

2001-2002 ANNUAL REPORT
(July 1, 2001 - June 30, 2002)

MPWMD MITIGATION PROGRAM
WATER ALLOCATION PROGRAM ENVIRONMENTAL IMPACT REPORT

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
January 2003

I. INTRODUCTION AND EXECUTIVE SUMMARY

BACKGROUND:

In April 1990, the Water Allocation Program Final Environmental Impact Report (EIR) was prepared for the Monterey Peninsula Water Management District (MPWMD) by Mintier and Associates. The Final EIR analyzed the effects of five levels of annual Cal-Am production, ranging from 16,744 acre-feet per annum (AFA) to 20,500 AFA. On November 5, 1990, the MPWMD Board certified the Final EIR, adopted findings, and passed a resolution that set Option V as the new water allocation limit. Option V resulted in an annual limit of 16,744 acre-feet (AF) for California-American Water Company (Cal-Am) production, and 3,137 AF for non-Cal-Am production, resulting in a total allocation of 19,881 AFA for the water resource system.

Even though Option V was the least damaging alternative of the five options analyzed in the Water Allocation EIR, production at this level still resulted in significant, adverse environmental impacts that must be mitigated. Thus, the findings adopted by the Board included a "Five-Year Mitigation Program for Option V" and several general mitigation measures.

In June 1993, Ordinance No. 70 was passed, which amended the annual Cal-Am production limit from 16,744 AF to 17,619 AF, and the non-Cal-Am limit from 3,137 AF to 3,054 AF; the total production limit was increased from 19,881 AF to 20,673 AF per year due to new supply from the Paralta Well in Seaside. In April 1996, Ordinance No. 83 slightly changed the Cal-Am and non-Cal-Am annual limits to 17,621 AF and 3,046 AF, respectively, resulting in a total limit of 20,667 AF per year. In February 1997, Ordinance No. 87 was adopted to provide a special water allocation for the planned expansion of the Community Hospital of the Monterey Peninsula, resulting in a new Cal-Am production limit of 17,641 AFA; the non-Cal-Am limit of 3,046 was not changed. These actions did not affect the implementation of mitigation measures adopted by the Board in 1990.

The Five-Year Mitigation Program formally began in July 1991 with the new fiscal year (FY) and was slated to run until June 30, 1996. Following public hearings in May 1996 and District Board review of draft reports through September 1996, the Five-Year Evaluation Report for the 1991-1996 comprehensive program as well as an Implementation Plan for FY 1997 through FY 2001 were finalized in October 1996. In its July 1995 Order WR 95-10, the State Water Resources Control Board (SWRCB) directed Cal-Am to carry out any aspect of the Five-Year Mitigation Program that the District does not continue after June 1996. To date, as part of the annual budget approval process, the District Board has voted to continue the program. The mitigation program presently accounts for a significant portion of the District budget in terms of revenue (derived primarily from the MPWMD fee on the Cal-Am bill) and expenditures.

The California Environmental Quality Act (CEQA) (Pub. Res. Code 21081.6) requires that the MPWMD adopt a reporting or monitoring program to insure compliance with mitigation measures when implementing the Water Allocation Program. Findings Nos. 387 through 404 adopted by the Board on November 5, 1990 describe mitigation measures associated with the Water Allocation Program; many entail preparation of annual monitoring reports. This 2001-2002 Annual Report for the MPWMD Mitigation Program responds to these requirements.

Previous annual reports (1991, 1992 and 1993) covered the calendar year January 1 through December 31. Because this time period conflicted with the District's budget cycle (July 1 - June 30), it was determined that an 18-month report was needed to bridge the transition from a calendar year to a fiscal year in 1994-95. Thus, the fourth MPWMD Annual Report covered the January 1994-June 1995 period. The fifth (and subsequent) annual reports covered the fiscal year (FY) period of July 1 through June 30 of the following year. This report is the eleventh in the series, and the sixth report using the fiscal year planning period. It is notable that hydrologic data and, for the first time, well reporting data, are tabulated using the water year, defined as October 1 through September 30, in order to be consistent with the accounting period used by the SWRCB. Some of the well production data are considered to be provisional subject to confirmation by District staff.

This 2001-2002 Annual Report will first address general mitigation measures relating to water supply and demand (Sections II through VIII), followed by mitigations relating to specific environmental resources (Sections IX through XII). Section XIII provides a summary of costs for the biological mitigation programs as well as related hydrologic monitoring and administrative costs.

For each topic, the mitigation measure adopted as part of the Final EIR is briefly described, followed by a summary of activities relating to the topic in FY 2002 (July 1, 2001 through June 30, 2002). Monitoring results, where applicable, are also presented. Tables and figures that support the text are found at the end of each section. Finally, a summary of observed trends, conclusions and/or recommendations are provided, where pertinent.

ACCOMPLISHMENTS:

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Table I-1 summarizes the mitigation measures described in this report for the past five years. Please refer to similar tables in previous annual reports or the Final Evaluation Report for the 1991-1996 Mitigation Program for a summary of activities and progress in previous years. Highlights of accomplishments in FY 2002 for each major category are shown in **Table I-2**.

OBSERVED TRENDS, CONCLUSIONS AND/OR RECOMMENDATIONS:

The following paragraphs describe observed trends (primarily qualitative), conclusions and/or recommendations for the mitigation program. General conclusions are followed by a summary of selected categories.

General Overview

In general, the Carmel River environment is in better condition than it was 10 years ago. This improvement is evidenced by biological/hydrologic indicators such as consistent steelhead adult spawner counts of roughly 400-850 fish in recent years as compared to less than five fish per year when the Mitigation Program began; improved densities of juvenile steelhead in quantities that reflect a healthy seeded stream; consistently increased bird diversity in MPWMD restoration project areas compared to control areas; fewer miles of dry river in summer and fall than in the past; and higher water tables in the Carmel Valley alluvial aquifer at the end of the water year.

The comprehensive MPWMD Mitigation Program is an important factor responsible for this improvement. Direct actions such as fish rescues and rearing, and riparian habitat restoration literally enable species to survive and reproduce. Indirect action such as conservation programs, ordinances/regulations and cooperative development of Cal-Am operation strategies result in less environmental impact from human water needs than would occur otherwise. The District's comprehensive monitoring program provides a solid environmental baseline and enables better understanding of the relationships between weather, hydrology, human activities and the environment. Better understanding of the water resources system enables informed decision-making that achieves the District's mission of benefiting the community and the environment.

It is acknowledged that there are other important factors responsible for this improved situation. For example, since 1991, the Carmel River watershed has received normal or wetter rainfall and runoff in nine out of ten years. Actions by federal resource agencies under the Endangered Species Act (ESA) or the State Water Resources Control Board (SWRCB) under its Order WR 95-10 have provided strong incentive for Cal-Am and other local water producers to examine and amend water production practices to the degree feasible, and for the community to reduce water use. Except for one year in 1997, the community has complied with the production limits imposed on Cal-Am by the SWRCB since Order 95-10 became effective in July 1995.

Despite these improvements, challenges still remain due to human influence on the river. The steelhead and red-legged frog remain listed as Threatened species under the ESA. Several miles of the river still dry up each year, harming habitat to fish and frogs. The presence of the two existing dams, flood plain development and water diversions to meet community needs continue to alter the natural dynamics of the river. Stream bank restoration projects may be significantly damaged in large winter storm events, and some people continue to illegally dump refuse into the river or alter their property without the proper permits. Thus, the Mitigation Program (or a comprehensive effort similar to it) will be needed as long as significant quantities of water are diverted from the Carmel River and people live in close proximity to it.

Water Resources

Streamflow and precipitation data continue to provide a scientific basis for management of the water resources within the District. These data continue to be useful in Basin planning studies, reservoir management operations, water supply forecast and budgeting, and defining the baseline hydrologic conditions of the Carmel River Basin. The District's streamflow monitoring program continues to produce high quality data in a cost effective manner. For example, the current annual cost of maintaining a single streamflow gaging station charged by the United States Geological Survey (USGS) is \$16,100/year. If the District's streamflow monitoring program was maintained by the USGS, the annual cost would be \$282,000/year (based on 16 gage sites). In addition, this annual cost does not include the labor costs associated with District staff installing new streamflow gages, such as the five installed in 2002, as these costs were absorbed into regular staff hours. The District is able to maintain its streamflow monitoring network with approximately 75 percent of a full-time District staff position (Associate Hydrologist), and an annual equipment operating budget of about \$2,000.

Ground water levels, and consequently ground water storage conditions, in the Carmel Valley alluvial aquifer have maintained a relatively normal pattern in recent years, in contrast to the dramatic storage declines that were observed during the prolonged 1987-91 drought period. The lowest storage level during the 2001-2002 reporting period in the upper valley (i.e., aquifer subunits 1 and 2) was 93 percent of capacity at the end of August 2002. (Note that hydrologic measurements are tabulated for a "water year," defined as October 1 through September 30 of the next year.) In the lower valley (i.e., aquifer subunits 3 and 4), the lowest storage level was 85 percent of capacity at the end of September 2002. This compares with the 89 percent and 42 percent capacity estimates recorded in 1991 for the upper and lower valley areas, respectively. The relatively stable storage in the Carmel Valley alluvial aquifer in recent years is attributable to a combination of more favorable hydrologic conditions and the adoption of improved water management practices that have tended to preserve storage conditions in the aquifer.

In contrast, storage conditions in the coastal portion of the Seaside Basin have not been stable in recent years, in particular with respect to the deeper Santa Margarita aquifer, from which over 80 percent of the Cal-Am production in the Seaside Basin is derived. This downward trend in water levels reflects the changed production operations in the Seaside Basin stemming from SWRCB Order 95-10. The increased annual reliance on production from Cal-Am's major production wells in Seaside have dramatically lowered water levels in this aquifer, and seasonal recoveries have not been sufficient to reverse this trend. One of the means to mitigate this observed trend is a program that the District has been actively pursuing since 1996-- the Seaside Basin groundwater injection program (also known as aquifer storage and recovery).

Expanded testing of the District's full-scale test injection well was carried out during FY 2002 to further confirm the feasibility of this water augmentation concept. Ground water quality conditions in both the Carmel Valley aquifer and Seaside Basin have remained acceptable in terms of potential indicators of contamination from shallow sources such as septic systems, and there have been no identifiable trends indicative of seawater intrusion in the coastal areas of these two aquifer systems. It is notable that development of a Seaside Basin Groundwater Management Plan is one of the strategic initiatives identified as a priority by the MPWMD Board at its September 5, 2001 workshop.

Steelhead Resource

Monitoring conducted by the District shows that the Carmel River steelhead population continues to recover from remnant levels that prevailed as a result of the last drought and past water supply practices. Since 1992, the spawning population has recovered from a handful of fish to levels approaching 900 adults per year as counted at San Clemente Dam (most recently, 642 fish in winter 2002). In addition, monitoring of the juvenile population at several sites along the mainstem Carmel River below Los Padres Dam shows that the population is recovering from low densities during the 1989-91 period (ranging below 0.50 fish per foot [fpf] of stream) to levels frequently ranging above 1.00 fpf during FY 2002, values that are typical of well-stocked steelhead streams. The recovery of steelhead in the Carmel River is believed to be directly related to the following factors:

- Improvements in streamflow patterns, due to favorable natural fluctuations, exemplified by relatively high base flow conditions since 1995,
- The District's and the SWRCB rules to actively manage the rate and distribution of groundwater extractions and direct surface diversions within the basin,
- Changes to Cal-Am's operations at San Clemente and Los Padres Dams, providing increased streamflow below San Clemente Dam,
- Improved conditions for fish passage at Los Padres and San Clemente Dams due to physical improvements,
- Recovery of riparian habitats, tree cover along the stream, and increases in woody debris, especially in the reach upstream of Robinson Canyon,
- Extensive rescues (and rearing) by MPWMD of juvenile steelhead for more than a decade, now totaling 157,100 fish through August 21, 2002; and by the transplantation of the younger juveniles to viable habitat upstream and of older smolts to the lagoon or ocean, and
- Implementation of a captive broodstock program by Carmel River Steelhead Association and California Department of Fish & Game, and planting of 186,882 juvenile fish, including 73,786 fry, 84,679 fingerlings, and 28,417 smolts during the period from 1991 to 1994.

Despite this positive news, significant changes in the very near future at San Clemente Dam are expected to have adverse effects on the steelhead resource during the next 10 to 20 years. The two major changes include: (1) lowering of the reservoir water level to address seismic safety concerns, and (2) significant changes in the sediment regime in the Carmel River downstream of San Clemente as the dam approaches complete filling with sediment and loss of reservoir storage.

Due to seismic safety concerns, the California Department of Water Resources (DWR), Division of Safety of Dams (DSOD), has ordered Cal-Am to lower the water level of the reservoir by 10 feet to 515 feet above mean sea level (msl) as of May 15, 2003, until a permanent structural solution is approved. The National Marine Fisheries Service (NMFS) has required that the water level be raised back to 525 msl to facilitate fish passage for the period February 7 through May 15. Periods of lowered water level may reduce the suitability of the existing fish ladder, thereby blocking passage of adult steelhead in December through early February, and interfering with passage of juveniles as they emigrate downstream in late Spring. There also may be passage difficulties for fish traversing the reservoir area. A shallower reservoir may result in release of warmer water in Summer and Fall at temperatures near the lethal level for steelhead, and could affect cooling system performance at the District's Sleepy Hollow Steelhead Rearing Facility.

Regarding sediment, finer sands and silts that used to be captured in the reservoir at the upstream end of the San Clemente Reservoir during low-to-moderate flows are now being passed over the dam; this phenomenon will increase as reservoir storage decreases. There is a high potential for this material to clog steelhead spawning nests and rearing habitat downstream of the dam beginning in water year 2003. The sediment problem is likely to worsen in the future, as alternatives being considered (including the "No Project" alternative) for retrofitting San Clemente Dam to meet seismic standards will lead to an increased sediment load downstream of the existing dam location. Initial studies indicate the potential release of up to 750 acre-feet of accumulated sediment from behind the dam, equivalent to 1.2 million cubic yards of material.

In Spring 2002, higher than normal sediment loads emanating from San Clemente Reservoir impacted the functioning of the District's Sleepy Hollow Steelhead Rearing Facility by damaging water intake and cooling pumps. The District will need to make significant and expensive alterations to the rearing facility beginning in year 2003 to keep the sediment from damaging pumps in the future and adversely affecting the artificial stream channel used to rear the rescued steelhead. The District Board has expressed concerns about the fiscal impacts of this situation, both in the near-term and the long-term; in early 2003, the Board may consider the option of turning the facility over to Cal-Am to operate. SWRCB Order 95-10 requires Cal-Am to continue implementing any aspect of the District's Water Allocation Program Mitigation Program that the District does not carry out.

The sediment situation at San Clemente Dam has the potential to significantly change the environmental setting on the Carmel River for many years to come, beginning in year 2003. Effective management of the sediment situation will require responsible agencies to consider the sometimes conflicting needs of people (dam safety, protection from flood hazard), protected species (steelhead, California red-legged frog), and riparian habitat.

Riparian Corridor

The flood events of 1995 and 1998 and their aftermath continue to dominate the form and composition of the channel bottom and riparian corridor. The listing of steelhead and California red-legged frogs as threatened species protected under the federal ESA has substantially influenced the scope of most instream activities, including vegetation management and channel restoration. Together, these events have significantly changed that way MPWMD carries out its responsibilities for protection, restoration, enhancement and monitoring of the river's resources.

Construction techniques in the restoration field continue to evolve, with an emphasis being placed on solutions that allow a limited amount of bank erosion (i.e., deformability) and encourage the establishment of streamside vegetation. Environmental review of proposed projects and the process of securing permits has become increasingly complex. MPWMD continues to work closely with Federal and State regulators to exchange information on best management techniques and also to remain aware of any changes in the status of sensitive species.

The most significant trends include the following:

- increased oversight of channel maintenance and restoration activities by Federal agencies,
- increased groundwater extraction downstream of Schulte Road,
- vegetation encroachment into the channel bottom,
- increased avian species diversity, and
- maturing of previous restoration projects.

Carmel River Erosion Protection and Restoration

Between 1986 and 1999, MPWMD completed nearly 20,000 lineal feet of river restoration work at eight major project sites. Many of these areas are now beginning to mature so that it is difficult in some areas to tell the difference between restored areas and "natural" areas. It appears that project areas are becoming more complex, both in channel structure and vegetation types. This has both positive and potentially negative impacts. Positive benefits include additional habitat and stream bank stabilizing vegetation, while increased channel complexity can lead to bank instability and property loss.

Sand contributed by erosion in the Tularcitos Creek drainage and from the collapse of main stem banks covered the channel bottom of the main stem for about 16 miles in 1998. This sand has largely been washed down to the lower three miles of river, except in areas with pools greater than 300 feet in length. Average winter flows between 1999 and 2002 have revealed the extent of pool scour from the 1995 flood, which was estimated to be a stream flow of approximately 16,000 cubic feet per second at its peak. Pool depths after the winter of 1994/1995 appeared to be much greater than previous years -- a result of the relatively short, sharp spike in flow on January 10 and March 10, 1995. However, sustained high flows in Spring 1998 filled pools in with sand and gravel. In addition to deep pool areas that are now present, there are more and larger areas of "cut banks," which generally provide deep water areas and overhanging vegetation.

Most of the streambanks destabilized or eroded in the 1990s were repaired shortly after they were damaged. However, there are a few areas where bank erosion may occur during high flows. The following list is based primarily on observations of current vegetative bank cover and past erosion at these sites. These are (from downstream to upstream):

1. in the vicinity of Hacienda Carmel (River Mile (RM) 3.2 to RM 3.9);
2. the south bank upstream of the Rancho San Carlos Road Bridge (RM 3.9), at the Quail Lodge golf course;
3. the south bank at the upstream end of the Valley Hills Restoration Project (RM 5.5);
4. the north bank at upstream end of the Schulte Restoration Project near the Cal-Am Manor well (RM 7.2);
5. across from Red Rock pool at RM 8;
6. the north bank at the upstream end of Garland Park (RM 11.2);
7. the vicinity of the Carmel Valley Trail and Saddle Club (RM 13.0);
8. the north bank next to the deDampierre baseball parking lot (RM 13.2); and
9. portions of Camp Steffani (RM 15.3).

Sites 1 through 5 lie in areas where groundwater extraction continues to be a key factor affecting the establishment and sustainability of streamside vegetation. Some natural recovery of the riparian corridor may be possible through irrigation; however, long-term recovery and stability is unlikely until overly steep streambanks are graded and protected against erosion. Problem areas at sites 6 through 9 have complex root causes including instability introduced into the system during the 1960s and 1970s, floodplain development, and the presence of main stem dams that cut off the supply of sediment to the lower river. MPWMD will continue to monitor these areas for degradation and/or instability.

Vegetation encroachment into the channel bottom, which has not been a significant problem since the mid-1990s, is beginning to occur at several locations. Mid-channel vegetation can lead to bank erosion during high flows. MPWMD's past practice was to strategically remove portions of vegetation that could cause bank loss or instability while maintaining as much aquatic habitat as feasible. Due to State and Federal regulations and concerns about habitat loss, this activity has been curtailed and replaced by an approach that deals with vegetation and debris treatment on a case-by-case basis.

It is likely that the following trends will continue or develop in the near future:

- Permit applications by MPWMD for river work will come under increasing scrutiny at all levels of government. More stringent avoidance and mitigation requirements will be placed on activities that could have negative impacts on sensitive aquatic species or their habitats.
- Activities that interrupt or curtail natural stream functions, such as lining streambanks with riprap, will be discouraged or denied permits. Activities that increase the amount of habitat or restore natural stream functions are more likely to be approved in a streamlined manner.
- Additional work to add instream features (such as large logs for steelhead refuge) will be necessary to restore and diversify aquatic habitat.
- Major restoration projects completed between 1992 and 1999 will require additional work to diversify plantings and to maintain irrigation systems during the establishment period (varies from 5 to 10 years depending on environmental conditions and the availability of staff resources). Streambank repair may be necessary after high flows as previously installed structural protection goes through an initial adjustment period.

A comprehensive long-term solution to river degradation requires a significant increase in dry season water flows in the lower river to pre-development levels, a reversal of the incision process, and reestablishment of a natural meander pattern. Of these, MPWMD has made progress with increasing summer low flows and in studying the effects of an increased sediment load to the river. Reversal, or at least halting of channel incision, which contributes to bank collapse, may be possible if the supply of sediment is brought into balance with the transport capacity of the river (the system is currently “sediment starved”). With San Clemente Reservoir over 90% filled with sediment, it is likely that the supply of sediment downstream of the San Clemente Dam will increase in the very near future. Studies currently underway by DWR to remediate San Clemente Dam show that additional sediment from the basin between San Clemente Reservoir and Los Padres Dam could increase bed elevations a small amount. Over the long term, an increase in sediment supply could help reduce streambank instability. Reestablishing a natural meander pattern presents significant political, environmental, and fiscal challenges, and is not currently being considered as part of the Mitigation Program.

Vegetation Restoration and Irrigation

Since 1998, a fundamental shift has taken place in streambank restoration design, which incorporates a functional floodplain that would be inundated in relatively frequent storm events (those expected every 1-2 years). For example, low benches at the Red Rock and All Saints Projects have served as natural recruitment areas and are currently being colonized by black cottonwoods, sycamores and willows. In addition, willow and cottonwood pole plantings in these areas were installed with a backhoe, which allows them to tap into the water table. These techniques have been successful and have reduced the need for supplemental irrigation. However, as pumping has increased in the lower Carmel Valley (pursuant to direction by the SWRCB and a Conservation Agreement between Cal-Am and NMFS) supplemental irrigation was installed on the engineered floodplain opposite the All Saints School. Summer pumping at Cal-Am’s Schulte Well impacted the District’s deep pole plantings, causing premature leaf drop. Riparian moisture stress was mitigated, by installing a drip irrigation system. It is anticipated in wet years this system will not have to be operated, but in average to below average years this system will have to be utilized.

The Conservation Agreement between Cal-Am and NMFS will change the lower Carmel Valley pumping regime. The increased pumping at the Cañada Well may cause significant stress to the riparian corridor and create the need for supplemental irrigation. The severity of these impacts will be monitored through the Conservation Agreement Monitoring Plan.

Channel Vegetation Management

Another notable trend relating to the District’s channel clearing program was the widening of the channel after the floods in 1995 and 1998. With relatively normal years following these floods the channel has narrowed as vegetation recruits on the streambanks and gravel bars. Current Federal regulations such as the “4 (d)” rules promulgated by NMFS to protect steelhead significantly restrict vegetation management activities. Currently, there are limited physical channel restrictions and erosion hazards in the lower 15 miles of the river. However, if normal to low flows continue in the next several years, expanding vegetation may significantly restrict the channel. As vegetation in the river channel recovers from the high flows of 1995 and 1998 and matures in the channel bottom, more conflicts are likely to arise between preserving habitat and reducing the potential for property damage during high flows. MPWMD will continue to balance the need to treat erosion hazards in the river yet maintain features that contribute to aquatic habitat quality.

Permits for Channel Restoration and Vegetation Management

Obtaining individual permits for conducting activities in the channel of the Carmel River has become increasingly complex since 1995 with the listing of steelhead and California red-legged frogs as Threatened species under the protection of the Federal Endangered Species Act. Staff time for obtaining authorizations from CDFG and the Corps has risen dramatically; the lead-time for obtaining these authorizations can stretch to years for a complex project. Much more emphasis is also being placed on incorporating habitat enhancements for steelhead and California red-legged frogs into projects. This has increased project development time and costs.

To cope with the rising level of environmental analysis and documentation necessary to obtain permits, MPWMD is actively seeking a long

term permit from the Corps and is negotiating a renewal of a long term Memorandum of Understanding with the California Department of Fish and Game to conduct regular maintenance and restoration activities. The District will also seek long-term permits or agreements with other regulatory agencies including the California Regional Water Quality Control Board, the Monterey County Planning and Building Inspection Department, and the Monterey County Water Resources Agency.

Monitoring Program

Vegetative moisture stress on a whole fluctuates depending on the rainfall, proximate stream flow, and average daily temperatures, and tends to be much lower in above-normal rainfall years. Typical trends for a single season start with little to no vegetative moisture stress in the spring when soil is moist and the river is flowing. As the river begins to dry up in the lower Carmel Valley (around June) and temperatures begin to increase, an overall increase in vegetative moisture stress occurs. For much of the riparian corridor this stress has been mitigated by supplemental irrigation and prevented the die off of large areas of riparian habitat. However, many recruiting trees experience high levels of stress or mortality in areas difficult to irrigate. Riparian vegetation exposed to rapid or substantial lowering of groundwater levels (i.e., below the root zones of the plants) will continue to require monitoring and irrigation during the dry season.

With respect to riparian songbird diversity, populations dropped after major floods in 1995 and 1998 because of the loss of streamside habitat. However, they have rebounded in the last few years and have shown some of the highest diversity since monitoring began in 1992, indicating that the District mitigation program is preserving and improving riparian habitat.

Carmel River Lagoon

The District continues to support and encourage the ongoing habitat restoration efforts in the wetlands and riparian areas surrounding the Carmel River Lagoon. These efforts are consistent with goals that were identified in the Carmel River Lagoon Enhancement Plan, which was partially funded by the District. Currently, District staff is participating in multi-agency and landowner discussions to implement restoration of approximately 100 acres on the Odello West property, including expansion of the south arm of the lagoon and re-establishment of riparian and wetland habitat. Because of the restoration activities on the south side of the lagoon, the District has concentrated its monitoring efforts on the relatively undisturbed north side. Staff have also attended meetings and had discussions with other agencies regarding a proposal to use treated water from the Carmel Area Wastewater District to augment the lagoon during periods of low water.

The District expanded its long-term been monitoring around the lagoon in 1995, in an attempt to determine if the reduction in freshwater flows due to ground water pumping upstream might be changing the size or ecological character of the wetlands. Demonstrable changes have not been identified. Because of the complexity of the estuarine system, a variety of parameters are monitored, including vegetative cover in transects and quadrats, soil and water conductivity, and hydrology. It is notable that due to the number of factors affecting this system, it would be premature to attribute any observed changes solely to ground water pumping. During this period, for example, there have been two extremely wet years (1995 and 1998), and two above normal years (1996 and 1997), in terms of annual runoff.

Other natural factors that affect the wetlands include introduction of salt water into the system as waves overtop the sandbar in autumn and winter, tidal fluctuations, and long-term global climatic change. In the winter of 2001-2002, for example, the lagoon was filled by waves overtopping the sandbar before any fresh water from the river had reached the lagoon. When the District initiated the long-term lagoon monitoring component of the Mitigation Program, it was with the understanding that it would be necessary to gather data for an extended period in order to draw conclusions about well draw-down effects on wetland dynamics. It is recommended that the annual vegetation, soil conductivity, topographical and wildlife monitoring be continued in order to provide a robust data set for continued analysis of potential changes around the lagoon.

Program Costs

The annual cost of mitigation efforts varies because several mitigation measures are weather dependent. However, the overall costs have remained fairly constant (about \$1.3-\$1.6 million) over the past few years. The one exception was FY 2000 (July 1999-June 2000) when an additional \$981,786 was added to the capital expense program to fund one half of the acquisition cost of the District's new office building, bringing the expenditure total to over \$2.6 million that year. This cost is being reimbursed over a period of 15 years.

Table I-1

**SUMMARY OF PROGRESS ON MPWMD MITIGATION PROGRAM ¹
JULY 1, 1997 THROUGH JUNE 30, 2002
Prepared January 2003**

MITIGATION MEASURES	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002
<i>WATER MANAGEMENT</i>					
Monitor Water Resources	ongoing	ongoing	ongoing	ongoing	ongoing
Manage Water Production	ongoing	ongoing	ongoing	ongoing	ongoing
Manage Water Demand	ongoing	ongoing	ongoing	ongoing	ongoing
Monitor Water Usage	ongoing	ongoing	ongoing	ongoing	ongoing

Augment Water Supply	ongoing	ongoing	ongoing	ongoing	ongoing
Allocation of New Supply	ongoing	ongoing	ongoing	ongoing	ongoing
Determine Drought Reserve	ongoing	ongoing	ongoing	ongoing	ongoing
STEELHEAD FISHERY					
Capture/Transport Emigrating Smolts in Spring					
Smolt rescues	ongoing	ongoing	ongoing	ongoing	ongoing
Build acclimation facility/tagging study	permit denied	N/A	N/A	N/A	N/A
Prevent Stranding of Fall/Winter Juvenile Migrants					
Juvenile rescues	ongoing	ongoing	ongoing	ongoing	ongoing
Build mid-Valley holding facility	deferred	deferred	deferred	deferred	deferred
Rescue Juveniles Downstream of Robles del Rio in Summer					
Juvenile rescues	ongoing	ongoing	ongoing	ongoing	ongoing
Build Sleepy Hollow holding/rearing facility	Completed in 1996-97; in operation	In operation, design cooling tower	In operation, begin cooling tower construction	In operation, complete cooling tower, safety platform, bird nets	Limited operation; installed alarm system and chillers; assessed pump failure
Modify Spillway/Transport Smolts Around Los Padres Dam	mortality study report completed	n/a	conduct experiments	analyze data	analyze data
Monitoring Activities for Mitigation Plan					
Adult counts at San Clemente Dam	ongoing	ongoing	ongoing	ongoing	ongoing
Juvenile population surveys	ongoing	ongoing	ongoing	ongoing	ongoing
Other Activities Not Required by Mitigation Plan					
Spawning habitat restoration	monitor and maintain	monitor and maintain	monitor and maintain	monitor and maintain	monitor and maintain
Fish planting (steelhead broodstock program) Coastal Salmon Recovery Program grant in mid 2001	none	none	none	awarded grants; obtaining permits	Conducted environmental review
Modify critical riffles	monitor and maintain	monitor and maintain	monitor and maintain	monitor and maintain	monitor and maintain
RIPARIAN VEGETATION AND WILDLIFE					
Conservation and Water Distribution Management	ongoing	ongoing	ongoing	ongoing	ongoing
Prepare/Oversee Riparian Corridor Management Plan	Implement Plan	Implement Plan	Implement Plan	Implement Plan	Implement Plan
Implement Riparian Corridor Management Program					
Cal-Am well irrigation (4 wells)	ongoing	ongoing	ongoing	ongoing	ongoing
Channel clearing	ongoing	ongoing	ongoing	ongoing	ongoing
Vegetation monitoring	ongoing	ongoing	ongoing	ongoing	ongoing
Track and pursue violations	ongoing	ongoing	ongoing	ongoing	ongoing
River Care Guide booklet	completed	available	available	revised booklet	available
CRMP Erosion Protection Program	ongoing	ongoing	ongoing	ongoing	ongoing
LAGOON VEGETATION AND WILDLIFE					
Assist with Lagoon Enhancement Plan Investigations	Continue to assist Caltrans ²	continue assistance	continue assistance	continue assistance	continue assistance
Expand Long-Term Lagoon Monitoring Program					

Water quality/quantity	ongoing	ongoing	ongoing	ongoing	ongoing
Vegetation/soils	repeated HRG methods ³ plus wildlife, soils, hydrology and topographic monitoring	repeated HRG methods plus wildlife, soils, hydrology and topographic monitoring	repeated HRG methods plus wildlife, soils, hydrology and topographic monitoring	repeated HRG methods plus wildlife, soils, hydrology and topographic monitoring	repeated HRG methods plus wildlife, soils, hydrology and topographic monitoring
Identify Alternatives to Maintain Lagoon Volume	mapping study completed; annual survey of 4 transects based on GMA study ⁴	annual survey of 4 transects			
AESTHETICS					
Restore Riparian Vegetation (see above)	ongoing	ongoing	ongoing	ongoing	ongoing

Note 1: See previous annual reports or the October 1996 Evaluation Report for a summary of action previous to year 1997-1998

Note 2: Mitigation measures are dependent on implementation of the Lagoon Enhancement Plan by the California Department of Parks and Recreation, the land owner and CEQA lead agency. Portions of the Enhancement Plan are being implemented by Caltrans as part of a "mitigation banking" project.

Note 3: Baseline study, "Biologic Assessment of Carmel River Lagoon Wetlands," completed by Habitat Restoration Group (HRG) in November 1995.

Note 4: GMA refers to Graham Matthews & Associates, a consultant retained in mid-1997 to map the lagoon and develop stage-volume and stage-area relationships.

**Table I-2
SUMMARY OF ACCOMPLISHMENTS IN FY 2002**

MITIGATION ACTION	ACCOMPLISHMENTS IN FY 2002
Monitor Water Resources	Regularly tracked precipitation, streamflow, surface and ground water levels and quality, and lagoon characteristics between Los Padres Dam and the Carmel River Lagoon, using real-time and computer monitoring methods. Maintained extensive monitoring network, continuous streamflow recorder at San Clemente Dam, and four gages at various sites; installed five new gaging stations.
Manage Water Production	Developed and implemented multi-agency Memorandum of Agreement and quarterly water supply strategies; worked cooperatively with resource agencies implementing the federal Endangered Species Act. Implemented Ordinance No. 96 regulating water distribution systems, including approval of three applications; changed well reporting period from fiscal year to water year.
Manage Water Demand	Inspected about 1,360 properties for permit compliance, which saved an estimated 44 acre-feet through required retrofits; provided retrofit refunds for 277 toilets, saving an estimated 6.4 acre-feet per year; conducted public outreach for conservation program; explored funding options to expand Pebble Beach reclamation program. Processed 984 permits of various types under allocation program; passed Ordinance No. 102 to end water credit transfer program; coordinated with jurisdictions to help streamline permit process.
Monitor Water Usage	Complied with SWRCB Order 95-10 for water year 2001.
Augment Water Supply	Adopted and began implementing strategic planning initiatives for long-term water supply and management of the Seaside Basin. Injected 310 acre-feet into Seaside Basin as part of testing of aquifer storage and recovery project (ASR). Retained consultant and conducted Phase 1 engineering and environmental studies for revised EIR on long-term water supply alternatives, including assessment of draft "Plan B" project identified by California Public Utilities Commission; completed Interim Draft Biological Assessment of California red-legged frog on the Carmel River; completed Interim Draft Historic Properties Management Plan for cultural resources near proposed Carmel River Dam site; updated CVSIM computer

	model and worked closely with National Marine Fisheries Service on revised instream flow recommendation for the Carmel River; participated on technical committee evaluating options for seismic safety and sediment management at San Clemente Dam.
Allocate New Supply	Remained within overall limits set by Water Allocation Program.
Determine Drought Reserve	Rationing was not required due to adequate storage reserve.
Steelhead Fishery Program	Counted 642 adult fish passing San Clemente Dam; rescued 43,750 young steelhead from drying reaches of the Carmel River in July 2001-June 2002 period; installed alarm system to alert staff of power or other failures at Sleepy Hollow steelhead rearing facility; completed safety quarantine platform and installed chillers around tanks; evaluated options to correct pump failure caused by excess sediment in river in Spring 2002; conducted annual juvenile population survey; coordinated with Cal-Am regarding operations to maximize fish habitat; conducted benthic invertebrate sampling at four stations for bioassessment of Carmel River.
Riparian Habitat Program Riparian Habitat (continued)	Continued revegetation at three restoration sites in the area between Via Mallorca and Scarlett Roads; continued planning and engineering for removing car bodies and restoring a streambank at Valley Hills Restoration Project; developed preliminary plans for stream bank restoration near Hacienda Carmel; concluded an agreement with California Department of Fish & Game for installing instream habitat structures for steelhead; continued working with federal agencies toward Regional General Permit for MPWMD river activities; inspected private projects for compliance with permit conditions; experimented with planting techniques to allow trees to mature more quickly with less irrigation; continued long-term monitoring of physical and biological processes.
Lagoon Habitat Program	Provided technical expertise to multi-agency sponsors of lagoon restoration program; continued vegetation habitat monitoring at eight transect locations; monitored four bathymetric transects; participated in interagency meetings regarding management of lagoon in winter storm events.
Aesthetic Measures	See Riparian Habitat Program measures.