

X. RIPARIAN HABITAT MITIGATION MEASURES

The Findings of Adoption of the 1990 Water Allocation Program Final EIR identified four mitigation measures to reduce impacts to the Carmel River riparian corridor, which includes wildlife that is dependent on streamside habitat (Finding Nos. 389-A through D, and 391). The measures are: (a) conservation and water-distribution management to retain water in the river; (b) prepare and oversee a Riparian Corridor Management Plan; (c) implement the Riparian Corridor Management Program; and (d) expand the existing monitoring program for soil moisture and vegetative stress.

In addition to the above measures, MPWMD is facilitating the implementation of an Integrated Regional Water Management Plan (IRWM Plan) for the purposes of coordinating water resource management projects in a planning region consisting of coastal watershed areas in Carmel Bay and south Monterey Bay between Pt. Lobos on the south and Sand City on the north – a 38.3-mile stretch of the Pacific coast. The area encompasses the six Monterey Peninsula cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, Seaside, and extends into portions of the unincorporated area of Monterey County in the Carmel Highlands, Pebble Beach and the inland areas of Carmel Valley and the Laguna Seca area. The District received a grant of approximately \$497,000 in 2006 from the Department of Water Resources to develop the plan. In November 2007, the MPWMD Board of Directors adopted the plan after a public hearing. Many of the activities and projects proposed in this plan will benefit the Carmel River streamside corridor. Additional information is contained at the end of this chapter, immediately before Table X-1.

A. Conservation and Water Distribution Management to Retain Water in the Carmel River

The purpose of this measure is to reduce pumping impacts on riparian vegetation, particularly in the region of Aquifer Subunit 2 (Scarlett Narrows to Carmel Valley Village). Activities to further this goal during 2007-2008 are summarized above in Sections II (Monitoring Water Resources), III (Manage Water Production), and IV (Manage Water Demand).

B. Oversee Riparian Corridor Management Program

Riparian habitat mitigation measures proposed in the Water Allocation Program Final EIR have formed the basis for riparian corridor management activities undertaken since the Board of Directors certified the EIR in November 1990. The Riparian Corridor Management Program (RCMP) integrates the District's many riparian mitigation and management activities into one program. Components of the RCMP include the Carmel River Erosion Protection and Restoration Program; continued irrigation around Cal-Am production wells in the lower Carmel Valley and around existing District restoration projects; in-channel vegetation management; public education; enforcement of District rules and regulations; and monitoring of wildlife, vegetation and soil.

C. Implement Riparian Corridor Management Program

The goal of the Riparian Corridor Management Program is the rehabilitation, restoration, enhancement and preservation of the streamside corridor along the Carmel River. As described below, several major sub-programs are carried out to achieve this goal.

During Fiscal year 2007-2008 (FY 07-08), MPWMD accomplished the following:

- Continued revegetation efforts at exposed banks with little or no vegetation located in Aquifer Subunits 2 and 3 (Via Mallorca Rd. to Esquiline Rd.);
- Operated under a Routine Maintenance Agreement with California Department of Fish and Game and a Regional General Permit with the U.S. Army Corps of Engineers for the maintenance activities associated with vegetation encroachment and restoration projects;
- Made public presentations showing MPWMD-sponsored restoration work over the past 20 years;
- Diversified restoration projects and experimented with planting techniques that allow trees to mature more quickly and depend less on irrigation;
- Continued long-term monitoring of physical and biological processes along the river in order to evaluate the District's river management activities;
- Continued the annual inspections of the Carmel River from the upstream end of the lagoon at River Mile (RM) 0.5 to Camp Steffani at RM 15.5. Staff members responsible for vegetation management and erosion prevention annually walk the entire river to observe and record erosion damage, conditions that could cause erosion (e.g., in-channel vegetation or debris), riparian ordinance infractions, presence of deleterious material, and the overall condition of the riparian corridor;
- Continued an enforcement action against two property owners for a serious violation of the District's riparian ordinances in late December 2003 on two residential properties on the north bank of the river just upstream of the Rancho Cañada Golf Club;
- Carried out vegetation management activities at three sites (West Garzas Well, Red Rock Restoration Project, and Valley Greens Bridge).
- Graham Matthews & Associates (GMA) was retained to collect longitudinal thalweg (the deepest continuous line) profile data and limited cross section data from the Carmel River for use in maintaining a long-term record and comparing to the past and future data.

The following sections describe MPWMD's work in more detail.

- **Carmel River Erosion Protection and Restoration**

Lower Carmel River Restoration Project: During the spring of 2006 and 2007, the District coordinated emergency streambank repairs to the north streambank along a portion of Carmel River between Rancho San Carlos Road and Via Mallorca. Due to staff workload constraints, MPWMD was unable to move forward with a comprehensive river restoration project in FY 2006-07 and FY 2007-2008. Additional work on the project was deferred to FY 2008-09 when it is expected that preliminary design work to complete repairs will be completed.

Riparian Ordinance Enforcement Action - A serious violation of the District's riparian ordinances occurred in December 2003 on two residential properties on the north bank of the river upstream of the Rancho Cañada Golf Club. One of the property owners had directed workers to cut riparian vegetation and place concrete slurry on the river bank in an area that had been armored with rip-rap following high flows in 1998. About half of the work was carried out on an adjacent property.

District staff took enforcement action against both property owners and recorded Notices of Non-Compliance on the titles of both properties. The District Board authorized legal proceedings to enforce District Rules concerning these activities within the streamside corridor. On March 8, 2007, the District filed a complaint in Monterey County Superior Court and requested that the Court issue an injunction to the first property owner to remove the work and obtain a permit from the District. During FY 2007-08, staff met with representatives of the property owners and a mediator on several occasions in an effort to resolve the violation. By June 2008, it appeared that most issues were resolved and the District was awaiting a final design plan and River Work Permit application.

Survey of the long profile and selected cross-sections in the channel of the Carmel River: The scope of the project included a survey by GMA of selected cross-sections and the thalweg (deepest part of the channel) profile from the mouth 8.5 miles upstream to the Robinson Canyon Road bridge and in the Carmel Valley Village reach. The survey was tied into existing benchmarks (from 1995) and new permanent benchmarks established by Central Coast Surveyors. In addition, data was compared with previous longitudinal profile and cross-section data (see **Figure X-2** for an example from the report).

Between the mouth and Robinson Canyon Road bridge, many areas of the river appear to have deeper pools than at any previous time since measurements have been recorded (i.e., beginning in 1978), with many reaches showing several feet of downcutting. This trend, which was identified as a concern in the 1984 Carmel River Management Program EIR, appears to have accelerated during the period from 1998 to 2007. This was a period of exceptional (for the Carmel River) stability as streambanks hardened with structural protection over the past several decades resisted erosion and the force of the river during high flows was directed into the channel bottom. This condition has resulted in the undermining of rip-rap protection and bridge infrastructure in some reaches. It should be noted that the maximum flow during this period was about a five-year return period flow, which in a balanced river system would not cause widespread bank erosion (such as in the period between 1978 to 1993).

San Clemente Dam: The DWR and the U.S. Army Corps of Engineers finalized a combined EIR/EIS in 2008 concerning alternatives to remediate the safety deficiencies that have been identified at San Clemente Dam. Presently, DWR has continued to direct CAW to draw San Clemente Reservoir down and maintain it 10 feet lower than the spillway, except between February 1 and May 1 (to allow for downstream migration of steelhead). CAW supports an alternative in which the dam would be buttressed to address the safety issues. The California Coastal Conservancy and other State and Federal agencies, along with citizens groups, support the Dam Removal and Reroute Alternative which consists of: storing sediment in the Carmel River portion of the reservoir; removal of the dam, and rerouting the Carmel River into San Clemente Creek. Funding for this alternative is uncertain.

- **Vegetation Restoration** -- Various techniques for vegetation installation were employed at District restoration projects in FY 07-08. Planting techniques involved either rooted seedlings or cuttings sustained by irrigation, or deeper plantings set to tap summer groundwater without supplemental water applications. The District continued work on barren streambanks by planting with willows, black cottonwoods, and sycamores, and installing new drip irrigation systems. A total of 122 riparian plants were planted this year throughout the river corridor.

The primary objectives of the District's restoration planting effort are to stabilize eroded stream banks with native vegetation and to enhance habitat values near the stream, on adjacent floodplains, and terrace areas. One of the goals of the habitat enhancement program is to diversify restoration plantings by identifying microhabitat areas and vegetating them with species typical of those riparian habitat sites. District staff provided riparian plants to several private property owners (**Table X-1**).

District staff also planted numerous rooted seedlings throughout degraded portions of the Carmel River including several private property areas and District restoration sites. **Table X-1** identifies the locations that riparian plantings were installed during FY 07-08. Rooted seedlings are obtained from cuttings and seeds collected from along the Carmel River and propagated by a local nursery.

- **Irrigation Program** -- Established riparian vegetation has proven to be an effective deterrent to stream erosion; the mat-like roots of most riparian species bind together loose channel banks and foliage tends to slow the velocity of high river flows. The District selectively irrigates mature streamside vegetation and newly established restoration plantings in order to maintain a healthy, vigorous riparian corridor both for erosion protection and habitat enhancement.

Table X-2 and **Figure X-1** show water use for FY 07-08. Please note that these figures include irrigation during two separate irrigation seasons. For the fiscal year, 12.98 acre-feet (AF) of water were applied. The 2007 irrigation season began in March and continued through the end of November 2007. Total water use for the season was 11.66 AF. This compares to 5.34 AF during the 2006 irrigation season, and is considerably less than the 1994 irrigation total of 51.1 AF, when drought conditions prevailed.

- **Vegetation Management** -- Since Fall 1990, the District has carried out annual vegetation management projects along portions of the Carmel River to reduce potential obstructions to river flow and possible bank erosion. In the past, the District has removed in-channel debris and vegetation that could potentially deflect high water onto adjacent stream banks, thereby inducing erosion and degrading streamside habitat.

Carmel River Inspection - Annually, staff assesses the alluvial portion of the river (the lower 15.5 miles) to determine if and where clearing should occur. At sites where debris and/or live vegetation is judged to be a potential hazard, staff balances the goals of conserving aquatic and streamside habitat with reducing the potential for erosion of private and public property and infrastructure. Only woody plant material representing a bank erosion threat is treated (notching or partially cutting through).

During the fall of 2007, three areas with virtually 100% vegetation encroachment in the channel bottom were selected for vegetation removal:

- (1) beginning just upstream of California American Water's (CAW) West Garzas Well at River Mile (RM) 12.2 and extending approximately 320 feet downstream; only the largest trees were removed growing on the south bank. Some sections of the larger trees were placed in the flowing stream to provide large wood habitat.

(2) beginning approximately RM 8.2 at the Red Rock Restoration Project and extending 150 feet downstream; trees blocking the channel on a gravel bar were removed. Portions of the trees were placed in the flowing stream to provide large wood habitat. The rest of the branches were chipped.

(3) beginning about 200 feet upstream of Valley Greens Bridge (RM 4.9) and extending 110 feet downstream, a large downed cottonwood was lying across the active channel. This tree could have become mobile in a high flow so it was notched and trimmed back towards the bank leaving portions of the trunk in the channel to provide large wood habitat.

A total of approximately 580 lineal feet of stream encompassing approximately 0.27 acres in the channel bottom was affected by the vegetation removal.

In addition to erosion hazard reduction, vegetation management objectives include removing trash and inorganic debris from the river channel. During FY 07-08, trash such as plastic, paper, cans, bottles and car parts were removed from the channel and disposed by the District.

In general, the health of the riparian corridor appears to be good with continued development of naturally recruited species, such as black cottonwoods and sycamores, on some of the engineered floodplains as well as natural gravel bars. While most of the alluvial channel remained clear of major obstructions, District staff documented increases in vegetation encroachment into the channel bottom that will likely require continued monitoring and vegetation management activities in the future. District staff believes that continued selective removal of encroaching vegetation will be necessary during the summer of 2009. Without such a program, it is possible that unauthorized vegetation removal will increase, which may lead to a decline in the health and stability of the riparian corridor.

- **Public Information and Partnerships**

Public Outreach at the Tularcitos School Fall Festival: The District had a booth at the Tularcitos School's Fall Festival in Carmel Valley on Friday, October 26, 2007. Staff from the Water Demand and Planning and Engineering Divisions educated visitors about the functions of the District and handed out water-conservation tools and publications. The outreach effort was well-received by the adults and children in attendance. The Festival had a "green" theme, and had a number of environmental education booths.

Public Outreach at Good Old Days Celebration: MPWMD staff and Director Doyle handed out water conservation devices and information at Pacific Grove's Good Old Days Celebration on April 13 and 14, 2008. The booth was located at the "Green Spot," an area dedicated to environmental protection, and was showcased by several large posters about steelhead, river restoration and the rebate program. Visitors learned about the District's extensive activities and programs.

Carmel River Watershed Task Force: In June 2008, MPWMD staff gave a presentation on the Carmel River lagoon annual hydraulic cycle. Formation of the task force was identified as the number one action in the Carmel River Watershed Action Plan. The task force is made up of stakeholders, regulators, and agency representatives involved in managing the resources of the

watershed.

D. Expand Monitoring Programs for Soil Moisture and Vegetative Stress

This mitigation measure involves implementing a soil moisture and vegetation monitoring program to better assess plant water stress and related irrigation needs in the riparian zone. Data from soil-moisture and plant water-stress tests facilitate the identification and location of impacts resulting from the prolonged depression or rapid drawdown of the water table. Soil and plant monitoring also documents the beneficial results of riparian mitigations, and provides a statistical foundation for determining trends in conditions over time.

In FY 07-08, staff collected semi-monthly canopy ratings of individual trees at four study sites in mid and lower Carmel Valley. Soil moisture was evaluated bi-monthly with tensiometers at the Schulte project, in the vicinity of the San Carlos Well, and at the Valley Hills Project. Photo documentation and measurements of foliage volume occurs in other areas as well, depending on river flow conditions and depth to groundwater.

In addition to vegetation and soil moisture monitoring, avian (bird) species diversity monitoring was continued during Summer 2007 and Spring 2008 by the Ventana Wildlife Society's Big Sur Ornithology Lab (BSOL). Data collected by Dr. David Mullen and the BSOL since 1992 compares habitat values at permanent monitoring stations and provides an indication of changing patterns of avian use in District restoration projects. The information collected on avian species diversity has helped document the response of populations to habitat enhancements implemented by the District. Since 1992, the avian monitoring work has shown healthy avian species diversity along river reaches where the District has implemented restoration projects, while diversity-index readings in control sites with established riparian vegetation seem to fluctuate depending on the presence of flow in the river channel and the health and vigor of invasive weeds.

OBSERVED TRENDS, CONCLUSIONS AND/OR RECOMMENDATIONS:

The Carmel River is showing many signs of recovery after the extreme drought and flood events during the 1990s that impacted property owners, threatened species, and riparian habitat. Fine material (silt and sand) that entered the main stem during floods in 1995 and 1998 has for the most part been washed downstream of River Mile 2 (measured from the ocean) leaving behind a more complex channel with diverse habitat and a richer riparian community. Areas with perennial flow (upstream of Schulte Bridge) or a high groundwater table, such as downstream of Highway 1, have experienced vigorous natural recruitment in the channel bottom, which has helped to stabilize streambanks and diversify aquatic habitat.

In these areas, natural recruitment has led to vegetation encroachment that, in some areas, may constrict high flows and threaten bank stability. MPWMD continues to monitor these areas closely and to develop a management strategy to balance protection of native habitat with the need to reduce erosion potential. Environmental review of proposed projects and the process of securing permits is quite complex and requires an exhaustive review of potential impacts.

In contrast to areas with perennial flow, the recovery of streamside area between Rancho Cañada

and Quail Lodge has been impacted by increased groundwater extraction. In this reach, only irrigated areas are able to sustain a diversity of plant species. Plant stress in the late summer and fall is evident in non-irrigated portions of the river. In these areas, streambanks exhibit unstable characteristics during high flows, such as sudden bank collapse, because of the lack of healthy vegetation that would ordinarily provide stability.

Restoration project areas sponsored by MPWMD since 1984 continue to mature and exhibit more features of relatively undisturbed reaches, such as plant diversity and vigor, complex floodplain topography, and a variety of in-channel features such as large wood, extensive vegetative cover, pools, riffles, and cut banks. Areas that were repaired after the 1995 and 1998 floods are still developing these natural features. In part, the location and geometry of the projects constrain the rate of progress toward a fully restored stream channel (i.e., several are located in highly developed, narrow sections of the river impacted by groundwater extraction). Also, many of these projects relied heavily on the use of bank hardening (e.g., rip-rap) to stabilize banks, which can discourage plant vigor and diversity.

Staff has observed that many pool areas in the lower 15 miles of the river have been scoured out and appear to be much deeper than at any time since the Mitigation Program went into effect in 1990. This condition may be due both to a lack of sediment from the upper watershed and the stabilization of streambanks in the lower river. With the banks relatively stable and little or no sediment from upstream, the streampower (i.e., the energy available to move sediment) of the lower river is directed into the channel bed. This incision into floodplain deposits is referred to technically as channel degradation. Thus, pools become deeper and when combined with scour along the outside of streambanks this creates “cut” banks. Although this leads to a more complex and dynamic channel, which is desirable condition, continued degradation can result in bank collapses and trigger an episode of erosion along the river.

As cited in previous reports, the most significant trends continue to include the following:

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

Carmel River Erosion Protection and Restoration

With the exception of the channel area between Via Mallorca Road and Rancho San Carlos Road, at present streambanks in the main stem appear to be relatively stable during average water years.

Consistent with previous reports, it is likely that the following trends will continue or develop in the near future:

- State and Federal agencies consider the Carmel River watershed as a high priority area for

restoration, as evidenced by the interest in addressing water supply issues, San Clemente Dam safety, impacts to the Carmel Bay Area of Special Biological Significance, and management of threatened species. Stringent avoidance and mitigation requirements will continue to 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 come under increasing scrutiny. Activities that increase the amount of habitat or restore natural stream functions are more likely to be approved or funded through State and Federal grant programs.
- Additional work to add instream features (such as large logs for steelhead refuge or backwater channel areas for frogs) will be necessary to restore and diversify aquatic habitat.
- Major restoration projects completed between 1992 and 1999 have had extensive and successful work to diversify plantings. However, maintenance of irrigation systems is ongoing and requires extensive work in water years classified as below normal, dry and critically dry.
- Downstream of the Robinson Canyon Road bridge, the river continues to cut into the channel bottom and form a more complex system of pools, riffles and gravel bars.

Downcutting into channel deposits has both positive and negative aspects. On the plus side, it is clear that sand and fine material deposited during the mid-1990's has been winnowed out, exposing gravel and cobble layers as far downstream as the Crossroads Shopping Center (just upstream of Highway 1). This has created spawning habitat for steelhead in some areas where spawning had not been recorded since records have been kept (since the early 1980's). In addition, the scouring of pools and streambank areas has added much needed complexity to the bottom of the river channel. However, a lack of a natural supply of sediment from the upper watershed (due to the presence of main stem dams) means that the river must remove material from the channel bottom and streambanks to make up for this deficit as the river system downstream of Los Padres Reservoir is considered "sediment starved." Because approximately 35% of the streambanks downstream of Carmel Valley Village have been altered or hardened over the past 40 years, most of the current sediment supply comes from scouring of the channel bottom, which results in exposing the base of streambanks, bridge piers and abutments.

Between the mouth and Robinson Canyon Road bridge, many areas of the river appear to be deeper than at any previous time since measurements have been recorded (i.e., beginning in 1978), with many reaches showing several feet of downcutting. This trend, which was identified as a concern in the 1984 Carmel River Management Program EIR, appears to have accelerated in the period from 1998 to 2007. This was a period of exceptional (for the Carmel River) stability as streambanks hardened with structural protection over the past several decades resisted erosion and the force of the river during high flows was directed into the channel bottom. This condition has resulted in the undermining of rip-rap protection and bridge infrastructure in some reaches.

Eventually, without corrective measures to balance the sediment load with the flow of water or to mitigate for the effect of the downcutting, streambanks will begin to collapse and the integrity of bridges and other infrastructure near the river may be threatened.

A comprehensive long-term solution to overall environmental degradation requires a significant

increase in dry-season water flows in the lower river, 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 identifying areas where a natural meander pattern could be considered. Reversal, or at least halting of channel incision, may be possible if the supply of sediment is brought into balance with the transport capacity of the river. The supply of sediment to the lower portion of the river is likely to increase when a project to make San Clemente Dam safe is completed. However, the effect of an increased sediment supply may not reach the lowest portion of the river for many years.

In January 2008, the California Department of Water Resources (DWR) and the U.S. Army Corps of Engineers completed a combined Environmental Impact Report and Environmental Impact Statement (EIR/EIS) concerning alternatives to remediate the safety deficiencies that have been identified at San Clemente Dam. Of the two alternatives being considered for approval (buttressing and dam removal and re-route), MPWMD supported the dam removal and re-route project that the California Coastal Conservancy proposed. In the interim, DWR has directed CAW to draw San Clemente Reservoir down and maintain it 10 feet lower than the spillway, except between February 1 and May 31 (to allow for downstream migration of steelhead).

Over the long term, an increase in sediment supply could help reduce streambank instability and erosion threats to public and private infrastructure. However, reestablishing a natural supply of sediment and 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

To the maximum extent possible, MPWMD-sponsored river restoration projects incorporate 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 NOAA Fisheries) supplemental irrigation has been installed on engineered floodplains and on vulnerable banks.

Channel Vegetation Management

Another notable trend relating to the District's vegetation management 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 Endangered Species Act (ESA) "Section 4(d)" rules promulgated by NOAA Fisheries to protect steelhead significantly restrict vegetation management activities. Currently, there are relatively few physical channel restrictions and erosion hazards in the lower 15 miles of the river. In the absence of high winter flows capable of scouring vegetation out of the channel bottom, encroaching 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

To cope with the rising level of environmental analysis and documentation necessary to obtain permits, MPWMD sought and obtained a long term permit from the Corps and the California Regional Water Quality Control Board. In January 2001, the District applied to the California Department of Fish and Game to renew a long-term Routine Maintenance Agreement (RMA) with CDFG to conduct regular maintenance and restoration activities. The District finally received a signed RMA in October 2005. The District may also seek long-term permits or agreements with other regulatory agencies including the Monterey County Water Resources Agency and Monterey County Planning and Building Inspection Department.

Monitoring Program

Vegetative moisture stress 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 the soil is moist and the river is flowing. As the river begins to dry up in 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, thereby preventing 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.

INTEGRATED REGIONAL WATER MANAGEMENT PLAN

In 2006, the District entered into an agreement with the Department of Water Resources to prepare an Integrated Regional Water Management Plan (IRWM Plan) for a planning region encompassing Monterey Peninsula areas within the District boundary, the area in the Carmel River watershed outside of the MPWMD boundary, Carmel Bay and the Southern Monterey Bay. The plan combines strategies to improve and manage potable water supply, water conservation, stormwater runoff, floodwaters, wastewater, water recycling, habitat for wildlife, and public recreation. MPWMD agreed to facilitate development of this plan on behalf of more than 40 stakeholders identified within the region.

In July 2007, the District Board held a public hearing to receive comment on the draft Plan. Subsequently, the Board adopted the final IRWM final plan in November 2007. MPWMD was reimbursed approximately \$497,000 to prepare the Plan, which cost a total of about \$1,107,000 to prepare. Funds for reimbursement were from the IRWM grant program funded by Proposition 50, which was approved by voters statewide in November 2002. Local agencies and stakeholders, including MPWMD, contributed about \$610,000 toward the completion of the plan by using in-kind (staff) and consultant services.

In addition, MPWMD facilitated the formation of a Regional Water Management Group (RWMG) to guide the continued development and implementation of the IRWM Plan. The RWMG is comprised of representatives of the Big Sur Land Trust, City of Monterey, Monterey County Water Resources Agency, Monterey Regional Water Pollution Control Agency and MPWMD.

More information about the IRWM Plan and the group of stakeholders in the planning region can be found at the following web site: http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

Table X-1
Riparian Species Planted July 1, 2007 through June 30, 2008

Plant Species	Number	Location
<i>Acer negundo</i> , box elder	2	McNamee (2)
<i>Aesculus californica</i> , buckeye	1	McNamee (1)
<i>Populus balsamifera ssp. trichocarpa</i> , black cottonwood	9	Tancredi (3) McNamee (6)
<i>Plantanus racemosa</i> , sycamore	5	Rosenthal (5)
<i>Salix ssp.</i> , willow	105	Rosenthal (25) Tancredi (20) Heaston (60)
TOTAL	122	

Table X-2
Monthly Irrigation Water Use During 2007-2008
 (Values in Acre-Feet)

Project Site	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Total
DeDampierre	0.000	0.126	0.064	0.035	0.033	0.000	0.000	0.000	0.000	0.000	0.045	0.020	0.323
Trail and Saddle	0.076	0.000	0.044	0.051	0.112	0.000	0.000	0.000	0.000	0.218	0.109	0.327	0.937
Scarlett	0.009	0.026	0.017	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.011	0.100
Begonia	0.046	0.026	0.026	0.018	0.018	0.007	0.000	0.000	0.008	0.020	0.028	0.029	0.226
Schulte South	0.076	0.052	0.051	0.062	0.045	0.000	0.000	0.000	0.000	0.036	0.039	0.057	0.418
Reimers	0.453	0.514	0.528	0.218	0.362	0.000	0.000	0.000	0.000	0.276	0.202	0.447	3.000
Schulte Bridge	0.255	0.199	0.193	0.155	0.150	0.073	0.000	0.000	0.000	0.042	0.092	0.099	1.258
All Saints	0.025	0.031	0.020	0.020	0.025	0.000	0.000	0.000	0.003	0.012	0.021	0.011	0.168
Cypress	0.177	0.392	0.552	0.353	0.396	0.000	0.000	0.000	0.000	0.012	0.249	0.289	2.420
San Carlos	0.901	1.056	0.537	0.505	0.401	0.016	0.000	0.000	0.000	0.000	0.000	0.000	3.416
San Carlos (Dow)	0.269	0.114	0.093	0.026	0.085	0.000	0.000	0.000	0.000	0.025	0.056	0.047	<u>0.715</u>
TOTAL WATER USE IN ACRE-FEET FOR DISTRICT RESTORATION PROJECTS IN 2007-2008 =													12.981

Figure X-1

July 2007 - June 2008 Irrigation Totals

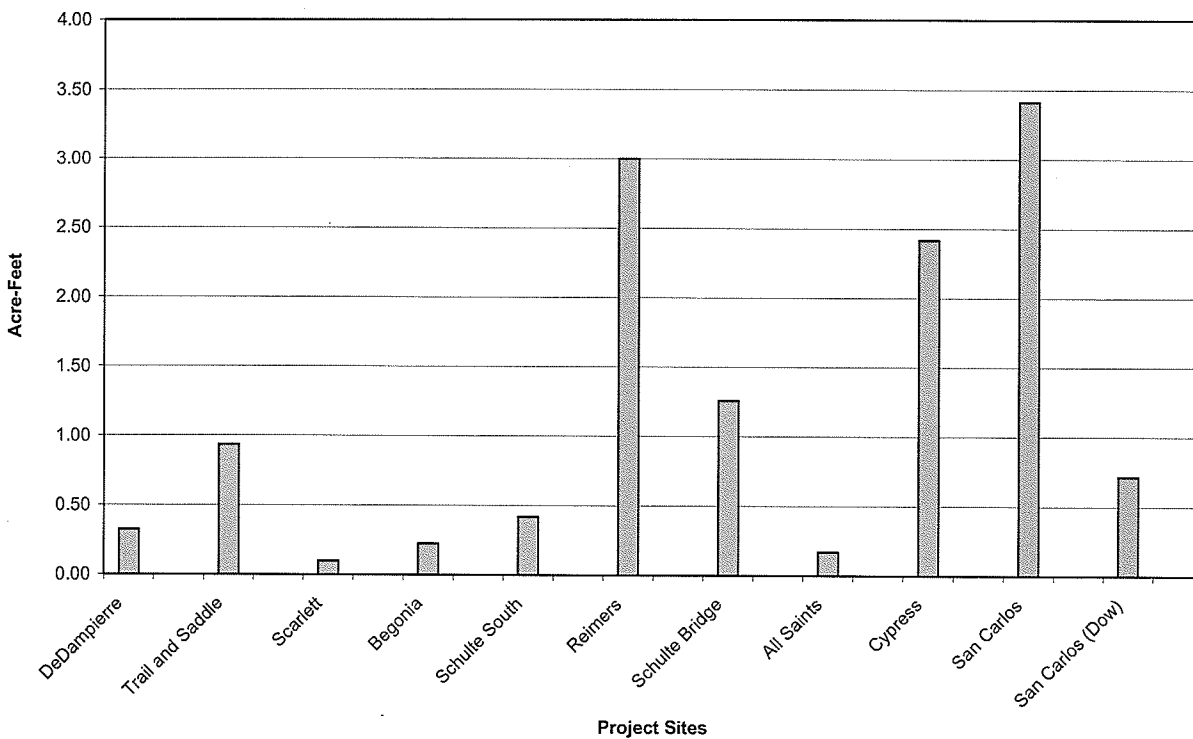


Figure X-2

CARMEL RIVER

Thalweg Profiles, Vicinity of Via Mallorca to San Carlos Road, 1978-2007

