Active Projects in the Carmel River Watershed

January 2018

Prepared by:

Gabriela Alberola
Sophia Kirschenman
Damien Lazzari

Mikaela Bogdan

Contact: Lorin Letendre,
carmelriverorg@gmail.com

http://www.carmelriverwatershed.org/

THE CARMEL RIVER WATERSHED CONSERVANCY

Table of Contents

I. Introduction 4
Figure 1. The Carmel River Watershed 4
II. Issues of Concern 5
1. Reducing the Extraction of Water 5
2. Flood Management 6
3. Management of the Carmel Lagoon 6
4. Conservation of Threatened Species 6
5. The San Clemente Dam Removal 7
6. Management of the Los Padres Dam (LPD) 7
7. Wildfire Management 8
8. Erosion and Sedimentation Management 9
III. Projects and Programs 11
Figure 2. Lower, Middle, and Upper Sub-watersheds 11
III.I Projects and Programs in the Lower Carmel River Sub-Watershed 12
1. Carmel River Lagoon Water Augmentation 12
2. State Parks Well Project 13
3. Carmel FREE Project 13
4. Carmel River Lagoon Ecosystem Protective Barrier (EPB) 14
5. Protecting Scenic Rd. armoring the bluffs and the State Beach parking area 16
6. Watershed Education Center at Garland Park 16
7. Carmel River Lagoon Restoration (Cuttings, Propagation, and Planting) 17
8. Carmel River Lagoon Beach Clean-up 17
9. Carmel River Lagoon Water Quality Monitoring 17
10. Carmel River Mitigation Bank 17
11. CSA 50's Flood Prevention Strategies 18
12. MEarth Projects 18
13. Schulte Rd. Bridge Replacement Construction of New Road 19
14. Schulte Rd. Documentation and Data Collection on BSLT Property 19
15. South Bank Recreation Trail 19
16. Large Woody Debris Installation in Carmel River near Lagoon 20
17. Canine Center and Off-Stream Water Storage 20
III.II Projects and Programs in the Middle Sub-Watershed 21
18. San Clemente Dam Removal and Carmel River Reroute 21
19. Sleepy Hollow Steelhead Rearing Facility Raw Water Intake and Water Supply System Upgrade 22
20. Sleepy Hollow Ford Bridge Project 22
21. Gravel Injection Project 22
III.III Projects and Programs in the Upper Sub-Watershed 24
22. Steelhead Passage Improvements at Los Padres Dam and Future of the Dam 24

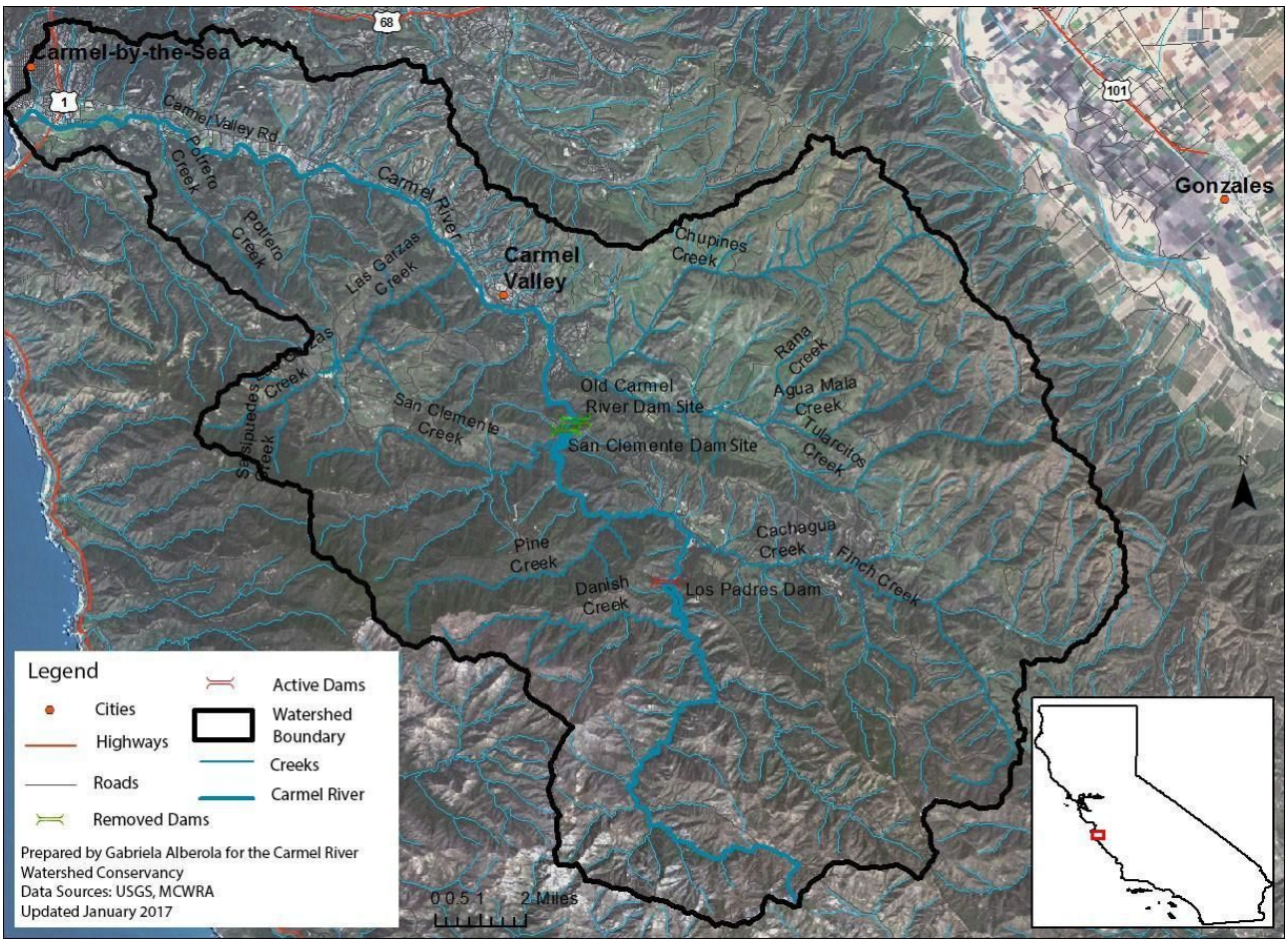
23. Los Padres Reservoir, management of capacity loss 24
III.IV Multi-Region Management Plans and Coordination Efforts 25
24. San Clemente Dam Removal Benefits Study 25
25. Carmel River Riparian Vegetation and Materials Management 25
26. Environment Quality Incentives Program (EQIP) 26
27. Steelhead Rescue in Creeks and the Main Stem of the River 26
28. Volunteer water quality monitoring program 27
29. Watershed tours 27
30. Bank stabilization projects 27
31. Bird and wildlife surveys and projects 28
32. Bird Conservation Plan 28
33. Bird monitoring and research 28
34. Carmel Area State Parks General Plan Update 28
35. Interim flood management plan in the Lower section of the River 28
36. Interpretative Signs for the River Parkway Program 29
37. Pharmaceutical Drug Collection and Disposal 29
38. Road Assessments 29
39. Steelhead Barrier Assessments in Cachagua Creek, Potrero Creek and Garzas Creek 29
40. Cachagua Creek and Potrero Creek Fish Passage Barrier Removal Project 29
41. Steelhead Genetic Characterization Project 30
42. Water conservation programs by Cal-Am and MPWMD 31
43. Watershed Coordination and Carmel River Task Force (CRTF) 31
44. Watershed Interpretation Signage Project 31
Figure 3. Interpretive Sign for Carmel River Watershed 32
45. Water supply project 32
46. Trust for Public Lands Project 37
47. Study of Striped Bass in Carmel River Lagoon 37
IV Literature Cited 37
V Appendices 37
Appendix A Carmel River Watershed Action Plan 2014 Update 37
Appendix B Contact List 42

I - Introduction

The Carmel River Watershed (Figure 1) provides countless benefits to residents within the watershed as well as to its neighbors in the greater Monterey Peninsula region. A diverse group of stakeholders is involved in the management of the Carmel River Watershed's many resources and services. These stakeholders—federal, state, and local government agencies and non-profits—meet regularly as members of the Carmel River Task Force to coordinate and synchronize their efforts.

The Carmel River Watershed drains an area of 255 mi^2, but its significance extends far past its geographic boundaries. Over 60% of all the potable water used in the Monterey Peninsula region is extracted from the Carmel River Watershed. Additionally, two threatened species, the Central Coast steelhead trout and the California red-legged frog depend on the Carmel River Watershed's resources. Many comprehensive, collaborative projects and programs are currently being implemented in the Carmel River Watershed to manage its resources more sustainably. The purpose of this document is to highlight these projects and programs. This is a working document and is part of a larger effort led by the members of the Carmel River Task Force to promote collaborative opportunities and to improve public access to their projects' information.

Figure 1. The Carmel River Watershed



II – Issues of Concern

Recognizing the history and the nature of current issues in the Carmel River Watershed is the key to

understanding both the challenging decisions faced by stakeholders, and the comprehensive plans and projects that are being implemented to address them. The information for the following sections was initially gathered from public meetings and management agencies' board meetings between 2010 and 2016. This section was later expanded through a review of relevant literature. The projects were updated most recently in October, November, and December of 2017 through direct contact with the agencies involved.

1. Reducing the Extraction of Water from the Carmel River Watershed

The Carmel River provides fresh water to the communities in the Monterey Peninsula. The California American Water Company (Cal Am) extracts water from the Carmel River Watershed and distributes it to its many residential, commercial, and municipal customers in the region (Cal Am, 2011). Land-owners, residents, and other private parties also extract water from the Carmel River for diverse uses, such as drinking and irrigation (MPWMD, 2011a). A fraction of the water that Cal Am extracts from the Carmel River during the winter is injected into the Seaside Groundwater Basin, where it is stored for later use, during the drier months, for a project called Aquifer Storage and Recovery (ASR).

The State Water Resources Control Board (SWRCB) determined that Cal Am only had legal rights to 3,376 acre-feet of water – about 40% of the total amount that they are allowed to extract each year – and has mandated that they find an alternative source of water by the year 2022 (SWRCB, 2016). A variety of options were discussed and debated, but after further consideration, Cal Am has opted for a three-part solution that consists of the construction of a desalination plant, a groundwater replenishment program, and an aquifer storage and recovery program (Cal Am, 2015).

As a result of SWRCB orders and a comprehensive water conservation program, extraction of water by Cal-Am from the Carmel River in Water Year 2016 (October 1 to September 30) was the lowest on record since 1960.

2. Flood Management

The Monterey County Water Resources Agency (MCWRA) reported that flooding along the Carmel River is generally linked to extreme weather events and flood damage is usually limited to properties located within the river's floodplain (MCWRA, 2008). Storm related floods have been documented in 1862, 1911, 1914, 1941,1943,1958, 1969, 1980, 1983, 1995, and 1998 (Durein, 1941; Howe, 1980; Kondolf, 1982; MCWRA, 2009; Telfer, 1983; Worst of…, 1983). With each consecutive flood, as more areas were developed and more structures were built within the floodplain, more damage occurred to public access roads, to public infrastructure, and to private property. On several occasions, the region was declared a disaster area (MCWRA, 2009). The lower portion of the Carmel River experiences flood damage at a higher frequency, and the area identified as most at risk is County Service Area 50 (CSA 50), a residential area near the mouth of the river and mostly located within the river's 100-year floodplain (MCWRA, 2008). In 2017, high rainfalls led to flooding in homes on Paso Hondo Road and downstream a ways.

For decades, Non-Governmental Organizations (NGOs), Federal, State, and Local Agencies have participated in the management of floods in the Carmel River Watershed. Efforts have led to the

development of comprehensive plans to identify flood sources, reduce flood risk, and to improve emergency response. A variety of management strategies have been implemented and continue to be studied.

3. Management of the Carmel Lagoon

The management of the Carmel Lagoon water level is a crucial, yet controversial process, and it has received special attention in the past two decades due to environmental concerns. For most of the year, the Carmel River does not flow into the Pacific Ocean (TAC, 2007) and its waters remain pooled at the Carmel Lagoon, contained by a sand barrier that forms naturally on the beach. In the winter, when the water level in the river increases due to an increase in storm water run-off, the water level at the lagoon also rises, threatening adjoining properties that sit within the floodplain (Carmel River…, 2011). Monterey County takes preemptive steps every year to artificially open a channel through the sand barrier to provide an outlet for the lagoon water before it threatens the properties at risk of flooding (TAC, 2007). However, because the Carmel River and the Lagoon provide important habitat for endangered species, adverse environmental effects of the artificial breaching have been noted, and the National Marine Fisheries Service (NMFS) as well as local conservation groups have insisted that the county find an alternative solution to the yearly breaching activities.

In October of 2011, MCWRA presented a plan with short and long-term strategies for the management of the sand barrier (Carmel River…, 2011). As part of the short-term actions for the 2011-2012 winter season, the County introduced emergency response strategies, made thousands of sand bags available for residents, and obtained the necessary permits to breach the sandbar once the lagoon levels reached a critical level. The long-term solution proposed by the County and the Carmel River Watershed Conservancy includes the construction of a protective barrier (the Ecosystem Protective Barrier, or EPB), the armoring of the adjacent bluffs and the State Beach parking area, and plans for the protection and preservation of Scenic Road. A less expensive option the County has been following is to lower a section at the south end of the beach to a level that the lagoon will overtop naturally and drain the lagoon more slowly. Local NGOs play a crucial role and actively contribute to the management of the Lower Carmel River through the planning and implementation of comprehensive programs in this part of the watershed.

4. Conservation of Threatened Species

The Carmel River Watershed is home to a variety of threatened and endangered species, including two major threatened species: the steelhead trout, *Oncorhynchus mykiss*, - listed for the Central Coast in 1997 (NOAA, 2012), and the California red legged-frog, *Rana aurora draytonii* – listed in 1996 (Endangered…, 2012).

Monitoring and protecting steelhead trout and their habitat is an important component of the management of the Carmel River Watershed, and federal and state regulatory requirements influence how the river, the lagoon, and all adjacent areas are managed. Water extraction, land use changes, flood management, dam management, and almost every other activity in the watershed that may impact steelhead or their habitat must conform to regulations aimed at protecting them. Surface

diversions and excessive groundwater pumping have caused the native steelhead population to drop to critically low levels, threatening the Carmel River steelhead population (McEwan, Jackson, 1996). Habitat loss caused by land use changes and by barriers to their migration has also been identified as an impairment to steelhead (MPWMD, 2004). A more recent threat has been posed by the invasion of predatory striped bass into the lower river of the lagoon.

Efforts to restore critical habitat and to mitigate negative impacts of human activities have been taking place in the watershed for many decades. Important components of the steelhead conservation programs include maintaining adequate amounts of water in the river, ensuring appropriate connectivity with the ocean and between the main stem and the reaches that provide critical habitat. The Monterey Peninsula Water Management District (MPWMD), Cal Am, and several local NGOs collaborate every year to monitor and rescue steelhead in the Carmel River. Recently, Trout Unlimited has secured grant funding to remove fish passage barriers in tributary creeks.

The California red-legged frog is another threatened species present in the Carmel River Watershed. It is currently only present in approximately 25% of its historic range, for reasons largely related to human activities (Rathbun, Schneider, 2001), such as exposure to pesticides, habitat destruction, climate change, and the introduction of competing non-native species such as bullfrogs (Doubledee et al., 2003). Because of its threatened status, management decisions in the Carmel River Watershed must take into account the direct and indirect effects that resource uses and activities may have on the California red-legged frogs and their critical habitat. Several restoration projects that have been proposed in the Carmel River watershed have goals to improve habitat conditions for the California red-legged frog (SCC, 2011). The removal of the San Clemente Dam aims to enhance the habitat for the red-legged frog, the steelhead, and other important species within the watershed. Although California red-legged frogs may be present throughout the watershed, assessing their population has proven challenging and it has been difficult to determine if their population is stable, growing, or if it has continued to decline (MPWMD, 2004). U.S. Fish and Wildlife is in the process of replanting CRLF juveniles in key stretches of the river.

5. The San Clemente Dam Removal

The largest and arguably most important project that has occurred in the Carmel River Watershed in recent years is the San Clemente Dam removal, which took place in August of 2015. This was the largest dam removal project to take place in California to date. The San Clemente Dam was built in 1920 by the Del Monte Properties Company exclusively to serve as a water storage reservoir (Olmsted, 1921). Originally, the reservoir could store up to 1,425 acre-feet of water, but its capacity greatly diminished over time. By the time the removal project began, the reservoir was filled with over 2.5 million cubic yards of sediment, leaving it at less than 5% capacity (SCC, 2011).

In 1992, the California Department of Water Resources (DWR) Division of Safety of Dams (DSOD) determined that the San Clemente Dam could potentially fail in a strong earthquake or a severe flood, and issued an order mandating Cal Am, the owner of the dam, to address this public safety issue (Cal Am, 2012). After exploring several alternatives to address the seismic concerns, Cal Am, in partnership with the State Coastal Conservancy, NOAA Fisheries, and the Planning & Conservation League Foundation, chose an alternative that included rerouting the Carmel River, removal of the dam, and

restoration of that section of the Carmel River watershed. Not only did this project address the public safety issues, but it will also improve the general health of the river. Sediment from the upper watershed is being transported downstream as it did before the construction of the dam, steelhead step pools were constructed to assist steelhead in their journey upstream, and new rearing and spawning habit has opened up. Additionally, the smaller Old Carmel River Dam was removed in 2016 and final riparian restoration was completed by the end of October 2016 (Coastal Conservancy, 2016). Among other benefits, the San Clemente Dam Removal and Carmel River Reroute project frees over 25 miles of natural spawning and rearing habitat to steelhead, improves sediment transport to the lower river, and provides connectivity of aquatic and riparian habitats (Cal Am, 2015). The project will not likely affect flood control management or the regional water supply. The San Clemente Dam removal and reroute project is a prime example of the benefits of cooperative, creative, multi-stakeholder approaches to solving watershed management issues.

6. Management of the Los Padres Dam (LPD)

Los Padres Dam, located approximately 25 miles inland from the mouth of the Carmel River, was built in 1948 to augment municipal water supply (Kondolf, 1982). The Los Padres reservoir had an original capacity of 3,030 acre-feet (Cal Am, 2006), but it is currently reduced to approximately 55% of its original capacity. High sediment yields caused by annual rains, steep slopes, fractured granitic rock, and powerful streams, have contributed to the accumulation of sediment in the Los Padres reservoir. Wildfires have also played an important role in the accumulation of sediment behind the dams. It is estimated that the 1977 "Marble Cone Fire" alone generated sediment yields responsible for a large portion of the capacity loss at the Los Padres Reservoir.

The retention of sediment behind the Los Padres Dam not only diminishes its functionality as a water storage reservoir, but it also has detrimental effects on important physical and biological attributes of the river. The reduction of sediment flows downstream of the Los Padres Dam contributes to channel narrowing, bed degradation, and decreased sinuosity (Kondolf, 1982). Additionally, the entrapment of gravel, cobble, and boulders diminishes essential habitat for the endangered steelhead trout (MPWMD, 2004). In 2013, Cal Am, the owner and operator of the Los Padres Dam conducted a feasibility study regarding the dredging of sediment out of the reservoir and found that dredging would cost between $105 and $110 million. Other options, such as removing the dam or expanding surface storage, are also being studied (MPWMD, 2016).

Los Padres Dam and the associated reservoir also constitutes a physical barrier that impairs the migration of steelhead (Smith et al., 2004). Currently, fish passage upstream is facilitated by one functional and one semi-functional fish ladder (Carmel River Advisory Committee 2012), and a trap-and-truck operation that transports the fish that are migrating (MPWMD, 2004). In addition, a 900-foot long smolt slide was recently constructed to assist smolts in their passage out of Los Padres Reservoir when water levels get too low. The project consists of a floating system to herd the fish to the pipe where they can then slide down the spillway tube (MPWMD, 2015).

The Los Padres Dam, however, also provides benefits for the management of the steelhead, because it allows the maintenance of flows during dry periods. A memorandum of agreement between the

California Department of Fish and Wildlife (CDFW), Cal Am, and the MPWMD governs the releases from storage, and it is estimated that without them, the Carmel River could dry up in the lower reaches during very dry periods (Carmel River Advisory Committee, 2012). At present, Cal Am will continue their track-and-truck operations, manage sediment, and manage downstream impact. Meanwhile, a study will begin in the near future to perform a water availability analysis, a steelhead data and habitat analysis, a geomorphological analysis, and the feasibility of installing upstream passage at the dam. The study was completed by the end 2017, but given the scope of the project, Cal Am and MPWMD will likely secure need to get an extension (MPWMD, 2015).

7. Wildfire management

Wildfire management is an important component of managing and maintaining natural areas in the Carmel River Watershed. Part of the Carmel River Watershed is located within the Los Padres National Forest, where an average 25,000 acres are burned annually by seasonally occurring wildfire (Smith et al., 2004). In 2008, two large fires took place in the Los Padres Forest: the "Indians Fire" and the "Basin Complex Fire." The "Basin Complex Fire" was caused by lightning, and merged with the "Indians Fire" which had been burning for a month; combined, the two fires burned over 240,000 acres, making it one of the largest wildfires in California's history (De Santis et al., 2010). More recently, the Tassajara Fire, which occurred in September 2015, burned 1,086 acres in Monterey County. The Soberanes Fire, which burned during the latter part of the summer of 2016, and was caused by an illegal campfire, which burned more than 132,000 acres of the Los Padres National Forest and Ventana Wilderness. Fire burned the upper Carmel River watershed where the Kirk Complex (1999) and Basin Complex fires burned, and into areas within tributary Sub-watersheds that had not burned for several decades. Approximately 38% of the watershed was burned.

Fire suppression responsibility within urban and wild land areas in the watershed is shared by the City of Monterey Fire Department, the Monterey County Regional Fire District, and the Statewide California Department of Forestry and Fire (Cal Fire); however, wildfire management activities and responsibilities are largely taken on by Cal Fire in collaboration with other large state and federal agencies. Firefighting and emergency response, however, are only some of the components of wildfire management. After recent large fires, awareness and collaborative efforts for wildfire management have increased. An example of a collaborative approach is a program called *FireScape Monterey*. The goal of *FireScape Monterey* is to provide a collaborative framework to manage wildfires in the Los Padres National Forest and the Ventana Wilderness (FireScape Monterey, 2012).

Wildfires play an important role in the health of natural ecosystems, but also pose serious threats to human lives and properties located in the wild land–urban interface (Everett, Fuller, 2010). Because of perceived and real dangers, residents of the wild land-urban interface can feel threatened by environmental regulations aimed at protecting wild areas. An example was observed at a community meeting in June 2011, where Congressman Sam Farr introduced the Big Sur Forest Service Management Unit Act, an act to reorganize the Monterey Ranger District into a Management Unit. Congressman Farr reiterated throughout the meeting that the proposed legislation would not interfere with fire management in the area. However, several participants maintained a firm opposition to the project based on their understanding of how it could potentially limit fire

suppression activities (Big Sur…, 2011).

In the Carmel River Watershed, an important and well-documented effect of very intense wildfires is the increased sediment loads that enter the river as a result of all the debris and erosion from fire impacted areas, and from fire suppression activities, particularly if a wildfire is followed by a strong rainy season (Smith et al., 2004). Following the large "Marble Cone Fire" of 1977, high sediment yields entered the Carmel River stream in the Los Padres watershed, and this single event contributed to a large part of the capacity loss at the Los Padres reservoir (Smith et al., 2004). However, sediment loads into the river from fires since 1999 have been limited. Repeated bathymetric surveys in 2008 and 2016 at Los Padres Reservoir indicate virtually no sediment entered the reservoir after the 2008 Basin Complex fire (HDR 2016). However, a 2017 study by CSUMB's Watershed Institute estimated that another nine percent of the reservoir was filled in as a result of the Soberanes Fire.

The Soberanes Fire burned to the edge of the former San Clemente Dam site and the Los Padres Dam reservoir, raising new fears that subsequent winter rains may cause significant erosion further reducing the storage volume of Los Padres and damage the restoration work at the former San Clemente Dam site. Additionally, a collaborative effort is underway to maintain the key firebreaks that were established to prevent the spread of the Soberanes Fire, so that they will be immediately accessible should another fire break out in that area. This could greatly reduce the extent of such a fire and all the costs (over $250 million) that would be incurred should it spread as far as the Soberanes Fire did.

8. Erosion and Sedimentation Management

The 2004 Physical and Hydrological Assessment of the Carmel River Watershed recognizes bedrock landslides, shallow soil slips, rock fall, stream incision and widening, and slope gullying as the main erosive processes in the Carmel Valley (Smith et al., 2004). For management purposes, erosive processes in the watershed are often grouped under two general categories: those that occur in the river and its banks (e.g. stream incision and widening); and, those that occur in the rest of the watershed (e.g. bedrock landslides and rock fall). Erosion is a natural geomorphic process that is beneficial for ecological functions (Florsheim et al., 2008), but it can be influenced and accelerated by human disturbances, making it a threat to the processes and functions of the river and its floodplain. Natural processes, such as fire and floods, and human modifications, such as the construction and use of dirt roads, deforestation, and the grading of slopes contribute to the erosion of sediment from the watershed (Smith et al., 2004).

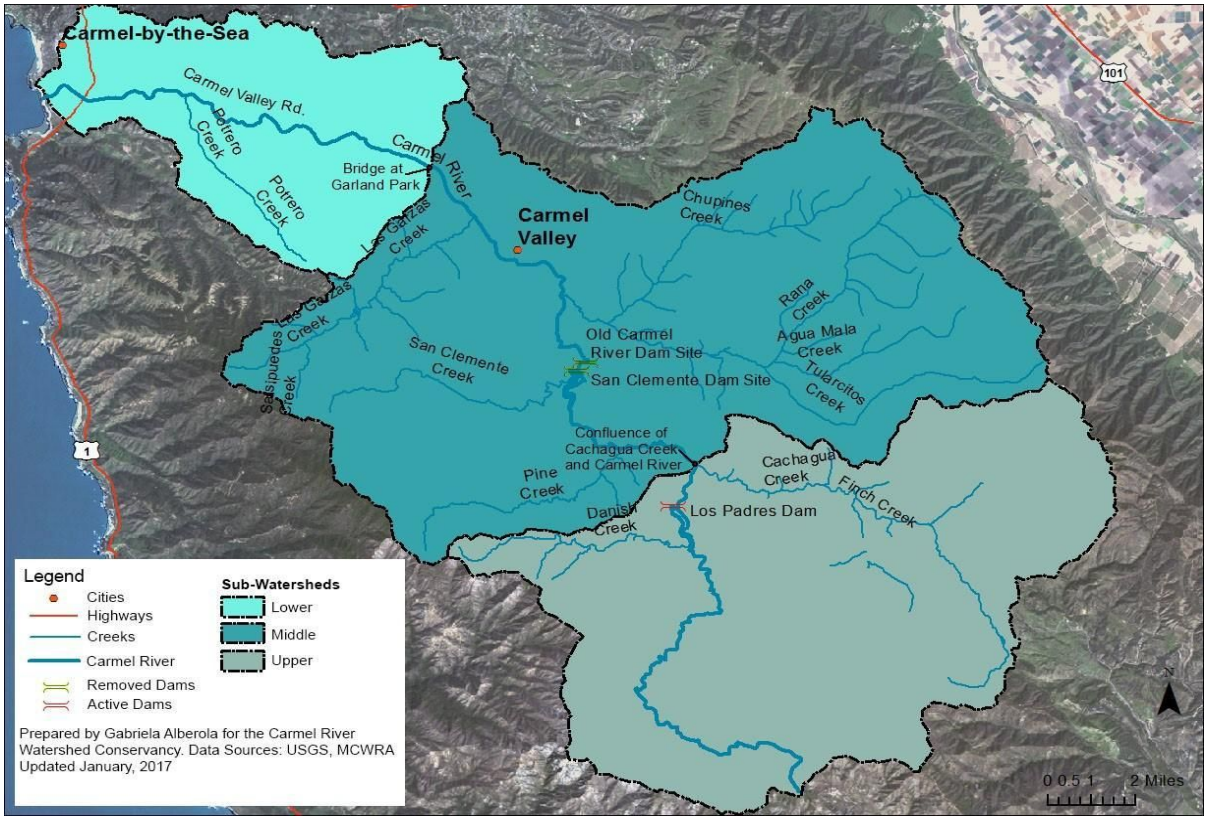
The accumulation of sediment in the reservoir of the Los Padres Dam and the former reservoir of San Clemente Dam reduced their capacity by 45% and 95% respectively. The retention of sediment by the dams not only affects the reservoirs' functionality, but also alters the river's natural sediment regime. Adequate amounts and sizes of sediment support habitat functions and maintain channel stability (Smith et al., 2004; Florsheim et al., 2008). The retention of beneficial sediment in the reservoirs limits the quality and quantity of habitat for the steelhead trout and for benthic macro invertebrates in the river (MPWMD, 2004). The Carmel River Action Plan (Carmel River Task Force, 2014) recommended several actions for erosion and sedimentation control, such as assessing incised

reaches, assessing roads, implementing restoration projects to stabilize stream banks, and promoting best management practices (BMPs) such as excluding cattle from riparian areas.

III – Projects and Programs in the Carmel River Watershed

Several groups and government agencies participate in the active management of the Carmel River Watershed and its resources. Projects and programs envisioned to address management issues in the Carmel River Watershed abound, and collaborative efforts are evidenced by the public and private partnerships that characterize many of them. The following sections detail the current projects and programs in the Carmel River Watershed. Relevant information, such as their status, location, and leading agencies is included for all of the projects. Each program is also linked to a corresponding action (if applicable) from the 2014 Carmel River Watershed Assessment and Action Plan (Appendix A). Some of the larger projects include a more detailed description of their goals and history. This list was compiled from the information shared by regional stakeholders in the Carmel River Task Force quarterly meetings, where local, state, and federal project managers meet to discuss watershed issues and projects and through direct contact with these agencies. The watershed projects and programs presented here are grouped by their general location in the lower, middle, or upper Sub-watersheds (Figure 2); this subdivision, however, does not correspond to official management units and is used for organizational purposes only. Projects and programs that are implemented in more than one area, or that take place outside of the watershed boundaries are grouped under 'multi-region' and 'outside of the watershed', respectively.

Figure 2. Lower, Middle, and Upper Sub-watersheds in the Carmel River Watershed.



III.I – Projects and Programs in the Lower Carmel River Sub-Watershed

The lower portion of the Carmel River Watershed is characterized by white sand beaches, floodplains, wetlands, and riparian habitats (BSLT, 2009). The Carmel River lagoon and the Carmel River State Beach are prominent natural features of this part of the watershed. Urban development is present in the lower Carmel River Watershed in the form of neighborhoods, commercial centers, levees, bridges, and roads. For this report, we have designated the Lower Carmel River Sub-watershed as the area of the watershed east of the Don Pedro Bridge at Garland Regional Park, down to the mouth of the River (Figure 2).

Human activities in the Lower Carmel River, such as groundwater pumping and the seasonal breaching of the Carmel Lagoon, have impaired the natural functions of the river (TAC, 2007). Flood control is a critical issue in this part of the watershed, as this area experiences flood damage at a higher frequency than other parts of the watershed (MCWRA, 2008). The following projects and programs represent the main initiatives that stakeholders are planning and implementing in the lower Carmel River.

1. **Carmel River Lagoon Water Augmentation**
   1.1. Agency / Organization(s): The Carmel Area Wastewater District, State Coastal Conservancy, the Carmel River Steelhead Association, and Carmel Development Co.
   1.2. Coordinates (approximate): 121.91927 W 36.5352 N
   1.3. General Goal: Threatened Species
   1.4. Action Plan 2014: Action 39
   1.5. Status as of January 2018: The CAWD water augmentation project has been withdrawn.
   1.6. Contact: 1.1. Contact: Michael Waxer, Carmel Development Co., or Barbara Buikema, CAWD

The Carmel River Lagoon provides important rearing habitat for the steelhead trout, but low water flows, largely due to overdrafting, have diminished its quantity and impaired its quality. For several years, the CAWD has been discharging advanced treated wastewater near the lagoon to filter through the soil and replenish the water level in the lagoon during the dry season, effectively increasing habitat for the steelhead (CAWD, 2012). Treated wastewater, regardless of the level of treatment achieved, cannot be discharged directly into the lagoon due to environmental regulations, and for this reason, augmentation efforts are focused on recharging the groundwater system, which also result in an increase of water in the lagoon. The project could have added up to 300 acre-feet of water per year to the lagoon for fish habitat.

The Carmel River Steelhead Association proposed a project to pump water from a well owned by State Parks and release it into the lagoon during the summer months to improve both quantity and quality of lagoon water. The
Conservancy commissioned Balance Hydrologics to evaluate the potential impacts of the high rate of pumping proposed by CRSA (600 gpm). The Balance report suggested that a lower rate of pumping might make more sense, but others thought the benefits of this lower rate would be limited. The last annual report incorrectly stated that CRSA was no longer pursuing this effort. In follow up conservations with Conservancy staff, CRSA proposed to conduct a study of how much benefit the lower pumping rate could achieve – for instance over how wide an area would reduced water temperatures be seen. Once the study is complete, CRSA and the Conservancy will re-consider whether to pursue this project on a longer-term basis.

2. **State Parks Well Project**
   2.1. Agency/Organization (s): Carmel River Steelhead Association
   2.2. Coordinates (approximate): Hwy 1 Causeway (3a): 121.9156 W 36.5336 N
   2.3. General Goal: Habitat Restoration
   2.4. Action Plan 2014: Action 39
   2.5. Status as of January 2018: CRSA is looking for funding to relocate the well as soon as possible.
   2.6. Contact: Brian LeNeve - bjleneve@att.net

A former agricultural supply well located on State Parks property has been operated in the dry season to augment water in the Lagoon. The well was operated by the Steelhead Association in the past as a means of augmenting freshwater to the Carmel Lagoon in the summer months in order to benefit

steelhead and other aquatic species. Funding may be needed to repair the well, as well as to maintain and pay for electricity. However, the well is also within the footprint of the pending Carmel River Floodplain Restoration Project (CR-FREE) and is planned to be relocated as part of the project. CRSA has decided it would be wise to wait until the well has been relocated before spending grant money to repair the well, and is in the process of finding funding to relocate the well as soon as possible.

3. Carmel River Floodplain Restoration and Environmental Enhancement Program (Carmel River FREE Project)

3.1. Agency / Organization(s): Big Sur Land Trust, County of Monterey Resource Management Agency, California State Parks, Monterey Peninsula Regional Park District, Caltrans

3.2. Coordinates (approximate):

3.2.1. Hwy 1 Causeway (3a): 121.9156 W 36.5336 N Coordinates

3.2.2. South Levee (3b): 121.9040 W 36.5356 N Coordinates

3.2.3. East Levee (3c): 121.9000 W 36.5355 N

3.2.4. Odello East (3d): 121.9060 W 36.5332 N

3.3. General Goal: Flood Control, Floodplain Restoration

3.4. Action Plan 2014: Actions 2, 4, 8, 9, 12, 26, and 28

3.5. Status as of January 2018: Draft CEQA/NEPA document pending release by the end of the year.

3.6. Contacts: Sarah Hardgrave – Shardgrave@bigsurlandtrust.org; Melanie Beretti – BerettiM@co.monterey.ca.us

Timeline as of August 2017:

- Public release of Draft CEQA/NEPA document has been on hold since beginning of 2017 to further address potential impact issues. An EIR is being prepared and should be ready for public release by early spring 2018.
- Caltrans Report and CEQA and NEPA review by Winter of 2017
- Construction to begin in 2019
- Full restoration to be complete by 2030

The Carmel River Floodplain Restoration and Environmental Enhancement Program is a multi-objective, comprehensive project that incorporates elements of flood control, floodplain and habitat restoration, public access, land protection, and protection of special species. Monterey County Resource Management Agency (MCRMA) and BSLT are co-sponsors of this project to restore the southern floodplain in the lower Carmel River and provide flood control to the adjacent urban areas. MCRMA has a cooperative agreement with Caltrans to sponsor the causeway component of the project, and the MCRMA is the lead CEQA agency. U.S. Fish and Wildlife Service is the NEPA lead agency and Caltrans is a cooperating agency on the NEPA review.

The objectives of this project are to reduce flood flows in urban areas, to increase riparian and wetland habitat, to recharge groundwater and base flows to the Carmel River, to provide habitat connectivity across the floodplain, to protect agricultural land from flooding, to improve water quality, and to create public trails (BSLT, 2010). The main features of this project are: The construction of a 350-ft flood bypass or causeway/bridge under State Hwy 1 to the south end of the

lagoon, removal of approximately 1,600 feet of non-engineered farm levees on the south bank of the Odello East Property, grading to contour the floodplain with topographic diversity for habitat benefits and two braided distributary channels that tie into the south arm of the Carmel Lagoon to carry floodwaters from the levee openings across the floodplain to the west side of the highway, restoration of over 90 acres of riparian and floodplain habitats, and the creation of public trails for public access and recreation (BSLT, 2016). In June 2016, Clinton Eastwood and Margaret Eastwood donated 79 acres of the Odello East property to BLST for the Carmel River FREE Project, adding to the 49 acres that had been donated in 1997.

Among the flood control benefits, this project will reduce flood risks to Hwy 1 and adjacent developed areas north of the lower Carmel River. Reconnecting the main stem of the river to the south floodplain and to the area west of Hwy 1 will also help reduce flood threat to infrastructure while providing access for wildlife movement. Habitat restoration is an important component of this project; approximately 90 acres of historic riparian and wetland habitat will be restored, increasing the quality and quantity of important habitat for the resident fish and wildlife. Additional benefits of this project include the protection of over 23 acres of organic farming land, increased groundwater recharge, wildlife connectivity under Highway 1 and increased public access through the creation of a series of recreational trails. Project costs, including pre-construction costs, are roughly $27 million. At present, over $14 million has been secured, but there is a funding gap of approximately $13 million. Current funders include a variety sources including grants as well as funds from private sources, NGOs, the local government and public funding from State and Federal Agencies.

4. Carmel River Lagoon Ecosystem Protective Barrier (EPB)

- 4.1. Agency / Organization(s): Monterey County Water Resources Agency
- 4.2. Coordinates (approximate): 121.92545 W 36.5411 N
- 4.3. General Goal: Public Safety
- 4.4. Action Plan 2014: Action 38
- 4.5. Status as of January 2018: Final draft EIR underway
  - 4.5.1. Timeline: DEIR submitted for public review in late 2016; permit acquisition to follow in 2017; construction to begin July 2018; to be completed in Fall of 2018
- 4.6. Contact: Melanie Beretti – BerettiM@co.monterey.ca.us

The MCWRA has conducted a feasibility study to evaluate the placement of a barrier floodwall, called and ecosystem protective barrier or EPB, along the northern portion of the Carmel River Lagoon (MPWMD, 2011b).

The Carmel Lagoon, located at the mouth of the Carmel River, is a productive estuary that serves as habitat for federally listed South-Central California Coast steelhead (S-CCC steelhead; *Oncorhynchus mykiss irideus*), California red-legged frog (CRLF, *Rana aurora draytonii*), western snowy plover (*Charadrius nivosus*), and Smith's blue butterfly (SBB; *Euphilotes enoptes smithi*). Each winter, when the water levels increase in the lagoon, homes and buildings situated within the floodplain are at risk to flooding. Every year, Monterey County takes preemptive action to lower the water level at the Carmel Lagoon by digging a channel through the sand barrier that contains the lagoon. If allowed to

breach naturally, the water level in the Carmel Lagoon could rise to levels that would threaten the surrounding infrastructure. The EPB is one possible solution to mitigate the impacts of flooding in the Carmel Lagoon.

An EPB will allow the levels in the lagoon to rise and breach the sandbar naturally without threatening adjacent low-lying structures. The resulting increase in water quantity and quality in the lagoon is expected to improve rearing habitat for the threatened steelhead and the California red-legged frog. The feasibility study is funded by a $145,000.00 grant from the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Fund of 2006 (Proposition 84), allocated by the Wildlife Conservation Board (WCB, 2011). Breaching dynamics directly affect lagoon stage (water surface elevation), which in turn determines aquatic habitat volume and area, as well as water quality. As a result, mechanical breaching of the lagoon (i.e., for flood protection) has the potential to adversely affect federally listed fish and wildlife in conflict with federal law. Natural breaching, with the assistance of the EPB, is therefore preferred by environmental groups and many key governmental agencies with an interest in the lagoon. Breaching at the north end of the lagoon facilitates a longer and more natural outflow channel, improving conditions for fish and wildlife within the lagoon, but has threatened to undermine Scenic Road and adjacent properties in the past.

The proposed project is a comprehensive plan meant to promote improvement in the ecological function of the lagoon, including natural floodplain function and improvement of habitat for federally listed species associated with the lagoon, by allowing the lagoon to breach naturally, without increasing flood and erosion risk to private structures and public facilities. The project area includes the lagoon and adjacent wetland, riparian and coastal habitats. The proposed project involves implementing three project components: 1) Ecosystem Protective Barrier (EPB), 2) Scenic Road Protection Structure (SRPS), and 3) Interim Sandbar Management Plan (ISMP). The project is currently in the environmental review stage, and distinct components are detailed below.

Ecosystem Protective Barrier details:

- The proposed EPB alignment includes a minimum setback of up to 40 feet from the State Parks property line with a top of wall elevation of 17.5 feet based on the North American Vertical Datum of 1988. This option was recommended as a component of the preferred alternative because it:
- Maintains the current level of protection of facilities and homes accounting for sea level rise over the next 50 years;
- Minimizes ecological impacts by eliminating drainage infrastructure and fill;
- Minimizes visual impacts with a lower height and greater area of vegetative cover;
- Reduces noise because of smaller pumps with less frequent pumping; and,
- Increases area that serves as a bio-swale to collect urban runoff.

While the County is seeking permits for a long-term solution, there is an Interim Sandbar Management Plan in place. The process to complete the design, environmental review, permitting, and construction of the EPB is estimated to take up to eight years, depending on resource availability; however, the County is making every effort to reduce this timeframe to five years or less. In the interim, the County

has developed the 5-Year ISMP in coordination with the regulatory agencies for managing the lagoon, including winter openings and summer closure in the best possible manner that reduces potential impacts to both wildlife and property. The County presently lowers the southern end of the barrier beach to the extent that when the rains begin and the lagoon fills, the lagoon will overtop the beach and open the barrier to the ocean prior to the homes flooding on the north side of the lagoon. The activities, conditions, and implementation of the ISMP will be carried out in accordance with the approved MOU between the County, USACE, and NMFS.

The Draft EIR was released in December 2016 with a 60-day public review period ending on January 31, 2017. CA State Parks, Carmel Area Wastewater District, and several nearby homeowners all submitted comments that opposed the construction of the EPB, so its feasibility is now in doubt.

5. Protecting Scenic Road and armoring the bluffs and the State Beach parking area

5.1. Agency / Organization(s): Monterey County Resource Management Agency
5.2. Coordinates (approximate): 121.92952 W 36.5397 N
5.3. General Goal: Public Safety and Resource Protection
5.4. Status as of January 2018: Ongoing
5.5. Contact: Melanie Beretti – BerettiM@co.monterey.ca.us

The feasibility report for the project evaluated four different alignments and designs ranging from riprap at the toe of the slope to a pile wall located at the top of slope (edge of the right-of-way). SRPS Alternative 1 – Revetment (Riprap) Located at Toe of Slope was determined to be the preferred alternative. The proposed SRPS project component consists of rock slope protection, also known as rock riprap or revetment, placed at the toe of the road embankment. The placement of armor rock would extend up as needed to protect Scenic Road from river scour and would extend down below the anticipated outlet channel scour elevation. The outer rock layer would be sized to withstand extreme ocean wave and river current forces (e.g., ½- to 1-ton sized rock) with a thinner layer of smaller rock and/or geotextile fabric underneath to prevent the soil from being eroded through the revetment. The feasibility report determined that riprap provides the most natural material and the structure would be covered with sand when the beach is not breached. The alignment allows continued use of the beach area located north of the barrier when, and if, the river breaches to the north. Subsequently, an analysis of alternatives funded by the County Service Area 1 recommended that a seawall would be more protective of the bluffs, will last longer than the rip rap alternative, and be less encroaching on the beach.

The Draft EIR was released in December 2016 with a 60-day public review period ending on January 31, 2017. The Final EIR is in progress as of January 2018.

6. Watershed Education Center at Garland Park

6.1. Agency / Organization(s): Monterey Peninsula Regional Park District
6.2. Coordinates (approximate): 121.76869 W 36.5072
6.3. General Goal: Education and Public Access

6.4. Action Plan 2014: Action 29
6.5. Status as of January 2018: Completed; Activities and Interpretive Exhibits Rotating and Ongoing
6.6. Contact: Jackie Nelson – Nelson@mprpd.org

The Monterey Peninsula Regional Park District (MPRPD) owns and manages 12,500 acres of open space and conservation lands, three of these properties within the Carmel River Watershed: The Cachagua Community Center (located near the headwaters of the Carmel River); the Watershed Education Center at Garland Ranch Regional Park (which includes Garland Park, Kahn Ranch and de Dampierre); and, Palo Corona Regional Park. The recently installed permanent interpretive and educational exhibits at Garland Ranch Regional Park are designed to connect students and visitors of all ages to the flora and fauna of the park and the Carmel River. Watershed Education/Visitor Center also offers a native plant drought tolerant, pollinator garden and arboretum with watershed specific vegetation.

MPRPD offers k-8th grade students, and teachers a free "Watershed Explorers" class program and professional development workshops funded by the National Oceanic and Atmospheric Administration (NOAA)-California Bay Watershed Education (BWET) grant program. The Watershed Explorers program provides hands-on watershed education that helps students develop an understanding of watershed science and water issues. Through introductory classroom activities to scientific monitoring on the Carmel River, Watershed Explorers engages elementary and middle school students in meaningful experiences that allow them to participate in real science activities and experiments along the National Marine Sanctuary's coast.

The Park District welcomes the public to both Garland Ranch and Palo Corona Regional Parks, where they participate in a Volunteer Naturalist-led tour or a variety of activities from the Let's Go Outdoors! (LGO!) Guide. Some of these offerings include, stargazing, wildlife watching, art and writing, watershed tours, and fire safety classes. The Park District runs numerous stewardship projects. Volunteers are encouraged to participate in activities such as non-native plant removal, trail reporting, stewardship maintenance projects, interpretive programs, and staffing the Visitor Center.

MPRPD is scheduled to receive ownership of the 190-acre Rancho Cañada Golf Course and clubhouse facility by January 2018. This accessible entrance to Palo Corona Regional Park will serve as the main office location, an educational and research site, and a gateway to backcountry hiking and the Big Sur coast. MPRPD is in the process of developing a General Development Plan for Palo Corona Regional Park with public input, to be completed in late-Spring 2018.

The Monterey Peninsula Regional Park District owns and manages 12,500 acres of open space and conservation lands, three of these properties within the Carmel River Watershed: The Cachagua Community Center, which is located at the headwaters of the Carmel River, the Watershed Education Center at Garland Ranch Regional Park (which includes Garland Park, Kahn Ranch and de Dampierre), and Palo Corona Regional Park. The Watershed Education/Visitor Center at Garland Park was recently expanded and remodeled. The center currently hosts temporary exhibits as well as a native plant garden/arboretum, and design plans for permanent interpretive exhibits are underway. The Park District welcomes school groups and the public to both Garland and Palo Corona Regional Parks, where they can take a Volunteer Naturalist led tour. They also have a grant through NOAA's California Bay Watershed Education Program, which allows them to educate students in the area about watershed awareness.

In addition to the exhibits and school education programs, a variety of activities from the *Let's Go Outdoors!* Guide also take place at Garland and Palo Corona. Some of these offerings include, stargazing, wildlife watching, art and writing, and fire safety classes. The Park District also runs numerous stewardship projects and welcomes volunteers to participate in activities such as non-native plant removal, trail reporting, stewardship maintenance projects, interpretive programs, and staffing the Visitor Center. The Park District is in the process of receiving the 190 acre Rancho Cañada Golf Course and clubhouse facility to serve as an all accessible entrance to Palo Corona Regional Park and hopes to open Palo Corona to backcountry hikers in the future. They are also in the process of developing an interpretive master plan for all district parks, which will include tours and interpretive signage installation.

7. Carmel River Lagoon Restoration (Cuttings, Propagation, and Planting)

7.1. Agency / Organization(s): California State Parks
7.2. Coordinates (approximate): 121.91985 W 36.5368 N
7.3. General Goal: Habitat Restoration
7.4. Action Plan 2014: Action 9
7.5. Status as of January 2018: Ongoing
7.6. Contact: Brent Marshall – brent.marshall@parks.ca.gov

At present, California State Parks is working to eradicate non-native plants and weeds at the Carmel River Lagoon. This project includes weed eradication efforts at the Carmel River Lagoon.

8. Carmel River Lagoon Beach Clean-up

8.1 Agency / Organization(s): Carmel Unified School District
8.2 Coordinates (approximate): 121.92783 W 36.5387 N General Goal: Clean-up
8.3 Action Plan 2015: Action 9
8.4 Status as of January 2018: Ongoing

9. Carmel River Lagoon Water Quality Monitoring

9.1 Agency / Organization(s): CSUMB Watershed Institute and Surfrider Foundation
9.2 Coordinates (approximate): 121.92551 W 36.5368 N
9.3 General Goal: Water Quality

9.4 Action Plan 2014: Actions 9, 10, 24
9.5 Status as of January 2018: Complete

The CSUMB Watershed Institute participates in a variety of water quality monitoring research activities, including studies to assess post-fire watershed impacts. More specifically, they study how increases in sediment runoff and debris affects lagoons, reservoirs, and streams, particularly now that the San Clemente Dam has been removed.

10. Carmel River Mitigation Bank

10.1 Agency / Organization(s): California Department of Transportation
10.2 Coordinates (approximate): 121.91472 W 36.5378 N
10.3 General Goal: Habitat Restoration
10.4 Action Plan 2014: Action 9
10.5 Status as of January 2018: Ongoing

11. Carmel Service Area (CSA) 50's Flood Prevention Strategies

11.1 Agency / Organization(s): Monterey County Public Works
11.2 Coordinates (approximate): 121.91381 W 36.5392 N
11.3 General Goal: Public Safety
11.4 Action Plan 2014: Action 12
11.5 Status as of January 2018: Ongoing
11.6 Contact: Lynette Redman – RedmanL@co.monterey.ca.us, Melanie Beretti – Berettim@co.monterey.ca.us,

The boundaries of CSA-50 were expanded in 1995 and 1996 to include all of the Mission Fields neighborhood and to encompass the entire north overbank floodplain as far east as Rancho Cañada. Along with the physical expansion of CSA-50 came the expansion of its mission beyond that of drainage services to encompass flood control services as well. This is particularly important given the flood hazard in the area.

A variety of strategies have been used in the past to manage flood risks, including clearing drains and ditches, repairing levees, and maintaining pumps. As part of the 2014 Lower Carmel River Stormwater Management and Flood Control Report, CSA 50 flood prevention analyses and strategies were updated. Monterey County Public Works created new floodplain and flood flow path maps and modeled floodplain scenarios, amongst other things. They found that the riverine flood risk to Mission Fields is relatively low as long as perimeter protection is provided east of Highway 1. In addition, they recommended that a variety of projects be undertaken to further mitigate flooding impacts.

12. MEarth Projects: Learning Center; bird, insect, and mammal data collection; nursery and native plant restoration; and organic food production

12.1. Agency / Organization(s): Carmel Unified School District, partners
12.2. Coordinates (approximate): 121.89433 W 36.5418 N
12.3. General Goal: Education and Public Access
12.4. Action Plan 2014: Actions 29, 37
12.5. Status as of January 2018: Ongoing
12.6. Contact: Tanja Roos - tanja@mearthcarmel.org

MEarth (pronounced Me-Earth) is an environmental education nonprofit with the mission to educate and inspire through environmental stewardship. MEarth provides instruction to approximately 5,000 people of all ages annually from all across Monterey County. Their programs operate at the award-winning Hilton Bialek Habitat, a ten-acre environmental education center which houses a one-acre organic garden/orchard, native plant nursery and demonstration gardens, native grasslands, outdoor amphitheater/bird sanctuary, pond, watershed interpretive area, greenhouses, vermicomposting and composting stations, wood-fired pizza oven/outdoor kitchen, and a LEED-certified multi-purpose "green" classroom. Established as a separate 501(c)3 nonprofit in 2008, MEarth's NatureConnect, FoodConnect, ClassroomConnect and CommunityConnect programs have introduced placed-based, hands-on environmental learning opportunities to both young people and adults from the Central Coast region. www.MEarthCarmel.org

Since the late 1990s, MEarth has received local and national funding to conduct large-scale restoration and hands-on educational experiences at several locations in the Carmel River Watershed. Funding partners such as NOAA/BWET, Audubon, California State and Regional Parks, Fish and Wildlife, the State Coastal Conservancy/Carmel River Steelhead Association, the Carmel River Watershed Conservancy and the City of Carmel have allowed thousands of young people to engage in meaningful work in the Carmel River Watershed, under the guidance of MEarth staff. Interested school or community groups can contact the MEarth office to inquire about field-trips or restoration experiences: (831) 624-1032. They are also always looking for enthusiastic volunteers!

13. Schulte Rd. Bridge Replacement and Construction of New Road Approaches

13.1. Agency/Organizations: Monterey County Department of Public Works
13.2. Coordinates (approx.): 121.83135 W 36.5255 N
13.3. General Goal: Public Safety
13.4. Action Plan 2014: Action 23
13.5. Status as January 2018: Complete
13.6. Contact: Thomas Christensen, MPWMD – Thomas@mpwmd.dst.ca.us

Schulte Bridge provides the only access to the areas south of the Carmel River along Schulte Road. The old, one-lane bridge was replaced with a two-lane bridge in late 2013, at a cost of $3.1 million. The new bridge has improved access to properties along the south side of the river, and is less susceptible to failure from high river flows. Additionally, fewer piers in the creek allows for more open river channel underneath the bridge, as well as a pathway for pedestrians and bikes. As part of the project,

the area was re-vegetated with plants. Restoration of the riparian corridor has progressed nicely on the upstream end of the bridge that once allowed construction access, and will continue to be monitored for years. MPWMD and CRWC jointly developed and installed an interpretive sign next to the new bridge, which describes the history and restoration progress made in the area.

14. Schulte Rd. Documentation and Data Collection of Birdlife on BSLT Property

15.1 Agency / Organization(s): Big Sur Land Trust, Ventana Wildlife Society
15.2 Coordinates (approximate): 121.83135 W 36.5255 N
15.3 General Goal: Habitat Restoration
15.4 Action Plan 2014: Action 30
15.5 Status as of January 2018: On hold
15.6 Contact: Sarah Hardgrave – Shardgrave@bigsurlandtrust.org

15. South Bank Recreation Trail

16.1 Agency / Organization(s): Big Sur Land Trust
16.2 Coordinates (approximate): 121.89391 W 36.5354 N
16.3 General Goal: Education and Public Access
16.4 Action Plan 2014: Action 8
16.5 Status as of January 2018: Completed

16. Large Woody Debris Installation in Carmel River near Lagoon

16.1. Agency/Organization: Carmel River Steelhead Association, the California Conservation Corps, MEarth
16.2. General Goal: Habitat Restoration
16.3. Action Plan 2014: Action 25
16.4. Status as of January 2018: Completed in November 2017.
17.5 Contact: Tom Gandesbery – tom.gandesbery@scc.ca.gov, Brian LeNeve - bjleneve@att.net

In the Central Coast, steelhead trout are listed as a threatened species and the Carmel River has been identified as one of the most important watersheds for recovery of the species. The lagoon is particularly important for rearing juvenile steelhead prior to them entering the ocean. The recovery plan developed by the National Marine Fisheries Services for Central Coast steelhead trout specifically identified the placement of additional large woody debris in the lagoon to enhance rearing habitat as a priority. Large woody debris creates areas for steelhead to hide and avoid predation by birds and other species.

The project involved constructing seven structures made up of large wood pieces anchored to large rock. These structures were assembled on shore and then placed by helicopter into the channel. The California Conservation Corps was a partner on the project and was responsible for constructing the structures. In addition, restoration of the staging areas was done in partnership with a MEarth, an environmental education center located along the river.

The Carmel River Steelhead Association is an all-volunteer group whose mission is to restore and

conserve the steelhead fishery in the Carmel River watershed. They have tackled many challenges in the watershed including completion of a similar project in the south arm of the lagoon several years ago. The Conservancy approved a grant to the Carmel River Steelhead Association (CRSA) to install multiple LWD structures in the Carmel River Lagoon to increase habitat complexity in the lagoon.

Despite being delayed by permitting issues in 2016, phase two of the project was completed in October 2017, and is one of the largest contributors to watershed health to date. Plans to design a third phase, are currently under way. This phase would include implementation of small woody debris upstream where the river flows year-round. Use of small woody debris in lieu of large woody debris would allow any wood that breaks free to pass under any bridge without causing flooding or a need for bridge removal. An exact location, and timeline for this project have yet to be determined.

17. Fish Passage Barrier Removal

17.1. Agency/Organization: Trout Unlimited
17.2. General Goal: Threatened Species
17.3. Action Plan 2014: Actions 20, 21
17.4. Status as of January 2018: Application rejected by Board of Supervisors
17.5. Contact: Tim Frahm – TFrahm@tu.org

The Coastal Conservancy provided a $350,000 grant to Trout Unlimited to undertake planning and design to remove and replace private road stream crossings as well as redesign an existing fish ladder located on san Clemente Creek. The impediments to fish migration were identified in an analysis of steelhead migration conducted by the Monterey County Water Resources Agency in 2014. That analysis ranked the road crossing and the fish ladder as fourth and first in priority. TU may also do similar work on one-to-two additional highly ranked site. Work is done in conjunction with the Monterey County Water Resources Agency, Resource Conservation District and other partners. TU will use completed design work as the basis for application to the Fisheries Restoration Grant Program and Proposition 1 funding by California Department of Fish and Wildlife and National Marine Fisheries Service. This design would be funded by the Carmel River Settlement Account.

Trout Lake Fish Ladder: TU will prepare plans, designs and permit application materials for modification of the fish ladder on San Clemente Creek, located immediately downstream of Trout Lake, a man-made lake located within the Rancho San Clemente family resort. The fish ladder below the dam is in poor condition and does not meet current design recommendations for such structures. Upstream, juvenile and adult fish passage is facilitated by the fish ladder, except in summer months (May through September) when the flashboard dam is installed to impound the lake.

No-Name Road: TU will also prepare plans, designs and permit application materials for modification of the creek crossing at No-Name Road. This is a concrete ford crossing of San Clemente Creek located three miles upstream from the confluence with the stem Carmel River. The ford is the vehicle and

pedestrian access to numerous residential/recreational cabins.

III.II – Projects and Programs in the Middle Carmel River Sub-Watershed

The Middle Carmel River Sub-watershed, extending from the confluence of the Cachagua Creek and the Carmel River down to the Garland Park Bridge (Fig. 2), is not as densely populated as the lower sub watershed. Large extensions of forest, ranches, farms, and small, rural communities characterize this part of the watershed. In this section, both the Old Carmel River Dam and the large San Clemente Dam once restricted Carmel River flows. However, as of January 2018, the Carmel River has been rerouted, the San Clemente Dam has been removed, and the Old Carmel River Dam was removed (Coastal Conservancy, 2016). The following projects and programs represent the main initiatives that stakeholders are planning and implementing in this part of the watershed:

18. San Clemente Dam Removal and Carmel River Reroute

18.1. Agency / Organization(s): California American Water, California State Coastal Conservancy, National Oceanic and Atmospheric Administration, Planning & Conservation League Foundation
18.2. Coordinates (approximate): 121.70866 W 36.4359 N
18.3. General Goal: Public Safety
18.4. Action Plan 2014: Action 35
18.5. Status as of January 2018: Complete
18.6. Contact: Catherine Stedman – catherine.stedman@amwater.com

Built in 1920, the San Clemente Dam was deemed unsafe by the Division of Safety of Dams in 1992 (Cal Am, 2010). To address the public safety concerns, Cal Am, the owners of the dam, determined that strengthening the dam was the most cost-effective alternative. Strengthening the dam in place, however, would not have addressed many of the environmental impairments associated with it. With the support from regional stakeholders, including the CRWC (2005 Assessment), an alternative project that addressed both the public safety and environmental concerns was favored. In 2007, the State Coastal Conservancy (SCC), NOAA's National Marine Fisheries Service, and the Planning & Conservation League Foundation (PCLF) formed a partnership with Cal Am to aid in the project's planning, funding, and public outreach activities (SCC 2011).

The San Clemente Dam Removal and Carmel River Reroute project was recently completed. The Carmel River was rerouted and the dam was successfully removed in August of 2015. At present, Cal Am and Granite Construction have also completed steelhead step pools to aid steelhead in their migration upstream. Re-vegetation and restoration of riparian habitat continues. The project was completed at the end of 2016. The Bureau of Land Management is assuming responsibility for the land around the former dam site. Additionally, Granite Construction removed the smaller Old Carmel River Dam (Coastal Conservancy, 2016).

Among other benefits, the San Clemente Dam Removal and Carmel River Reroute project opens up over 25 miles of natural spawning and rearing habitat for steelhead trout, improves sediment

transport to the lower river, and provides connectivity of aquatic and riparian habitats (Cal Am 2012). The project will not affect flood control management or the regional water supply.

The total cost of the San Clemente Dam Removal and River Reroute Project has been estimated at $83 million. Cal Am contributed $49 million, which is the estimated cost of strengthening the dam and the SCC and NOAA Fisheries raised the additional $34 million. Other funders include the Nature Conservancy and the Resources Legacy Fund. The San Clemente Dam removal and reroute project is a prime example of the benefits of cooperative, creative, multi-stakeholder approaches to solving watershed management issues.

Assessments from CSUMB's geomorphology and hydrology classes between 2016 and 2017 show erosion of channel banks, and movement of boulders used to create the step pools, which were supposed to aid in steelhead migration. The step pools were expected to withstand a 25- to 50-year flood event, but a 1.5-year flood in 2016 noticeably altered original reroute designs (Marson et al. 2016). Since the 30-year flood event in winter of 2016, scattered boulders and buildup of sediment can be found just upstream of the former dam site, creating three shallow channels and a wide wetted area.

19. Sleepy Hollow Steelhead Rearing Facility (SHSRF) Raw Water Intake and Water Supply System Upgrade

19.1. Agency / Organization(s): Monterey Peninsula Water Management District

19.2. Coordinates (approximate): 121.71544 W 36.4438 N

19.3. General Goal: Threatened Species

19.4. Action Plan 2014: Action 3, 32

19.5. Status as of January 2018: SCC grant to MPWDM for designing/CEQA. Mitigated Negative Declaration certified in November 2016. Basis of Design 50% complete with completion in Q2, 2017; construction improvements expected to be completed in 2018 or early 2019; Coastal Conservancy to fund construction grant in 2017 (MPWMD, November 2016).

19.6. Contact: Larry Hampson, District Engineer - Larry@mpwmd.net

The SHSRF started operations in 1997 with the purpose of rescuing and rearing steelhead that were stranded in the Lower Carmel River as a result of water diversions. The facility includes a laboratory, a diversion and pump station, several rearing tanks, an 800-foot long rearing channel, and electrical, water, pressurized air and drainage systems (MPWMD 2011c). In 2003, the MPWMD completed significant improvements to ensure that the facility could continue to operate under increasing sediment loads. The District has continued to upgrade the facility in subsequent years, but additional improvements are still needed in order to renew the necessary operating permits and to prepare the intakes for the increase in sediment loads after the removal of the San Clemente Dam (MPWMD 2011c). The Project is being funded by a $450,000 grant from Cal-Am Settlement Agrement funds administered by the Coastal Conservancy to MPWMD to prepare permitting, engineering, and environmental review documents to improve the intake structure of the Sleepy Hollow Rearing Facility. At present, MPWMD has hired Tetra Tech to lead the planning phase of the settlement.

Planning and permit acquisition is currently underway and should be complete in 2017.

20. Sleepy Hollow Ford Bridge Project

21.1 Agency/Organization(s): CalAm, the California Coastal Commission, Granite Construction
21.2 Coordinates (approximate): 121.71544 W 36.4438 N
21.3 General Goal: Public Safety
21.4 Action plan 2014: Action 32
21.5 Status as of January 2018: Construction is complete (MPWMD, 2016).
21.6 Contact: Kevan Urquhart – kevan@wpwmd.net

As part of the San Clemente Dam removal project, the Sleepy Hollow Ford was removed and a new bridge was constructed in spring/summer of 2016.

21. Gravel Injection Project

22.1 Agency/Organization(s): Monterey Peninsula Water Management District
22.2 Coordinates (approximate): 121.71347 W 36.4448 N
22.3 General Goal: Threatened Species
22.4 Action Plan 2014: Action 4
22.5 Status as of January 2018: Complete
22.6 Contact: Beverly Chaney - beverly@mpwmd.dst.ca.us

This was a Monterey Peninsula Water Management District (District) project, funded by the California Department of Fish and Wildlife's Fisheries Restoration Grant Program (FRGP), and with cooperation by the California American Water Company. This project was a continuation of the District's long-term commitment to improving steelhead spawning habitat in the upper river since 1994. This gravel enhancement was needed because the Los Padres Dam blocks all naturally occurring gravel behind it, thus starving the downstream riverbed of the proper sized material for steelhead spawning. This project involved placing 1,500 tons of clean, river-run, spawning gravel into the Carmel River at three locations just below Los Padres Dam.

In the spring of 2014, the gravel was delivered via truck and trailer from the Central Valley and stockpiled in the open field below the dam. During the summer/fall of 2014/2015 the gravel was placed into the river using a conveyor truck and/or loader. Over time, the gravel will disperse slowly downstream with high winter river flows, eventually seeding up to five miles of the Carmel River with much needed gravel. A proposal to add additional gravel from the San Clemente Dam removal

project was submitted to CDFW and NOAA in March 2015.

III.III – Projects and Programs in the Upper Carmel River Sub-Watershed

For this report, we define the Upper Sub-watershed as the drainage area that extends from the upper boundary of the Carmel River Watershed to the Confluence of Cachagua Creek and the Carmel River, downstream from the Los Padres Dam (fig. 2). Sections of this Sub-watershed are located within the boundaries of the Los Padres National Forest and the Hastings Natural History Reservation. Little development and sparse roads characterize this part of the watershed. Most of the projects and programs in this Sub-watershed address environmental concerns associated with the presence and operation of the Los Padres Dam.

22. Steelhead Passage Improvements at Los Padres Dam and Future of the Dam

24.1 Agency / Organization(s): California Department of Fish and Game, Monterey Peninsula Water Management District, National Oceanic and Atmospheric Administration, Cal Am

24.2 Coordinates (approximate): 121.66954 W 36.3868 N

24.3 General Goal: Threatened Species

24.4 Action Plan 2014: Actions 33, 34

24.5 Status as of January 2018: Downstream passage completed. Smolt-slide, funded by Cal Am, complete; Additional studies to be completed regarding the construction of a fish passage way up the side of the dam. Expected completion in late 2018.

24.6 Contact: Kevan Urquhart, Senior Fisheries Biologist, mailto:Kevan@mpwmd.net; Larry Hampson, Larry@mpwmd.net

A 900-ft long smolt slide was constructed at Los Padres Dam and was placed into service in 2015. The project consists of a floating system, which helps to herd fish into the pipe where they can then slide down below the spillway. The smolt slide was constructed to assist smolts in their passage downstream from Los Padres Dam. Cal Am will continue their track and truck operations for upstream passage, manage sediment, and manage downstream impact. An upstream passage study was commenced in mid-2016 to study the feasibility of installing upstream volitional passage improvements at Los Padres Dam. NMFS, CDFW, MPWMD and Cal-Am will jointly review feasible options. The study is expected to conclude in 2018.

23. Los Padres Reservoir, management of capacity loss

25.1 Agency / Organization(s): California American Water and MPWMD

25.2 Coordinates (approximate): 121.66954 W 36.3868 N

25.3 General Goal: Water Supply

25.4 Action Plan 2014: Actions 34, 36

25.5 Status as of January 2018: MPWMD issued a Request for Proposals to study alternatives. The study is expected to be completed in late 2018. Alternatives to be studied include dam removal, reservoir expansion and sediment management.

25.6 Contact: Larry Hampson – Larry@mpwmd.net

MPWMD will combine a watershed availability analysis, a steelhead data and habitat analysis, a geomorphological analysis, feasibility of upstream passage, and feasibility of long-term alternatives to manage the dam. The effort was planned to be completed by the end of 2017, but given the scope of the project, project completion will extend into 2018.

III.IV – Multi-Region Management Plans and Coordination Efforts

This section includes projects and programs that are being implemented in more than one location or that change locations periodically. This section also includes projects and programs that are focused on coordination efforts, such as the Carmel River Task Force (CRTF) meetings. Coordinates are not included for most of these projects due to their nature.

24. San Clemente Dam Removal Benefits Study

26.1 Agency / Organization(s): CSU Monterey Bay, NOAA Fisheries, US Geological Survey
26.2 General Goal: Document geomorphic changes related to dam removal
26.3 Action Plan 2014: Actions 4,5-geomorphology
26.4 Status as of January 2018: Ongoing
26.5 Contact: Doug Smith, dosmith@csumb.edu

The San Clemente Dam removal poses a large-scale experiment in watershed engineering. Not only is it the largest dam removal in California history, it also includes a world-class example of river construction engineering. Removal of the San Clemente Dam was supposed to reintroduce spawning gravel and large wood to the lower Carmel River, without any significant increase in flood risk or channel stability. Our collective goal is to measure three key variables in many places along the river to characterize the dam removal impact on river morphology and habitat. We are studying the following four parameters to assess those stated goals.

1) We are measuring sediment size distribution to evaluate changes in spawning gravel character through time.
2) We are surveying channel cross sections to assess channel stability and bank erosion through time.
3) We are also using the surveys to assess channel filling that might lead to increased flood risk through time.
4) Lastly, we are inventorying all large wood greater than 15 cm in diameter and 1 m long from the lagoon to Camp Stefani to assess changes related to dam removal.

The newly-constructed river reach located upstream of the removed dam was designed to be generally stable up to the 50-year flood. Assessing the structural evolution of the engineered channel and floodplain will benefit future projects of this kind.

Our monitoring efforts were initiated several years before dam removal so that we could see how the river changes in the post-dam era.

25. Carmel River Riparian Vegetation and Materials Management

25.1. Agency / Organization(s): Monterey Peninsula Water Management District
25.2. General Goal: Habitat Restoration
25.3. Action Plan 2014: Actions 19, 25
25.4. Status as of January 2018: Ongoing
25.5. Contact: Thomas Christensen, Riparian Projects Coordinator, thomas@mpwmd.net

The riparian vegetation, the vegetation that grows along the river, is crucial for the proper physical and biological functions of the river. The riparian vegetation provides important habitat to the fish and wildlife associated with the river and plays a critical role in bank stability and floodplain function. De-vegetation along the Carmel River has promoted channel instability historically, causing loss of land and structural damage in the river's floodplain (Kondolf and Curry 1986).

To promote the health of the riparian vegetation along the Carmel River, the MPWMD conducts regular assessments of the riparian vegetation. The MPWMD follows a management plan that includes irrigation, removal of encroached vegetation, and reestablishment of native vegetation with cuttings and seedlings (MPWMD 2004). The MPWMD also manages the wood and woody debris in the river for flood management and habitat improvement purposes.

26. Environment Quality Incentives Program (EQIP)

26.1. Agency / Organization(s): Natural Resources Conservation Service
26.2. General Goal: Habitat Restoration
26.3. Action Plan 2014: Actions 20, 22, 27
26.4. Status as of January 2018: Ongoing
26.5. Contact: Erika Boyland, District Conservationist, erika.boyland@cs.usda.gov

The EQIP provides financial and technical assistance to agricultural producers in the State of California (NRCS 2012). In the Carmel River Watershed, the NRCS works primarily with rangelands.

Through this yearly program, the NRCS assists landowners with the implementation of best management practices tailored to address each site's concerns. The NRCS assists with practices that improve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland (NRCS 2012). Examples of activities in the Carmel River Watershed that are implemented through the EQUIP include brush and fuel load management, fencing riparian pastures, installing troughs away from streams, and pasture and hay planting.

27. Steelhead Rescue in Creeks and the Main Stem of the River

30.1 Agency / Organization(s): Carmel River Steelhead Association, Monterey Peninsula Water Management District

30.2 General Goal: Threatened Species

30.3 Action Plan 2014: Action 32

30.4 Status as of January 2018: Ongoing

30.5 Contact: Kevan Urquhart, MPWMD, Kevan@mpwmd.net; Greg, CRSA, bjleneve@att.net

Steelhead rescue as well as track and truck operations take place throughout the watershed at specific times during the year in order to help with steelhead migration. MPWMD's extensive 25-year rescue has rescued over 400,000 steelhead from the main stem of the Carmel River since 1989. These fish are moved upstream to permanent habitat or reared in the Sleepy Hollow Steelhead Rearing Facility (SHSRF). For example, in 2013, MPWMD staff began fish rescues on April 19 as flow at the HW 1 gage declined to 10 cfs. Through the end of September, 42,805 steelhead had been captured and released upstream in permanent habitat or taken to the Sleepy Hollow Steelhead Rearing Facility (SHSRF) including: 41,893 young-of-the-year (YOY), 650 age 1+ juveniles, 13 adults (released in ocean), and 249 mortalities (0.58%). MPWMD continues to monitor steelhead, but water levels have been so low recently that rescue operations have been minimal. To date, CRSA has rescued over 100,000 fish from tributaries and over 72,000 fish from the mainstream Carmel River Channel.

28. Volunteer water quality monitoring program

28.1. Agency / Organization(s): Coastal Watershed Council

28.2. Coordinates, Nason Rd. Site (27a): 121.660468 W 36.399207 N
Coordinates, Rosie's Bridge Site (27b): 121.727515 W 36.474359 N
Coordinates, Schulte Rd. Bridge Site (27c): 121.831448 W 36.525450 N
Coordinates, Carmel River at Hwy 1 (27d): 121.911678 W 36.536376 N

28.3. General Goal: Water Quality

28.4. Action Plan 2014: Action 10

28.5. Status as of January 2018: Water quality in Carmel River complete; water quality monitoring in Santa Cruz County ongoing

28.6. Contact: Greg Pepping – gpepping@coastalws.org

Through their Livestock and Land Program, the Coastal Watershed Council is monitoring water quality parameters at four sites on the Carmel River. The sites being monitored are Carmel River at Cachagua Community Park on Nason Rd.; Carmel River at Rosie's Bridge; Carmel River at Schulte Rd;

and Carmel River near Rio Rd. and Hwy 1. This program was implemented in 2012, from January through December, for a total of 12 monitoring events. The data is collected by CWC's staff and volunteers, and their findings will be publicly available online on the Central Coast Ambient Monitoring Program (CCAMP) website and the Coastal Watershed Council's website.

29. Watershed tours

29.1. Agency / Organization(s): Carmel River Watershed Conservancy (CRWC) and MPRPD
29.2. General Goal: Education and Public Access
29.3. Action Plan 2014: Actions 13, 22, 29, 43
29.4. Status as of January 2018: Ongoing
29.5. Contact: Lorin Letendre, Executive Director of CRWC, carmelriverorg@gmail.com

In the summer of 2012, the Carmel River Watershed Conservancy started conducting periodic public and student tours of the watershed as part of their education and outreach programs. The four and six hour tours provide visitors with the opportunity to learn about the importance and the history of the watershed while highlighting both the sustainability concerns and the projects that are being implemented to address them. The MPRPD is a partner on the public tours. The tour stops at important sites in the watershed including the DeDampierre Park, Garland Park, the Carmel River State Beach, the former San Clemente Dam site, and Los Padres Dam. Staff from the MPWMD, the MPRPD, and State Parks, may provide additional support at the various stop sites. The watershed tours were partially funded through grants from the Community Foundation, and a new AmericanWater Environmental grant is providing funds for public tours of the former San Clemente Dam site. The Baskin Foundation provided funds for watershed tours with public school students who are in a program entitled Recruitment in Science Education (RISE); these students are all from low-income families and hope to be the first in their families to attend college.

30. Bank stabilization projects

33.1 Agency / Organization(s): Monterey Peninsula Water Management District
33.2 General Goal: Habitat Restoration
33.3 Action Plan 2014: Action 19
33.4 Status as of January 2018: Ongoing
33.5 Contact: Maureen Hamilton MHamilton@mpwmd.net

Projects to restore and re-vegetate unstable banks and incised reaches of tributaries and mainstream areas based on Proper Functioning Condition (PFC) tributary assessments, engineering and fluvial process determinations.

31. Bird and wildlife surveys and projects

31.1. Agency / Organization(s): US Fish and Wildlife Service
31.2. General Goal: Wildlife Monitoring and Assessments
31.3. Action Plan 2014: Action 28
31.4. Status as of January 2018: Ongoing

32. Bird Conservation Plan

32.1. Agency / Organization(s): Big Sur Land Trust
32.2. General Goal: Wildlife Monitoring and Assessment
32.3. Action Plan 2014: Action 28
32.4. Status as of January 2018: Ongoing

33. Bird monitoring and research

33.1. Agency/Organization(s): Audobon Society, Ventana Wildlife Society
33.2. General Goal: Wildlife Monitoring and Assessment
33.3. Action Plan 2014: Action 28
33.4. Status as of January 2018: Ongoing

34. Carmel Area State Parks General Plan Update

34.1. Agency / Organization(s): California State Parks
34.2. General Goal: Coordination
34.3. Action Plan 2014: Action 2
34.4. Status as of January 2018: Ongoing
34.5. Contact: Brent Marshall – brent.marshall@parks.ca.gov

California State Parks is in the process of developing a regional General Plan for the four state park units located in the Carmel area: Carmel River State Beach, Point Lobos State Natural Reserve, Point Lobos Ranch and Hatton Canyon. A second public workshop was held on July 22, 2015 to introduce general plan alternatives as well as conservation projects, visitor uses, and facilities that could be included. Additional public meetings will be held in the upcoming months. California State Parks intends to prepare the Preliminary General Plan and Draft EIR in late 2015 to early 2016 and a Final EIR in 2016 or 2017. They hope to have the General Plan completed by summer of 2018.

35. Interim flood management plan in the Lower section of the River (Sand bagging, emergency preparedness, securing permits for emergency sandbar breaching)

35.1. Agency / Organization(s): Monterey County Resource Management Agency, Monterey County Water Resources Agency, US Army Corps of Engineers
35.2. General Goal: Public Safety
35.3. Action Plan 2014: Actions 9, 12
35.4. Status as of January 2018: Ongoing until long-term components are implemented

While the County is seeking permits for long-term solutions, there is an Interim Sandbar Management Plan in place. This is a coordination between the regulatory agencies for managing the lagoon, including winter openings and summer closure in the best possible manner that reduces potential impacts on community members and wildlife. The first step is installation of sandbags, followed by a lowering of the southern end of the barrier beach using bulldozers, such that the lagoon will fill to a level that will overtop the beach and open up the lagoon to the ocean before the homes on the north side of the lagoon are flooded.

36. Interpretative Signs for the River Parkway Program

36.1. Agency / Organization(s): Big Sur Land Trust
36.2. General Goal: Education and Public Access
36.3. Action Plan 2014: Not Applicable
36.4. Status as of January 2018: Signs completed and installed

37. Pharmaceutical Drug Collection and Disposal

37.1. Agency / Organization(s): Carmel River Watershed Conservancy and California American Water.
37.2. General Goal: Water Quality
37.3. Action Plan 2014: Action 24
37.4. Status as of January 2018: Drug recycling boxes completed and installed at the Carmel Police Department,
Pebble Beach Maintenance Center, and Pacific Grove Police Station.

38. Road Assessments

38.1. Agency / Organization(s): Resource Conservation District of Monterey County (RCD)
38.2. General Goal: Sediment Control
38.3. Action Plan 2014: Actions 20, 21
38.4. Status as of January 2018: Completed
38.5. Contact: Paul Robins – paul.robins@rcdmonterey.org

There were two assessments conducted by the RCD and NRCS (Natural Resources Conservation Service) in Carmel Valley in 2011 and 2012. One assessment was conducted on 1 mile of Parrot Ranch Road, off Cachagua Road and the other ½ mile off the Potrero Creek Trail (on the Santa Lucia Preserve). Another assessment was conducted by a contractor in 2015 on the Big Sur Land Trust

Mitteldorf Preserve in the San Jose Creek watershed, which is just south of the Carmel River watershed, but also drains into the Carmel Bay. No other assessments are currently planned. Funding for future road assessments can be requested upon public demand.

39. Steelhead Barrier Assessments in Cachagua Creek, Potrero Creek and Garzas Creek

42.1 Agency / Organization(s): MPWMD, Carmel River Watershed Conservancy, Trout Unlimited, RCD of Monterey County, and CRSA
42.2 General Goal: Threatened Species
42.3 Action Plan 2014: Actions 20, 21
42.4 Status as of January 2018: Field surveys completeequ; removal of passage barriers in progress
42.5 Contact: Larry Hampson – Larry@mpwmd.net

Field surveys have been completed at all barriers located on properties whose owners permitted access. No estimated date has been established as to when project construction will begin (Coastal Conservancy, 2016).

43. Cachagua Creek and Potrero Creek Fish Passage Barrier Removal

43.1 Agency / Organization(s): Trout Unlimited
43.2 General Goal: Threatened Species
43.3 Action Plan 2014: Actions 20, 21
43.4 Status as of January 2018: In Progress
43.4 Contact: Tim Frahm, TFrahm@tu.org

Cachagua Creek Ford Design project is underway. Topographic and geotechnical analysis has been completed, but may need follow up to address for liquefaction. Alternatives proposed and forwarded to CDFW are currently being reviewed. Still on target for design documents for the March 2017 application for FRGP construction.

Potrero Creek– Trout Unlimited hired consultants to develop plans for removal of passage barriers and improvement of riparian habitat along Potrero Creek as it passes through the Quail Meadows Golf Course and Carmel Valley Athletic Club. The initial barrier and habitat assessment is complete and conceptual alternatives were identified. Trout Unlimited is now working on the preliminary designs. This project should be completed by the end of 2017. Trout Unlimited intends to apply for implementation funding for the project from other sources. The Conservancy is currently budgeting $300,000 from Settlement Funds for implementation. There is not yet an estimate as to when project construction will begin.

44. Steelhead Genetic Characterization Project

45.1 Agency / Organization(s): Hopkins Marine Station
45.2 General Goal: Threatened Species
45.3 Action Plan 2014: Action 31

45.4 Status as of January 2018: Funding needed
45.5 Contact: Carol Reeb – creeb@stanford.edu

45. Water conservation programs by Cal-Am and MPWMD

46.1 Agency / Organization(s): Cal Am; Monterey Peninsula Water Management District
46.2 General Goal: Water Supply
46.3 Action Plan 2014: Action 14
46.4 Contact: Catherine Stedman catherine.stedman@amwater.com
46.5 Status as of January 2018: Ongoing

Every 2 years, Cal Am applies to the Public Utilities Commission (PUC) and as part of the application they ask for funding for various conservation programs. If approved, consumers then have a small surcharge on their bill to run the conservation programs. Some of these conservation programs are:

- Rebates for more-efficient indoor toilets, dishwashers and washing-machines;
- Outdoor rebates for grey water systems, rainwater catchments, turf replacement, and smart irrigation; and,
- Landscape grant program: Cal Am and MPWMD will go to public institutions, such as schools, and replace dirt with drought-tolerant plants or update their irrigation systems.

46. Watershed Coordination and Carmel River Task Force (CRTF)

47.1 Agency / Organization(s): Carmel River Watershed Conservancy
47.2 General Goal: Coordination and synchronization of projects in the watershed
47.3 Action Plan 2014: Action 1
47.4 Status as of January 2018: Ongoing

The Resource Conservation District of Monterey County chaired the CRTF for three years under a grant program. The CRWC has volunteered to continue coordinating and chairing the CRTF indefinitely. The CRTF meets quarterly to share developments and projects in the watershed and to set priorities for further work and for collaborative applications for grants

47. Watershed Interpretation Signage Project

48.1 Agency / Organization(s): CRWC

48.2 General Goal: Education and Public Access

48.3 Action Plan 2014: Action 43

48.4 Status as of January 2018: 22 signs have been installed at river and creek bridge crossings and entrances to the CR watershed.

48.5 Contact: Lorin Letendre – carmelriverorg@gmail.com

48.6 22 interpretive signs have been completed and installed, plus two new signs that announce "Entering the Carmel River Watershed (see sample below)." Thanks go to Andy Magnasco of the Carmel Valley Ranch for the installation of all these signs. Due to vandalism, six of the signs have had to be replaced by the Conservancy.

Figure 3. Interpretive Sign for Carmel River Watershed

48. Monterey Peninsula Water Supply Project

49.1 Agency / Organization(s): California American Water, Monterey Peninsula Water Management District, Monterey Regional Water Pollution Control Agency
49.2 General Goal: Water Supply
49.3 Coordinates: 121.81364 W 36.6233 N
49.4 Action Plan 2014: Action 14
49.5 Status as of January 2018: Draft EIR submitted
49.6 Contact: Catherine Stedman Catherine.stedman@amwater.com
or Larry Hampson larry@mpwmd.net

At present, up to about 80% of the water consumed by people on the Monterey Peninsula comes from the Carmel River. In order to protect steelhead trout and other threatened species that live within the watershed, the State Water Board ordered Cal Am to reduce water withdrawals from the river. In order to comply with this mandate, more than 100 options were considered and now Cal Am has decided upon a three-part solution that consists of the construction of a 6.4 million gallon per day desalination plant capable of delivering 6,300 acre-feet of water per year, a groundwater replenishment project to deliver 3,500 acre-feet of advanced treated recycled water per year, and expansion of the aquifer storage and recovery project to deliver Carmel River water and desalinated water in winter to the Seaside Basin for storage and later use in the dry season. In addition, pipeline and other Cal Am system improvements are needed to deliver the new water supplies to Cal Am customers. Completion of all components of the project will result in a dramatic reduction in Carmel River diversions, especially during the critical dry season months. This project will have, by far, the most beneficial effects on threatened species in the river.

Cal Am submitted an application to the California Public Utilities Commission for the Monterey

Peninsula Water Supply Project in April 2012. The expected timeline for the project is detailed below:

- Summer 2017: Construction of Pure Water Monterey (PWM) recycled water project begins
- End of 2017: Monterey Pipeline construction completed
- March 2018: Final EIR for desalination component to be released
- 2018: CPUC decision to approve the desalination project
- After CPUC decision: Coastal Commission decision on a Coastal Development Permit
- Fall 2018: Construction of desalination project begins
- Fall 2018: PWM project begins operation
- 2021: Desalination plant begins operation

49. Trust for Public Lands Project

50.1 Agency / Organization(s): Monterey Peninsula Regional Park District, Santa Lucia Conservancy, and Trout Unlimited
50.2 General Goal: Property acquisition and conversion to parks
50.3 Coordinates: Various
50.4 Action Plan 2014: Action #2
50.5 Status as of January 2018: Acquisition completed
50.6 Contact: Rafael Payan, MPRPD at rpayan@mprpd.org and Christy Fischer, Cfischer@slconservancy.org, Santa Lucia Conservancy.

In mid-2016, a consortium of organizations including the Monterey Peninsula Regional Park District, Santa Lucia Conservancy, and Trout Unlimited entered into an agreement to purchase the property on which the Rancho Cañada Golf Course resided in order to convert this property from a golf course to a new park and to convert the clubhouse into offices for the participating organizations and other environmental non-profits. An adjacent property owned by Tony Lombardo has also been acquired by TPL. The golf course was closing anyway at the end of 2016 due to an expiration of its lease on the property. This project aims to return approximately 300 acre feet of water annually to the Carmel River, water which would have been used to irrigate the two 18-hole golf courses. This will have positive effects for the river's threatened species as well as providing public access to a new riverside park and enhanced access to Palo Corona Regional Park. In December 2016, the Conservancy approved a grant to the Monterey Peninsula Regional Park District (MPRPD) to acquire approximately 170 acres of the Rancho Cañada Golf Club in order to retire significant water rights, enable future floodplain restoration, and expand regional recreation opportunities along the river. The total project cost is approximately $11 million. Acquisition is expected to be completed by the end of 2017.

51. Study of Striped Bass Movement in Carmel River Lagoon

51.1 Agency/ Oganization(s): CRSA, NMFS, CDFW
51.2 General Goal: Protecting special status species
51.3 Action Plan 2014: Action #32

51.4 Status as of December 2018: Under review

Study of Striped Bass Movement in Carmel River Lagoon – As a first step in an effort to reduce striped bass impact on steelhead in the Carmel River and Lagoon, CRSA has suggested a multiple year study to gain information on striped bass movement in the Carmel River Lagoon. This proposal is currently under review by NMFS and CDFW.

IV – Literature Cited

[BSLT] Big Sur Land Trust. 2009. Lower Carmel River and Lagoon floodplain restoration and enhancement project. Big Sur Land Trust, Carmel CA.

[BSLT] Big Sur Land Trust. 2010. Flood Corridor Program 2010-2011 Funding Cycle California Department of Water Resources. Funded Projects. Available from: http://www.water.ca.gov/floodmgmt/fpo/sgb/fpcp/docs/Summary_CarmelRiv.pd

[Cal Am] California American Water. 2006. Monterey District Urban Water Management and Water Shortage Contingency Plan 2006-2010.

[Cal Am] California American Water. 2011. Customer & Consumption by Political Jurisdiction, Monterey County District.

[Cal Am]California American Water. 2012. Monterey's San Clemente Dam Removal Project. [Internet] [Cited 2012 March 05]. Available from: http://www.amwater.com/caaw/customer-service/rates-information/monterey-san-clemente-dam-removal-project.html.

[Carmel River TAC] Carmel River Technical Advisory Committee. 2007. 2007 Action Plan Matrix.

[CAWD]Carmel Area Wastewater District. 2010. Carmel Lagoon Water Augmentation. FRGP Proposal Application. [Internet] [Cited 2012 June 13]. Available from: http://cawd.org/documents/environmental/CAWD-FishGame-LagoonRechargeGrant%20App.pdf

[CAWD]Carmel Area Wastewater District. 2012. Environmental Focus. [Internet] [Cited 2012 June 13]. Available from: http://cawd.org/environmental.html#3

[Coastal Conservancy] NOAA-CAW Carmel River Settlement Fund Annual Report. 2016.

[HDR]Hdr Engineering, Inc. 2016. FINAL Los Padres Reservoir Survey Study Report, Technical Memorandum prepared for Monterey Peninsula Water Management District, October 17, 2016.
Available from:
http://www.mpwmd.net/request-for-proposals-los-padres-dam-and-reservoir-alternatives/

[MCWRA] Monterey County Water Resources Agency. 2008. Monterey County floodplain management plan.

[MCWRA] Monterey County Water Resources Agency. 2009. [Internet] [Cited 2012 March 21]. Available from: http://www.mcwra.co.monterey.ca.us/Floodplain%20Management/Historical%20Floodi

ng.htm
[MPWMD] Monterey Peninsula Water Management District. 2004. Environmental and biological assessment of portions of the Carmel River Watershed.
[MPWMD] Monterey Peninsula Water Management District. 2011a. Draft Water Production Summary for Water year 2010 October 2009 - September 30, 2010.
[MPWMD] Monterey Peninsula Water Management District. 2011b, EXHIBIT 6-B, Project 9 Implementation Plan Project 9 - Feasibility of Scenic Road Protection and Preservation with Proposed Carmel River Lagoon Ecosystem Protective Barrier. [Internet] [Cited 2012 June 03]. Available from: http://www.mpwmd.dst.ca.us/asd/board/boardpacket/2011/20111212/06/item6_exh6b.htm
[MPWMD] Monterey Peninsula Water Management District. 2011c. 2011 Mitigation Report. Available from: http://www.mpwmd.dst.ca.us/programs/mitigation_program/annual_report/2010_2011/RY2011%20Mitigation%20Report.pdf
[MPWMD] Monterey Peninsula Water Management District. 2016. Request for Proposals Los Padres Dam and Reservoir Alternatives and Sediment Management Study Available from: http://www.mpwmd.net/request-for-proposals-los-padres-dam-and-reservoir-alternatives/
[NRCS] Natural Resources Conservation Service. 2012. Environmental Quality Incentives Programs. [Internet] [Cited 2012 July 07]. Available from: http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/financial/eqip/?&cid=stelprdb1044009
[SCC] State Coastal Conservancy. 2011. San Clemente Dam removal project: Implementation phase. Staff Recommendation. Project No. 07-004-03.
[SWRCB] State of California State Water Resources Control Board. 2009. Order No. WR 2009- 0060. In the matter of the unauthorized diversion and use of water by the California American Water Company. Cease and Desist Order.
[SWRCB] State of California State Water Resources Control Board. 2016. Order No. WR 2016- 0016. In the Matter of the Application of California American Water Company to Amend State Water Board Order 2009-0060.
[TAC] Technical Advisory Committee. 2007. Study plan for long term adaptive management of the Carmel River State Beach and Lagoon. [Internet] [Cited 2012 March 21]. Available from: http://www.mpwmd.dst.ca.us/Mbay_IRWM/IRWM_library/CarmelBay/LongTermStudyPlanFinal2007-04-17.pdf
[WCB] Wildlife Conservation Board. 2011. Meeting Agenda September 13 2011, Sacramento California. [Internet] [Cited 2012 June 10] Available from: http://nrm.dfg.ca.gov/documents/ContextDocs.aspx?cat=WCB.
"Big Sur Forest Service Management Unit Act Public Meeting". Community meeting hosted by Congressman Sam Farr. Pfeiffer Big Sur State Park Conference Center, Big Sur, CA, June 18 2011. Speech.
"Carmel River – Lagoon". 2011. Community meeting hosted by the Monterey County Water

Resources Agency. Carmel Mission Ranch, Carmel CA, October 20, 2011. Speech.
"Endangered and threatened wildlife". 2012. Title 50 Code of Federal Regulations §17.11. [Internet]. [Cited 2012 March 25].
"Water Supply Alternatives". 2011. Community meeting hosted by Monterey Peninsula cities, featuring Cal Am, the Monterey Peninsula Water Management District and the Monterey County Water Pollution Control Agency. Portola Plaza Hotel, Monterey, CA, October 26, 2011. Speech.
"Worst of storm is believed over here" [author unknown]. 1943 January 23.. Monterey Peninsula Herald; page 1.
Carmel River Advisory Committee. 2012. January 26 Meeting Minutes. Mid Valley Fire Station Community Room, Carmel CA. Electronic Minutes available from: http://www.mpwmd.dst.ca.us/programs/river/crac/cracinfo.htm
De Santis A, Asner GP, Vaughan PJ, Knapp DE. 2010. Mapping burn severity and burning efficiency in California using simulation models and Landsat imagery. Remote Sensing of Environment 114: 1535–1545.
Doubledee RA, Muller EB, Nisbet RM. 2003. Bullfrogs, Disturbance Regimes, and the Persistence of California Red-Legged Frogs. The Journal of Wildlife Management 67 (2): 424-438.
Durein T. 1941 March 4. Salinas-Monterey Highway is closed. Monterey Peninsula Herald; Page 1.
Everett Y, Fuller M. 2010. Fire Safe Councils in the interface. Society & Natural Resources: An International Journal 24(4):319-333.
FireScape Monterey. 2012. Keeping Wild Fires in its Natural Place. [Internet] [Cited 2012 April 1]. Available from http://firescape.ning.com/
Florsheim JL, Mount FM, Chin A. 2008. Bank erosion as a desirable attribute of rivers. Bioscience 58(6): 519-529.
Howe K. 1980 January 14. Series of Storms Floods Salinas-Area homes, highways; More rain due. Monterey Peninsula Herald; pages 1,4.
Kondolf GM. 1982. Recent channel instability and historic channel changes of the Carmel River, Monterey County, California [master's thesis]. Santa Cruz: University of California Santa Cruz.
Kondolf MG, Curry RR. 1986. Channel erosion along the Carmel River, Monterey County, California. Earth Surface Processes and Landforms 11: 307-319.
McEwan D, Jackson TA. 1996. Steelhead restoration plan for California: California, Department of Fish and Game.
NOAA Fisheries. 2012. Office of Protected Resources. [Internet] [Cited 2012 March 25]. Available from: http://www.nmfs.noaa.gov/pr/species/esa/
Olmsted SC. 1921. The San Clemente Dam. The Architect and Engineer 67(2): 109.
Rathbun GB, Schneider J. 2001. Translocation of California Red-Legged Frogs (Rana aurora draytonii). Wildlife Society Bulletin 29 (4): 1300-1303.
Smith DP, Newman WB, Watson FGR, Hameister J. 2004. Physical and hydrologic assessment of the Carmel River Watershed, California. The Watershed Institute, California State University Monterey bay, Publication No. WI – 2004 -05/2.

Telfer J. 1983 March 3. Slides breach Highway 1 in many places, stranding hundreds on Big Sur coast. Monterey Peninsula Herald; page 1.

V – Appendices

Appendix A – Carmel River Watershed Action Plan 2014 Update

			Critical Issues Addressed												
No	Action Description	Action Type	1. Water Quantity	2. Water Quality	3. Flood Mgt	4. Estuary Lagoon	5. special Satus Species	6. Dam Mgt	7. Wildire Mgt	8. Erosion Sediment	9. Geomo-rphology	10. Drought/Climate	11. Public Safety	12. Public Access & Awareness	Related Past & Current Projects and Programs (from February 2014 list)
1	Continue support of the Carmel River Watershed Task Force (CRTF). The CRTF meets quarterly and is open to all stakeholders in the watershed. The purpose of this group is to achieve the successful outcome of watershed projects identified in the Carmel River watershed plan, and other needs in the watershed.	Watershed Partnerships	X	X	X	X	X	X	X	X	X	X		X	Watershed Coordination (RCDMC), ongoing RTF meetings (RCDMC, tbd)
2	Acquire or accept, in fee title or easement, lands that provide multiple benefits to the watershed such as: improving natural habitat and functions, facilitating recovery of listed aquatic and terrestrial species including Steelhead trout and CRLF, reduce flood and erosion risk, and improve public access.	Watershed Management	X	X	X	X	X	X	X	X	X	X		X	
3	Cooperate with local agencies to plan and implement watershed-wide restoration projects of riparian and upland habitat to benefit California red-legged frogs (CRLF), steelhead, and other species of concern. Funding should address development of a monitoring plan for CRLF and other benchmark species.	Watershed Partnerships					X								Carmel Area State Parks General Plan Update (State Parks); CR Riparian Vegetation and Materials Management (MPWMD)
4	Maintain, restore and enhance natural stream functions & features to provide high quality habitat for steelhead, CRLF, and other species of concern.	Watershed Management					X				X	X			Steelhead Habitat Ehancement (CRSA)
5	Expand & maintain the existing network of volunteers in the Carmel River Basin to provide planning, labor, outreach, and mapping services throughout the watershed.	Watershed Partnerships												X	Carmel River Heritage Area Project (CRWC), Volunteer Monitoring Programs (CWC); Watershed Tours (CRWC)
	Encourage the public to comply with the county's landscaping codes.	Education	X									X		X	Water Conservation Programs (Cal-Am and MPWMD), Watershed Manual (RCDMC)
7	Identify, retrofit, and label storm drains.	Education		X										X	
8	Support plans to expand public access to the Carmel River and watershed with willing landowners.	Access												X	South Bank Restoration Trail (BSLT)
9	Develop an adaptive management program for water quality and quantity in the lagoon.	Watershed Management	X	X		X	X								CR Lagoon Restoration (State Parks), CR Lagoon WQ Monitoring (CSUMB), CR Lagoon Beach Clean Up (MEarth); CR Lagoon Ecosystem Protective Barrier (EPB); CR Mitigation Bank (Caltrans)
10	Expand the Volunteer Water Quality Monitoring Program incorporating local schools, Snapshot & First Flush program participants, and other interested stakeholders to tie into existing programs and to include all the main tributaries.	Education		X										X	Pharmaceutical Drug Collection (CRWC); Volunteer Monitoring Program (CWC)

			Critical Issues Addressed												
No	Action Description	Action Type	1. Water Quantity	2. Water Quality	3. Flood Mgt	4. Estuary Lagoon	5. special Satus Species	6. Dam Mgt	7. Wildire Mgt	8. Erosion Sediment	9. Geomo-rphology	10. Drought/Climate	11. Public Safety	12. Public Access & Awareness	Related Past & Current Projects and Programs (from February 2014 list)
11	Establish a sediment transport monitoring program in concert with the surface flow monitoring program of MPWMD for the main stem and tributaries.	Watershed Management		X	X					X					
12	Reduce the risk of flood damage by supporting the evaluation and implementation of multi- objective flood control projects.	Watershed Management			X										Carmel River Abutment at Rancho Canada Village (Rancho Canada); CSA 50 Flood Prevention Strategies & Update to Flood Control Report (Monterey Co.); Interim Flood Management in Lower CR (Monterey Co.); CR Floodplain Restoration & Environmental Enhancement (BSLT & Monterey Co.)
13	Develop an outreach program to increase the public's awareness about how groundwater pumping in the alluvial aquifer and uplands directly impacts surface water flows in the Carmel River.	Education	X									X		X	Water Conservation Programs (Cal-Am and MPWMD); Watershed Manual (RCDMC); Watershed Tours (CRWC)
14	Support implementation of a water supply project that minimizes the export of water from the Carmel River basin during the dry season that causes the chronic reduction in flow and meets the goals of State Water Resources Control Board Order 95/10.	Watershed Management	X			X	X					X		X	Water Supply Project (Cal-Am); Aquifer Storage and Recovery Phases 1 & 2 (MPWMD)
15	Develop projects to maintain or increase water storage in the watershed.	Watershed Management	X					X				X		X	
16	Reduce the amount of water extracted from the Carmel River Basin during summer months by supporting improvements to MPWMD's Aquifer Storage and Recovery (ASR) project in the Seaside Ground Water Basin.	Project	X									X		X	Aquifer Storage and Recovery (ASR) project (MPWMD)
17	Expand water conservation programs to areas beyond the existing MPWMD boundary in the watershed. Programs may include rebates for low flow fixtures & the encouragement of drought tolerant landscaping.	Education	X									X		X	Water Conservation Programs (Cal-Am and MPWMD); Watershed Awareness Events (MCRCD); Watershed Manual (RCDMC)
18	Support studies on areas with wells located in upland areas (fractured rock) and the connection they may have to creeks and ultimately the Carmel River Alluvial Aquifer.	Watershed Management	X											X	Water Extraction Study in Upland Areas (MPWMD)
19	Restore and revegetate unstable banks and incised reaches of tributaries and mainstem areas based on Proper Functioning Condition (PFC) tributary assessments.	Watershed Management		X	X		X			X	X				Bank Stabilization Projects (MPWMD); Riparian Vegetation and Materials Management (MPWMD)

			Critical Issues Addressed												
No	Action Description	Action Type	1. Water Quantity	2. Water Quality	3. Flood Mgt	4. Estuary Lagoon	5. special Satus Species	6. Dam Mgt	7. Wildire Mgt	8. Erosion Sediment	9. Geomo-rphology	10. Drought/Climate	11. Public Safety	12. Public Access & Awareness	Related Past & Current Projects and Programs (from February 2014 list)
20	Implement BMPs for erosion prevention to reduce sediment deposition throughout the watershed including the main tributaries and the main stem of the Carmel River.	Watershed Management		X	X					X				X	Gravel Injection Project (MPWMD)?; Road Assessments (RCDMC); Watershed Manual (RCDMC)
21	In cooperation with Monterey County Public Works Department, conduct assessments of all roads in the watershed. Identify and prioritize treatments that will minimize erosion and restore natural stream function.	Watershed Management								X					Schulte Road Bridge Replacement (Monterey Co. PW)
22	Conduct outreach program to inform watershed residents about the impacts past and present activities have on streambank stability.	Education								X	X			X	Environmental Quality Incentives Program(NRCS); Watershed Awareness Events (RCDMC); Watershed Manual (RCDMC); Watershed Tours (CRWC)
23	Continue to develop, update and support MPWMD's ground water and surface water flow model.	Watershed Management	X												
24	Conduct periodic trash removal and outreach events throughout the watershed to remove urban debris and trash from the Carmel River and its tributaries.	Watershed Management		X										X	Pharmaceutical Drug Collection (CRWC); Watershed Awareness Events (RCDMC)
25	Continue and expand the MPWMD and CRSA Large Woody Debris (LWD) program, including further LWD recruitment location studies and installation of redwood & Douglas fir root balls in reaches of the river that would benefit most from the introduction of LWD.	Watershed Management					X								MPWMD Project - upper/mid watershed
26	Expand programs that create a watershed-wide coordinated riparian vegetation restoration program that includes post-project monitoring and maintenance.	Watershed Management					X			X					Post San Clemente Dam Removal Impact Monitoring (CSUMB)
27	Encourage public and private landowners to adopt and employ nutrient source reduction practices.	Education		X			X							X	Environmental Quality Incentives Program(NRCS); Watershed Awareness Events (RCDMC); Watershed Manual (RCDMC)
28	Plan and implement monitoring programs of key indicator species (Benthic macroinvertebrates and birds) in areas where riparian vegetation has been restored.	Watershed Management					X								Bird and Wildlife Surveys and Projects (BSLT), Bird Monitoring and Research (VWS); The CR Bird Conservation Plan (BSLT)

No	Action Description	Action Type	1. Water Quantity	2. Water Quality	3. Flood Mgt	4. Estuary Lagoon	5. special Satus Species	6. Dam Mgt	7. Wildire Mgt	8. Erosion Sediment	9. Geomo-rphology	10. Drought/Climate	11. Public Safety	12. Public Access & Awareness	Related Past & Current Projects and Programs (from February 2014 list)
29	Continue and expand existing resource conservation and stewardship programs for the community and actively disseminate information to residents and landowners through peer to peer groups and multi-media outreach.	Education												X	MEarth Projects; Watershed Education Center at Garland Park (MPRPD); "Experience Carmel River" Interpretive Panels (BSLT); Environmental Quality Incentives Program(NRCS); Pharmaceutical Drug Collection (CRWC); Watershed Awareness Events (RCDMC); Watershed Manual (RCDMC); Watershed Tours (CRWC)
30	Expand volunteer activities, and maintain the existing network of volunteers in the Carmel River Basin to provide planning, labor, outreach, and mapping services throughout the watershed.	Watershed Partnerships												X	Steelhead Habitat Ehancement (CRSA), Volunteer Monitoring Program (CWC); Watershed Awareness Events (RCDMC); Watershed Tours (CRWC)
31	Expand the current fisheries assessment and monitoring program to include tributaries and multiple mainstem locations to quantify steelhead habitat utilization and migration patterns throughout the Carmel River Watershed. This expansion should include funding to evaluate methods to count fish at selected monitoring stations.	Watershed Management					X								Steelhead Barrier Assessments in Potrero Creek and Garzas Creek (MPWMD); Steelhead Tagging Project (Hopkins)
32	Continue fish rescue programs in main stem and tributaries when appropriate.	Watershed Management					X								Steelhead Rescues (CRSA); Sleepy Hollow Facility Improvements (MPWMD)
33	Redesign and install the fish screen at the entry to the outlet at LPD.	Watershed Management					X	X							Steelhead Passage Improvements (MPWMD)
34	Support efforts to modify the Los Padres Dam spillway for downstream fish migration.	Watershed Management					X	X							Los Padres Reservoir - Management of Capacity Loss (Cal-Am); Los Padres Water Release for Habitat Management (MPWMD)
35	Develop and implement plan to identify, remove or modify fish passage barriers within the watershed	Watershed Management					X								San Clemente Dam Removal and River Reroute (Cal-Am); Steelhead Barrier Assessments in Potrero Creek and Garzas Creek (MPWMD)

			Critical Issues Addressed												
No	Action Description	Action Type	1. Water Quantity	2. Water Quality	3. Flood Mgt	4. Estuary Lagoon	5. special Satus Species	6. Dam Mgt	7. Wildire Mgt	8. Erosion Sediment	9. Geomo-rphology	10. Drought/Climate	11. Public Safety	12. Public Access & Awareness	Related Past & Current Projects and Programs (from February 2014 list)
36	Provide fish passage around dams and diversions	Watershed Management					X	X							San Clemente Dam Removal and River Reroute
37	Develop and implement a non-native vegetation and wildlife education, monitoring, and eradication program.	Watershed Management					X							X	Watershed Manual (RCDMC)
38	Support the development and implementation of a lagoon/estuary and barrier beach restoration and management plan.	Watershed Partnerships	X		X	X	X				X				Interim Flood Management in Lower CR (Monterey Co.); CR Lagoon Ecosystem Protective Barrier (EPB)
39	Support efforts to provide supplemental water to lagoon.	Watershed Partnerships	X	X		X	X								CR Lagoon Water Augmentation (CAWD)
40	Develop and implement an integrated wildland fire and hazardous fuels management plan	Watershed Management							X			X			
41	Develop and maintain a public-accessible database of CRLF data for the Carmel River Watershed.	Watershed Management					X							X	
42	Identify and map all essential, priority and potential habitat for CLF and other species of concern in the watershed.	Watershed Management					X								
43	Develop educational public outreach materials that summarize recommendations for restoration, protection, and conservation efforts to improve and expand CRLF habitat and the habitat of other species of concern in the Carmel River watershed.	Education					X							X	Watershed Education Center at Garland Park (MPRPD); "Experience Carmel River" Interpretive Panels (BSLT); Watershed Awareness Events (RCDMC); Watershed Manual (RCDMC); Watershed Tours (CRWC)
44	Implement landowner outreach program to recruit participants with achievable projects to improve extent of CRLF habitat and the habitat of other species of concern in the Carmel River watershed.	Watershed Partnerships					X							X	Environmental Quality Incentives Program(NRCS); Watershed Manual (RCDMC)

Appendix B: Contact List

Contact	Email
Beretti, Melanie	BerettiM@co.monterey.ca.us
Boyland, Erika	erika.boyland@ca.usda.gov
Chaney, Beverly	beverly@mpwmd.dst.ca.us
Christensen, Thomas	Thomas@mpwmd.dst.ca.us
Ekelund, Ken	ken@carmelcaninesports.com
Frahm, Tim	tfrahm@tu.org
Gandesbery, Tom	Tom.Gandesbery@scc.ca.gov
Hamilton, Maureen	MHamilton@mpwmd.net
Hampson, Larry	Larry@mpwmd.net
Hardgrave, Sarah	Shardgrave@bigsurlandtrust.org
Harwayne, Erin	eharwayne@ddaplanning.com
LeNeve, Brian	bjleneve@att.net
Letendre, Lorin	letendre@sbcglobal.net
Lienk, Laura	laura_lienk@csumb.edu
Marshall, Brent	Brent.marshall@parks.ca.gov
Moss, Tom	mosst@co.monterey.ca.us
Nelson, Jackie	Nelson@mprpd.org
Parsons, Bobette	Bobette.Parsons@ca.usda.gov
Payan, Rafael	payan@mprpd.org
Pepping, Greg	gregpepping@gmail.com
Redman, Lynette	RedmanL@co.monterey.ca.us
Reeb, Carol	creeb@stanford.edu
Robins, Paul	paul.robins@rcdmonterey.org
Roos, Tanja	tanja@mearthcarmel.org
Smith, Doug	dosmith@csumb.edu
Stedman, Catherine	Catherine.stedman@amwater.com
Urquhart, Kevan	Kevan@mpwmd.net