any CPUC general rate proceedings concerning the recovery in rates of costs of a replacement long-term water supply project and funds paid for mitigation by explaining to the CPUC: (1) the benefits to steelhead of any mitigation funds paid pursuant to any agreement with NOAA; (2) the penalties applicable to violations of the ESA; and (3) compliance with the ESA is mandatory.

B. Other Agencies with Permitting/Regulatory Authority over the Coastal Water Project.

1. Monterey Bay National Marine Sanctuary (MBNMS)

NOAA will cooperate with CAW by meeting with NOAA personnel who manage MBNMS to educate them about how a replacement long-term water supply project will benefit listed species in the Carmel River and its habitat; discuss with CAW and MBNMS any concerns of MBNMS regarding a replacement long-term water supply project's potential effects on MBNMS.

2. California Coastal Commission (CCC)

A Coastal Development Permit from CCC is required. NOAA will cooperate with CAW by (1) explaining the critical need for the replacement of a long-term water supply for Carmel River to CCC and that the means of providing such a replacement water supply are extremely limited and (2) that CCC should consider the overall environmental picture for Monterey Peninsula, including the benefit to listed species in and along the Carmel River, and not just the marine species in MBNMS.

3. State Water Resources Control Board (SWRCB)

The second component of the CWP is aquifer storage and recovery (ASR), which will require water rights permits from SWRCB. NOAA has supported the concept

of ASR for years. NOAA will cooperate with CAW regarding the benefits of diversions to ASR during times of excess flow on the Carmel River. NOAA will meet and confer with CAW to discuss any of its concerns with CAW'S ASR permit applications before commenting publicly.

4. U.S. Fish and Wildlife Service (USFWS)

NOAA will cooperate with CAW regarding USFWS issues related to permits for a replacement long-term water supply project.

5. California Department of Fish & Game (CDF&G)

NOAA will cooperate with CAW regarding CDF&G issues related to permits for a replacement long-term water supply project.

V. Prosecutorial Discretion:

It is the responsibility of NOAA to investigate and take appropriate enforcement action with respect to violations of the ESA involving species under its jurisdiction. In light of the substantial amounts of time and money that have been, and will continue to be, expended by CAW on steelhead conservation measures, NOAA agrees that prosecution of CAW for ESA violations relating to its pumping operations and water withdrawals from the Carmel River is not the preferred course of action.

Accordingly, so long as CAW complies with the terms and conditions of this Agreement, NOAA will exercise enforcement discretion relative to any potential violation of the ESA committed by CAW involving its pumping operations or water withdrawals from the Carmel River in the following manner:

A. NOAA may investigate and document each apparent ESA violation.

B. NOAA will exercise enforcement discretion in prosecuting such ESA violations, if in the sole view of NOAA, CAW has fully complied with the terms and conditions of this Agreement.

C. If NOAA believes CAW has not complied with any term or condition of this Agreement, NOAA shall notify CAW of said belief within five (5) business days after making this determination.

VI. Term of Agreement:

A. This Agreement shall commence on the date of signature by the last Party executing this Agreement, and shall expire (i) on the calendar day immediately preceding the expire on the seventh (7th) anniversary of this Agreement or (ii) upon CAW's compliance with Ordering Paragraph 2 of the State Water Resources Control Board Order 95-10, whichever occurs first.

B. The term of this Agreement may be extended by mutual consent of the Parties.

VII. Miscellaneous Provisions:

A. Although this Agreement does not address NOAA's ESA concerns with respect to any of CAW's operations other than well-pumping and water withdrawals, the Parties agree that they will negotiate in good faith using their best efforts to reach an agreement by August 31, 2006, to address NOAA's ESA concerns regarding CAW's remaining operations. Any subsequent agreement may include an extension of the term of this Agreement.

B. Either of the Parties may issue a press release regarding the contents of this Agreement after the other Party has been given adequate opportunity to review and comment on the draft press release.

C. The provisions of this Agreement shall apply to and be binding upon the Parties and their respective successors and assigns.

D. This written Agreement and the Conservation Agreement signed by the Parties on September 18, 2001, shall constitute the sole and entire agreement between the Parties and supersede any prior agreements and understandings whether oral or otherwise. The terms and conditions of the Conservation Agreement, except any obligations to increase well capacity in the lower Carmel Valley as previously required by Phase II Tier I, are expressly incorporated herein by reference. Any modification of this Agreement shall be in writing and signed by the Parties.

E. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, and such counterparts shall constitute one and the same agreement.

F. Each undersigned representative of a party to this Agreement certifies that he or she is fully authorized by that party to enter into and execute the terms of this Agreement and legally bind such party to this Agreement.

G. If CAW breaches section II.A of this Agreement by failing to provide any funding required under II A. within the time period set forth in this paragraph, NOAA shall give CAW written notice of such breach and demand that the funding be provided within ten (10) business days of receipt of such notice by CAW.

ACCEPTED ON BEHALF OF CALIFORNIA-AMERICAN WATER COMPANY BY:

Paul Townsley
California-American Water Company

DATED: June 29, 2006

ACCEPTED ON BEHALF OF THE DEPARTMENT OF COMMERCE BY:

Michele Kuruc
Office of General Counsel for Enforcement & Litigation, NOAA

DATED: June 29 2006

for Rodney McInnis
Regional Administrator Southwest Region
National Marine Fisheries Service, NOAA

DATED: June 29, 2006

EXHIBIT 19-D

Carmel River Watershed Assessment & Action Plan

2006Action Plan Revision

Conducted by the Carmel River Watershed Conservancy with guidance and assistance from an assembled group of the Carmel River Technical Advisory Committee (TAC)

Included herein is the final matrix of the Carmel River Action Plan items, originally included as part of the 2002 Carmel River Watershed Assessment & Action Plan, provided for the purposes of inclusion into other relevant documents.

Prepared for the Carmel River Watershed Conservancy by,
Tamara Doan, Director of Programs, Coastal Watershed Council
&
Monica S. Hunter, Ph.D. Central Coast Watersheds Project Manager,
Planning and Conservation League Foundation

October 9, 2006

	NEW ACTION PLAN #	Orig ACTION PLAN #	Details	Problems addressed	Benefits to be achieved	Lead Org/ Agency	Key Partners	Est. Cost	Permits required	Potential Funding Sources (Funding Organization)	Project Ranked by TAC, within each category (1=TOP PRIORITY)	Watershed Area/ tributary to focus specific action on:
CROSS-CUT ITEMS (3)												
1	CC-1	CC-6	Create a Carmel River Watershed Task Force that is open to all stakeholders. The purpose of this group will be to achieve the successful outcome of watershed projects identified in this plan and address other needs in the watershed. This group should function as advisors for projects to review and provide input that reflects local priorities, creates cooperative management strategies, and incorporates local experience to help identify potential problems and solutions.	Need for coordinated effort to address watershed issues	Better coordination and a vehicle to lead or assist in successful implementation of the actions identified in this plan	CRTF	CRWC, MPWMD, CRSA, BSLT, VWS, NOAA, USFWS, CDFG, SCC, RWQCB, RCD, NRCS, MCWRA, County DPW, landowners, USFS, etc.	$50,000/year	No	CDFG, private foundations, American Rivers, RLFF, CalAM	1	
2	CC-2	CC-1	Acquire or accept, in fee title or easement, lands that provide multiple benefits to the watershed such as: improving natural habitat and functions, facilitating recovery of listed aquatic and terrestrial species including Steelhead trout and CRLF, reduce flood and erosion risk, and improve public access.	Loss and degradation of natural habitat; erosion and flood risk; limited public access	Protect and restore natural habitats; protect riparian buffers; provide opportunities for restoration; expand park area; increase flood protection	BSLT, MPRPD	Cal-Am, Willing Private Property Owners, TNC, FWS, local jurisdictions	Varies; depending on appraised valuation	No	SCC, WCB, MPRPD, SWRCB, DWR, CDFG, private sources	2	
3	CC-3	CC-NEW(from HAB)	Establish a watershed work program with the Californian Conservation Corps, or other outside work groups, to assist the Carmel River Task Force, the Carmel River Steelhead Association and the Carmel River Watershed Conservancy and other community groups and volunteers in habitat restoration projects.	Impaired habitat	Improved habitat	CRWC, CRSA	California Conservation Corps	5-10K; varies by projects annually	No	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout	3	
FLOWS ACTIONS (5)												
4	FLOWS-1	FLOWS-1	Support implementation of a water supply project that minimizes the export of water from the Carmel River basin that causes the chronic reduction in flow and meets the goals of State Water Resources Control Board Order 95/10.	Overdraft, degradation of riparian function including: habitat loss and associated impacts of degradation on wildlife and aquatic species; loss of recreation and public access.	Continuous flow in the main stem and tributaries, recovery of sensitive species and riparian habitat, complies with State Order 95-10, increased Carmel River flow to Lagoon in many years	Cal-Am, MPWMD	State, Federal and local agencies - NOAA, USFWS, CDFG, DWR; SWRCB, CCRWQCB, PUC, MCo, and interested groups and non-profits.	$150- 200 million	N/A	MPWMD, CalAM, DWR	3	
5	FLOWS-2	FLOWS-2	Develop a project to maintain or increase surface water storage at Los Padres Dam Reservoir (LPD) until it is no longer needed to maintain summer flows for fish; including but not limited to dredging or excavation to remove sediment upstream of the dam or installing a rubber dam.	Lack of summer stream flow	Increased stream flow in low flow periods, increase water storage and reduce possibility of drying up of the lower reaches of the river	Cal-Am, MPWMD	Gravel extraction companies	needs feasibility study	Yes	CalAM, DWR, NOAA Fisheries,	4	

6	**FLOWS-3**	*FLOWS-3*	Study the feasibility of installing a rubber dam at LPD to temporarily increase water storage during the spring of each year. This would slow the drying up of the lower reaches of the river in a normal water year.	Reduction in surface storage capacity; passage impairments	Increased stream flow in low flow periods; improved migration of salmonids	Cal-Am, MPWMD	Cal-Am/MPWMD; State, Federal and local agencies - NOAA, USFWS, CDFG, DWR; SWRCB, CCRWQCB, PUC, MCo; and interested groups and non-profits.	$250,000	Yes	CalAM, DWR, NOAA Fisheries,	5	
7	**FLOWS-4**	*FLOWS-4*	Support improvements to the MPWMD's Aquifer Storage and Recovery (ASR) Project to reduce the amount of water extracted from the Carmel River Basin during summer months.	Overdraft, degradation of riparian function including: habitat loss and associated impacts of degradation on wildlife and aquatic species; loss of recreation and public access	Continuous flow in the main stem and tributaries, recovery of sensitive species and riparian habitat, complies with State Order 95-10; increased Carmel River flow to Lagoon in many years	MPWMD	Cal-Am	Ph.I = $3 million, Ph. II unknown, potentially $10-$20 million	Yes	CalAM, DWR, MPWMD	1	
8	**FLOWS-5**	*CC-7a*	Expand water conservation programs to all areas of the watershed, including rebates for low flow fixtures & encouraging drought tolerant landscaping. Use MPWMD water conservation program as a model.	Insufficient flows in the river and tributaries	Increased flows in the river & tributaries, increased aquatic habitat availability	CRTF/CRWC, MCo	MPWMD; CalAM, MC, landscaping & contractors professional associations	$250K/yr	No	DWR, CalAM, Rate payers,	2	
GROUNDWATER ACTIONS (3)												
9	**GW-1**	*GW-1 new*	Educate the public on the direct impact to surface water flows from groundwater pumping in unconfined alluvial aquifers such as the Carmel River, and based on the findings of the technical study to develop a water budget (GW-2), increase the public's awareness of how groundwater pumping in upland areas may impact surface flow in creeks and streams.	Impacts from groundwater extraction such as loss of surface flow, riparian vegetation, and aquatic habitat	Conservation, and increased surface flow for aquatic habitat	MPWMD, CRWC	NOAA Fisheries, CDFG, CRSA	$2K per year	No	Mitigation Program, and Grants	3	
10	**GW-2**	*GW-2*	Develop a water budget for the entire watershed so that the full resource system can be better quantified and managed for sustainability of human use and the broader diverse ecosystem. Foremost in this assessment is the analysis of how upland bedrock aquifer withdrawals impact the resources of the lower valley. The water budget should attempt to quantify rainfall, surface flow, evaporation, transpiration, and groundwater. Develop a set of water management recommendations based on the water budget results.	Lack of knowledge regarding water availability, extraction rates or potential impacts to the aquatic and riparian habitats and wildlife	Increased information with the potential for better management	CRWC, CRSA (CRTF)	NOAA Fisheries, CRSA, CRWC, MPWMD	$500K-1M	Yes	SWRCB, CDFG, NOAA, DWR, American Rivers	1	
11	**GW-3**	*GW-2 new*	Quantify the impact of groundwater extraction (multiple wells) in upland areas on summer surface flow in creeks draining from the well field area.	Premature drying of creeks and irregular hydrographs	Increased aquatic habitat and increased spawning success for steelhead	NOAA Fisheries, CRSA, CRWC, MPWMD	CDFG, MCWRA	$100K	Yes	SWRCB, CDFG, NOAA, DWR, American Rivers	2	

HABITAT ACTIONS (7)												
12	**HAB-1**	*HAB-1*	Extend the MPWMD mitigation program of periodic injections of gravels and cobbles downstream of Los Padres and San Clemente Dams to a level that restores the channel bottom to a condition similar to areas upstream of Los Padres Reservoir (LPD).	Lack of spawning gravels	Increased spawning habitat	MPWMD	CRWC	$50-100K	404,1601, 401	Mitigation Program; NOAA Restoration Center; CDFG;	2	
13	**HAB-2**	*HAB-2*	Conduct annual survey of tributaries and conduct annual "Creek Clean-up" to remove urban debris and trash throughout the watershed.	Degraded habitat and water quality, fish passage barriers	Improved habitat, water quality, and passage	CRWC, CRSA	CCC, creek volunteers, CRTF, private landowners, MCPWDept.	$10K first year	Yes	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout	5	*Hitchcock, Robinson Canyon, Potrero, Cachagua, San Clemente creeks.*
14	**HAB-3**	*HAB-4*	Continue and expand MPWMD and CRWC Large Woody Debris (LWD) program, including further LWD recruitment location studies and installation of Redwood & Douglas fir root balls in those reaches of the river that would most benefit from the introduction of LWD.	Impaired fish rearing habitat; slow flows and increase complexity	Improved habitat	MPWMD	CRWC, CRSA, CDFG	$10K - study; $20K/root ball installation	Yes	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout	3	
15	**HAB-4**	*HAB-5*	Expand on MPWMD program to create a watershed wide coordinated riparian vegetation restoration program that includes post-project monitoring and maintenance throughout the Carmel River watershed.	Degraded riparian habitat and stream function; streambank instability, erosion	Improved aquatic and riparian habitat	MPWMD	CRWC, BSLT, private landowners	$10K/year	No	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout, SCC, DWR	1	
16	**HAB-5**	*HAB-7*	Based on existing and future habitat typing, identify and implement priority projects to enhance CRLF habitat along the mainstem, and incorporate CRLF habitat benefits within other riparian restoration projects throughout the watershed.	Degraded CRLF habitat	Increased CRLF habitat	CDFG	BSLT, MPWMD, CRWC, public & private landowners	$50-80K/Yr	Yes	USFW; CDFG; Cal-AM; NOAA	4	
17	**HAB-6**	*HAB-8*	Develop a program to provide oversight and encourage land management organizations including park agencies, forest preserves, and golf course owners to strategically place large broken tree limbs from windstorms in the Carmel River for improved habitat. [small scale projects, Ex; willow and cottonwood mattresses, etc]	Impaired fish rearing habitat; slow flows and increase complexity	Improved habitat, reduced costs for disposal of woody material	CRSA, CRWC	MPWMD, CRWC	$2-10K per year/proj	Varies with project	CDFG, Private land owners	7	
18	**HAB-7**	*HAB-NEW*	Initiate program to remove/control aquatic and terrestrial invasives species.	Degradation of habitat quality and competition with native species	Improve habitat for native species; improve potential for restoring native habitat	CRWC, CRSA	BSLT, MPWMD	Varies with project	Varies with project	CDFG, NOAA, SCC, RWQCB, Trout Unlimited, CalTrout, American Rivers	6	

PUBLIC SAFETY (1)												
19	**PS-1**	*PS-2*	Reduce the risk of flood damage through combination of multi-objective flood control projects, retrofit of bridges, vegetation management, individual flood proofing, land acquisitions for flood plain restoration, removing structures from the 100 year flood plain with willing partners as feasible, and other beneficial projects.	Degraded habitat, property loss, flood risk	Properly functioning channel; reduced public safety risk; potential reduction in flood insurance costs	MCWRA, FEMA	MCWRA, ACOE, CalTrans, FHWA, County Public Works, CSA50, BSLT, landowners, Carmel River Lagoon Coalition.	Varies with project: $200K-$200m	Yes	SCC, DWR, ACOE, FEMA, NOAA, SWRCB, CDFG, CalTrans, FHWA, CSA50, effected property owners	1	
PUBLIC OUTREACH & EDUCATION ACTIONS (3)												
20	**PUB-1**	*PUB-2*	Establish a resource conservation and stewardship program for the community and actively disseminate the information to residents and landowners through peer to peer groups and multi-media outreach. Activities should include establishing an outreach campaign to inform the community of the impacts on water flows of excessive turf irrigation and establish a hotline for information and anonymous reporting; and, sending out an annual reminder, that storm drains flow to streams and the ocean and that drains should not be used for illegal disposal.	Negative public opinion; lack of public knowledge and support for conservation efforts	Facilitate understanding and support for residents modifying behavior; potential indirect benefits to water quality and water quantity	MPWMD and CRWC	VWS; CSUMB capstone students, MPRPD, RCD, BSLT, CRWC, CRSA, NOAA, MBNMS, CWC	$20K/year	No	CCRWQCB, NOAA	1	
21	**PUB-2**	*PUB-4*	Implement the Carmel River Parkway Plan between the ocean and San Clemente Dam, as well as similar efforts elsewhere in the watershed for "managed" public access in partnership with watershed stakeholders including local residents, land owners and recreational group representatives.	Trespassing leading to environmental damage to sensitive areas; lack of appropriate access	Improve appropriate public access; reduce impacts of public access	BSLT, MPRPD, CRWC	CRSA, TAMC, County Public Works, DPR, CalTrans	Varies depending on project: $50K-$5M	Varies with project	SCC, FHWA, Resources Agency	2	
22	**PUB-3**	*PUB-5*	Expand volunteer activities, and maintain the existing network of volunteers in the Carmel River Basin to provide planning, labor, outreach, and mapping services throughout the watershed.	More work than can be done	Get more work done	CRWC	CRSA, MPRPD	$20K/year to coordinate	No	Foundations, NOAA community based restoration	3	
SEDIMENT ACTIONS (6)												
23	**SED-1**	*SED-1*	Based on CRWC's Proper Functioning Condition (PFC) tributary assessments and other watershed assessments, restore and revegetate unstable banks and incised reaches of tributaries and main stem areas including: Conejo Creek, Finch Creek, James Creek & Tularcitos Creek.	Arresting further erosion and additional anthropogenic contribution of sediment into the system	Achieving a sediment budget closer to the natural balance	MPWMD, CRWC, RCDMC	Private Landowners, Resource Conservation District, Permitting Agencies, Interested Nonprofit Organizations	+/- $25,000 per project	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG, EQIP (NRCS)	1	*Conejo Creek, Finch Creek, James Creek & Tularcitos Creek.*
24	**SED-2**	*SED-3 new*	Implement restoration projects in Hitchcock Creek and sub-basin to stabilize stream banks. Conduct a program to inform the residents and property owners on the issues of in-stream home construction, riparian cover removal, and impediments to fish. See CRWC PFC assessment of tributaries.	Arresting further erosion and additional anthropogenic contribution of sediment into the system	Educating watershed residents regarding their impacts to the system and possibly abating further damage. Achieving a sediment budget closer to the natural balance.	CRWC	Private Landowners, Resource Conservation District, MC, Permitting Agencies, Interested Nonprofit Organizations	Varies depending on type of restoration practice needed.	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG, EQIP (NRCS)	5	

25	**SED-3**	*SED-5*	Identify and map existing sediment basins to evaluate their effectiveness in order to determine the appropriate locations for installation or removal (restoration).	Removal of inappropriate sediment basins in flowing creeks	Reduction in disturbance to stream bed and banks	CRWC and CRSA	MPWMD, NRCS,	$10K	None	SWRCB, EQIP	6	
26	**SED-4**	*SED-6*	Implement BMPs for erosion prevention to reduce sediment deposition throughout the watershed including the main tributaries and the main stem of the Carmel River. Potential projects include, but are not limited to, excluding cattle from riparian areas and streambeds .	Excessive erosion	Higher water quality and better spawning habitat; identification of rural land use practices that accelerate sedimentation	RCDMC, BSLT, MPWMD, MC	CRWC and CRSA, NRCS, Private Landowners, Interested Nonprofit Organizations, CCC, MCPW	$20K per year	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG, EQIP (NRCS)	3	
27	**SED-5**	*SED-7*	In cooperation with the County Public Works Department (PWD) replace culverts on Carmel Valley Road as appropriate to minimize erosion and restore natural stream function.	Fish passage and erosion caused by failing culverts	Better fish passage and reduced erosion from failing culverts	MCWRA, CRWC	Pacific Watershed Associates	$10-100K per culvert	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG	4	
28	**SED-6**	*SED-8*	Conduct assessment of rural and unpaved roads throughout the watershed to identify and prioritize road treatments and roads for decommissioning; implement priority recommendations.	Sediment delivery to streams; road maintenance issues	Reduced sediment delivery to stream, reduced need for road management, decreased costs for rural road maintenance	RCDMC, MC; Road Assns	Pacific Watershed Associates, CalGeoSurvey, County, Private & public land owners and road assns.	$100K/yr	Varies with project	SWRCB, SCC, NOAA Fisheries, CDFG	2	
STEELHEAD ACTIONS (9)												
29	**SH-1**	*SH-1*	Expand the current fisheries assessment and monitoring program to include tributaries and multiple mainstem locations to quantify steelhead habitat utilization and migration patterns throughout the Carmel River Watershed.	Knowledge gap for numbers of salmonid fish using system	Acquiring the information required to determine implementation projects to provide full access for adult migrants to occupy all potential spawning habitats upstream	MPWMD, CRWC, CDFG, NOAA Fisheries	Cal-Am	$1.25M over five years	CDFG, NOAA Fisheries	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout; MPWMD, CalAm	3 / 6	
30	**SH-2**	*SH-5*	As a component of SH-1, Install a weir trap between Mallorca bridge and the Highway One bridge to count immigrating adults. The weir can be designed to collapse when flow reaches flood levels. Additionally, use of "fyke" nets can allow kelts & smolts moving downstream to be collected.	Unknown population dynamics for entire watershed	Known population dynamics for entire watershed; better management of steelhead resource and sport fishery; opportunity to delist	MPWMD, CRSA, CRWC	CDFG, NOAA Fisheries, USFWS, Private Property Owners	$75K capital cost and $65K operating cost per year	CDFG, NOAA Fisheries, USFWS	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout; MPWMD, CalAm	8 / 6	
31	**SH-3**	*SH-2*	Establish a Rescue Fund for the implementation of annual watershed restoration and steelhead rescue projects.	Insufficient labor to conduct complete and timely rescues of juvenile steelhead in drying tributaries and install habitat components	Maintain volunteer base and technical expertise to improve the survival of stranded fish	CRSA, CRWC, & BSLT	MPWMD & Cal Conservation Corps	$20K/yr	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	NOAA Restoration Center; American Rivers; Cal-Trout; MPWMD, MPRPD, MCo, Private Land Owners	4 / 9	

32	**SH-4**	*SH-3*	Conduct a watershed-wide assessment and map culverts & fish barriers including an estimate of the replacement cost of non functioning units. Incorporate the problems identified in the CRWC PFC findings for the main tributaries.	Partial or complete migration barriers include: Syndicate Camp fords; critical riffle above Pine Creek; concrete crossings	Full access for adult migrants to occupy all potential spawning habitats	Monterey County, MPWMD	CDFG, NOAA Fisheries, Private Land Owners	$350K to produce a comprehensive watershed assessment	Landowner access agreements	NOAA Restoration Center; SCC, CDFG; American Rivers; Cal-Trout; MPWMD, MCo, Private Land Owners	1	
33	**SH-5**	*HAB-2*	Remove or modify priority fish passage barriers throughout the watershed.	Impaired access to usable habitat	Improved passage to usable habitat, increased spawning and rearing success	CRWC, CRSA	CCCorps, CRSA, CRWC, CDFG, NOAA, MPWMD, MPRPD, MCo, CalTrans, Private Land Owners	$100K first year	Yes	NOAA Restoration Center; SCC, CDFG; American Rivers; Cal-Trout; MPWMD, MPRPD, MCo, Private Land Owners	2	*Hitchcock, Robinson Canyon, Potrero, Cachagua, San Clemente creeks.*
34	**SH-6**	*SH-4*	Redesign and install the fish screen at the entry to the outlet at LPD.	Loss of emigrating juvenile and smolts from habitat areas upstream of Los Padres Reservoir	Survival of entrained downstream migrants	Cal-Am	Cal-Am, MPWMD, ; NOAA/NMFS, CDFG;	$500K	CDFG, NOAA Fisheries, USFWS	CalAM	5	
35	**SH-7**	*SH-6*	Establish a partnership with other agencies to sort, store, and discharge a portion of the coarse-grained sediment (spawning gravels) stored in San Clemente and Los Padres Reservoirs to the lower Carmel River based on prior studies.	Inadequate gravel supply for spawning adults, juvenile steelhead and aquatic insects	This will Increase juvenile steelhead production; increased abundance and diversity of aquatic insects; benefit critical steelhead spawning habitat areas, increase the diversity and abundance of aquatic benthic macro invertebrates, and add physical complexity to the riparian areas downstream of the existing San Clemente and Los Padres Dams	MPWMD, Cal-Am	Cal-Am	$60K per year/reservoir	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	CalAM, MPWMD, Cal-Trout, NOAA	6	
36	**SH-8**	*SH-7*	Concentrate the flow at the Los Padres Dam spillway for out-migration of steelhead.	Fish trapped in reservoir	Increased fish passage for emigration (out-migration)	Cal-Am	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	North : $50K; Dam: +/-$200K	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	CalAM, MPWMD, Cal-Trout, NOAA, CDFG	7	
37	**SH-9**	*FLOWS-7*	Monitor the Carmel River & tributaries for fish barriers twice annually (during the in-migration and out-migration) to insure that no barriers to fish passage go unnoticed. Mitigate as appropriate.	Fish passage, access to habitat	Increased spawning habitat	CRWC	SA; MPWMD; CalAM; volunteers	$15K/yr	No	MPWMD	9	

NEW CATEGORY:												
MONITORING ACTIONS (4)												
38	**MON-1**	*CC-14*	Develop an adaptive management program for water quality in the lagoon, including installing an automated water quality monitoring station in the lagoon; coordinating with Carmel Area Wastewater District (CAWD) for discharge of tertiary water into the lagoon; and investigating use of California Department of Parks and Recreation wells for emergency discharges to lagoon.	Poor water quality; lack of inflow	Improved water quality and quantity	CRSA/ MPWMD /DPR	CAWD	$20K/year	Yes	SWRCB, CalAM, CAWD, MPWMD	1	
39	**MON-2**	*HAB-10*	Expand habitat and species monitoring programs including: 1) aquatic and terrestrial non-native invasive species; 2) BMI index; 3) riparian habitat; 4) instream habitat; and, 5) restoration projects.	Habitat quality and sustainability; presence of invasive species	Evaluate the relationship between the BMI index and steelhead; identify and prioritize invasive species for management/removal measures; identify and prioritize restoration needs and locations; evaluate success of restoration efforts	MPWMD	CRWC, CRSA, BSLT, VWS, CSUMB	$50K - $150K/year	Depends on location and species	DFG, NOAA, RWQCB, Trout Unlimited, CalTrout, American Rivers	2	
40	**MON-3**	*PUB-1*	Establish a Volunteer Water Quality Monitoring Program incorporating local schools, Snapshot & First Flush program participants, and other interested stakeholders to tie into the MPWMD program and to include all the main tributaries.	Inconsistency in water quality monitoring effort	Early detection of water quality problems with increased response time; ability to focus implementation projects where the greatest need exists; promote stewardship values	MPWMD	Carmel Unified School District, Boys and girls clubs, NOAA, USGS, CWC	$20K/year	No	CCRWQCB, SWRCB	4	
41	**MON-4**	*SED-4*	Establish a sediment transport monitoring program in concert with the surface flow monitoring program of MPWMD for the main stem and tributaries. Thus, providing decision makers with the key to quantify the problems and assessing future changes. See Physical & Hydrologic Assessment WI 2004-05/2, p 76 # 8.2.	Lack of information about sediment transport throughout the watershed	Increased information leading to better sediment management	CRTF	CSUMB, MPWMD, CalAM, USGS	$50K-100K/year	No	SWRCB, NOAA, CalAM	3	