

EXECUTIVE SUMMARY

2000-2001 ANNUAL REPORT

(July 1, 2000 - June 30, 2001)

MPWMD MITIGATION PROGRAM

WATER ALLOCATION PROGRAM ENVIRONMENTAL IMPACT REPORT

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

December 2001

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 year (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 AF 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. The Annual Reports for the MPWMD Mitigation Program respond 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 period of July 1 through June 30 of the following year. The 2000-2001 report is the tenth in the series, and the fifth report for the FY 1997-2001 planning period. It is notable that hydrologic data are often 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. This year, for the first time, the District's well production reporting program is in transition from a fiscal year to a water year format. Thus, some FY 2001 production data from small producers who report only once per year are estimates.

The 2000-2001 Annual Report first addresses 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 2000-2001. Monitoring results, where applicable, are also presented. Tables and figures that support the text are found at the end of each section. Finally, a new addition for the 2000-2001 report is a summary of observed trends, conclusions and/or recommendations, where pertinent. The District will expand this discussion in a 10-year review of the Mitigation Program planned in year 2002.

ACCOMPLISHMENTS:

Highlights of accomplishments in FY 2001 for each major category are shown in the following table:

Table 1: Summary of Mitigation Program Accomplishments in FY 2001

MITIGATION CATEGORY	ACCOMPLISHMENTS IN FY 2001
Monitor Water Resources	Regularly tracked precipitation, streamflow, surface and ground water levels and quality, and lagoon characteristics; maintained extensive monitoring network; installed continuous streamflow recorder at San Clemente Dam and four gages at various sites; expanded real-time and other computerized monitoring capabilities.
Manage Water Production	Developed and implemented multi-agency MOA and quarterly water supply strategies; cooperatively addressed unforeseen events; adopted and implemented Ordinance No. 96 regulating water distribution systems; processed record number of well applications; in process of changing well reporting period from fiscal year to water year.
Manage Water Demand	Inspected 1,360 properties for permit compliance; saved an estimated 44 acre-feet (AF) through required retrofits; refunded 723 voluntary toilet retrofits, with estimated savings of 17 AF; conducted public outreach for conservation program; explored funding options to expand Pebble Beach reclamation program; processed 603 permits of various types under allocation program; coordinated with jurisdictions.

Monitor Water Usage	Complied with SWRCB Order 95-10 for water year 2001.
Augment Water Supply	Completed full-scale injection well to expand testing of Seaside Basin injection/recovery; provided technical data and peer review to California Public Utilities Commission (CPUC) consultants regarding Plan B non-dam alternative; conducted detailed studies of Carmel River red-legged frog for Biological Assessment report; participated on technical committee evaluating options for San Clemente Dam, including dredging; began discussions on funding mechanisms for expanded Pebble Beach reclamation project; applied for grants for stormwater reuse.
Allocate New Supply	Remained within limits set by Water Allocation Program.
Determine Drought Reserve	Rationing was not required due to adequate storage reserve.
Steelhead Fishery Program	Rescued record number of steelhead in July 2000-June 2001 period (roughly 22,500); constructed cooling tower, refined bird netting enclosure and built safety quarantine platform at Sleepy Hollow steelhead rearing facility; analyzed data on impact of Los Padres Dam on fish passage; tracked adult spawning run and conducted juvenile population survey; coordinated with Cal-Am regarding operations to maximize fish habitat; conducted environmental review and negotiated with federal agencies regarding permits for state grant project for steelhead habitat restoration.
Riparian Habitat Program	Continued working with federal agencies toward Regional General Permit for MPWMD river activities; inspected private projects for compliance with permit conditions; repaired projects damaged in previous flood events; received state grant to install instream habitat structures, performed environmental review and began design work; planted over 1,200 riparian seedlings; monitored and irrigated vegetation to prevent stress; removed 8,200 pounds of inorganic waste from river channel; conducted annual river inspection; conducted species diversity monitoring to document program benefits to habitat.
Lagoon Habitat Program	Provide technical expertise to multi-agency sponsors of lagoon restoration program; continue habitat monitoring at eight habitat and four bathymetric transect locations; participate in interagency meetings regarding management of lagoon in winter storm events.
Aesthetic Measures	See Riparian Habitat Program measures.

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. More formal statistical trend analysis will be part of a planned 10-Year Evaluation Report in

year 2002, which will assess the Mitigation Program since its inception in mid-1991.

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 action 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 benefitting the community and the environment.

It is acknowledged that there are other important factors responsible for this improved situation. For example, since 1992, the Carmel River watershed has received above-normal (or very wet) rainfall and streamflow in five out of seven 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 \$225,000/year (based on 14 gage sites). 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 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 2000-2001 period in the upper valley (i.e., aquifer subunits 1 and 2) was 94 percent of capacity at the end of September 2000. In the lower valley (i.e., aquifer subunits 3 and 4), the lowest storage level was 90 percent of capacity at the end of September 2000. 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 better 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 ground water injection program (also known as aquifer storage and recovery). Expanded testing of the District's full-scale test injection well is planned 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 sea water 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. The Board will review a detailed work plan associated with a Management Plan at its January 16, 2002 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, 804 fish in winter 2001). In addition, monitoring of the juvenile population at several sites along the mainstem 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 2001, 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 the Narrows,
- Extensive rescues (and rearing) by MPWMD of juvenile steelhead over the last ten years, now totaling 120,251 fish 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 (CDFG), 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.

Riparian Corridor

Major floods in 1995 and 1998 tested MPWMD restoration designs and construction methods, and caused a fundamental shift in the District's restoration approach. MPWMD's modified approach now includes designing stable low lying floodplains adjacent to the river bottom that mimic natural river environments. This increases natural recruitment and allows MPWMD to reduce irrigation requirements because plantings are in close proximity to the water table.

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. In addition, environmental review and securing permits has become increasingly complex. However, awareness of these species and their dependence on quality habitat has increased.

Carmel River Erosion Protection and Restoration: Prior to the flood events in 1995, MPWMD used a "soft" approach to stream restoration that relied primarily on channel shaping and revegetation to stabilize streambanks. Structural protection, such as rip-rap and concrete rubble, was used sparingly, generally near infrastructure. In 1995, floods battered most of the river from Carmel Valley Village downstream, including MPWMD-sponsored restoration project areas. However, the District learned several important lessons and concepts after the floods including:

- MPWMD restoration techniques were very effective downstream of the Narrows and met or exceeded expectations for erosion protection, aquatic habitat creation, and the return of riparian vegetation.
- High flows are extremely effective in promoting the vigor and diversity of plants in floodplain areas and in creating complex channels with deep pools and shallow backwater areas.
- More structural protection was required along restored streambanks to avoid erosion during the establishment period for vegetation.
- Using a stable channel design in very dynamic areas of the river, such as upstream of the Narrows, did not meet the goal of reducing bank erosion and creating stable floodplain areas.
- A trend by MPWMD and riverfront property owners toward using more and larger rip-rap along the river has resulted in the armoring, or bank hardening, of more than 35% of the streambanks.

MPWMD has completed nearly all the streambank stabilization projects initially identified in the 1984 Carmel River Management Plan. Private property owners have also stabilized large portions of the streambanks since the 1995 and 1998 floods. As a result of this work, it is likely that the following trends will continue or develop in the near future:

- Bank erosion will occur at progressively higher flows as bank hardening is likely to continue in the foreseeable future. This has potential benefits to property owners and may reduce the need for structural protection in the near term. Although these streambanks continue to be planted with riparian vegetation and are less likely to erode at high flows, hardened streambanks reduce the potential for plant diversity and channel complexity within the riparian corridor.

- The need for major streambank stabilization projects may decrease.
- Additional work to add instream features (such as large logs for steelhead refuge) will be necessary to meet goals for restoration of aquatic habitat.
- MPWMD began several major restoration projects between 1992 and 1999. These 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.

High flows in 1995 and in 1998 demonstrated the effectiveness of floods to promote plant diversity and channel complexity. But they also showed how quickly a channel can become disconnected from its floodplain (i.e., a floodplain may be inundated less frequently due to channel incision and floodplain deposition). MPWMD's approach to river restoration now focuses more on the interaction between these critical components and finding a balance between long term bank stability and habitat creation.

MPWMD's river restoration program has measurably improved portions of the river and many project areas withstood recent highly erosive flows. But, bank hardening and channel shaping, even with significant revegetation, is a partial solution to long term problems. A comprehensive long term solution to river degradation requires a significant increase in dry season water flows to pre-development levels, a reversal of the incision process, and a 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. 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 are installed with a backhoe that allows them to tap into the water table. These techniques have been successful and have reduced the need for supplemental irrigation.

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 began to narrow as vegetation repopulated the streambanks. Current federal regulations (e.g., the National Marine Fisheries Service "4d Rule" for steelhead) has prohibited any channel clearing activities since Fall 2000. Currently, there are limited physical channel restrictions and erosional 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. The District is currently applying for a Regional General Permit (RGP) from the U.S. Army Corps of Engineers (Corps) that includes vegetation management guidelines for a limited channel clearing program. The intent is to balance the need to remove erosional hazards from 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, issues of indemnification, and documentation necessary to obtain permits, MPWMD is actively seeking a long term permit from the Corps to conduct regular activities. The District will also seek long term permits or agreements with other authorizing agencies including CDFG, 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 stress and wildlife monitoring have shown interesting trends. Vegetative moisture stress on a whole fluctuates depending on the rainfall and streamflow conditions, and tends to be much lower in above-normal rainfall years. However, riparian song bird diversity 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 restoration program is improving habitat quality.

Carmel River Lagoon

Lagoon bathymetric cross sectional surveys, initially conducted in 1988, have been completed annually since 1994 in August or September. These data are useful in assessing changes in the sand supply within the main body of the lagoon. So far, no major trends indicating sand accumulation or depletion have been identified. Sand accumulation is of interest due to its impact on lagoon habitat quantity and quality.

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 participate 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.

The District expanded its long-term 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. No demonstrable changes have been identified. Because of the complexity of the estuarine system, a variety of parameters are monitored, including vegetation transects and quadrats, soil 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 runoff. Other natural factors that affect the wetlands include tidal fluctuations, introduction of salt water into the system as waves overtop the sandbar in autumn and winter, and possible long-term global climatic change. When the District initiated this component of the mitigation program, it was with the understanding that monitoring would be necessary 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 six years.

