

Carmel River Watershed Assessment & Action Plan

2007 Action Plan Matrix

Carmel River Technical Advisory Committee (C-TAC)

6/30/07

	NEW ACTION PLAN #	Orig ACTION PLAN #	Details	Problems addressed	Benefits to be achieved	Lead Org/ Agency	Key Partners	Est. Cost	Permits required	Potential Funding Sources (Funding Organization)	Rank by category (1=TOP PRIORITY)
CROSS-CUTTING ACTIONS (3)											
1	CC-1	CC-6	Create a Carmel River Watershed Task Force that is open to all stakeholders. The purpose of this group will be to achieve the successful outcome of watershed projects identified in this plan and address other needs in the watershed. This group should function as advisors for projects to review and provide input that reflects local priorities, creates cooperative management strategies, and incorporates local experience to help identify potential problems and solutions.	Need for coordinated effort to address watershed issues.	Better coordination and a vehicle to lead or assist in successful implementation of the actions identified in this plan.	CRTF	CRWC, MPWMD, CRSA, BSLT, VWS, NOAA, USFWS, CDFG, SCC, RWQCB, RCD, NRCS, MCWRA, County DPW, landowners, USFS, etc.	\$50k/year	No	CDFG, private foundations, American Rivers, RLFF, CalAM	1
2	CC-2	CC-1	Acquire or accept, in fee title or easement, lands that provide multiple benefits to the watershed such as: improving natural habitat and functions, facilitating recovery of listed aquatic and terrestrial species including Steelhead trout and CRLF, reduce flood and erosion risk, and improve public access.	Loss and degradation of natural habitat; erosion and flood risk; limited public access.	Protect and restore natural habitats; protect riparian buffers; provide opportunities for restoration; expand park area; increase flood protection.	BSLT, MPRPD	Cal-Am, Willing Private Property Owners, TNC, FWS, local jurisdictions	Varies; depending on appraised valuation	No	SCC, WCB, MPRPD, SWRCB, DWR, CDFG, private sources	2

3	CC-3	CC-NEW (was HAB)	Establish a watershed work program with the Californian Conservation Corps, or other outside work groups, to assist the Carmel River Task Force, the Carmel River Steelhead Association and the Carmel River Watershed Conservancy and other community groups and volunteers in habitat restoration projects.	Impaired habitat.	Improved habitat.	CRWC, CRSA	California Conservation Corps	\$5-\$10k; varies by projects annually	No	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout	3
FLWS (5 ACTIONS)											
4	FLWS-1	FLWS-1	Support implementation of a water supply project that minimizes the export of water from the Carmel River basin that causes the chronic reduction in flow and meets the goals of State Water Resources Control Board Order 95/10.	Overdraft, degradation of riparian function including: habitat loss and associated impacts of degradation on wildlife and aquatic species; loss of recreation and public access.	Continuous flow in the main stem and tributaries, recovery of sensitive species and riparian habitat, complies with State Order 95-10, increased Carmel River flow to Lagoon in many years.	Cal-Am, MPWMD	State, Federal and local agencies - NOAA, USFWS, CDFG, DWR; SWRCB, CCRWQCB, PUC, MCo, and interested groups and non-profits.	\$150m- \$200m	N/A	MPWMD, CalAM, DWR	3
5	FLWS-2	FLWS-2	Develop a project to maintain or increase surface water storage at Los Padres Dam Reservoir (LPD) to maintain summer flows for fish; including but not limited to dredging or excavation to remove sediment upstream of the dam.	Lack of summer stream flow.	Increased stream flow in low flow periods, increase water storage and reduce possibility of drying up of the lower reaches of the river.	Cal-Am, MPWMD	Gravel extraction companies	needs feasibility study	Yes	CalAM, DWR, NOAA Fisheries,	4

6	FLows-3	FLows-3	Study the feasibility of installing a rubber dam at LPD to temporarily increase water storage during the spring of each year.	Reduction in surface storage capacity; passage impairments..	Increased stream flow in low flow periods; improved migration of salmonids.	Cal-Am, MPWMD	Cal-Am/MPWMD; State, Federal and local agencies - NOAA, USFWS, CDFG, DWR; SWRCB, CCRWQCB, PUC, MCo; and interested groups and non-profits.	\$250k	Yes	CalAM, DWR, NOAA Fisheries,	5
7	FLows-4	FLows-4	Support improvements to the MPWMD's Aquifer Storage and Recovery (ASR) Project to reduce the amount of water extracted from the Carmel River Basin during summer months.	Overdraft, degradation of riparian function including: habitat loss and associated impacts of degradation on wildlife and aquatic species; loss of recreation and public access.	Continuous flow in the main stem and tributaries, recovery of sensitive species and riparian habitat, complies with State Order 95-10, increased Carmel River flow to Lagoon in many years.	MPWMD	Cal-Am	Phase I, \$3m; Phase II unknown, potentially \$10m-\$20m	Yes	CalAM, DWR, MPWMD	1
8	FLows-5	CC-7a	Expand water conservation programs to all areas of the watershed, including rebates for low flow fixtures & encouraging drought tolerant landscaping. Use MPWMD water conservation program as a model.	Insufficient flows in the river and tributaries.	Increased flows in the river and tributaries, increased aquatic habitat availability.	CRTF/ CRWC, Monterey County	MPWMD; CalAM, MC, landscaping & contractors professional associations	\$250k/year	No	DWR, CalAM, Rate payers,	2

GROUNDWATER (3 ACTIONS)											
9	GW-1	GW-1 new	Educate the public on the direct impact to surface water flows from groundwater pumping in unconfined alluvial aquifers such as the Carmel River, and based on the findings of the technical study to develop a water budget (GW-2), increase the public's awareness of how groundwater pumping in upland areas may impact surface flow in creeks and streams.	Impacts from groundwater extraction such as loss of surface flow, riparian vegetation, and aquatic habitat.	Conservation, and increased surface flow for aquatic habitat.	MPWMD, CRWC	NOAA Fisheries, CDFG, CRSA	\$2k/year	No	Mitigation Program, and Grants	3
10	GW-2	GW-2	Develop a water budget for the entire watershed so that the full resource system can be better quantified and managed for sustainability of human use and the broader diverse ecosystem. Foremost in this assessment is the analysis of how upland bedrock aquifer withdrawals impact the resources of the lower valley. The water budget should attempt to quantify rainfall, surface flow, evaporation, transpiration, and groundwater. Develop a set of water management recommendations based on the water budget results.	Lack of knowledge regarding water availability, extraction rates or potential impacts to the aquatic and riparian habitats and wildlife.	Increased information with the potential for better management.	CRWC, CRSA (CRTF)	NOAA Fisheries, CRSA, CRWC, MPWMD	\$500k-\$1m	Yes	SWRCB, CDFG, NOAA, DWR, American Rivers	1
11	GW-3	GW-2 new	Quantify the impact of groundwater extraction (multiple wells) in upland areas on summer surface flow in creeks draining from the well field area.	Premature drying of creeks and irregular hydro-graphs.	Increased aquatic habitat and increased spawning success for steelhead.	NOAA Fisheries, CRSA, CRWC, MPWMD	CDFG, MCWRA	\$100K	Yes	SWRCB, CDFG, NOAA, DWR, American Rivers	2

HABITAT (7 ACTIONS)											
12	HAB-1	HAB-1	Extend the MPWMD mitigation program of periodic injections of gravels and cobbles downstream of Los Padres and San Clemente Dams to a level that restores the channel bottom to a condition similar to areas upstream of Los Padres Reservoir (LPD).	Lack of spawning gravels.	Increased spawning habitat.	MPWMD	CRWC	\$50-\$100k	404,160 1, 401	Mitigation Program; NOAA Restoration Center; CDFG;	2
13	HAB-2	HAB-2	Conduct annual survey of tributaries and conduct annual "Creek Clean-up" to remove urban debris and trash throughout the watershed.	Degraded habitat and water quality, fish passage barriers.	Improved habitat, water quality, and passage.	CRWC, CRSA	CCC, creek volunteers, CRTF, private landowners, MCPW Dept.	\$10k first year	Yes	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout	5
14	HAB-3	HAB-4	Continue and expand MPWMD and CRWC Large Woody Debris (LWD) program, including further LWD recruitment location studies and installation of Redwood & Douglas fir root balls in those reaches of the river that would most benefit from the introduction of LWD.	Impaired fish rearing habitat; slow flows and increase complexity.	Improved habitat.	MPWMD, CRWC, CRSA	CRWC, CRSA, CDFG	\$10K - study; \$20k/root ball installation	Yes	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout	3
15	HAB-4	HAB-5	Expand on MPWMD program to create a watershed wide coordinated riparian vegetation restoration program that includes post-project monitoring and maintenance throughout the Carmel River watershed.	Degraded riparian habitat and stream function; streambank instability, erosion.	Improved aquatic and riparian habitat.	MPWMD, BSLT	CRWC, BSLT, private landowners	\$10k/year	No	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout, SCC, DWR	1

16	HAB-5	HAB-7	Based on existing and future habitat typing, identify and implement priority projects to enhance CRLF habitat along the mainstem, and incorporate CRLF habitat benefits within other riparian restoration projects throughout the watershed.	Degraded CRLF habitat.	Increased CRLF habitat.	CDFG	BSLT, MPWMD, CRWC, public & private landowners	\$50-\$80k/year	Yes	USFW; CDFG; Cal-AM; NOAA	4
17	HAB-6	HAB-8	Develop a program to provide oversight and encourage land management organizations including park agencies, forest preserves, and golf course owners to strategically place large broken tree limbs from windstorms in the Carmel River for improved habitat. [small scale projects (e.g., willow and cottonwood mattresses, etc)].	Impaired fish rearing habitat; slow flows and increase complexity.	Improved habitat, reduced costs for disposal of woody material.	CRSA, CRWC	MPWMD, CRWC	\$2-10K per year/project	Varies with project	CDFG, Private land owners	7
18	HAB-7	HAB-NEW	Initiate program to remove/control aquatic and terrestrial invasive species.	Degradation of habitat quality and competition with native species.	Improve habitat for native species; improve potential for restoring native habitat.	CRWC, CRSA	BSLT, MPWMD	Varies with project	Varies with project	CDFG, NOAA, SCC, RWQCB, Trout Unlimited, CalTrout, American Rivers	6
PUBLIC SAFETY (1 ACTION)											
19	PS-1	PS-2	Reduce the risk of flood damage through combination of multi-objective flood control projects, retrofit of bridges, vegetation management, individual flood proofing, land acquisitions for flood plain restoration, removing structures from the 100 year flood plain with willing partners as feasible, and other beneficial projects.	Degraded habitat, property loss, flood risk.	Properly functioning channel; reduced public safety risk; potential reduction in flood insurance costs.	MCWRA, FEMA	MCWRA, ACOE, CalTrans, FHWA, County Public Works, CSA50, BSLT, landowners, Carmel River Lagoon Coalition.	Varies with project: \$200k-\$200m	Yes	SCC, DWR, ACOE, FEMA, NOAA, SWRCB, CDFG, CalTrans, FHWA, CSA50, effected property owners	1

PUBLIC OUTREACH (3 ACTIONS)											
20	PUB-1	PUB-2	Establish a resource conservation and stewardship program for the community and actively disseminate the information to residents and landowners through peer to peer groups and multi-media outreach. Activities should include establishing an outreach campaign to inform the community of the impacts on water flows of excessive turf irrigation and establish a hotline for information and anonymous reporting; and, sending out an annual reminder, that storm drains flow to streams and the ocean and that drains should not be used for illegal disposal.	Negative public opinion; lack of public knowledge and support for conservation efforts.	Facilitate understanding and support for residents modifying behavior; potential indirect benefits to water quality and water quantity.	MPWMD and CRWC	VWS; CSUMB capstone students, MPRPD, RCD, BSLT, CRWC, CRSA, NOAA, MBNMS, CWC	\$20k/year	No	CCRWQCB, NOAA	1
21	PUB-2	PUB-4	Implement the Carmel River Parkway Plan between the ocean and San Clemente Dam, as well as similar efforts elsewhere in the watershed for "managed" public access in partnership with watershed stakeholders including local residents, land owners and recreational group representatives.	Trespassing leading to environmental damage to sensitive areas; lack of appropriate access.	Improve appropriate public access; reduce impacts of public access.	BSLT, MPRPD, CRWC	CRSA, TAMC, County Public Works, DPR, CalTrans	Varies depending on project: \$50k-\$5m	Varies with project	SCC, FHWA, Resources Agency	2
22	PUB-3	PUB-5	Expand volunteer activities, and maintain the existing network of volunteers in the Carmel River Basin to provide planning, labor, outreach, and mapping services throughout the watershed.	More work than can be done.	Get more work done.	CRWC	CRSA, MPRPD	\$20k/year to coordinate	No	Foundations, NOAA community based restoration	3

SEDIMENT (6 ACTIONS)											
23	SED-1	SED-1	Based on CRWC's Proper Functioning Condition (PFC) tributary assessments and other watershed assessments, restore and revegetate unstable banks and incised reaches of tributaries and main stem areas including: Conejo Creek, Finch Creek, James Creek & Tularcitos Creek.	Arresting further erosion and additional anthropogenic contribution of sediment into the system.	Achieving a sediment budget closer to the natural balance.	MPWMD, CRWC, RCDMC	Private Landowners, Resource Conservation District, Permitting Agencies, Interested Nonprofit Organizations	+/- \$25,k/project	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG, EQIP (NRCS)	1
24	SED-2	SED-3 new	Implement restoration projects in Hitchcock Creek and sub-basin to stabilize stream banks. Conduct a program to inform the residents and property owners on the issues of in-stream home construction, riparian cover removal, and impediments to fish. See CRWC PFC assessment of tributaries.	Arresting further erosion and additional anthropogenic contribution of sediment into the system.	Educating watershed residents regarding their impacts to the system and possibly abating further damage. Achieving a sediment budget closer to the natural balance.	CRWC	Private Landowners, Resource Conservation District, MC, Permitting Agencies, Interested Nonprofit Organizations	Varies depending on type of restoration practice needed	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG, EQIP (NRCS)	5
25	SED-3	SED-5	Identify and map existing sediment basins to evaluate their effectiveness in order to determine the appropriate locations for installation or removal (restoration).	Removal of inappropriate sediment basins in flowing creeks.	Reduction in disturbance to stream bed and banks.	CRWC and CRSA	MPWMD, NRCS,	\$10k	None	SWRCB, EQIP	6
26	SED-4	SED-6	Implement BMPs for erosion prevention to reduce sediment deposition throughout the watershed including the main tributaries and the main stem of the Carmel River. Potential projects include, but are not limited to, excluding cattle from riparian areas and streambeds .	Excessive erosion.	Higher water quality and better spawning habitat; identification of rural land use practices that accelerate sedimentation.	RCDMC, BSLT, MPWMD, MC	CRWC and CRSA, NRCS, Private Landowners, Interested Nonprofit Organizations, CCC, MCPW	\$20k/year	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG, EQIP (NRCS)	3

27	SED-5	SED-7	In cooperation with the County Public Works Department (PWD) replace culverts on Carmel Valley Road as appropriate to minimize erosion and restore natural stream function.	Fish passage and erosion caused by failing culverts.	Better fish passage and reduced erosion from failing culverts.	MCWRA, CRWC	Pacific Watershed Associates	\$10-\$100k/culvert	Yes: L/S/F	SWRCB, SCC, NOAA Fisheries, CDFG	4
28	SED-6	SED-8	Conduct assessment of rural and unpaved roads throughout the watershed to identify and prioritize road treatments and roads for decommissioning; implement priority recommendations.	Sediment delivery to streams; road maintenance issues.	Reduced sediment delivery to stream, reduced need for road management, decreased costs for rural road maintenance.	RCDMC, MC; Road Assns	Pacific Watershed Associates, CalGeoSurvey, County, Private & public land owners and road assns.	\$100k/year	Varies with project	SWRCB, SCC, NOAA Fisheries, CDFG	2
STEELHEAD ACTIONS (9 ACTIONS)											
29	SH-1	SH-1	Expand the current fisheries assessment and monitoring program to include tributaries and multiple mainstem locations to quantify steelhead habitat utilization and migration patterns throughout the Carmel River Watershed. This expansion should include funding to evaluate methods to count fish at selected monitoring stations.	Knowledge gap for numbers of salmonid fish using system.	Acquiring the information required to determine implementation projects to provide full access for adult migrants to occupy all potential spawning habitats upstream.	MPWMD, CRWC, CDFG, NOAA Fisheries	Cal-Am	\$1.25m over five years	CDFG, NOAA Fisheries	NOAA Restoration Center; CDFG; American Rivers; Cal-Trout; MPWMD, CalAm	3
	SH-2	SH-5	This action eliminated.								
30	SH-3	SH-2	Establish a Rescue Fund for the implementation of annual watershed restoration and steelhead rescue projects.	Insufficient labor to conduct complete and timely rescues of juvenile steelhead in drying tributaries and install habitat components.	Maintain volunteer base and technical expertise to improve the survival of stranded fish.	CRSA, CRWC, & BSLT	MPWMD & Cal Conservation Corps	\$20k/year	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	NOAA Restoration Center; American Rivers; Cal-Trout; MPWMD, MPRPD, MCo, Private Land Owners	4

31	SH-4	SH-3	Conduct a watershed-wide assessment and map culverts & fish barriers including an estimate of the replacement cost of non-functioning units. Incorporate the problems identified in the CRWC PFC findings for the main tributaries.	Partial or complete migration barriers include: Syndicate Camp fords; critical riffle above Pine Creek; concrete crossings.	Full access for adult migrants to occupy all potential spawning habitats.	Monterey County, MPWMD	CDFG, NOAA Fisheries, Private Land Owners	\$350k to produce a comprehensive watershed assessment	Landowner access agreements	NOAA Restoration Center; SCC, CDFG; American Rivers; Cal-Trout; MPWMD, MCo, Private Land Owners	1
32	SH-5	HAB-2	Remove or modify priority fish passage barriers throughout the watershed.	Impaired access to usable habitat.	Improved passage to usable habitat, increased spawning and rearing success.	CRWC, CRSA	CCCORPs, CRSA, CRWC, CDFG, NOAA, MPWMD, MPRPD, MCo, CalTrans, Private Land Owners	\$100k first year	Yes	NOAA Restoration Center; SCC, CDFG; American Rivers; Cal-Trout; MPWMD, MPRPD, MCo, Private Land Owners	2
33	SH-6	SH-4	Redesign and install the fish screen at the entry to the outlet at LPD.	Loss of emigrating juvenile and smolts from habitat areas upstream of Los Padres Reservoir.	Survival of entrained downstream migrants.	Cal-Am	CalAM, MPWMD, ; NOAA/NMFS, CDFG;	\$500k	CDFG, NOAA Fisheries, USFWS	CalAM	5
34	SH-7	SH-6	Establish a partnership with other agencies to sort, store, and discharge a portion of the coarse-grained sediment (spawning gravels) stored in San Clemente and Los Padres Reservoirs to the lower Carmel River based on prior studies.	Inadequate gravel supply for spawning adults, juvenile steelhead and aquatic insects.	This will increase juvenile steelhead production; increased abundance and diversity of aquatic insects; benefit critical steelhead spawning habitat areas, increase the diversity and abundance of aquatic benthic macro invertebrates, and add physical complexity to the riparian areas downstream of the existing San Clemente and Los Padres Dams	MPWMD, Cal-Am	Cal-Am	\$60k/year for each reservoir	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	CalAM, MPWMD, Cal-Trout, NOAA	6

35	SH-8	SH-7	Concentrate the flow at the Los Padres Dam spillway for out-migration of steelhead.	Fish trapped in reservoir.	Increased fish passage for emigration (out-migration).	Cal-Am	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	North: \$50k Dam: +/- \$200k	CDFG, NOAA Fisheries, COE, RWQCB, USFWS	CalIAM, MPWMD, Cal-Trout, NOAA, CDFG	7
36	SH-9	FLows-7	Monitor the Carmel River & tributaries for fish barriers twice annually (during the in-migration and out-migration) to insure that no barriers to fish passage go unnoticed. Mitigate as appropriate.	Fish passage, access to habitat.	Increased spawning habitat.	CRWC	SA; MPWMD; CalIAM; volunteers	\$15k/year	No	MPWMD	9
37	SH-10	NEW	Construct a removable Steeppass fish ladder that would allow fish (smolts and kelts) to pass downstream into the spillway notch at Los Padres Dam and then to the river pool below. This may involve a rubber dam as part of the Steeppass fish ladder design	Downstream fish passage at Los Padres Dam.	Improved fish passage.	CRWC, CRSA	MPWMD, CalIAM	\$85k	CDFG, COE, NOAA Fisheries	CalIAM, CDFG	No rank. This action was added as of March 07 (ranking process concluded 10/06)
MONITORING (4 ACTIONS)											
38	MON-1	CC-14	Develop an adaptive management program for water quality in the lagoon, including installing an automated water quality monitoring station in the lagoon; coordinating with Carmel Area Wastewater District (CAWD) for discharge of tertiary water into the lagoon; and investigating use of California Department of Parks and Recreation wells for emergency discharges to lagoon.	Poor water quality; lack of inflow.	Improved water quality and quantity.	CRSA, MPWMD, DPR	CAWD	\$20k/year	Yes	SWRCB, CalIAM, CAWD, MPWMD	1

39	MON-2	HAB-10	Expand habitat and species monitoring programs including: 1) aquatic and terrestrial non-native invasive species; 2) BMI index; 3) riparian habitat; 4) instream habitat; and, 5) restoration projects.	Habitat quality and sustainability; presence of invasive species.	Evaluate the relationship between the BMI index and steelhead; identify and prioritize invasive species for management/removal measures; identify and prioritize restoration needs and locations; evaluate success of restoration efforts.	MPWMD	CRWC, CRSA, BSLT, VWS, CSUMB	\$50k - \$150k/year	Depends on location and species	DFG, NOAA, RWQCB, Trout Unlimited, CalTrout, American Rivers	2
40	MON-3	PUB -1	Establish a Volunteer Water Quality Monitoring Program incorporating local schools, Snapshot & First Flush program participants, and other interested stakeholders to tie into the MPWMD program and to include all the main tributaries.	Inconsistency in water quality monitoring effort.	Early detection of water quality problems with increased response time; ability to focus implementation projects where the greatest need exists; promote stewardship values.	MPWMD	Carmel Unified School District, Boys and Girls Clubs, NOAA, USGS, CWC	\$20k/year	No	CCRWQCB, SWRCB	4
41	MON-4	SED-4	Establish a sediment transport monitoring program in concert with the surface flow monitoring program of MPWMD for the main stem and tributaries. Thus, providing decision makers with the key to quantify the problems and assessing future changes. See Physical & Hydrologic Assessment WI 2004-05/2, p 76 ## 8.2.	Lack of information about sediment transport throughout the watershed.	Increased information leading to better sediment management.	CRTF	CSUMB, MPWMD, CalAM, USGS	\$50k-\$100k/year	No	SWRCB, NOAA, CalAM	3