Attachment 1. CALFED Ecosystem Restoration Program – Multi-species Conservation Strategy (ERP–MSCS) Milestones

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Delta and East Side Tributaries		
Ecological Processes		
Develop a methodology for evaluating delta flow and hydrodynamic patterns and begin implementation of an ecologically based plan to restore conditions in the rivers and sloughs of the Delta sufficient to support targets for the restoration of aquatic resources.	Bay-Delta Hydrodynamics	Central Valley chinook salmon and steelhead, green sturgeon, delta smelt, longfin smelt, and Sacramento splittail
Develop and implement temperature management programs within major tributaries in the Eastside Delta Tributaries EMZ. The goal of the programs should be achievement of the ERP temperature targets for salmon and steelhead. The programs shall include provisions to: a) develop accurate and reliable water temperature prediction models; b) evaluate the use of minimum carryover storage levels and other operational tools; c) evaluate the use of new facilities such as temperature control devices; and d) recommend operational and/or physical facilities as a long-term solution.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead
Provide a fall or early winter outflow that emulates the first "winter" rain through the Delta.	Central Valley Streamflow	all Central Valley salmonids
Complete a fluvial geomorphic assessment of coarse sediment supply needs and sources to maintain, improve, or supplement gravel recruitment and natural sediment transport processes linked to stream channel maintenance, erosion and deposition, maintenance of fish spawning areas, and the regeneration of riparian vegetation. Develop and implement a program to reduce erosion and maintain gravel recruitment on at least one tributary within the Eastside Delta Tributaries EMZ.	Coarse Sediment Supply	all races of chinook salmon, steelhead, splittail, delta smelt, green sturgeon, bank swallow, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, valley elderberry longhorn beetle, Norther California black walnut
Develop floodplain management plans, including feasiblility studies to	Natural Floodplain	all Central Valley salmonids, Sacramento splittail,

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construct setback levees, to restore and improve opportunities for rivers to inundate their floodplain on a seasonal basis for at least one tributary within the Eastside Delta Tributary EMZ.	and Flood Processes	delta smelt, longfin smelt, western yellow-billed cuckoo, California yellow warbler, Least Bell's vireo, San Joaquin Valley woodrat, Valley elderberry long-horn beetle, Northern California black walnut
Habitats		
In the Sacramento-San Joaquin Delta EMZ, cooperatively enhance at least 15% of the ERP target for wildlife friendly agricultural practices.	Agricultural Lands	greater sandhill crane, giant garter snake, Swainson's hawk
Restore a minimum of 15 miles of slough habitat (widths less than 50 to 75 feet) in each of the North, East, South, Central and West Delta EMUs that allows for the colonization of delta mudwort and delta tule pea.	Delta Sloughs	all Central Valley salmonids, delta smelt, Sacramento splittail, Sacramento perch, giant garter snake,delta mudwort, delta tule pea
Restore a minimum of 500, 250, 1,000, and 2,500 acres of nontidal emergent wetland in the North, East, South, and Central and West Delta Ecological Management units respectively. Establish at least one population of bristly sedge in each EMU.	Fresh Emergent Wetland (nontidal)	giant garter snake, California black rail, bristly sedge
Restore a minimum of 500, 500, 4,000, and 5,000 acres of tidal emergent wetland in the North, East, South, and Central and West Delta Ecological Management units respectively.	Fresh Emergent Wetland (tidal)	all Central Valley salmonids, green sturgeon, longfin smelt, delta smelt, Sacramento splittail, California black rail, Mason's lilaeopsis, delta mudwort, delta tule pea
Conduct surveys to locate potential habitat restoration sites capable of supporting Antioch dunes evening primrose, Contra Costa wallflower, and Lange's metalmark butterfly. Enhance 50 acres of low to moderate quality Antioch inland dune scrub habitat to support these species. Annually monitor establishment success.	Inland Dune Scrub	Lange's metalmark butterfly, Antioch dunes evening primrose, Contra Costa wallflower
Restore a minimum of 125 acres of channel islands and 125 acres of shoals in the Delta.	Midchannel Islands and Shoals	all Central Valley salmonids, Sacramento splittail, delta smelt, black rail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop and implement a program to establish, restore, and maintain riparian habitat to improve floodplain habitat, salmonid shaded riverine aquatic habitat, and instream cover along at least one tributary within the Eastside Delta Tributary EMZ	Riparian and Riverine Aquatic Habitats	Central Valley steelhead, fall/late fall-run chinook salmon, western yellow-billed cuckoo, Valley elderberry long-horn beetle, riparian brush rabbit, California yellow warbler, Least Bell's vireo, little willow flycatcher, delta coyote thistle
Implement 25 percent of the ERP target for diverse, self-sustaining riparian community for each EMU in the Sacramento-San Joaquin Delta EMZ.	Riparian and Riverine Aquatic Habitats	Central Valley fall/late fall-run chinook salmon, steelhead, western yellow-billed cuckoo, little willow flycatcher, California yellow warbler
Restore a minimum of 300 acres of self-sustaining or managed diverse natural riparian habitat along the Mokelumne River, Cosumnes River, and Calaveras River and protect existing riparian habitat.	Riparian and Riverine Aquatic Habitats	Central Valley fall/late fall-run chinook salmon, steelhead, western yellow-billed cuckoo, little willow flycatcher, California yellow warbler, Valley elderberry long-horn beetle
Enhance, protect and restore 1,000 to 1,500 acres of seasonal wetlands in the East Delta EMU for optimum greater sandhill crane habitat.	Seasonal Wetlands	greater sandhill crane, Swainson's hawk
Restore a minimum of 500, 250, 500, and 750 acres of tidal perennial aquatic habitat in the North, East, South, and Cental and West Delta Ecological Management units respectively.	Tidal Perennial Aquatic Habitat	all Central Valley salmonids, delta smelt, Sacramento splittail, longfin smelt, green sturgeon
Stressors Reduction		
Develop and implement a program to address inadequate instream flows for steelhead and chinook salmon on streams within Eastside Delta tributaries. Where appropriate provide adequate flows for Sacramento splittail and green sturgeon.	Dams and Other Structures	steelhead, fall/late fall-run chinook salmon, green sturgeon, Sacramento splittail
Provide unimpeded upstream and downstream passage for salmon and steelhead on Eastside Delta tributaries.	Dams and Other Structures	all Central Valley salmonids

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Assist in the development and implementation of a black and clapper rail impact reduction program.	Disturbance	California black rail, California clapper rail
Develop and begin implementation of a program to reduce or eliminate the influx of non-native aquatic species in ship ballast water.	Invasive Aquatic Organisms	all covered fish species
Complete installation of fish passage facilities at Bellota Weir, Clements Dam, and Cherryland Dam on the Calaveras River and provide passage flows.	Dams and Other Structures	Central Valley fall/late fall-run chinook salmon and steelhead
Develop and begin implemention of a demonstration program to reduce invasive non-native plant abundance within at least one EMU in the Delta.	Invasive Aquatic Plants	Susiun Marsh aster, Mason's lilaeopsis, delta mudwort, delta tule pea
Implement a program to improve fish passage and reduce predation on juvenile salmonids below Woodbridge Dam on the lower Mokelumne River that includes the following elements: (1) improving the form and function of the stream channel; (2) rebuilding the Woodbridge Dam fish passage and diversion screening facilities to minimize losses of downstream migrating salmon and steelhead; and (3) improving the fish bypass discharge.	Predation and Competition	Central Valley fall/late fall-run chinook salmon, steelhead
Consolidate and screen 50 small agricultural diversions in the Delta, prioritized according to size, location, and season of operation.	Water Diversions	all R and r covered fish
Upgrade screens at Southern Energy's Contra Costa power plants with screens acceptable to the Fish and Wildlife Agencies.	Water Diversions	all R and r covered fish
Actions to minimize or eliminate low dissolved oxygen conditions (DO sag) in lower San Joaquin River near Stockton (from Phase II Report): • Complete studies of causes for DO sag in San Joaquin River near Stockton. • Define and implement corrective measures for DO sag. • Finalization of investigation of methods to reduce constituents that cause low DO for inclusion in total maximun daily load (TMDL) recommendation by the Central Valley RWQCB.	dissolved oxygen, oxygen depleting substances, nutrients, total organic carbon (TOC)	Salmonids, delta smelt, Sacramento splittail, longfin smelt, green sturgeon

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
• Finalization of Basin Plan Amendment and TMDL for constituents that cause low DO in the San Joaquin River. • Implement appropriate source and other controls and other management practices, as recommended in the TMDL, to reduce anthropogenic oxygen depleting substances loadings and minimize or eliminate low DO conditions.		
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report)	oxygen depleting substances, nutrients, TOC, ammonia	Salmonids, Sacramento splittail
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	turbidity/ sedimentation	Salmonids
Conduct the necessary research to determine no adverse	mercury	Salmonids, Sacramento splittail, green

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ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.		sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following mercury evaluation and abatement work in the Cache Creek watershed (from Phase II Report): • Support development and implementation of TMDL for mercury. • Determine bioaccumulation effects in creek and Delta. • Source, transport, inventory, mapping and speciation of mercury. • Participate in Stage 1 remediation (drainage control) of mercury mines as appropriate. • Determine sources of high levels of bioavailable mercury	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake
Conduct the following mercury evaluation and abatement work in the Delta (from Phase II Report): • Determine methylization (part of bioaccumulation) process in Delta. • Determine sediment mercury concentration in areas that would be dredged during levee maintenance or conveyance work. • Determine potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon. • Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.
Conduct the following selenium work:	selenium	Salmonids, delta smelt, longfin smelt,

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
• Conduct selenium research to fill data gaps in order to refine regulatory goals of source control actions; determine bioavailability of selenium under several scenarios (from Phase II Report). • Evaluate and, if appropriate, implement real-time management of selenium discharges (from Phase II Report). • Expand and implement source control, treatment, and reuse programs (from Phase II Report). • Coordinate with other programs; e.g., recommendations of San Joaquin Valley Drainage Implementation Program, CVPIA for retirement of lands with drainage problems that are not subject to correction in other ways (from Phase II Report). • Support development and implementation of TMDL for selenium in the San Joaquin River watershed (focus on Grassland area).		Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
• Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.		
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon
Suisun Marsh and North San Francisco Bay		
Habitats		
Restore and maintain a minimum of three linear miles of riparian habitat along corridors of existing riparian scrub and shrub vegetation in each of the Ecological Management Units of the Suisun Marsh/North San Francisco Bay Ecological Management Zone.	Riparian and Riverine Aquatic Habitats	Sacramento splittail, all Central Valley salmonids, Valley elderberry long-horn beetle, riparian brush rabbit, California yellow warbler, Least Bell's vireo, little willow flycatcher
In the Suisun Marsh/North San Francisco Bay EMZ, restore a minimum of 7,000 acres of Saline Emergent Wetland by restoring tidal action in the Suisun Bay and Marsh Ecological Management Unit (including 200 acres of muted tidal marsh along the Contra Costa shoreline) and a cumulative total of 1,000 acres in the Napa River, Sonoma Creek, Petaluma River, and San Pablo Bay Ecological Management Units. Restore high marsh and high-marsh upland transition habitat in conjunction with restoration of saline emergent wetland. Develop cooperative programs to acquire, in fee-title or through a conservation easement, the land needed for tidal restoration, and complete the needed steps to restore the wetlands to tidal action. Begin aggressive program	Saline Emergent Wetland	All Central Valley salmonids, delta smelt, longfin smelt, Sacramento splittail, Suisun song sparrow, San Pablo song sparrow, California Clapper rail, California black rail, Suisun thistle, soft bird's beak, Point Reyes bird's-beak, salt marsh harvest mouse, Suisun ornate shrew, San Pablo California vole, Suisun aster, salt marsh common yellow throat

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
of control of non-native plant species that are threatening the known populations of Suisun thistle, Suisun Marsh aster, soft bird's beak, and Point Reyes bird's beak. - Bring into protection at least 25% of currently occupied, but unprotected Suisun Marsh aster habitat, spread throughout the North, East, South Delta and Napa River Ecological Units, and ensure appropriate management. -Expand suitable tidal slough habitat for Suisun Marsh aster by 25 linear miles. -Identify at least three protected and managed sites for introduction of at least three additional populations of Suisun thistle; increase overall population size at least threefold. -Establish at least one new population of soft bird's beak with high likelihood of success in restored habitat in each of the Suisun Bay and Marsh EMU, the Napa River EMU, and the Petaluma River EMU. -Establish at least one new Point Reyes bird's beak population in the Petaluma River and San Pablo Bay EMUs.		
Restore suitable, occupied slough edge habitat for delta mudwort and delta tule pea by at least 5 miles in the Suisun Bay and Marsh EMU and by at least 10 miles in the Napa River EMUs. Bring at least 25% the currently existing but unprotected occurrences of delta mudwort and delta tule into protection through purchase or conservation agreement, and ensure appropriate management.	Saline Emergent Wetland	all Central Valley salmonids, delta smelt, Sacramento splittail, California black rail, Mason's lilaeopsis, delta mudwort, delta tule pea
In the Suisun Marsh/North San Francisco Bay Ecological Management Zone, restore and manage a minimum of 500 acres of seasonal wetland, and improve management of a minimum of 7,000 acres of existing, degraded seasonal wetland in a manner that provides suitable habitat for salt marsh harvest mouse, San Pablo California vole, and Suisun ornate	Seasonal Wetlands	salt marsh harvest mouse, San Pablo California vole, Suisun ornate shrew

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
shrew.		
Restore a minimum of 400 acres of tidal perennial aquatic habitat in the Suisun Marsh/North San Francisco Bay Ecological Management Zone.	Tidal Perennial Aquatic Habitat	all Central Valley salmonids, delta smelt, Sacramento splittail, longfin smelt
Develop a cooperative program to acquire, manage and restore 100 acres of vernal pools and 500 to 1,000 acres of adjacent buffer areas in the Suisun Marsh/North San Francisco Bay EMZ. Protect all existing known occurrences of Crampton's tuctoria through conservation easement or purchase from willing sellers (including CNDDB Element Occurrence #2 and any new populations that are found). Identify at least two protected and managed sites for introduction of additional populations; begin introduction and monitor for success. Manage at least 250 acres of the ERP target for vernal pools near the Jepson Prairie preserve as suitable habitat for alkali milk vetch. Establish new populations on protected and appropriately managed lands. Bring 50% of currently unprotected, existing populations into protection through purchase or conservation agreement, and ensure appropriate management.	Vernal Pools	Delta green ground beetle, Crampton's tuctoria, Alkali milk- vetch
Stressors Reduction		
Develop a program to consolidate, screen, or eliminate 25% of the unscreened diversions in Suisun Marsh.	Water Diversions	all R and r covered fish
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from	oxygen depleting substances,	Salmonids, Sacramento splittail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
concentrated animal feeding operations. (from Phase II Report)	nutrients, TOC, ammonia	
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	turbidity/ sedimentation	Salmonids
Conduct the necessary research to determine no adverse ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon.	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
• Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs		
Conduct the following selenium work: • Conduct selenium research to fill data gaps in order to refine regulatory goals of source control actions; determine bioavailability of selenium under several scenarios (from Phase II Report). • Evaluate and, if appropriate, implement real-time management of selenium discharges (from Phase II Report). • Expand and implement source control, treatment, and reuse programs (from Phase II Report). • Coordinate with other programs; e.g., recommendations of San Joaquin Valley Drainage Implementation Program, CVPIA for retirement of lands with drainage problems that are not subject to correction in other ways (from Phase II Report). • Support development and implementation of TMDL for selenium in the San Joaquin River watershed (focus on Grassland area).	selenium	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper. • Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon
Sacramento River Basin		
Ecological Processes		
Construct a network of channels totaling 20 miles within the Sutter and Yolo Bypasses that effectively drains flooded lands after floodflows stop entering the bypasses. The channels should be designed to allow juvenile anadromous and resident fish to move from rearing and	Natural Floodplain and Flood Processes	Central Valley chinook salmon and steelhead, Sacramento splittail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
migratory areas. Develop and begin implementation of a program in the Yolo Basin to restore channel-floodplain connectivity and floodplain processes. Design natural stream channel configurations and expand floodplain overflow areas in the lower Cache and Putah Creek floodplains, as well as in channels and sloughs of the upper Yolo Bypass to provide connections with the Delta in a manner consistent with flood control requirements. Diversions (water source) into the Yolo Basin should not result in direct or indirect adverse impacts to salmonids. Project design features would include sloughs and creek channels, setback levees, and wetlands, where feasible and consistent with flood protection.		
Develop and implement temperature management programs within major tributaries in the Sacramento River Basin. The goal of the programs should be achievement of the ERP temperature targets for salmon and steelhead. The programs shall include provisions to: a) develop accurate and reliable water temperature prediction models; b) evaluate the use of minimum carryover storage levels and other operational tools; c) evaluate the use of new facilities such as temperature control devices; and d) recommend operational and/or physical facilities as a long-term solution.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead
Develop and implement a program to address the thermal impacts of irrigation return flows in the Sacramento River Basin. The goal of the program should be achieve Basin Plan objectives for water temperature. The program should include provisions to: a) identify locations of irrigation return flows with thermal impacts; b) develop measures to avoid or eliminate thermal impacts from irrigation return flows; and c) prioritize problem sites based on impacts to chinook salmon and steelhead. If feasible, proceed with implementation of some or all	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
actions to address thermal impacts of irrigation return flows.		
Design and begin implementation of an ecologically based streamflow regulation plan for Yuba River, Butte Creek, Big Chico Creek, Deer Creek, Mill Creek , Antelope Creek, Battle Creek, Cottonwood Creek, and Clear Creek.	Central Valley Streamflow	all Central Valley salmonids, green sturgeon, Sacramento splittail, western yellow-billed cuckoo, yellow warbler, Least Bell's vireo
Complete a fluvial geomorphic assessment of coarse sediment supply needs and sources to maintain, improve, or supplement gravel recruitment and natural sediment transport processes linked to stream channel maintenance, erosion and deposition, maintenance of fish spawning areas, and the regeneration of riparian vegetation. Develop and implement a program to reduce erosion and maintain gravel recruitment on at least one tributary within each EMZ in the Sacramento River Basin.	Coarse Sediment Supply	all races of chinook salmon, steelhead, splittail, delta smelt, green sturgeon, bank swallow, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, valley elderberry longhorn beetle, Norther California black walnut
Develop floodplain management plans, including feasiblility studies to construct setback levees, to restore and improve opportunities for rivers to inundate their floodplain on a seasonal basis for at least one tributary within each of the EMZs in the Sacramento River Basin. Among the areas to be included are the lower 10 miles of Clear Creek, Antelope Creek, and Deer Creek, and the lower reach of Cottonwood Creek.	Natural Floodplain and Flood Processes	all Central Valley salmonids, Sacramento splittail, delta smelt, longfin smelt, western yellow-billed cuckoo, California yellow warbler, Least Bell's vireo, San Joaquin Valley woodrat, Valley elderberry long-horn beetle, Northern California black walnut
Protect 15,000 acres within the Inner River Zone areas between Red Bluff and Colusa reaches within identified the Sacramento River Conservation Area. Establish between 3 and 5 habitat preserves for bank swallows along the upper reaches of the Sacramento River capable of supporting 5000 bank swallow burrows between the towns of Colusa and Red Bluff.	Stream Meander	all Central Valley salmonids, steelhead, western yellow-billed cuckoo, Least Bell's vireo, Swainson's hawk, Valley elderberry longhorn beetle, bank swallow

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Habitats		
In the American River Basin, Butte Basin, Colusa Basin, Feather River/Sutter Basin EMZs, cooperatively enhance at least 15 to 25% of the ERPP target for wildlife friendly agricultural practices.	Agricultural Lands	greater sandhill crane, giant garter snake, Swainson's hawk
Develop and implement a program to establish, restore, and maintain riparian habitat to improve floodplain habitat, salmonid shaded riverine aquatic habitat, and instream cover along at least one tributary within each of the following Ecological Management Zones: American River Basin, Butte Basin, Colusa Basin, Cottonwood Creek, Feather River/Sutter Basin, North Sacramento Valley, Sacramento River, and Yolo Basin. While restoring habitat conditions in the American River EMZ, maintain continuous corridors of suitable riparian habitat for valley elderberry longhorn beetle. Protect existing known occurrences of northern California black walnut native stands through conservation easement or purchase. Identify at least 3 protected and managed sites for introduction of additional populations of northern California black walnut; begin introduction and monitor for success. Population creation should be part of a broader effort to restore riparian areas which historically contained walnut.	Riparian and Riverine Aquatic Habitats	all Central Valley salmonids, western yellow-billed cuckoo, Valley elderberry long-horn beetle, California yellow warbler, Least Bell's vireo, little willow flycatcher
In the Cottonwood Creek EMZ, complete (1) long-term agreements with local landowners to establish, restore, and maintain riparian communities along 25 percent of the upper and 25 percent of the lower reaches of Cottonwood Creek, and (2) the development of a comprehensive watershed management plan that supports local land use	Riparian and Riverine Aquatic Habitats	all Central Valley salmonids, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, little willow flycatcher

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decisions to protect existing riparian and restore lost riparian.		
Restore 2 miles of the 10 mile target of riparian habitat restoration along the lower reaches of each of the following tributaries: Battle, Clear, Deer, Mill, Butte, Big Chico, Antelope, Feather, Yuba, and Bear Rivers.	Riparian and Riverine Aquatic Habitats	all Central Valley salmonids, California yellow warbler, western yellow-billed cuckoo, little willow flycatcher, Least Bell's vireo, Valley elderberry long-horn beetle
Implement 25 percent of the ERP target for enhancing, protecting, and restoring seasonal wetlands in the following EMZs: American River Basin, Butte Basin, Colusa Basin, and Feather River/Sutter Basin.	Seasonal Wetlands	greater sandhill crane, Swainson's hawk, giant garter snake
Stressors Reduction		
Develop and implement a program to address inadequate instream flows for steelhead and chinook salmon on streams within Sacramento River Basin tributaries. Where appropriate provide adequate flows for Sacramento splittail and green sturgeon.	Dams and Other Structures	all Central Valley salmonids, green sturgeon, Sacramento splittail
Provide unimpeded upstream and downstream passage for salmon and steelhead on Sacramento River Basin tributaries.	Dams and Other Structures	all Central Valley salmonids, green sturgeon, Sacramento splittail
On Big Chico Creek, repair the Lindo Channel weir and fishway at the Lindo Channel box culvert at the Five Mile Diversion to improve upstream fish passage.	Dams and Other Structures	all Central Valley salmonids
Develop and implement a solution to improve passage of upstream migrant adult fish and downstream migrant juvenile fish Battle Creek.	Dams and Other Structures	all Central Valley salmonids, green sturgeon
Evaluate the feasibility of constructing fish passage facilities at the Grays Bend-Old River-Freemont weir complex at the upper end of the Yolo Bypass.	Dams and Other Structures	all Central Valley salmonids

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Develop a program to reduce or eliminate fish stranding in the Sacramento, Feather and Yuba rivers and the Colusa Basin drain and Sutter Bypass in the active stream channels, floodplains, shallow ponds and borrow areas. Develop protocols for ramping flow reductions. Conduct surveys of stranding under a range of flow conditions and recommend solutions.	Stranding	all Central Valley salmonids, green sturgeon, lonfin smelt, Sacramento splittail
Install positive barrier fish screens on all diversions greater than 250 cfs in all EMZs and 25% of all smaller unscreened diversions in the Sacramento River Basin. Among those diversions to be screened are the DWR Pumping Plants and 50% of small diversion located on east side of Sutter Bypass, the Bella Vista diversion in the upper Sacramento River near Redding, East-West Diversion Weir, Weir 5, Weir 3, Guisti Weir and Weir 1 in the Sutter Bypass, White Mallard Dam, Morton Weir, Drivers Cut Outfall and Colusa Shooting/Tarke Weir Outfall and associated diversion screens in the Butte Sink..	Water Diversions	all R and r covered fish
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report)	oxygen depleting substances, nutrients, TOC, ammonia	Salmonids, Sacramento splittail
Actions to minimize or eliminate inter-substrate low dissolved oxygen conditions in salmonid spawning and rearing habitat, especially in the Mokelumne, Cosumnes, American, Merced, Tuolumne, and Stanislaus Rivers (from Phase II Report and Water Quality Program Plan): • Develop inter-substrate DO testing for salmonid spawning and rearing habitat. • Conduct comprehensive surveys to assess the extent and severity of inter-substrate low DO conditions.	dissolved oxygen, turbidity/ sedimentation	Salmonids

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
• Develop and begin implementing appropriate best management practices (BMPs), including reducing anthropogenic fine sediment loads, to minimize or eliminate inter-substrate low DO conditions.		
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	turbidity/ sedimentation	Salmonids
Conduct the necessary research to determine no adverse ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following mercury evaluation and abatement work in the Cache Creek watershed (from Phase II Report): • Support development and implementation of TMDL for mercury.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
• Determine bioaccumulation effects in creek and Delta. • Source, transport, inventory, mapping and speciation of mercury. • Participate in Stage 1 remediation (drainage control) of mercury mines as appropriate. • Determine sources of high levels of bioavailable mercury		
Conduct the following mercury evaluation and abatement work in the Sacramento River (from Phase II Report): • Determine, inventory, and sources of high levels of bioavailable mercury • Refine mercury models. • Participate in remedial activities.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon. • Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper. • Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon
San Joaquin River Basin		
Ecological Processes		
Develop and implement temperature management programs within major tributaries in the San Joaquin River Basin. The goal of the programs should be achievement of the ERP temperature targets for salmon and steelhead. The programs shall include provisions to: a) develop accurate and reliable water temperature prediction models; b) evaluate the use of minimum carryover storage levels and other operational tools; c) evaluate the use of new facilities such as temperature control devices; and d) recommend operational and/or	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
physical facilities as a long-term solution.		
Develop and implement a program to address the thermal impacts of irrigation return flows in the San Joaquin River Basin. The goal of the program should be achieve Basin Plan objectives for water temperature. The program should include provisions to: a) identify locations of irrigation return flows with thermal impacts; b) develop measures to avoid or eliminate thermal impacts from irrigation return flows; and c) prioritize problem sites based on impacts to chinook salmon and steelhead. If feasible, proceed with implementation of some or all actions to address thermal impacts of irrigation return flows.	Central Valley Stream Temperatures	Central Valley fall/late fall-run chinook salmon and steelhead
Complete a fluvial geomorphic assessment of coarse sediment supply needs and sources to maintain, improve, or supplement gravel recruitment and natural sediment transport processes linked to stream channel maintenance, erosion and deposition, maintenance of fish spawning areas, and the regeneration of riparian vegetation. Develop and implement a program to reduce erosion and maintain gravel recruitment on at least one tributary within each EMZ within the San Joaquin River Basin. In the East San Joaquin Basin EMZ, complete fluvial geomorphic assessments on all tributaries.	Coarse Sediment Supply	all races of chinook salmon, steelhead, splittail, delta smelt, green sturgeon, bank swallow, California yellow warbler, western yellow-billed cuckoo, Least Bell's vireo, valley elderberry longhorn beetle, Northern California black walnut
Develop floodplain management plans, including feasiblility studies to construct setback levees, to restore and improve opportunities for rivers to inundate their floodplain on a seasonal basis for at least one tributary within each of the EMZs in the San Joaquin River Basin. Among the areas to be included are at least 10 miles of stream channel in the West San Joaquin EMZ.	Natural Floodplain and Flood Processes	all Central Valley salmonids, Sacramento splittail, delta smelt, longfin smelt, western yellow-billed cuckoo, California yellow warbler, Least Bell's vireo, San Joaquin Valley woodrat, Valley elderberry long-horn beetle, Northern California black walnut
Develop a cooperative program to restore salmonid spawning and rearing habitat in the Tuoloumne, Stanislaus, and Merced Rivers that	Stream Meander (also Predation and	Central Valley fall/late fall-run chinook salmon, steelhead, western yellow-billed

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
includes the following elements: (1) reconstructing channels at selected sites by isolating or filling in inchannel gravel extraction areas; (2) increasing natural meander by removing riprap and relocating other structures that impair stream meander; and (3) restoring more natural channel configurations to reduce salmonid predator habitat and improve migration corridors.	Competition)	cuckoo, California yellow warbler, bank swallow
Restore and maintain a defined stream-meander zone and increase floodplain habitat on the San Joaquin River between Vernalis and the mouth of the Merced River.	Stream Meander	Sacramento splittail, Central Valley fall/late fall-run chinook salmon, steelhead, bank swallow
Establish a river meander corridor between the Chowchilla Bypass and Mendota Pool to expand the floodway corridor to convey increased anticipated floodflows and restore floodplain habitat.	Stream Meander	Sacramento splittail, Central Valley fall/late fall-run chinook salmon, steelhead, bank swallow
Habitats		
In the San Joaquin River and West San Joaquin Basin EMZs, cooperatively enhance at least 15 to 25% of the ERPP target for wildlife friendly agricultural practices	Agricultural Lands	Swainson's hawk, greater sandhill crane, giant garter snake
In the West San Joaquin Basin EMZ, restoring or create 100 acres of fresh emergent wetland habitat.	Fresh Emergent Wetland	giant garter snake
In the West San Joaquin Basin EMZ, restore or enhance 1,000 acres of perennial grassland associated with existing or proposed wildlife corridors, wetlands, or floodplain habitats.	Perennial Grasslands	Swainson's hawk, greater sandhill crane
Develop and implement a program to establish, restore, and maintain riparian habitat to improve floodplain habitat, salmonid shaded riverine aquatic habitat and instream cover along at least one tributary within the	Riparian and Riverine Aquatic	Central Valley steelhead, fall/late fall-run chinook salmon, western yellow-billed cuckoo, Valley elderberry long-horn beetle,

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
East San Joaquin and San Joaquin River EMZs.	Habitats	riparian brush rabbit, California yellow warbler, Least Bell's vireo, little willow flycatcher, delta coyote thistle
Implement 25 percent of the ERP target for diverse, self-sustaining riparian community for all EMZs in the San Joaquin River Basin. Bring at least three of the currently existing but unprotected delta coyote thistle occurrences into protection through purchase or conservation agreement, and ensure appropriate management. Increase suitable habitat for delta coyote thistle by at least 20% and the number of populations and individuals by at least 10% through habitat management and protection. Establish two new riparian brush rabbit habitat preserves within the historical range of the species. Protect and enhance a minimum of 150 contiguous acres of mature, shrub-rich riparian forest and associated highwater refugia on the San Joaquin River, between the Merced River confluence and Vernalis, and on each of the east-side tributaries (the Stanislaus, Tuolumne and Merced rivers) for habitat values and as potential riparian brush rabbit re-introduction sites.	Riparian and Riverine Aquatic Habitats	San Joaquin Valley woodrat, delta coyote thistle, western yellow-billed cuckoo, Valley elderberry long-horn beetle, riparian brush rabbit
Stressors Reduction		
Develop and implement a program to address inadequate instream flows for steelhead and chinook salmon on streams within San Joaquin River tributaries. Where appropriate provide adequate flows for Sacramento splittail and green sturgeon.	Dams and Other Structures	steelhead, fall/late fall-run chinook salmon, green sturgeon, Sacramento splittail
Provide unimpeded upstream and downstream passage for salmon and	Dams and Other	steelhead, fall/late fall-run chinook salmon

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
steelhead on San Joaquin River Basin tributaries.	Structures	
Initiate a feasibility study of restoring steelhead migration into upper watershed areas (e.g., upstream of major low-elevation dams) in at least one San Joaquin River Basin EMZ Tributary.	Dams and Other Structures	steelhead
Install positive barrier fish screens on all diversions greater than 250 cfs in all EMZs and 25% of all smaller unscreened diversions in the San Joaquin River Basin. Among those diversions to be screened are the El Solyo, Patterson, and West Stanislaus irrigation district diversions.	Water Diversions	all R and r covered fish
Actions to minimize or eliminate low dissolved oxygen conditions (DO sag) in lower San Joaquin River near Stockton (from Phase II Report): • Complete studies of causes for DO sag in San Joaquin River near Stockton. • Define and implement corrective measures for DO sag. • Finalization of investigation of methods to reduce constituents that cause low DO for inclusion in total maximun daily load (TMDL) recommendation by the Central Valley RWQCB. • Finalization of Basin Plan Amendment and TMDL for constituents that cause low DO in the San Joaquin River. • Implement appropriate source and other controls and other management practices, as recommended in the TMDL, to reduce anthropogenic oxygen depleting substances loadings and minimize or eliminate low DO conditions.	dissolved oxygen, oxygen depleting substances, nutrients, total organic carbon (TOC)	Salmonids, delta smelt, Sacramento splittail, longfin smelt, green sturgeon
Develop, implement, and support measures to reduce pollutant (oxygen depleting substances, nutrients, and ammonia) discharges from concentrated animal feeding operations. (from Phase II Report)	oxygen depleting substances, nutrients, TOC, ammonia	Salmonids, Sacramento splittail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Actions to minimize or eliminate inter-substrate low dissolved oxygen conditions in salmonid spawning and rearing habitat, especially in the Mokelumne, Cosumnes, American, Merced, Tuolumne, and Stanislaus Rivers (from Phase II Report and Water Quality Program Plan): • Develop inter-substrate DO testing for salmonid spawning and rearing habitat. • Conduct comprehensive surveys to assess the extent and severity of inter-substrate low DO conditions. • Develop and begin implementing appropriate best management practices (BMPs), including reducing anthropogenic fine sediment loads, to minimize or eliminate inter-substrate low DO conditions.	dissolved oxygen, turbidity/ sedimentation	Salmonids
Assess the ecological effects of low DO conditions in Suisun Marsh due to adding oxygen-depleted water from anthropogenic sources (from Water Quality Program Plan).	dissolved oxygen, oxygen depleting substances, nutrients, TOC	Delta smelt, Sacramento splittail, longfin smelt, salmonids, green sturgeon
Encourage regulatory activity to reduce discharge of oxygen reducing substances and nutrients by unpermitted dischargers. (from Phase II Report)	dissolved oxygen, oxygen depleting substances, nutrients	Salmonids, Sacramento splittail
Actions to reduce fine sediment loading to streams, especially Tuolumne, Merced, Stanislaus, Cosumnes, Napa, and Petaluma Rivers, and Sonoma Creek, due to human activities (from Phase II Report and Water Quality Program Plan): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban stormwater runoff, and other	turbidity/ sedimentation	Salmonids

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
specific sites. • Implement stream restoration and revegetation work. • Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.		
Conduct the necessary research to determine no adverse ecological/biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta estuary and its watershed.	mercury	Salmonids, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following pesticide work (from Phase II Report): • Develop diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations. • Support development and implementation of a TMDL for diazinon. • Develop BMPs for dormant spray and household uses. • Determine the ecological significance of pesticide discharges. • Support implementation of BMPs. • Monitor to determine effectiveness of BMPs	carbofurans, chloropyrifos, diazinon	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, possibly other species depending on type of actions and specific sites.
Conduct the following selenium work: • Conduct selenium research to fill data gaps in order to refine regulatory goals of source control actions; determine bioavailability of selenium under several scenarios (from Phase II Report). • Evaluate and, if appropriate, implement real-time management of selenium discharges (from Phase II Report). • Expand and implement source control, treatment, and reuse programs (from Phase II Report). • Coordinate with other programs; e.g., recommendations of San Joaquin Valley Drainage Implementation Program, CVPIA for	selenium	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
retirement of lands with drainage problems that are not subject to correction in other ways (from Phase II Report). • Support development and implementation of TMDL for selenium in the San Joaquin River watershed (focus on Grassland area).		
Conduct the following actions in reduce organochlorine pesticide inputs to streams (from Phase II Report): • Participate in implementation of USDA sediment reduction program. • Implement sediment reduction BMPs on agricultural lands and other specific sites. • Implement BMPs for urban/industrial stormwater runoff and discharges to reduce PCB and organochlorine pesticides.	chlorodane, DDT, PCBs, toxaphene	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake
Conduct the following trace metals work (from Phase II Report): • Determine spatial and temporal extent of metal pollution. • Determine ecological significance and extent of copper contamination. • Evaluate impacts of other metals such as cadmium, zinc, and chromium. • Participate in Brake Pad Partnership to reduce introduction of copper. • Partner with municipalities on evaluation and implementation of stormwater control facilities. • Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	cadmium, copper, zinc	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon, giant garter snake, salt marsh harvest mouse, California clapper rail, California black rail
Conduct the following unknown toxicity work (from Phase II Report): • Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.	toxicity of unknown origin	Salmonids, delta smelt, longfin smelt, Sacramento splittail, green sturgeon

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
Research Milestones		
Develop and implement a comprehensive monitoring, assessment and research program (CMARP) for terrestrial and aquatic habitats and species populations acceptable to the fish and wildlife agencies. Conduct rangewide surveys for all "R" and "r" covered plants and animals in the MSCS Focus Area.		
Develop and begin implementation of a study to determine appropriate conditions for the germination and establishment of riparian woody plants along the Sacramento River and San Joaquin River. Complete development of a cooperative program to plant vegetation on unvegetated riprapped banks consistent with flood control requirements.		
Conduct a study to investigate the effects of the road through Olcott Lake on vernal pool hydrology and impacts on vernal pool species.		
Conduct instream flow studies to determine the flows necessary to support all life stages of anadromous and estuarine fish species.		
Conduct an investigation of in-channel structures that focuses on the following issues: (1) habitat suitability for both predator and prey fishes; (2) predator-prey interactions; and (3) recommendations for reducing predation on juvenile salmonids.		
Conduct experimental introductions of Sacramento perch into nontidal perennial aquatic habitats		
Assess the impact of hatchery practices on naturally spawning		

Milestones	Ecosystem Element/Water Quality Parameter	MSCS "R" and "r" Covered Species that would Benefit from Achieving Milestones
populations of chinook salmon and steelhead and operate hatcheries in a manner consistent with safe genetic practices that will maintain genetic integrity of all Central Valley anadromous salmonid populations.		
Through the use of existing, expanded, and new programs, monitor adult anadromous salmonid returns to each watershed within the MSCS focus area. Monitoring techniques, data compilation and analysis, and reporting should be standardized among researchers and watersheds to the greatest extent possible.		