

12. Mojave Rim Biogeographic Population Group

“The motivation to consider steelhead recovery from a broad perspective stems from the realization that there is no meaningful way to discuss the science of steelhead recovery without fully embracing its many intricate connections with the human population of the region and the climatic changes now underway.”

Dr. David A. Boughton, Chair, NOAA Fisheries South-Central/Southern California Steelhead Technical Recovery Team, 2010

12.1 LOCATION AND PHYSICAL CHARACTERISTICS

The Mojave Rim BPG region encompasses three large coastal watersheds that drain the northern slopes of the Santa Monica Mountains and the coastal slopes of the San Gabriel and San Bernardino mountains in southern Los Angeles County, southwestern San Bernardino, and western Riverside and Orange counties: the Los Angeles River, San Gabriel River, and the Santa Ana River (Figure 12-1). Major tributaries in these drainages include: Arroyo Seco in the Los Angeles River watershed; the East and West forks of the San Gabriel River, and Mill, Lytle, and Fish creeks in the upper Santa Ana River watershed. The upper portions of each of these watersheds include steep, mountainous terrain and the lower watersheds cut across the Los Angeles Watershed—an extensive coastal plain. The Los Angeles, San Gabriel, and Santa Ana rivers have not always discharged to the Pacific Ocean at their current locations, but sometimes migrated across the Los Angeles

Watershed and discharged as far west as Ballona Creek and as far east as present-day Huntington Beach. The Los Angeles, San Gabriel, and Santa Ana rivers currently discharge to the Pacific Ocean within 20 miles of each other in southern Los Angeles and northern Orange counties. The component watersheds are large, extending up to 83 miles inland in the case of the Santa Ana River watershed (Figure 12-4).



Los Angeles Basin

Average annual precipitation in these three watersheds is higher than that of the two adjacent BPG regions (*i.e.*, the Santa Monica

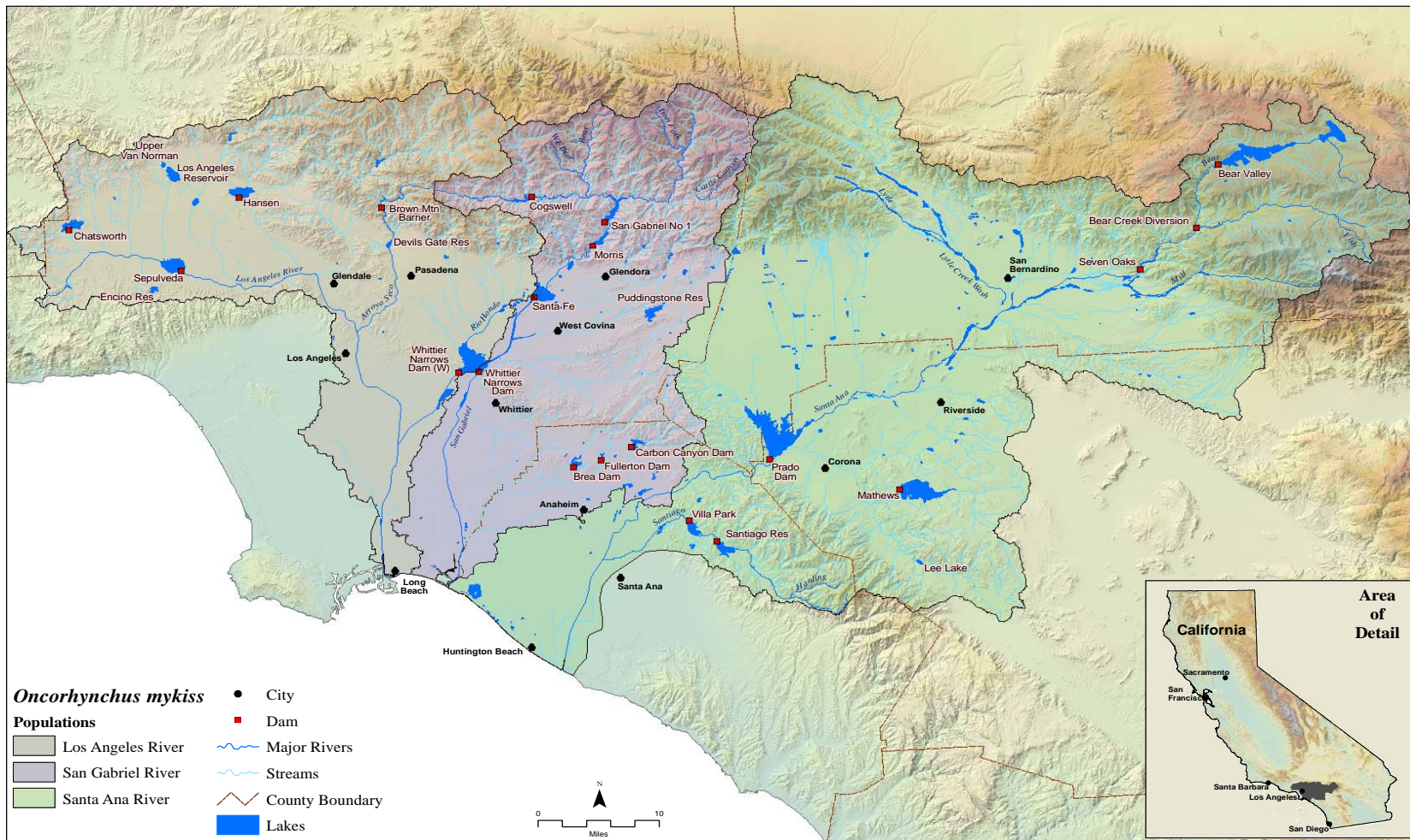


Figure 12-1. The Mojave Rim BPG region. Eight *O. mykiss* populations/watersheds were analyzed in this region: two in the Los Angeles River watershed; three in the San Gabriel River watershed, and three in the Santa Ana River watershed.

Mountains and Santa Catalina Gulf Coast) because the upper watersheds include the San Gabriel and San Bernardino mountain ranges, whose upper elevations receive high annual rainfall and snowfall (Table 12-1). Rainfall along the coastal terrace portion of each of these watersheds is significantly lower than in the mountainous portions. Many of the mainstem rivers and tributaries in the Mojave Rim BPG region flow across the relatively flat Los Angeles Watershed, with comparatively few small tributaries for watersheds of their size. As a result, the overall stream length in these watersheds is less than that in other BPG regions of comparable size (Hunt & Associates 2008a, Kier Associates 2008b).

12.2 LAND USE

Table 12-1 summarizes land use and population density in this region. This BPG region encompasses the second-largest metropolitan area in the United States. Human population density here is the highest of any of the five BPG regions, averaging 2,964 persons per square mile. Population centers are mostly concentrated in the Los Angeles River watershed (5,237 persons per square mile), but the interior portions of the Santa Ana River watershed also have densely developed metropolitan areas.



Urban Transportation and Flood Control

There are at least 20 dams on the mainstem and/or major tributaries of each of the three drainages in this BPG that are large enough to be regulated by the California Department of Water Resources and/or Department of Defense (also see Figure 12-1 for distribution and size of reservoirs). These dams are owned and operated by federal, state, public utility, local government, or private interests for irrigation, flood control and storm water management, recreation, municipal water supply, fire protection, farm ponds, or some combination of these purposes. Most of the reservoirs and lakes in this region receive high recreational use and many are sources of non-native crayfish, fishes, and bullfrogs, and other non-native species that prey on or compete with *O. mykiss* for food and habitat space.



Angeles National Forest

Public land ownership is concentrated in the upper portions of these watersheds, mostly within the Angeles National Forest, San Bernardino National Forest, and the northern portion of Cleveland National Forest. These three National Forests encompass several federally-designated wilderness areas: the San Gabriel and Sheep Mountain Wilderness Areas (Angeles National Forest), San Geronio, Cucamonga, San Jacinto, Santa Rosa, and Big Horn Mountain Wilderness Areas (San Bernardino National Forest). Additionally, several rivers have been evaluated for

inclusion in the federally-designated Wild and Scenic River system: Little Rock Creek, North and South forks of the San Gabriel River (tributaries to the San Gabriel River), and Middle Fork Lytle Creek, Bear Creek, and Siberia Creek (tributaries to the Santa Ana River). Agriculture (row crop, orchard cultivation, and livestock ranching), used to be important land uses throughout the flatter portions of these watersheds, but have largely been displaced by urban development (Hunt & Associates 2008a, Kier Associates 2008b).

Creeks. Santa Ana River tributaries include Harding Canyon, Coldwater Canyon, and San Antonio Creeks.



East Fork San Gabriel River

12.3 CURRENT WATERSHED CONDITIONS

Watershed conditions were assessed for eight watersheds and sub-watersheds in the Mojave Rim BPG region. In general, instream, riparian, and floodplain conditions for anadromous *O. mykiss* are poor in this BPG region, reflecting pervasive urban conversion of watershed lands, particularly along the mainstems of these drainages, but also in the upper sub-watersheds of the Santa Ana River watershed. The upper watersheds of the San Gabriel River watershed (East and West forks) still provide good to very good habitat conditions for resident *O. mykiss*, but these fish are isolated from the anadromous component of the population found in the mainstem (Hunt & Associates 2008a, Kier Associates 2008b).

San Gabriel River tributaries include Bear, Salilier, and Prairie Creeks and the East and West Forks. The East and West forks of the San Gabriel River watershed, above Morris, San Gabriel, and Cogswell dams and their reservoirs, are mostly in public ownership (Angeles National Forest and Cleveland National Forest) and these reaches provide relatively good habitat conditions. Both the East and West Forks of the Sana Gabriel River support reproducing populations of non-anadromous *O. mykiss* that are isolated from their anadromous counterparts downstream of the dams.



Morris Dam – San Gabriel River

The mainstems of the Los Angeles and Santa Ana rivers provide little suitable spawning or rearing habitat for anadromous *O. mykiss* because of fish-passage barriers, channelization and flood control activities, loss of surface flows, and impaired water quality. However, several of the tributaries to these major rivers contain suitable habitat for steelhead. Los Angeles River tributaries include Arroyo Seco, Mill, and Alder

Table 12-1. Physical and Land Use Characteristics of Major Watersheds in the Mojave Rim BPG region.

PHYSICAL CHARACTERISTICS						LAND USE			
WATERSHEDS (north to south)	Area (acres) ¹	Area (sq. miles) ¹	Stream Length ² (miles)	Ave. Ann. Rainfall ³ (inches)	Total Human Population ⁴	Public Ownership*	Urban Area ⁵	Agriculture/ Barren ⁵	Open Space ⁵
Los Angeles River	535,923	837	766	19.1	4,383,260	25%	61%	1%	38%
San Gabriel River	463,167	723	784	19.8	2,417,034	35%	53%	2%	46%
Santa Ana River	1,141,195	1,783	2,074	17.3	3,109,937	29%	37%	8%	55%
TOTAL or AVERAGE	2,140,285	3,343	3,624	18.7	9,910,231	30%	50%	4%	46%

¹ From: CDFFP CalWater 2.2 Watershed delineation, 1999 (www.ca.nrcs.usda.gov/features/calwater/)

² From: CDFG 1:1,000,000 Routed stream network, 2003 (www.calfish.org/)

³ From: USGS Hydrologic landscape regions of the U.S., 2003 (1 km grid cells)

⁴ From: CDFFP Census 2000 block data (migrated), 2003; preliminary analysis of Census 2010 indicates the population in the BPG has increased to 10,561,011

⁵ From: CDFFP Multi-source land cover data (v02_2), 2002 (100 m grid cells) (<http://frap.cdf.ca.gov/data/frapgisdata/select.asp>)

* National Forest Lands only; Military Reservations or State and County Parks not included



Figure 12-2. The Los Angeles River Watershed.

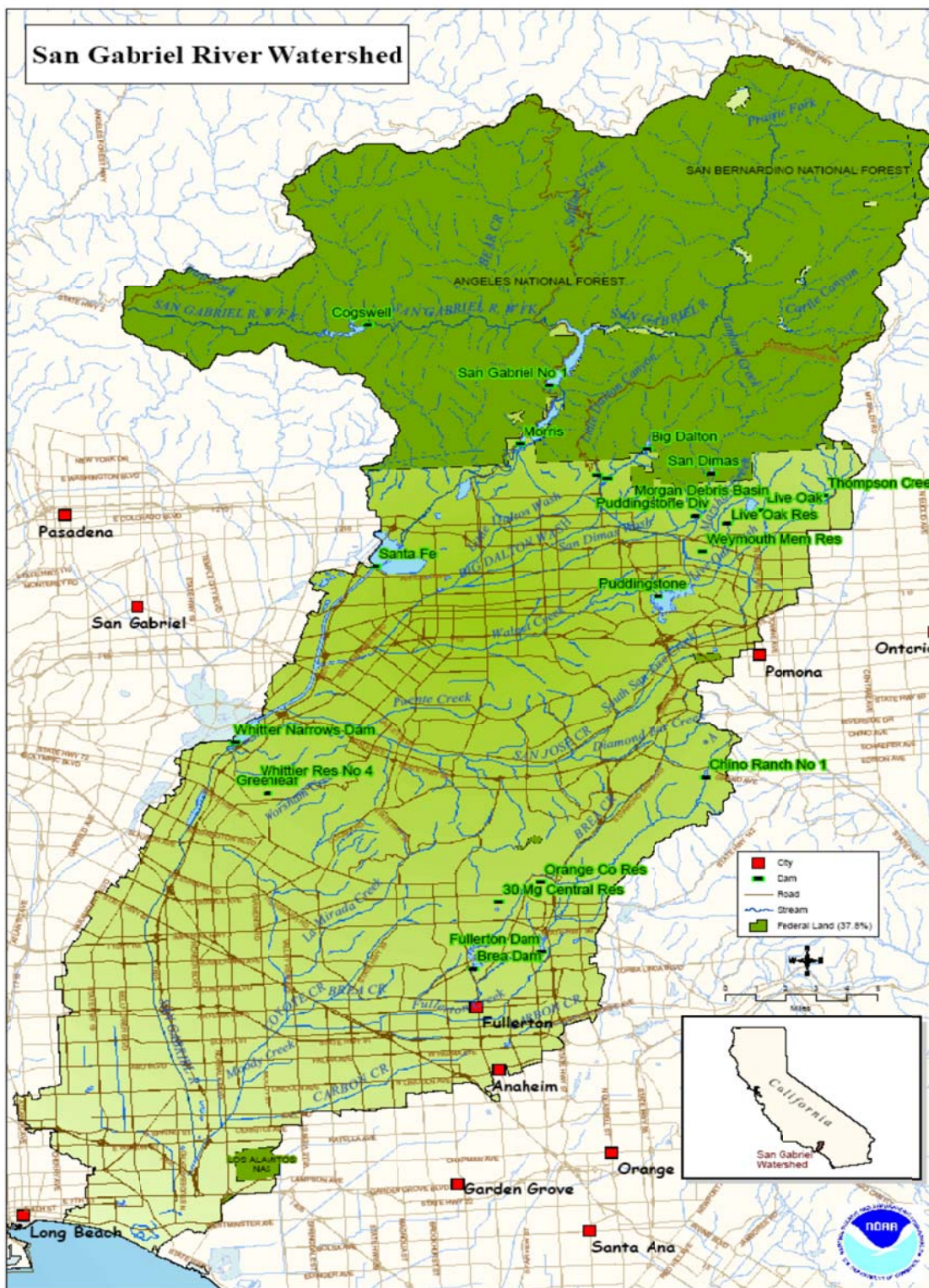


Figure 12-3. The San Gabriel River Watershed.

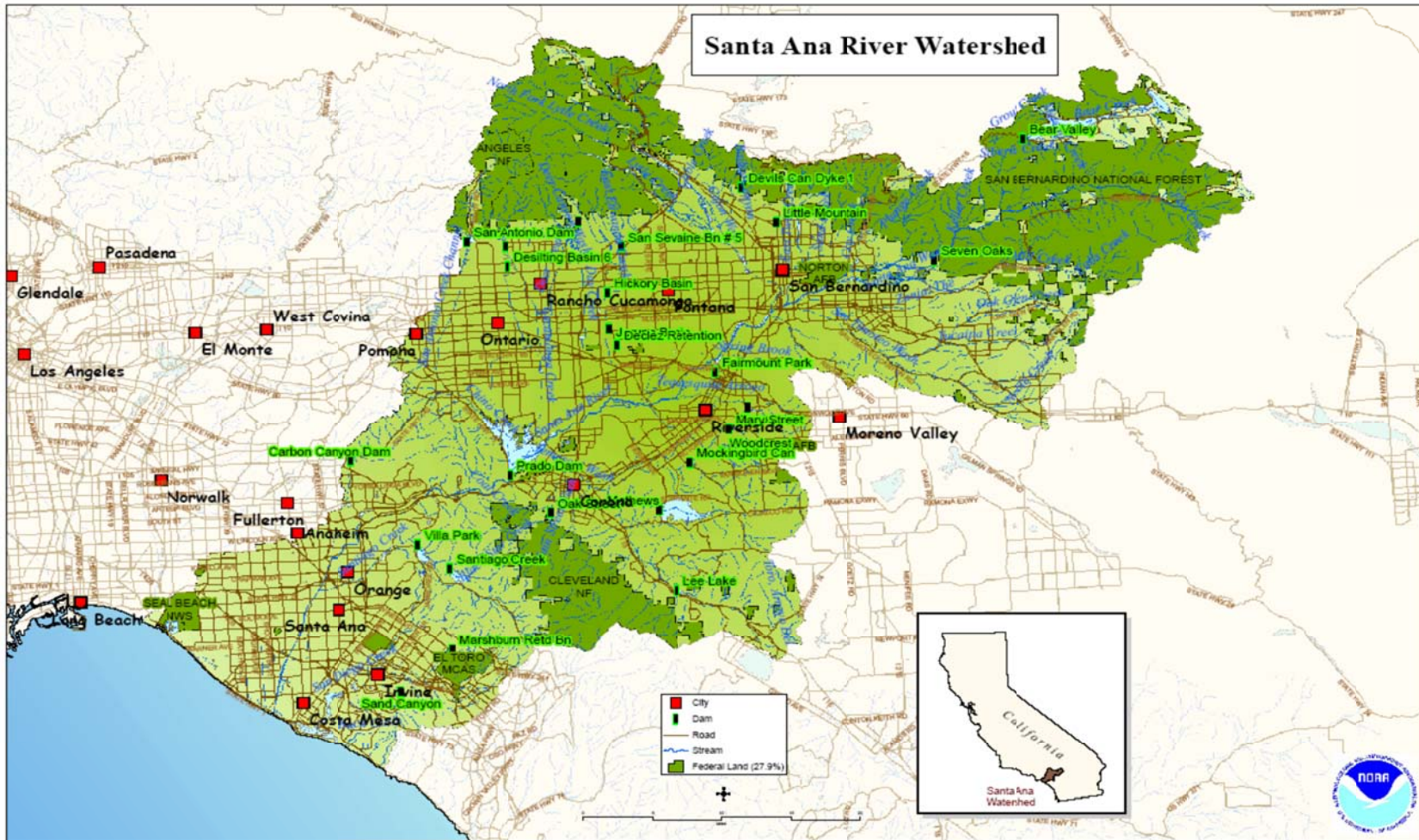


Figure 12-4. The Santa Ana River Watershed.

Urban and agricultural conversion of coastal and middle reaches of three major watersheds in this BPG has created a number of severe stressors on anadromous *O. mykiss*. High road density throughout the floodplains has constricted the mainstems of these rivers to narrow channels, increased sediment and non-point pollutant inputs, and degraded rearing and spawning habitats (including estuaries). Nutrient and coliform bacteria-loading from agricultural and wastewater treatment effluents degrades water quality in most of these drainages (Hunt and Associates 2008a). In urban areas, channelization, levee construction, and other flood control activities have completely removed instream and riparian habitat from extensive reaches of the mainstems of the lower Los Angeles River, Santa Ana River, and San Gabriel River. The increase of impermeable surfaces as a result of urbanization (including roads) within the interior valleys, and on the coastal plain, has altered the natural flow regime of streams, particularly in the lower reaches, increasing the frequency and intensity of flood flows.



San Gabriel Dam – San Gabriel River

Other significant threat sources in the Mojave Rim BPG region are recreational facilities, wildfire, and the loss of extensive estuarine habitat. Most watersheds receive very high recreational use because of their proximity to large urban areas. Trash, foot traffic, and off-road vehicle traffic have

significantly affected instream and riparian habitats along extensive reaches of the upper watersheds. Fires have burned 21% and 26% of the San Gabriel River and Santa Ana River watersheds, respectively, in the past 25 years and may be significant, widespread, and long-term sources of sedimentation, turbidity, substrate embeddedness, and loss of riparian canopy cover. The historically extensive estuaries that formed at the mouths of the Los Angeles River, San Gabriel River, and Santa Ana River have been all but eliminated by urban and commercial development (Hunt & Associates 2008a, Kier Associates and National Marine Fisheries Service 2008b).



Santa Ana River Estuary

Estuarine habitats at the mouths of these watersheds in this BPG region have been reduced in size by 98 – 100% by the development of harbors, roads and railroads, urbanization. Historically, these estuaries were extensive, formed by the confluence of several watersheds, encompassing thousands of acres. The remaining estuarine habitats are subject to constriction and isolation by development, surface runoff from roads and other impervious surfaces, as well as a reduction in the amount and quality of surface flows resulting from groundwater extraction.

Despite widespread habitat degradation to the coastal and middle mainstems in these watersheds, native non-anadromous *O.*

mykiss populations still persist upstream of the dams in this BPG region and small numbers of anadromous *O. mykiss* attempt to enter and spawn in each of the watersheds when flow conditions are suitable.



New and Old Prado Dams – Santa Ana River

12.4 THREATS AND THREAT SOURCES

Habitat impairments were rated as severe to very severe in five of the eight watersheds and sub-watersheds in this BPG region because of the very high human population densities. Ten anthropogenic activities ranked as the top sources of stresses to steelhead and their habitat in the Mojave Rim BPG (Table 12-2). These sources of threats focus on water management activities to serve municipal uses (dams, surface water diversions, and groundwater extraction). Dams and surface water

diversions in this BPG region have been constructed to serve mostly urban purposes. These dams have numerous impacts on physical, hydrological, and habitat characteristics of the middle and lower reaches of mainstem rivers in this region. Dams also create and maintain favorable habitat conditions for several species of non-native fishes and bullfrogs that may affect one or more life history stages of *O. mykiss* either directly (e.g., predation) or indirectly (e.g., competition for food). Non-native fishes, crayfish, and/or amphibians occur in the mainstems of the Los Angeles River, San Gabriel River, and Santa Ana River, as well as in most or all of the major tributaries. Water management practices and facilities have significantly altered natural sediment and hydrological processes in these watersheds. Widespread pumping of groundwater from aquifers throughout the region routinely eliminates surface flows in portions of most of these drainages. The magnitude of such losses of surface flows is greater during years of below-average precipitation. Another major indirect impact of dam construction and operation on the mainstem of the San Gabriel River is the periodic sluicing of sediments accumulated behind these dams, which severely degrades instream and riparian habitat quality for downstream of these structures (Hunts & Associates 2008a, Kier Associates 2008b).

Table 12-2. Threat source rankings in the Mojave Rim BPG (see CAP Workbooks for individual watersheds for details).

Mojave Rim BPG Component Watersheds								
Threat Sources	Los Angeles River mainstem	Arroyo Seco	San Gabriel River mainstem	West Fork San Gabriel River	East Fork San Gabriel River	Santa Ana River mainstem	Lytle Creek	Mill Creek
Dams and Surface Water Diversions	Red	Yellow	Red	Red	Red	Red	Dark Green	Red
Flood Control Maintenance	Red	Red	Red	Dark Green	Dark Green	Red	Red	Dark Green
Groundwater Extraction	Red	Yellow	Dark Green	Dark Green	Dark Green	Red	Red	Red
Levees and Channelization	Red	Red	Red	Dark Green	Dark Green	Red	Red	Dark Green
Urban Development	Red	Red	Red	Dark Green	Dark Green	Red	Red	Dark Green
Recreational Facilities	Dark Green	Dark Green	Dark Green	Dark Green	Dark Green	White	Dark Green	Dark Green
Culverts and Road Crossings	Yellow	Light Green	Red	Dark Green	Dark Green	White	Dark Green	Dark Green
Agricultural Development	Dark Green	Dark Green	Dark Green	Dark Green	Dark Green	White	Dark Green	Dark Green
Upslope/Upstream Development	Yellow	Yellow	Yellow	Dark Green	Dark Green	White	Yellow	Yellow
Wildfires*	Dark Green	Dark Green	Red	Red	Red	Red	Red	Red

Key: Red = Very High threat; Yellow = High threat; Light green = Medium threat; Dark green = Low threat (Threat cell colors represent threat rating from CAP Workbook)

* Wildfires as a source of threats to steelhead habitat is not reflected in the top five threat sources in the CAP summary for these watersheds (see CAP workbooks), but is included here because of the extent and severity of recent (2005-2007) wildfires in this region; additionally, the presence of non-native species is not reflected in the CAP workbook, but non-native species is a potential threat in this BPG because of the potential for anthropogenic introduction.

12.5 SUMMARY

Dams and water diversions (including groundwater extraction) along with flood control structures on the major rivers of the Mojave Rim BPG (Los Angeles River, San Gabriel River, and Santa Ana River) have had the most severe impacts on the anadromous *O. mykiss* populations in this BPG region by cutting off access to upstream spawning and rearing habitats and altering the magnitude, duration, and timing of flows necessary for immigration of adults and emigration of juveniles. Dams and surface water diversions in this BPG region have been constructed to serve mostly urban purposes. This BPG region encompasses the second-largest metropolitan area in the United States and human population density here is the highest of any of the five BPG regions. Such widespread urbanization has created a number of severe stressors for steelhead. Additionally, impacts associated with wildland fires, including fire-fighting measures to control or extinguish them, and the post-fire measures to repair damages incurred in fighting wildland fires, poses a potential threat to watersheds in this BPG. Table 12-3 summarizes the critical recovery actions needed within the Core 1 populations of this BPG.

Restoring conditions for anadromous *O. mykiss* passage, spawning, and rearing in the Mojave Rim BPG region will require multiple, long-term, measures related to water management, recreation, and urban development. A fish passage barrier inventory and assessment should be conducted for each of the major watersheds. Impediments to fish passage stemming from the construction and operation of dams, groundwater extraction, and channel modification, and the loss of instream and adjacent riparian habitats by flood control measures need to be further evaluated for

this BPG region. Additionally, the loss of estuarine functions caused by filling and pollution from point and non-point agricultural and urban waste discharges need to be addressed further in this region.



Los Angeles River Steelhead -1940.

Threat sources discussed in this section should be the focus of a variety of recovery actions to address specific stresses on anadromous *O. mykiss* viability. Spatial and temporal data, for water temperature, pH, nutrients, *etc.*, are not uniformly available, and should be further developed, along with general habitat typing assessments, to better identify natural as well as anthropogenic limiting factors. This type of data acquisition should be the subject of site-specific investigations in order to refine the primary recovery actions or to target additional recovery actions as part of any recovery strategy for the Mojave Rim BPG. Tables 12-4 through 12-6 below rank and describe proposed recovery actions for each

sub-watershed in the Mojave Rim BPG, including the estimated cost for implementing the actions in five year increments over the first 25 years, and

where applicable extended out to 100 years, though many recovery actions can be achieved within a shorter period.

Table 12-3. Critical recovery actions for Core 1 populations within the Mojave Rim BPG.

POPULATION	CRITICAL RECOVERY ACTION
San Gabriel River	Implement operating criteria to ensure the pattern and magnitude of groundwater extractions and water releases from Morris, San Gabriel, and Cogswell dams provide the essential habitat functions to support the life history and habitat requirements of adult and juvenile steelhead. Physically modify Morris, San Gabriel, Cogswell, and Santa Fe dams, and road, highway, and railway crossings to allow natural rates of migration of steelhead to upstream spawning and rearing habitats, and passage of smolts and kelts downstream to the estuary and ocean.

Southern California Steelhead DPS Recovery Action Tables Identification Key, Mojave Rim BPG (Tables 12-4 – 12-6).

Recovery Action Number Key: XXXX – SCS – 1.2		XXXX ID Table		Threat Source Legend	
XXXX	Watershed	LAM	Los Angeles River Mainstem	1	Agricultural Development
SCS	Species Identifier – Southern California Steelhead	AS	Arroyo Seco	2	Agricultural Effluents
1	Threat Source	SG	San Gabriel River	3	Culverts and Road Crossings
2	Action Identity Number	WSG	West Fork San Gabriel	4	Dams and Surface Water Diversions
Action Rank		ESG	East Fork San Gabriel	5	Flood Control Maintenance
A	Action addresses the first listing factor regarding the destruction or curtailment of the species' habitat	SAM	Santa Ana River Mainstem	6	Groundwater Extraction
B	Action addresses one of the other four listing factors	LC	Lytle Creek	7	Levees and Channelization
		MiIC	Mill Creek	8	Mining and Quarrying
				9	Non-Native Species
				10	Recreational Facilities
				11	Roads
				12	Upslope/Upstream Activities
				13	Urban Development
				14	Urban Effluents
				15	Wildfires

See Chapter 8, Table 8.1 for Detailed Description of Recovery Actions

Table 12-4. Southern California Steelhead DPS Recovery Action Table for the Los Angeles River Watershed (Mojave Rim BPG).

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
Los Angeles River Mainstem												
LAM-SCS-3.2	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS, ACOE, USDOT, USFWS, CDFG, CSCC, CDOT, MWDSC DWR, FOLAR, CT, TU, LAC	Culverts and Road Crossings (Passage Barriers)	1, 4	2A	20 - refer to regional costs	0	0	0	0	0	0
LAM-SCS-4.1	Provide fish passage around dams and diversions	NMFS, ACOE, USDOT, USFWS, CDFG, CSCC, CDOT, MWDSC DWR, FOLAR, CT, TU, LAC	Dams and Surface Water Diversions	1, 3, 4	1B	20	TBD	TBD	TBD	TBD	TBD	TBD
LAM-SCS-4.2	Develop and implement a water management plan for dam operations (e.g., Whittier Narrows, Sepulveda, and Lower San Fernando dams)	NMFS, ACOE, USGS, USFWS, CDFG, CSCC, CDOT, MWDSC DWR, FOLAR, CT, TU, LAC	Dams and Surface Water Diversions	1, 3, 4	1B	20	TBD	TBD	TBD	TBD	TBD	TBD
LAM-SCS-3/4.3	Conduct watershed-wide fish passage barrier assessment	NMFS, ACOE, USDOT, USFWS, CDFG, CSCC, CDOT, MWDSC, DWR, FOLAR, CT, TU	Dams and Surface Water Diversions, Culverts and Road Crossings (Passage Barriers)	1, 4	2B	5	96692	0	0	0	0	96692

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
LAM-SCS-5.1	Develop and implement flood control maintenance program	ACOE,NMFS, USFWS,CDFG, CSCC,FOLAR, CT,TU,LAC	Flood Control Maintenance	1, 4	3B	100	0	0	0	0	0	0
LAM-SCS-6.1	Conduct groundwater extraction analysis and assessment	USGS,DWR, SWRCB, MWDSC, NMFS,FOLAR, CT,TU,LAC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550
LAM-SCS-6.2	Develop and implement groundwater monitoring and management program	USGS,DWR, SWRCB, MWDSC, NMFS,FOLAR, CT,TU,LAC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125
LAM-SCS-7.1	Develop and implement stream bank and riparian corridor restoration plan	ACOE,NMFS, USFWS,CDFG, CSCC,FOLAR, CT,TU,LAC	Levees and Channelization	1, 4	3B	100	0	0	0	0	0	0
LAM-SCS-7.2	Develop and implement plan to vegetate levees and eliminate or minimize herbicide use near levees	FEMA,ACOE, NMFS,USFWS, CDFG,CSCC, FOLAR,CT,TU, LAC	Levees and Channelization	1, 4	3B	100	0	0	0	0	0	0
LAM-SCS-7.3	Develop and implement plan to restore natural channel features	ACOE,NMFS, USFWS,CDFG, CSCC,FOLAR, CT,TU,LAC	Levees and Channelization	1, 4	3B	20	4217625	4217625	4217625	4217625	0	16870500
LAM-SCS-9.1	Develop and implement non-native species monitoring program	CDFG,CSCC, NMFS,USFWS FOLAR,CT,TU, LAC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
LAM-SCS-9.2	Develop and implement public education program on non-native species impacts	CDFG,CSCC, NMFS,USFWS FOLAR,CT,TU, LAC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
LAM-SCS-9.3	Develop and implement watershed-wide plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, NMFS,USFWS FOLAR,CT,TU, LAC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
LAM-SCS-10.1	Review and modify development and management plans for recreational areas and national forests (e.g., Los Angeles River Revitalization Master Plan, U.S. Forest Service Angeles National Forest Land Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria)	CDFG,CSCC, NMFS,USFWS FOLAR,CT,TU, LAC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing -cost of doing business	0	0	0	0	0	0
LAM-SCS-10.2	Develop and implement public education program on watershed processes	CDFG,CSCC, NMFS,USFWS FOLAR,CT,TU, LAC	Recreational Facilities	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
LAM-SCS-11.1	Manage roadways and adjacent riparian corridor and restore abandoned roadways	USDOT,NMFS, CDOT,FOLAR CT,TU,LAC	Roads	1, 4	3B	On-going cost of doing business	0	0	0	0	0	0
LAM-SCS-12.1	Review and modify applicable County and/or City Local Coastal Plans	CCC,CDFG, NMFS,USFWS, FOLAR,CT,TU, LAC	Upslope/ Upstream activities	1, 2, 3, 4, 5	3B	5	62400	0	0	0	0	62400
LAM-SCS-13.1	Develop, adopt, and implement urban land-use planning policies and standards	CDFG,CSCC, NMFS,USFWS, FOLAR,CT,TU, LAC	Urban Development	1, 4	3B	5	62400	0	0	0	0	62400
LAM-SCS-13.2	Retrofit storm drains in developed areas	USDOT,NMFS, CDOT,FOLAR CT,TU,LAC	Urban Development	1, 4	3B	20	0	0	0	0	0	0
LAM-SCS-13.3	Develop and implement riparian restoration plan to replace artificial bank stabilization structures	ACOE,NMFSUS FWS,CDFG, CSCC,FOLAR, CT,TU,LAC	Urban Development	1, 4	3B	10	10521940	10521940	0	0	0	21043880
LAM-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, SWRCB,NMFS, USFWS,CDFG, FOLAR,CT,TU, LAC	Urban Effluents	1, 4, 5	3B	On-going cost of doing business	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
LAM-SCS-14.2	Review, assess and modify NPDES wastewater discharge permits (e.g., Whittier Narrows Water Reclamation Facility, D.C. Tillman Water Reclamation Facility and Hyperion Wastewater Treatment Facility)	RWQCB,CDFG USFWS,NMFS, FOLAR,CT,TU, LAC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
LAM-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS,USFWS, NMFS,USGS, CDF,CDFG FOLAR,CT,TU, LAC	Wildfires	1, 4, 5	2B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
Arroyo Seco												
AS-SCS-1.1	Develop, adopt, and implement agricultural land-use planning policies and standards	NRCS, BLM, NMFS, CDFG, FOLAR, CT, TU, LAC	Agricultural Development	1, 4	3B	5	62400	0	0	0	0	62400
AS-SCS-1.2	Manage livestock grazing to maintain or restore aquatic habitat functions	NRCS, BLM, NMFS, CDFG, FOLAR, CT, TU, LAC	Agricultural Development	1, 4	3B	5	47520	0	0	0	0	47520
AS-SCS-1.3	Manage agricultural development and restore riparian zone	NRCS, BLM, NMFS, CDFG, FOLAR, CT, TU, LAC	Agricultural Development	1, 4	3B	10 - refer to regional costs	0	0	0	0	0	0
AS-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS, ACOE, USDOT, USFWS, CDFG, CSCC, CDOT, DWR, FOLAR CT, TU, LAC	Culverts and Road Crossings (Passage Barriers)	1, 4	2B	20 - refer to regional costs	0	0	0	0	0	0
AS-SCS-4.1	Provide fish passage around dams and diversions	NMFS, ACOE, USFWS, CDFG, CSCC, CDOT, MWDSCDWR, FOLAR, CT, TU, LAC	Dams and Surface Water Diversions	1, 3, 4	2B	20 - refer to regional costs	0	0	0	0	0	0
AS-SCS-4.2	Develop and implement water management plan for diversion operations	NMFS, ACOE, USFWS, CDFG, CSCC, MWDSC, DWR, FOLAR, CT, TU, LAC	Dams and Surface Water Diversions	1, 3, 4	3B	5	91850	0	0	0	0	91850
AS-SCS-4.3	Develop and implement water management plan for dam operations	NMFS, ACOE, USFWS, CDFG, CSCC, CDOT, MWDSCDWR,	Dams and Surface Water Diversions	1, 3, 4	3B	5	91850	0	0	0	0	91850

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
		FOLAR,CT,TU, LAC										
AS-SCS-3/4.4	Conduct watershed-wide fish passage barrier assessment	NMFS,ACOE, USDOT,USFWS CDFG,CSCC, CDOT,FOLAR CT,TU,LAC	Dams and Surface Water Diversions, Culverts and Road Crossings (Passage Barriers)	1, 4	2B	1	96692	0	0	0	0	96692
AS-SCS-5.1	Develop and implement flood control maintenance program	USGS,ACOE, BLM,NMFS, CDFG,FOLAR, CT,TU,LAC	Flood Control Maintenance	1, 4	3B	100	0	0	0	0	0	0
AS-SCS-6.1	Conduct groundwater extraction analysis and assessment	USGS,NMFS, USFWS,DWR, SWRCB, MWDSC, FOLAR,CT,TU, LAC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550
AS-SCS-6.2	Develop and implement groundwater monitoring and management program	USGS,NMFS, USFWS,DWR, CDFG,SWRCB, MWDSC, FOLAR,CT,TU, LAC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125
AS-SCS-7.1	Develop and implement plan to vegetate levees and eliminate or minimize herbicide use near levees	FEMA, ACOE,NMFS, USFWS,CDFG, CSCC,FOLAR, CT,TU,LAC	Levees and Channelization	1, 4	3B	100	0	0	0	0	0	0
AS-SCS-7.2	Develop and implement plan to restore natural channel features	ACOE,NMFS, USFWS,CDFG, CSCC,FOLAR, CT,TU,LAC	Levees and Channelization	1, 4	3B	20	4217625	4217625	4217625	4217625	0	16870500

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
AS-SCS-9.1	Develop and implement non-native species monitoring program	CDFG,CSCC, USFWS,NMFS, FOLAR,CT,TU, LAC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
AS-SCS-9.2	Develop and implement public education program on non-native species impacts	CDFG,CSCC, USFWS,NMFS, FOLAR,CT,TU, LAC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
AS-SCS-9.3	Develop and implement watershed-wide plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, USFWS,NMFS, FOLAR,CT,TU, LAC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
AS-SCS-10.1	Review and modify development and management plans for recreational areas and national forests (e.g., Arroyo Seco Master Plan (Hahanonga Watershed Park Master Plan, Central Arroyo Master Plan, Lower Arroyo Master Plan, Design Guidelines for the Arroyo Seco)	CDFG,CSCC, USFWS,NMFS, BLM,FOLAR, CT,TU,LAC	Recreational Facilities	1, 2, 3, 4, 5	3B	1	68030	0	0	0	0	68030

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
AS-SCS-10.2	Develop and implement public education program on watershed processes	CDFG,NMFS, USFWS,USFS, FOLAR, CT,TU,LAC	Recreational Facilities	1,3,5	3B	20	76140	76140	76140	76140	0	304560
AS-SCS-13.1	Develop, adopt, and implement urban land-use planning policies and standards	CDFG,CSCC, NMFS,USFWS, FOLAR,CT,TU	Urban Development	1, 4	3B	5	62400	0	0	0	0	62400
AS-SCS-13.2	Retrofit storm drains in developed areas	USDOT,NMFS, CDOT,CDFG, FOLAR,CT,TU, LAC	Urban Development	1, 4	3B	20	0	0	0	0	0	0
AS-SCS-13.3	Develop and implement riparian restoration plan to replace artificial bank stabilization structures	AOEC,NMFS, CDFG,CSCC, FOLAR,CT,TU, LAC	Urban Development	1, 4	3B	10	10521940	10521940	0	0	0	21043880
AS-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, SWRCB,CDFG, USFWS,NMFS, FOLAR,CT,TU, LAC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
AS-SCS-14.2	Review, assess and modify NPDES wastewater discharge permits	RWQCB, CDFG,NMFS, USFWS,FOLAR, CT,TU,LAC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
AS-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS,USFWS, NMFS,USGS, CDF,CDFG, FOLAR CT,TU,LAC	Wildfires	1, 4, 5	2B	100 - refer to regional costs	0	0	0	0	0	0

Table 12-5. Southern California Steelhead DPS Recovery Action Matrix for the San Gabriel River Watershed (Mojave Rim BPG).

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
San Gabriel River Mainstem												
SG-SCS-1.1	Manage livestock grazing to maintain or restore aquatic habitat functions	USCSS,BLM, USFS,USFWS, NMFS,CDFG, RWQCB,CT,TU, SGMRC,LAC, SBRC	Agricultural Development	1, 4	3B	5	47520	0	0	0	0	47520
SG-SCS-1.2	Manage agricultural development and restore riparian zones	USCSS,BLM, USFS,USFWS, NMFS,CDFG, RWQCB, CCCC,CT,TU, SGMRC,LAC, SBRC	Agricultural Development	1, 4	3B	10 - refer to regional costs	0	0	0	0	0	0
SG-SCS-2.1	Develop and implement plan to minimize runoff from agricultural activities	NRCS,USFS, USFWS,BLM, NMFS,CDFG, RWQCB, CT,TU,SGMRC, LAC,SBRC	Agricultural Effluents	1, 4	3B	20	99200	7997440	7997440	7997440	0	24091520
SG-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS,ACOE, USDOT,USFWS, USFS,CDFG,CS CC,CDOT, DWR,CT,TU, SGMRC,LAC, SBRC	Culverts and Road Crossings (Passage Barriers)	1, 4	1A	20 - refer to regional costs	0	0	0	0	0	0
SG-SCS-4.1	Develop and implement a water management plan for diversion operations	NMFS,ACOE, USFWS,CDFG, CCCC, MWDSC,DWR, CT,TU,SGMRC, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	1A	10	TBD	TBD	TBD	TBD	TBD	TBD

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SG-SCS-4.2	Develop and implement water management plan for dam operations (e.g., Santa Fe, Morris, and San Gabriel dams)	NMFS,ACOE, USFWS,CDFG, CSCC, MWDCS,DWR, CT,TU,SGMRC, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	1A	10	TBD	TBD	TBD	TBD	TBD	TBD
SG-SCS-4.3	Provide fish passage around dams and diversions (e.g., Santa Fe, Morris, and San Gabriel dams)	NMFS,ACOE, USFWS,CDFG, CSCC, MWDCS,DWR, CT,TU,SGMRC, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	1A	10	TBD	TBD	TBD	TBD	TBD	TBD
SG-SCS-3/4.4	Conduct watershed-wide fish passage barrier assessment	NMFS,ACOE, USDOT,USFWS CDFG,CSCC, CDOT,CT,TU, SGMRC, LAC,SBRC	Dams and Surface Water Diversions, Culverts and Road Crossings (Passage Barriers)	1, 4	1A	5	96692	0	0	0	0	96692
SG-SCS-5.1	Develop and implement flood control maintenance program	USGS,ACOE, BLM,NMFS, SGRMC,CT,TU, LAC,SBRC	Flood Control Maintenance	1, 4	3B	100	0	0	0	0	0	0
SG-SCS-6.1	Conduct groundwater extraction analysis and assessment	USGS,NMFS, DWR,CDFG, MWDCS,CT, TU,SGRMC, LAC,SBRC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550
SG-SCS-6.2	Develop and implement groundwater monitoring and management program	USGS,NMFS, DWR,CDFG, MWDCS, CT,TU,SGRMC, LAC,SBRC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SG-SCS-7.1	Develop and implement plan to vegetate levees and eliminate or minimize herbicide use near levees	FEMA, NRCS,ACOE, BLM,NMFS, CDFG,CSCC, SGRMC,CT,TU, LAC,SBRC	Levees and Channelization	1, 4	3B	100	0	0	0	0	0	0
SG-SCS-7.2	Develop and implement plan to restore natural channel features	NRCS,ACOE, BLM,NMFS, CDFG,CSCC, SGRMC,CT,TU, LAC,SBRC	Levees and Channelization	1, 4	3B	20	4217625	4217625	4217625	4217625	0	16870500
SG-SCS-9.1	Develop and implement non-native species monitoring program	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
SG-SCS-9.2	Develop and implement public education program on non-native species impacts	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
SG-SCS-9.3	Develop and implement watershed-wide plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
SG-SCS-10.1	Review and modify development and management plans for recreational areas and national forests (e.g., San Gabriel River Corridor Plan, U.S.	USFS,USFWS, NMFS,BLM, CDFG, SGRMC,CT,TU, LAC,SBRC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing - cost of doing business	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
	Forest Service Angeles National Forest Land Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria											
SG-SCS-10.2	Develop and implement public education program on watershed processes	USFS,USFWS, NMFS,BLM, CDFG,CSCC, SGRMC,CT,TU, LAC,SBRC	Recreational Facilities	1,3,5	3B	20	76140	76140	76140	76140	0	304560
SG-SCS-11.1	Manage roadways and adjacent riparian corridor and restore abandoned roadways	USCSSL,BLM, USFS,USFWS, NMFS,CDFG, RWQCB, CSCC,CT,TU, SGMRC,LAC, SBRC	Roads	1, 4	3B	on-going cost of doing business	0	0	0	0	0	0
SG-SCS-12.1	Develop and implement an estuary restoration and management plan	CDFG,CSCC, USFWS,NMFS, SGRMC,CT,TU, LAC,SBRC	Upslope/ Upstream activities	1, 2, 3, 4, 5	3B	5	56615000	0	0	0	0	56615000
SG-SCS-12.2	Review and modify applicable County and/or City Local Coastal Plans	CCC,CDFG, NMFS,USFWS, SGRMC,CT,TU, LAC,SBRC	Upslope/ Upstream activities	1, 2, 3, 4, 5	3B	5	62400	0	0	0	0	62400
SG-SCS-13.1	Develop, adopt and implement urban land-use planning policies and standards	CDFG, RWQCB, CDOT,USFWS, NMFS,SGRMC, CT,TU,LAC, SBRC	Urban Development	1, 4	3B	5	62400	0	0	0	0	62400

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SG-SCS-13.2	Retrofit storm drains in developed areas	USDOT,NMFS, USFWS,CDOT, SGRMC,CT,TU, LAC,SBRC	Urban Development	1, 4	3B	20	0	0	0	0	0	0
SG-SCS-13.3	Develop and implement riparian restoration plan replace artificial bank stabilization structures	NMFS,CDFG, CT,TU,LAC, SBRC	Urban Development	1, 4	3B	10	10521940	10521940	0	0	0	21043880
SG-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, SWRCB,CDOT, USFWS,NMFS, SGRMC,CT,TU, LAC,SBRC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
SG-SCS-14.2	Review, assess and modify NPDES wastewater discharge permits	RWQCB, USFWS,NMFS, SGRMC,CT,TU, LAC,SBRC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
SG-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS,USFWS, NMFS,USGS, CDF,CDFG, SGRMC,CT,TU, LAC,SBRC	Wildfires	1, 4, 5	2B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
West Fork San Gabriel River												
WSG-SCS-1.1	Manage livestock grazing to maintain or restore aquatic habitat functions	USCSS,BLM, USFS,USFWS, NMFS,CDFG, RWQCB,CT,TU, SGRMC,LAC, SBRC	Agricultural Development	1, 4	3B	5	47520	0	0	0	0	47520
WSG-SCS-1.2	Develop, adopt, and implement agricultural land-use planning policies and standards	USCSS,BLM, USFS,USFWS, NMFS,CDFG, RWQCB,CT,TU, SGRMC,LAC, SBRC	Agricultural Development	1, 4	3B	5	62400	0	0	0	0	62400
WSG-SCS-1.3	Manage agricultural development and restore riparian zones	USCSS,BLM, USFS,USFWS, NMFS,CDFG, RWQCB,CT,TU, SGRMC,LAC, SBRC	Agricultural Development	1, 4	3B	10 - refer to regional costs	0	0	0	0	0	0
WSG-SCS-2.1	Develop and implement plan to minimize runoff from agricultural activities	NRCS,USFS, USFWS,BLM, NMFS,CDFG, RWQCB,CT,TU, SGRMC,LAC, SBRC	Agricultural Effluents	1, 4	3B	20 - included in San Gabriel Mainstem	0	0	0	0	0	0
WSG-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS,ACOE, USDOT,USFWS, USFS,CDFG, CSCC,CDOT, DWR,CT,TU, LAC,SBRC	Culverts and Road Crossings (Passage Barriers)	1, 4	1A	20 - refer to regional costs	0	0	0	0	0	0
WSG-SCS-4.1	Develop and implement water management plan for diversion operations	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, SGRMC,CT,TU, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	3B	5	91850	0	0	0	0	91850

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
WSG-SCS-4.2	Develop and implement an water management plan for dam operations (e.g., Cogswell Dam) in the West Fork of the San Gabriel River	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, SGRMC,CT,TU, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	3B	5	91850	0	0	0	0	91850
WSG-SCS-4.3	Provide fish passage around dams and diversions	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, SGRMC,CT,TU, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	1A	10	TBD	TBD	TBD	TBD	TBD	TBD
WSG-SCS-3/4.4	Conduct watershed-wide fish passage barrier assessment	NMFS,ACOE, USDOT,USFWS CDFG,CSCC, CDOT,CT,TU, LAC,SBRC	Dams and Surface Water Diversions, Culverts and Road Crossings (Passage Barriers)	1, 4	1A	1	96692	0	0	0	0	96692
WSG-SCS-6.1	Conduct groundwater extraction analysis assessment	USGS,NMFS, DWR,CDFG, MWDSC,CT, TU,SGRMC, LAC,SBRC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550
WSG-SCS-6.2	Develop and implement groundwater monitoring and management program	USGS,NMFS, DWR,CDFG, MWDSC,CT, TU,SGRMC, LAC,SBRC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125
WSG-SCS-9.1	Develop and implement non-native species monitoring program	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
WSG-SCS-9.2	Develop and implement public education program on non-native species impacts	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
WSG-SCS-9.3	Develop and implement watershed-wide plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
WSG-SCS-10.1	Develop and implement public education program on watershed processes	USFS,USFWS, NMFS,BLM, CDFG,CSCC, SGRMC,CT,TU, LAC,SBRC	Recreational Facilities	1,3,5	3B	20	76140	76140	76140	76140	0	304560
WSG-SCS-10.2	Review and modify development and management plans for recreational areas and national forests (e.g., U.S. Forest Service Angeles National Forest Land Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria)	USFS,USFWS, NMFS,BLM, CDFG,CSCC, SGRMC,CT,TU, LAC,SBRC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing - cost of doing business	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
WSG-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify stormwater Permits	RWQCB, SWRCB, CDFG, USFWS, NMFS, SGRMC, CT, TU, LAC, SBRC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
WSG-SCS-14.2	Review, assess and modify NPDES wastewater discharge permits	RWQCB, CDFG, USFWS, NMFS, SGRMC, CT, TU, LAC, SBRC	Urban Effluents	1, 4	2B	ongoing - cost of doing business	0	0	0	0	0	0
WSG-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS, USFWS, NMFS, USGS, CDF, CDFG, SGRMC, CT, TU, LAC, SBRC	Wildfires	1, 4, 5	1B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
East Fork San Gabriel River												
ESG-SCS-1.1	Develop and implement plan to minimize runoff from agricultural activities	NRCS,USFS, USFWS,BLM, NMFS,CDFG, RWQCB,CT,TU, SGRMC,LAC, SBRC	Agricultural Development	1, 4	3B	20- Include d in San Gabriel Main-stem	0	0	0	0	0	0
ESG-SCS-1.2	Manage livestock grazing to maintain or restore aquatic habitat functions	USCSS,BLM, USFS,USFWS, NMFS,CDFG, RWQCB,CT,TU, SGRMC,LAC, SBRC	Agricultural Development	1, 4	3B	5	47520	0	0	0	0	47520
ESG-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS,ACOE, USDOT,USFWS, USFS,CDFG,CS CC,CDOT, DWR,SGRMC, CT,TU,LAC, SBRC	Culverts and Road Crossings (Passage Barriers)	1, 4	1A	20 - refer to regional costs	0	0	0	0	0	0
ESG-SCS-4.1	Develop and implement water management plan for diversion operations	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, CT,TU,SGRMC, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	1A	5	91850	0	0	0	0	91850
ESG-SCS-4.2	Provide fish passage around dams and diversions	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, CT,TU,SGRMC, LAC,SBRC	Dams and Surface Water Diversions	1, 3, 4	1A	10	TBD	TBD	TBD	TBD	TBD	TBD
ESG-SCS-3/4.3	Conduct watershed-wide fish passage barrier assessment	NMFS,ACOE, USDOT,USFWS CDFG,CSCC, CDOT, SGRMC,CT,TU, LAC,SBRC	Dams and Surface Water Diversions, Culverts and Road Crossings (Passage Barriers)	1, 4	1A	1	96692	0	0	0	0	96692

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
ESG-SCS-5.1	Develop and implement flood control maintenance plan	USFS,USFWS, NMFS,CDFG, CT,TU,SGRMC, LAC,SBRC	Flood Control Maintenance	1, 4	3B	100	0	0	0	0	0	0
ESG-SCS-6.1	Conduct groundwater analysis and assessment	USGS,NMFS, DWR,CDFG, MWDS, CT, TU,SGRMC, LAC,SBRC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550
ESG-SCS-6.2	Develop and implement groundwater monitoring program	USGS,NMFS, DWR,CDFG, MWDS, CT, TU,SGRMC, LAC,SBRC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125
ESG-SCS-9.1	Develop and implement non-native species monitoring program	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
ESG-SCS-9.2	Develop and implement public education program on non-native species impacts	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
ESG-SCS-9.3	Develop and implement plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, USFWS,USFS, NMFS,SGRMC, CT,TU,LAC, SBRC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
ESG-SCS-10.1	Develop and implement public education program on watershed processes	USFS,USFWS, NMFS,BLM, CDFG,CSCC, SGRMC,CT,TU, LAC,SBRC	Recreational Facilities	1,3,5	3B	20	76140	76140	76140	76140	0	304560

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
ESG-SCS-10.2	Review and modify development and management plans for recreation areas and national forests (e.g., U.S. Forest San Bernardino National Forest Land Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria	USFS,USFWS, NMFS,BLM, CDFG,CSCC, SGRMC,CT,TU, LAC,SBRC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing - cost of doing business	0	0	0	0	0	0
ESG-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, SWRCB,CDFG, USFWS,NMFS, SGRMC,CT,TU, LAC,SBRC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
ESG-SCS-14.2	Review, assess and modify NPDES wastewater discharge permits	RWQCB,CDF, USFWS,NMFS, SGRMC,CT,TU, LAC,SBRC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
ESG-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS,USFWS, NMFS,USGS, CDF,CDFG, SGRMC,CT,TU, LAC,SBRC	Wildfires	1, 4, 5	1B	100 - refer to regional costs	0	0	0	0	0	0

Table 12-6. Southern California Steelhead DPS Recovery Action Matrix for the Santa Ana River Watershed (Mojave Rim BPG).

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
Santa Ana River Mainstem												
SAM-SCS-1.1	Manage livestock grazing to maintain or restore aquatic habitat functions	USCSSL,BLM, USFS,USFWS, NMFS,CDFG, RWQCB,CT,TU, SARWA,LAC, OC,RC	Agricultural Development	1, 4	3B	5	47520	0	0	0	0	47520
SAM-SCS-1.2	Manage agricultural development and restore riparian zones	USCSSL,BLM, USFS,USFWS, NMFS,CDFG, RWQCB,CT,TU, SARWA,LAC, OC,RC	Agricultural Development	1, 4	3B	10 - refer to regional costs	0	0	0	0	0	0
SAM-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS,ACOE, USDOT,USFWS, USFS,CDFG,CS CC,CDOT, DWR,CT,TU, SARWA,LAC OC,RC	Culverts and Road Crossings (Passage Barriers)	1, 4	1A	20 - refer to regional costs	0	0	0	0	0	0
SAM-SCS-4.1	Develop and implement water management plan for diversion operations	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, CT,TU,SARWA, LAC, OC,RC	Dams and Surface Water Diversions	1, 3, 4	2A	5	91850	0	0	0	0	91850
SAM-SCS-4.2	Develop and implement water management plan for dam operations (e.g., Prado and Seven Oaks Dams)	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, CT,TU,SARWA, LAC,OC,RC	Dams and Surface Water Diversions	1, 3, 4	2A	5	91850	0	0	0	0	91850

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SAM-SCS-4.3	Provide fish passage around dams and diversions (e.g., Prado, New Prado, Seven Oaks, and Bear Valley dams)	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, CT,TU,SARWA, LAC,OC,RC	Dams and Surface Water Diversions	1, 3, 4	3B	10	TBD	TBD	TBD	TBD	TBD	TBD
SAM-SCS-3/4.4	Conduct watershed-wide fish passage barrier assessment	NMFS,ACOE, USDOT,USFWS CDFG,CSCC, CDOT,CT,TU, SARWA,LAC, OC,RC	Dams and Surface Water Diversions, Culverts and Road Crossings (Passage Barriers)	1, 4	1A	1	96692	0	0	0	0	96692
SAM-SCS-5.1	Develop and implement flood control maintenance program	USFS,USFWS, NMFS,CDFG, CT,TU,SARWA, LAC,OC,RC	Flood Control Maintenance	1, 4	3B	100	0	0	0	0	0	0
SAM-SCS-6.1	Conduct groundwater extraction analysis and assessment	USGS,NMFS, DWR,CDFG, MWDSC,CT, TU,SARWA, LAC,OC,RC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550
SAM-SCS-6.2	Develop and implement groundwater monitoring and management program	USGS,NMFS, DWR,CDFG, MWDSC,CT, TU,SARWA, LAC,OC,RC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125
SAM-SCS-7.1	Develop and implement stream bank and riparian corridor restoration plan	USGS,ACOE, BLM,NMFS, CT,TU,SARWA, LAC,OC,RC	Levees and Channelization	1, 4	3B	20	4217625	4217625	4217625	4217625	0	16870500

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SAM-SCS-7.2	Develop and implement plan to vegetate levees and eliminate or minimize herbicide use near levees	FEMA, USGS,ACOE, BLM,NMFS, CT,TU,SARWA, LAC,OC,RC	Levees and Channelization	1, 4	3B	100	0	0	0	0	0	0
SAM-SCS-7.3	Develop and implement plan to restore natural channel features	CCC,NMFS, CDFG,CT, TU,SARWA, LAC,OC,RC	Levees and Channelization	1, 4	3B	20	4217625	4217625	4217625	4217625	0	16870500
SAM-SCS-9.1	Develop and implement non-native species monitoring program	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
SAM-SCS-9.2	Develop and implement public education program on non-native species impacts	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
SAM-SCS-9.3	Develop and implement watershed-wide plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SAM-SCS-10.1	Review and modify development and management plans for recreational areas and national forests (e.g., San Bernardino National Recreational Trail Master Plan, U.S. Forest San Bernardino National Forest Land Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria)	USFS,USFWS, NMFS,BLM, CDFG,CSCC, CT,TU,SARWA, LAC,OC,RC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing - cost of doing business	0	0	0	0	0	0
SAM-SCS-10.2	Develop and implement public education program on watershed processes	USFS,USFWS, NMFS,BLM, CDFG,CSCC, CT,TU,SARWA, LAC,OC,RC	Recreational Facilities	1,3,5	3B	20	76140	76140	76140	76140	0	304560
SAM-SCS-10.3	Manage off-road recreational vehicle activity in riparian floodplain corridors	USFS,USFWS, NMFS,BLM, CDFG,CSCC, CT,TU,SARWA, LAC,OC,RC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing - cost of doing business	0	0	0	0	0	0
SAM-SCS-11.1	Manage roadways and adjacent riparian corridor and restore abandoned roadways	CDFG, RWQCB, CDOT,USFWS, NMFS,CT,TU SARWA,LAC, OC,RC	Roads	1, 4	3B	20	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SAM-SCS-12.1	Develop and implement an estuary restoration and management plan	CDFG,CSCC, USFWS,NMFS, CT,TU,SARWA, LAC,OC,RC	Upslope/ Upstream activities	1, 2, 3, 4, 5	3B	5	201000	0	0	0	0	201000
SAM-SCS-13.1	Develop, adopt, and implement urban land-use planning policies and standards	CDFG, RWQCB, CDOT,USFWS, NMFS,CT,TU, SARWA,LAC, OC,RC	Urban Development	1, 4	3B	5	62400	0	0	0	0	62400
SAM-SCS-13.2	Retrofit storm drains in developed areas	CDFG, RWQCB, CDOT,USFWS, NMFS,CT,TU SARWA,LAC, OC,RC	Urban Development	1, 4	3B	20	0	0	0	0	0	0
SAM-SCS-13.3	Develop and implement riparian restoration plan to replace artificial bank stabilization structures	CDFG, RWQCB, CDOT,USFWS, NMFS,CT,TU, SARWA,LAC, OC,RC	Urban Development	1, 4	3B	10	10521940	10521940	0	0	0	21043880
SAM-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, SWRCB,CDFG, USFWS,NMFS, CT,TU.SARWA, LAC,OC,RC	Urban Effluents	1, 4	3B	ongoing -cost of doing business	0	0	0	0	0	0
SAM-SCS-14.2	Review, assess and modify NPDES wastewater discharge permits	RWQCB, CDFG,USFWS, NMFS,CT,TU, SARWA,LAC, OC,RC	Urban Effluents	1, 4	3B	ongoing -cost of doing business	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
SAM-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS,USFWS, NMFS,USGS, CDF,CDFG CT,TU,SARWA, LAC,OC,RC	Wildfires	1, 4, 5	1B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
Lytle Creek												
LC-SCS-1.1	Manage livestock grazing to maintain or restore aquatic habitat functions	BLM,NMFS, CT,TU,SARWA, LAC,OC,RC	Agricultural Development	1, 4	3B	5	47520	0	0	0	0	47520
LC-SCS-1.2	Develop, adopt and implement agricultural land-use planning policies and standards	CDFG,NMFS, CT,TU,SARWA, LAC,OC,RC	Agricultural Development	1, 4	3B	10 - refer to regional costs	0	0	0	0	0	0
LC-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS,ACOE, USDOT,USFWS, USFS,CDFG, CSCC,CDOT, DWR,CT,TU, SARWA,LAC, OC,RC	Culverts and Road Crossings (Passage Barriers)	1, 4	2A	20 - refer to regional costs	0	0	0	0	0	0
LC-SCS-4.1	Develop and implement a water management plan for diversion operations	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, CT,TU, SARWA,LAC, OC,RC	Dams and Surface Water Diversions	1, 3, 4	2A	5	91850	0	0	0	0	91850
LC-SCS-4.2	Provide fish passage around dams and diversions	NMFS,ACOE, USDOT,USFWS, USFS,CDFG, CSCC,CDOT, DWR,CT,TU, SARWA,LAC, OC,RC	Dams and Surface Water Diversions	1, 4	2A	20 - refer to regional costs	0	0	0	0	0	0
LC-SCS-3/4.3	Conduct watershed-wide fish passage barrier assessment	NMFS,ACOE, USDOT,USFWS CDFG,CSCC, CDOT,CT,TU, SARWA,LAC,	Dams and Surface Water Diversions, Culverts and Road Crossings	1, 4	3B	5	96692	0	0	0	0	96692

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
		OC,RC	(Passage Barriers)									
LC-SCS-6.1	Conduct groundwater extraction analysis and assessment	USGS,NMFS, DWR,CDFG, MWDSC,CT, TU,SARWA, LAC,OC,RC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550
LC-SCS-6.2	Develop and implement groundwater monitoring and management program	USGS,NMFS, DWR,CDFG, MWDSC, CT,TU,SARWA, LAC,OC,RC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125
LC-SCS-9.1	Develop and implement watershed-wide plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
LC-SCS-9.2	Develop and implement non-native species monitoring program	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
LC-SCS-9.3	Develop and implement public education program on non-native species impacts	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
LC-SCS-10.1	Develop and implement public education program on watershed processes	USFS,USFWS, NMFS,BLM, CDFG,CSCC, CT,TU,SARWA, LAC,OC,RC	Recreational Facilities	1,3,5	3B	20	76140	76140	76140	76140	0	304560

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
LC-SCS-10.2	Review and modify development and management plans for recreational areas and national forests (e.g., U.S. Forest San Bernardino National Forest Land Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria)	USFS,USFWS, NMFS,BLM, CDFG,CSCC, CT,TU,SARWA, LAC,OC,RC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing - cost of doing business	0	0	0	0	0	0
LC-SCS-12.1	Review and modify applicable County and/or City Local Coastal Plans	CCC,CDFG, NMFS,USFWS CT,TU,SARWA, LAC,OC,RC	Upslope/ Upstream activities	1, 2, 3, 4, 5	3B	5	62400	0	0	0	0	62400
LC-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, SWRCB,CDFG, USFWS,NMFS, CT,TU.SARWA, LAC,OC,RC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
LC-SCS-14.2	Review, assess and modify NPDES wastewater discharge permits	RWQCB, CDFG,USFWS, NMFS,CT,TU.SA RWA,LAC,OC, RC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
LC-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS,USFWS, NMFS,USGS, CDF,CDFG CT,TU,SARWA, LAC,OC,RC	Wildfires	1, 4, 5	1B	100 - refer to regional costs	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
Mill Creek												
MilC-SCS-1.1	Manage livestock grazing to maintain or restore aquatic habitat functions	BLM,NMFS, CT,TU,SARWA, LAC,OC,RC	Agricultural Development	1, 4	3B	5	47520	0	0	0	0	47520
MilC-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	NMFS,ACOE, USDOT,USFWS, USFS,CDFG,CS CC,CDOT, DWR,CT,TU, SARWA,LAC, OC,RC	Culverts and Road Crossings (Passage Barriers)	1, 4	2A	20 - refer to regional costs	0	0	0	0	0	0
MilC-SCS-4.1	Develop and implement water management plan for diversion operations	NMFS,ACOE, USFWS,USFS, CDFG,CSCC, MWDSC,DWR, CT,TU, SARWA	Dams and Surface Water Diversions	1, 3, 4	2A	5	91850	0	0	0	0	91850
MilC-SCS-4.2	Provide fish passage around dams and diversions	NMFS,ACOE, USDOT,USFWS, USFS,CDFG,CS CC,CDOT, DWR,CT,TU, SARWA,LAC, OC,RC	Dams and Surface Water Diversions	1, 4	2A	20 - refer to regional costs	0	0	0	0	0	0
MilC-SCS-3/4.3	Conduct watershed-wide fish passage barrier assessment	NMFS,ACOE, USDOT,USFWS CDFG,CSCC, CDOT,CT,TU, SARWA,LAC, OC,RC	Dams and Surface Water Diversions, Culverts and Road Crossings (Passage Barriers)	1, 4	2A	1	96692	0	0	0	0	96692
MilC-SCS-6.1	Conduct groundwater extraction analysis and assessment	USGS,NMFS, DWR,CDFG, MWDSC, CT,TU,SARWA, LAC,OC,RC	Groundwater Extraction	1, 4	3B	5	275550	0	0	0	0	275550

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
MilC-SCS-6.2	Develop and implement groundwater monitoring program	USGS,NMFS, DWR,CDFG, MWDSC,CT, TU,SARWA, LAC,OC,RC	Groundwater Extraction	1, 4	3B	10	254350	39775	0	0	0	294125
MilC-SCS-9.1	Develop and implement watershed-wide plan to assess the impacts of non-native species and develop control measures	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
MilC-SCS-9.2	Develop and implement non-native species monitoring program	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	100 - refer to regional costs	0	0	0	0	0	0
MilC-SCS-9.3	Develop and implement public education program on non-native species impacts	CDFG,CSCC, USFWS,USFS, NMFS,CT,TU SARWA,LAC, OC,RC	Non-Native Species	1, 3, 5	3B	20	76140	76140	76140	76140	0	304560
MilC-SCS-10.1	Develop and implement public education program on watershed processes	USFS,USFWS, NMFS,BLM, CDFG,CSCC, CT,TU,SARWA, LAC,OC,RC	Recreational Facilities	1,3,5	3B	20	76140	76140	76140	76140	0	304560
MilC-SCS-10.2	Review and modify development and management plans for recreational areas and national (e.g., U.S. Forest San Bernardino National Forest Land	USFS,USFWS, NMFS,BLM, CDFG,CSCC, CT,TU,SARWA, LAC,OC,RC	Recreational Facilities	1, 2, 3, 4, 5	3B	ongoing - cost of doing business	0	0	0	0	0	0

Action #	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B, 3A, 3B)	Task Duration	Estimated Costs (\$)					
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	FY 1-100
	Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria)											
MilC-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, SWRCB,CDFG, USFWS,NMFS, CT,TU.SARWA, LAC,OC,RC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
MilC-SCS-14.1	Review, assess and modify NPDES wastewater discharge permits	RWQCB, SWRCB,CDFG, USFWS,NMFS, CT,TU.SARWA, LAC,OC,RC	Urban Effluents	1, 4	3B	ongoing - cost of doing business	0	0	0	0	0	0
MilC-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS,USFWS, NMFS,USGS, CDF,CDFG CT,TU,SARWA, LAC,OC,RC	Wildfires	1, 4, 5	1B	100 - refer to regional costs	0	0	0	0	0	0