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MULTI SPECIES CONSERVATION STRATEGY MILESTONE 26 -- ROLLED UP SUMMARY							
MILESTONE 26 -- 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 maximum 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.	PROJECTS REVIEWED -- ERP-99-B16, ERP-01-N61, ERP-02D-P50, ERP-02D-P51, ERP-02D-P63		SUMMARY -- The results from the studies funded in 1999 (ERP-99-B16) and 2001 (ERP-01-N61) have provided substantial information on the sources and causes of low dissolved oxygen (DO sag) in the San Joaquin River. This was further validated in the Peer Review Report from July, 2002. These studies and the Peer Review recommendations provide the basis for a plan of further studies upstream, construction of an aeration demonstration project, and other pilot projects. The studies provided the basis for a stakeholder implementation plan and progress on development of the TMDL for the RWQCB. A draft Basin Plan Amendment will be available for public review in April 2004 and scheduled for consideration for adoption by the CVRWQCB in July, 2004. The Basin Plan Amendment will propose a phased approach to correct the DO problem. The phased approach includes a demonstration aeration project in the DWSC, further study of upstream sources, and control of Stockton WTP discharges.		SUMMARY continued - The aeration project is considered to be an interim control solution while more detailed studies on the upstream sources of oxygen depleting substances are completed. A final Basin Plan Amendment for the DO will be completed in 2008. The remaining studies on sources and causes (contract under development) and the modeling projects (ERP-02D-P50 and ERP-02D-P51) should be completed in 2007. In the interim, dissolved oxygen conditions should improve following completion and activation of the aeration demonstration project (2005). The final implementation solution will be identified in 2008 as part of the final TMDL. . There are other projects under different grant programs (SWRCB Prop 50 Grants) that contribute to this milestone but were not evaluated. The dissolved oxygen issue and the current and future actions will affect the SJR in both the Delta and San Joaquin River regions.	AGENCY NOTES --	NOTES CONT'D --

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 26 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
26	Delta	SR	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 maximum 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.		26 A. Status of studies determining the causes for DO sag in the San Joaquin River near Stockton.	ERP-99-B16	Jul-99	Jun-03	866,408		866,408	Department of Water Resources	Peggy Lehman		Determination of the Causes of Dissolved Oxygen Depletion in the San Joaquin River	This project is primarily monitoring and research. The purpose of the project was to determine the relative importance of natural and anthropogenic oxygen depleting substances in the DWSC in fall. The primary emphasis of the project was to investigate (through monitoring and research) the sources and causes of the DO sag. <i>Project is considered complete; all reports except one are available on sjrtmdl.org.; final report was released in March and should have been recently transmitted to the USBR as per Charlie Kratzer, USGS.</i>

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
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26	Delta	SR			26 A. Status of studies determining the causes for DO sag in the San Joaquin River near Stockton.	ERP-01-N61	Jun-01	Jul-04	1,645,000	107,000	1,752,000	G. Fred Lee and Associates	G. Fred Lee		This project is comprised of several contacts for different tasks: ERP-01-N61-01:Project Coordination, Integration, and Technical Administration(G. Fred Lee); ERP-01-N61-02:SJR Diversion Data and west-side Sources of Nutrients (Tulloch Engineering); ERP-01-N61-03:City of Stockton Water Quality Sampling(City of Stockton); ERP-01-N61-04:Sediment Deposition Rates(UOP); ERP-01-N61-05:Aeration Technology Performance Evaluation(Jones and Stokes); ERP-01-N61-06:Downstream Tidal Exchange and Residence Time(Jones and Stokes); ERP-01-C61-1-D:Calibration of Upstream Water Quality Model, DSM2 and Use of Auxiliary Flow Pumps (Hutton/Nadar, DWR); ERP-01-C61-2-D:Sources and Causes of Algal Biomass in SJR(Peggy Lehman, DWR); ERP-01-C61-3-D:IEP Data Management(Karl Jacobs, DWR); ERP-01-C61-4-D:Monitoring of Nutrients and Oxygen Depleting Substances in the SJR Upstream of Vernalis (USGS-Note: same as ERP-01-C06 #3)	<i>This project was awarded as a directed action and considered as next phase funding for ERP-99-B16; the project continued to investigate and define the sources and causes of DO depletion in the Deep Water Ship Channel. The project also addressed the relationship of the DO sag to flow, water diversions, and the operation of the temporary barriers in Old River. The project included technical evaluations of possible solutions to manage the low-DO problems. The results of these components projects were evaluated by an external science panel and discussed at an external Peer Review Workshop in May 2002. The results of this investigation and the Peer Review Report served as the basis for dischargers and the RWQCB to formulate a phased approach that would lead to the development of a final TMDL and implementation plan. Additional data gaps and tasks were identified and have been addressed in subsequent projects and proposals. All tasks for this project are complete except for ERP-01-C61-2-D scheduled for completion July 2004.</i>
26	Delta	SR			26 A. Status of studies determining the causes for DO sag in the San Joaquin River near Stockton.	ERP-02D-P50	Nov-03	Mar-06	500,000		500,000	HydroQual, Inc.	Andy Thuman		San Joaquin River Dissolved Oxygen Depletion Modeling	The goal of this project is to provide a water quality model for the development of a TMDL for the Stockton Deep Water Ship Channel (DWSC). The conceptual model for the project includes the identification of sources as well as river water quality mechanisms in the DWSC and the upstream river. This model used with existing and new data will be helpful in refining and validating prior studies on sources and causes. <i>Project has started but is not complete.</i>
26	Delta	SR			26 A. Status of studies determining the causes for DO sag in the San Joaquin River near Stockton.	ERP-02D-P51	Nov-03	Jun-06	863,732	0	863,732	UC Davis	Geoffrey Schladow		Hydrodynamics and Oxygen Modeling of the Stockton Deep Water Ship Channel	<i>This study will be a parallel (and somewhat different approach) effort to the on-going HydroQual modeling project (ERP-02D-P50). The Science Program believes the UCD project will have greater implications for overall Delta hydrodynamics as well as the Stockton Deep Water Ship Channel. The objective of this project is to provide a better understanding of how hydrodynamics and biogeochemical processes interact to produce reductions in DO concentrations in the DWSC. This project will address management strategies to eliminate low oxygen conditions.</i>
26	Delta	SR			26 A. Status of studies determining the causes for DO sag in the San Joaquin River near Stockton.	ERP-02D-P63	Mar-03		6,886,960	1,083,463	7,970,424	San Joaquin Valley Drainage Authority	Dan Nelson		Monitoring and Investigations of the San Joaquin River and Tributaries Related to Dissolved Oxygen	This directed action study is focused on understanding the sources of oxygen-consuming materials in the SJR upstream of the DWSC. The purpose of this study is to provide a comprehensive understanding of the sources and fate of oxygen-consuming materials in the SJR watershed between Channel Point and Lander Avenue.

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26	Delta	SR			26 B. Status of defining and implementing corrective measures for DO Sag	ERP-99-B16	Jul-99	Jun-03	866,408		866,408	Department of Water Resources	Peggy Lehman		Determination of the Causes of Dissolved Oxygen Depletion in the San Joaquin River	The primary emphasis of the project was to investigate (through monitoring and research) the sources and causes of the DO sag in the Stockton deep Water Ship Channel. Task 4 of this project includes a preliminary evaluation of management alternatives for the DO sag. These are: 1) control of ammonia from the RWCF, 2) reduction of upstream non-point loads of oxygen depleting substances 3) flow and channel geometry controls, and 4) aeration devices. This plan formed the basis for subsequent study of these control measures. <i>Project is considered complete; all reports except one are available on sjrtmdl.org.; final report was released in March and should have been recently transmitted to the USBR as per Charlie Kratzer, USGS.</i>
26	Delta	SR			26 B. Status of defining and implementing corrective measures for DO Sag	ERP-01-N61	Jun-01	Jul-04	1,645,000	107,000	1,752,000	G. Fred Lee and Associates	G. Fred Lee		This project is comprised of several contracts for different tasks: ERP-01-N61-01:Project Coordination, Integration, and Technical Administration(G. Fred Lee); ERP-01-N61-02:SJR Diversion Data and west-side Sources of Nutrients (Tulloch Engineering); ERP-01-N61-03:City of Stockton Water Quality Sampling(City of Stockton); ERP-01-N61-04:Sediment Deposition Rates(UOP); ERP-01-N61-05:Aeration Technology Performance Evaluation(Jones and Stokes); ERP-01-N61-06:Downstream Tidal Exchange and Residence Time(Jones and Stokes); ERP-01-C61-1-D:Calibration of Upstream Water Quality Model, DSM2 and Use of Auxiliary Flow Pumps (Hutton/Nadar, DWR); ERP-01-C61-2-D:Sources and Causes of Algal Biomass in SJR(Peggy Lehman, DWR); ERP-01-C61-3-D:IEP Data Management(Karl Jacobs, DWR); ERP-01-C61-4-D:Monitoring of Nutrients and Oxygen Depleting Substances in the SJR Upstream of Vernalis (USGS-Note: same as ERP-01-C06 #3)	<i>The project included technical evaluations of possible solutions to manage the low-DO problems. This study resulted in substantial progress towards completion of this milestone. The results from this project showed that a primary source for oxygen demand was discharges of algae from Mud and Salt Slough upstream of the DWSC and from discharges of ammonia effluent from the City of Stockton WTP. Technical evaluation from this project identified aeration in the DWSC as a technical and economically feasible way to control DO depletions below the water quality standard. The project concludes increased flow would improve the DO sag. The ability to require increases in flow is not directly within the regulatory authority of the CVRWQCB and therefore not considered a feasible control measure at this time. All tasks for this project complete except for ERP-01-C61-2-D scheduled for completion July 2004.</i>
26	Delta	SR			26 B. Status of defining and implementing corrective measures for DO Sag	ERP-02D-P50	Nov-03	Mar-06	500,000		500,000	HydroQual, Inc.	Andy Thuman		San Joaquin River Dissolved Oxygen Depletion Modeling	This project will provide a water quality model for the development of a TMDL for the Stockton Deep Water Ship Channel (DWSC) to help predict how DO will respond by controlling other variables (or methods to reduce constituents). These variables are 1) control of nutrients sources, 2) control of point sources, 3) flow management (HORBs), and 4) aeration. This milestone will not be 100 percent complete until 1) the aeration demonstration project has been installed and operated for performance evaluation, 2) completion of the Upstream Monitoring Studies (recently awarded), and 2) more information on the effectiveness of source control measures can be obtained. The model and resulting Information won't be available for inclusion in the "phased" or interim TMDL scheduled for July 2004 but will be used in the final TMDL for 2008 and the completion of this milestone. <i>Project has started but is not complete.</i>
26	Delta	SR			26 B. Status of defining and implementing corrective measures for DO Sag	ERP-02D-P51	Nov-03	Jun-06	863,732	0	863,732	UC Davis	Geoffrey Schladow		Hydrodynamics and Oxygen Modeling of the Stockton Deep Water Ship Channel	<i>The model and resulting information won't be available for inclusion in the "phased" or interim TMDL scheduled for July 2004 but will be used in the final TMDL for 2008 and the completion of this milestone. As this project is more research oriented rather than management oriented, the results are less likely to contribute to the development of the TMDL when compared to the Hydroqual modeling study (ERP-02D-P50). The benefits of this study have broader implications for Delta hydrodynamics and may also be linked to other Delta milestones where hydrodynamic studies are needed.</i>

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26	Delta	SR			26 C. Status of investigation of methods to reduce constituents that cause low DO for inclusion in total maximum daily load recommendation by the Central Valley RWQCB.	ERP-01-N61	Jun-01	Jul-04	1,645,000	107,000	1,752,000	G. Fred Lee and Associates	G. Fred Lee		This project is comprised of several contracts for different tasks: ERP-01-N61-01:Project Coordination, Integration, and Technical Administration(G. Fred Lee); ERP-01-N61-02:SJR Diversion Data and west-side Sources of Nutrients (Tulloch Engineering); ERP-01-N61-03:City of Stockton Water Quality Sampling(City of Stockton); ERP-01-N61-04:Sediment Deposition Rates(UOP); ERP-01-N61-05:Aeration Technology Performance Evaluation(Jones and Stokes); ERP-01-N61-06:Downstream Tidal Exchange and Residence Time(Jones and Stokes); ERP-01-C61-1-D:Calibration of Upstream Water Quality Model, DSM2 and Use of Auxiliary Flow Pumps (Hutton/Nadar, DWR); ERP-01-C61-2-D:Sources and Causes of Algal Biomass in SJR(Peggy Lehman, DWR); ERP-01-C61-3-D:IEP Data Management(Karl Jacobs, DWR); ERP-01-C61-4-D:Monitoring of Nutrients and Oxygen Depleting Substances in the SJR Upstream of Vernalis (USGS-Note: same as ERP-01-C06 #3)	<i>The results from this project showed that a primary source for oxygen demand was discharges of algae from Mud and Salt Slough upstream of the DWSC and from discharges of ammonia effluent from the City of Stockton WTP. Technical evaluation from this project identified aeration in the DWSC as a technical and economically feasible way to control DO depletions below the water quality standard. The project concludes increased flow would improve the DO sag. The ability to require increases in flow is not directly within the regulatory authority of the CVRWQCB and therefore not considered a feasible control measure at this time. The methods to reduce ammonia from the SWTP are known. Aeration technologies have been well studied and used effectively in many water bodies. The methods for effectively removing oxygen depleting substances from upstream sources are not known at this time. All tasks for this project complete except for ERP-01-C61-2-D scheduled for completion July 2004.</i>
26	Delta	SR			26 C. Status of investigation of methods to reduce constituents that cause low DO for inclusion in total maximum daily load recommendation by the Central Valley RWQCB.	ERP-02D-P50	Nov-03	Mar-06	500,000		500,000	HydroQual, Inc.	Andy Thuman		San Joaquin River Dissolved Oxygen Depletion Modeling	This project will provide a water quality model for the development of a TMDL for the Stockton Deep Water Ship Channel (DWSC) to help predict how DO will respond by controlling other variables (or methods to reduce constituents). These variables are 1) control of nutrients sources, 2) control of point sources, 3) flow management (HORBs), and 4) aeration. This milestone will not be 100 percent complete until 1) the aeration demonstration project has been installed and operated for performance evaluation, 2) completion of the Upstream Monitoring Studies (recently awarded), and 2) more information on the effectiveness of source control measures can be obtained. The model and resulting Information won't be available for inclusion in the "phased" or interim TMDL scheduled for July 2004 but will be used in the final TMDL for 2008 and the completion of this milestone. Project has started but is not complete.
26	Delta	SR			26 C. Status of investigation of methods to reduce constituents that cause low DO for inclusion in total maximum daily load recommendation by the Central Valley RWQCB.	ERP-02D-P51	Nov-03	Jun-06	863,732	0	863,732	UC Davis	Geoffrey Schladow		Hydrodynamics and Oxygen Modeling of the Stockton Deep Water Ship Channel	The objective of this project is to provide a better understanding of how hydrodynamics and biogeochemical processes interact to produce reductions in DO concentrations in the Stockton Deep Water Ship Channel. This project will address management strategies to eliminate low oxygen conditions.

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MULTI SPECIES CONSERVATION STRATEGY MILESTONE 29 -- ROLLED UP SUMMARY

MILESTONE 29 -- 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):	PROJECTS REVIEWED - ERP-98-B10, ERP-99-N06, ERP-02-P02	SUMMARY -- A few contracts have been awarded. One project will result in a model used to simulate the hydrological effects of historic and projected land use/land cover changes and surface and groundwater management methods. The relationship of this project to the milestone is more indirect but the information from this project could contribute to this milestone because the research and modeling efforts could contribute to future evaluation and improvements to reduce fine sediment loading. The project is important in that one of the study areas includes watershed of high importance (Cosumnes River). One project will reduce the amount of fine sediment loading to the Cosumnes River by preventing development of the property while also reducing the likelihood that additional parcels adjacent to it will be developed as well. The Cat Creek Watershed project will reduce the amount of sediment moving into the Cosumnes River. Projects from other fund sources and programs may also contribute to this milestone but were not evaluated. See milestones 47, 76, and 105 for additional projects that address this milestone at			AGENCY NOTES --	NOTES CONT'D --
· Participate in implementation of USDA sediment reduction program. · Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban storm water runoff, and other specific sites. · Implement stream restoration and revegetation work. · Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.						

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 29 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY

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MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
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29	Delta	SR			29 I. Status of the sub element of actions to reducing fine sediment loading to the Merced River: Implementation of stream restoration and revegetation work.											
29	Delta	SR			29 J. Status of the sub element of actions to reducing fine sediment loading to the Merced River: Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	ERP-99-N06	Jan-00	Jan-03	1,546,016	none	1,546,016	UC Davis	Jeff Mount		Linked Hydrogeomorphic-Ecosystem Models to Support Adaptive Management: Cosumnes-Mokelumne Paired Basin Project	Develop a model that will be used to simulate the hydrological effects of historic and projected land use/land cover changes and surface and groundwater management methods. Jeff Mount, UC Davis. Research and Planning; The project is wrapping up. The final reports are being finalized and should be available soon. Research and modeling efforts from this project could contribute to future evaluation and improvements to riparian habitats (12 and 14), to instream flows (17), to fish passage and reduction of predation (23, and to reduce fine sediment loading (29).
29	Delta	SR			29 K. Status of actions to reduce fine sediment loading to streams in the Stanislaus River due to human activities (from Phase II Report and Water Quality Program Plan):											
29	Delta	SR			29 L. Status of the sub element of actions to reducing fine sediment loading to the Stanislaus River: Participate in implementation of USDA sediment reduction program.											
29	Delta	SR			29 M. Status of the sub element of actions to reducing fine sediment loading to the Stanislaus River: Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban storm water runoff, and other specific sites.											
29	Delta	SR			29 N. Status of the sub element of actions to reducing fine sediment loading to the Stanislaus River: Implementation of stream restoration and revegetation work.											
29	Delta	SR			29 O. Status of the sub element of actions to reducing fine sediment loading to the Stanislaus River: Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	ERP-99-N06	Jan-00	Jan-03	1,546,016	none	1,546,016	UC Davis	Jeff Mount		Linked Hydrogeomorphic-Ecosystem Models to Support Adaptive Management: Cosumnes-Mokelumne Paired Basin Project	Develop a model that will be used to simulate the hydrological effects of historic and projected land use/land cover changes and surface and groundwater management methods. Jeff Mount, UC Davis. Research and Planning; The project is wrapping up. The final reports are being finalized and should be available soon. Research and modeling efforts from this project could contribute to future evaluation and improvements to riparian habitats (12 and 14), to instream flows (17), to fish passage and reduction of predation (23, and to reduce fine sediment loading (29).

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
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					29 O. Status of the sub element of actions to reducing fine sediment loading to the Stanislaus River: Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.											
29	Delta	SR			29 P. Status of actions to reduce fine sediment loading to streams in the Cosumnes River due to human activities (from Phase II Report and Water Quality Program Plan);	ERP-98-B10	Jun-98	Jun-00	38,000	none	38,000	U.S. Forest Service, Eldorado National Forest	Cheryl Mulder		Cat Creek Watershed Project	Review of the forest road system for repair, relocation of obliteration. If the recommendations from this project are implemented, there will be a reduction in the amount of sediment moving into the Cosumnes River. Cheryl Mulder, U.S. Forest Service, Eldorado National Forest. Planning; project completed.
29	Delta	SR			29 Q. Status of the sub element of actions to reducing fine sediment loading to the Cosumnes River: Participate in implementation of USDA sediment reduction program.											
29	Delta	SR			29 R. Status of the sub element of actions to reducing fine sediment loading to the Cosumnes River: Implement sediment reduction BMPs in construction areas, on agricultural lands, for urban storm water runoff, and other specific sites.											
29	Delta	SR			29 S. Status of the sub element of actions to reducing fine sediment loading to the Cosumnes River: Implementation of stream restoration and revegetation work											
29	Delta	SR			29 T. Status of the sub element of actions to reducing fine sediment loading to the Cosumnes River: Quantify and determine ecological impacts of sediments in target watersheds, implement corrective actions.	ERP-99-N06	Jan-00	Jan-03	1,546,016	none	1,546,016	UC Davis	Jeff Mount		Linked Hydrogeomorphic-Ecosystem Models to Support Adaptive Management: Cosumnes-Mokelumne Paired Basin Project	Develop a model that will be used to simulate the hydrological effects of historic and projected land use/land cover changes and surface and groundwater management methods. Jeff Mount, UC Davis. Research and Planning; The project is wrapping up. The final reports are being finalized and should be available soon. Research and modeling efforts from this project could contribute to future evaluation and improvements to riparian habitats (12 and 14), to instream flows (17), to fish passage and reduction of predation (23, and to reduce fine sediment loading (29).

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MULTI SPECIES CONSERVATION STRATEGY MILESTONE 30 -- ROLLED UP SUMMARY								
MILESTONE 30 -- 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.		PROJECTS REVIEWED - ERP-97-C05, ERP-99-B06, ERP-02-C06A, ERP-02-C06B, ERP-02D-C12, ERP-02D-P62, ERP-02-P40		SUMMARY -- This milestone should be reworded. Previous research has shown that there are many factors that affect mercury methylation and bioaccumulations, and we cannot set an "effects threshold" for mercury concentration in sediments, without consideration of the other factors. However, ERP has made substantial investments for research projects to understand mercury sources, transformations, and factors controlling the methlation/demethylation and bioaccumulation processes. Two studies have been completed, and four more studies are just beginning that will evaluate sources, processes and effects. However, at this time there are still significant knowledge gaps in understanding mercury transformations, bioaccumulation and effects to fish and wildlife. The mercury strategy also provides additional information on what is known, and a framework for future investigations to investigate this issue. See milestones 48, 77 and 106 for additional projects that address this milestone at a landscape level.			AGENCY NOTES --	NOTES CONT'D --

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 30 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
30	Delta	SR	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.		30 A. Status of 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. (Work specific to a key organism in a specific watershed	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	<i>Conduct the necessary research to determine no adverse ecological / biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta and its watershed. This large multifaceted research project investigated sources and cycling of mercury, including bioaccumulation and effects on avian populations. The in-depth study of sources was focused on the Sacramento River, Cache Creek and the Delta, but the biogeochemical cycling component applies to all regions. This milestone is difficult to achieve because mercury sediment concentrations are not well correlated with affects, and there are many other factors that influence methylation, exposure, bioaccumulation and effects. The results from this project made significant gains in understanding mercury sources and cycling, but there are still many critical unknown processes that are not understood.</i>
30	Delta	SR			30 A. Status of 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. (Work specific to a key organism in a specific watershed	ERP-02D-C12			5,337,012		5,337,012	U.S. Fish and Wildlife Service	Tom Suchanek		Mercury in San Francisco Bay-Delta Birds: Trophic Pathways, Bioaccumulation and Ecotoxicological Risk to Avian Reproduction	<i>NO CONTRACT STILL UNDER DEVELOPMENT. This is a very comprehensive study to determine exposure pathways and effects of mercury exposure and bioaccumulation in 3 bird guilds in the Bay-Delta. The guilds include: terns, diving ducks and recurvirostrids. The project includes both field and lab studies, reproductive effects, dietary exposure and bioaccumulation, and histopathological effects in bird populations. (NOTE: this milestone is somewhat misleading because there are many factors that affect exposure and bioaccumulation of mercury - not just mercury concentrations in sediment - therefore it is unlikely to develop NOEL sediment concentrations)</i>

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							START DATE	END DATE								
30	Delta	SR			30 A. Status of 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. (Work specific to a key organism in a specific watershed	ERP-02D-P62			1,656,569		1,656,569	San Francisco Bay Institute	Donald Yee		Mercury and Methylmercury Processes in North San Francisco Bay Tidal Wetland Ecosystems	NO CONTRACT STILL UNDER DEVELOPMENT. This project will examine mercury and methylmercury concentrations in the sediments, water and biota of five tidal marshes along a salinity gradient up the Petaluma River. The study will investigate how environmental variables affect methylmercury production and bioaccumulation, including age of marsh and salinity, and assess seasonal and interannual variation. The project will also investigate potential effects to Virginia Rail and Clapper Rail populations in these marshes. The process-oriented investigations are applicable to other watersheds.
30	Delta	SR			30 A. Status of 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. (Work specific to a key organism in a specific watershed	ERP-02-P40	Jul-03	Jun-06	2,262,567			U.S. Geological Survey	Mark Marvin-DiPasquale		Evaluation of Mercury Transformations and Trophic Transfer in the San Francisco Bay Delta: Identifying Critical Processes for Ecosystem Restoration Program	This research project conducts investigations to understand mercury bioavailability in two different Delta locations and the processes and factors that control it, including bioaccumulation in the food chain. Understanding of processes applies to other regions as well.
30	Delta	SR			30 A. Status of 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. (Work specific to a key organism in a specific watershed	ERP-97-C05	Jul-98	Sep 98?	546,171		546,171	University of California, Davis	Darell Slotton		The Effects of Wetland Restoration on the Production of Methyl Mercury in the San Francisco Bay Delta System	This research project looks at methylmercury production and exposure in wetland environments, which are found in all regions. This project found elevated methylmercury in the water column and biota of wetlands, compared to adjacent channels. More studies are needed to determine methylation / demethylation and exposure in different types of wetlands and other habitats, to determine if there are controllable factors that can reduce methylation rates and exposure.
30	Delta	SR			30 A. Status of 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. (Work specific to a key organism in a specific watershed	ERP-02-C06-A	Apr-03	Mar-06	2,668,091		2,668,091	Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 204 funded	This research projects have a number of investigations to understand mercury bioavailability in different sediment environments and the processes and factors that control it.
30	Delta	SR			30 A. Status of 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. (Work specific to a key organism in a specific watershed	ERP-02-C06-B			1,213,121			Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 13 funded	Conduct the necessary research to determine no adverse ecological / biological effects threshold concentrations for mercury in sediments and key organisms in the Bay-Delta and its watershed. This research projects have a number of investigations to understand mercury bioavailability in different sediment environments and the processes and factors that control it.

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 31 -- ROLLED UP SUMMARY						
MILESTONE 31 -- 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	PROJECTS REVIEWED - ERP-99-B06, ERP-01-C07-D, ERP-02-C03D, ERP-02-C06A, ERP-02-C06B, ERP-02D-C12, ERP-02D-P62, ERP-02-P40, ERP-03-C03,		SUMMARY -- First... note that this milestone should probably not be in the Delta region. ERP usually considers the Cache Creek drainage to be a part of the Sacramento region. One large multifaceted project has been completed to evaluate mercury in Cache Creek, including mercury loads, particularly during storm events, mercury sources and source bioavailability, mine remediation feasibility, mercury bioaccumulation and trophic transfer in the food chain. This project provided significant information on loads of mercury from Cache Creek and the contribution of the mine sites to the mercury loads that is being used in the development of the Cache Creek TMDL for mercury. Several other mercury research studies that have recently begun will contribute information on mercury processes and effects on birds. Significant unknowns include the extent of mercury contamination in stream bed and bank sediments and its ability to mobilize, particularly during storm events. Factors such as speciation of mercury, presence of sulfides, redox conditions, availability of organic carbon, and structure of the trophic web have all been identified as potentially at	SUMMARY continued -- bioavailability of mercury. However, this watershed has not been characterized to determine where these conditions exist or how to control them. Several other mercury research studies that have recently begun will contribute information on mercury processes and effects on birds. Several large mine sites in this watershed have been assessed, but no remediation has yet occurred. See milestone 78 for additional projects that address this milestone at a landscape level.	AGENCY NOTES --	NOTES CONT'D --

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 31 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
31	Delta	SR	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		31 A. Status of actions undertaken to support the development and implementation of TMDL for mercury in Cache Creek watershed	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	<i>Status of actions undertaken to support the development and implementation of TMDL for mercury in Cache Creek watershed. Task 1: Evaluate sources and storm loading of mercury in Cache Creek watershed, Task 5: Mercury Sources, bioaccumulation and trophic transfer in the Cache Creek Watershed. This project contributed most of the scientific basis for development of the Cache Creek draft TMDL, including water and sediment concentrations and loads, identification of sources, mercury levels in biota, sediment flux rates, and estimated bioaccumulation factors in the Cache Creek watershed. NOTE: Cache Creek is in the Sacramento Region, although there are milestones related to Cache Creek listed in the Delta and Sacramento Regions.</i>
31	Delta	SR			31 A. Status of actions undertaken to support the development and implementation of TMDL for mercury in Cache Creek watershed	ERP-02-C03-D	May-02	Sep-04	400,000	0	400,000	California Department of Conservation	Douglas Craig		Department of Conservation, Abandoned Mine Lands Unit Mine Remediation Assessment and Field Investigations of the Middle Yuba River and other Watersheds	<i>Support development and implementation of TMDL for mercury. This project identifies sources of mercury that contribute loads to the Sacramento River and Delta. Identification of sources will assist in sources load reductions in the TMDL.</i>
31	Delta	SR			31 A. Status of actions undertaken to support the development and implementation of TMDL for mercury in Cache Creek watershed	ERP-03-C03	no contract	no contract	100,000	0	100,000	Central Valley Regional Water quality Control Board	Patrick Morris		Regulatory Activities of Inactive Mine Sites Affecting Bay-Delta Water quality	<i>Support development and implementation of TMDL for mercury. This project provides support for TMDL implementation - to support activities that will get inactive mine sites cleaned up by the owners.</i>

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
31	Delta	SR			31 B. Status of the determination of bioaccumulation effects in Cache Creek and the Delta	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	<i>Status of the determination of bioaccumulation effects in Cache Creek and the Delta. Task 1: Evaluate sources and storm loading of mercury in Cache Creek watershed, Task 5: Mercury Sources, bioaccumulation and trophic transfer in the Cache Creek Watershed. This project contributed most of the scientific basis for development of the Cache Creek draft TMDL, including water and sediment concentrations and loads, identification of sources, mercury levels in biota, sediment flux rates, and estimated bioaccumulation factors in the Cache Creek watershed. NOTE: Cache Creek is in the Sacramento Region, although there are milestones related to Cache Creek listed in the Delta and Sacramento Regions.</i>
31	Delta	SR			31 B. Status of the determination of bioaccumulation effects in Cache Creek and the Delta	ERP-02D-C12			5,337,012		5,337,012	U.S. Fish and Wildlife Service	Tom Suchanek		Mercury in San Francisco Bay-Delta Birds: Trophic Pathways, Bioaccumulation and Ecotoxicological Risk to Avian Reproduction	<i>NO CONTRACT STILL UNDER DEVELOPMENT. This is a very comprehensive study to determine exposure pathways and effects of mercury exposure and bioaccumulation in 3 bird guilds in the Bay-Delta. The guilds include: terns, diving ducks and recurvirostrids. The project includes both field and lab studies, reproductive effects, dietary exposure and bioaccumulation, and histopathological effects in bird populations.</i>
31	Delta	SR			31 B. Status of the determination of bioaccumulation effects in Cache Creek and the Delta	ERP-02D-P62			1,656,569		1,656,569	San Francisco Bay Institute	Donald Yee		Mercury and Methylmercury Processes in North San Francisco Bay Tidal Wetland Ecosystems	<i>NO CONTRACT STILL UNDER DEVELOPMENT. Status of the determination of bioaccumulation effects in Cache Creek and the Delta. This project will investigate dietary exposure and potential reproductive effects to Virginia Rail and Clapper Rail. The study also includes investigations on food web transfer of mercury in these systems.</i>
31	Delta	SR			31 B. Status of the determination of bioaccumulation effects in Cache Creek and the Delta	CSP-01-C01	??-01	??-02	395,500		395,500	Dept. of Water Resources	Ted Somer		Science Program Directed Action for Ecological evaluation of Yolo Bypass to support floodplain restoration	<i>Research. Project 50% complete. Most of research has been done.</i>
31	Delta	SR			31 C. Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed.	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	<i>Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed. Task 1: Sources and loads from Cache Creek watershed, including special storm events-- Subtask 5A: Source Bioavailability and Mine Remediation Feasibility in the Cache Creek Watershed; Subtask 5B Mercury Bioaccumulation and Trophic Transfer in the Cache Creek Watershed; Subtask 5C1: Assessment of the Feasibility of Remediation of Mercury Mine Sources in the Cache Creek Watershed. This project has contributed substantial information towards evaluating the loads from Cache Creek, mine sources, and bioavailability of some of those sources. Critical unknowns still remain, as the mercury is widespread in the streambeds and banks and is thought to be the most significant source of most mercury loads to the Delta. Water quality sampling occurred in only 3 years, so it is not known how sources and loads relate to a variety of flow events. It is not known how the bioavailability changes as the sediment moves downstream.</i>

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments	
							START DATE	END DATE									
31	Delta	SR			31 C. Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed.	ERP-01-C07-D			100,000		100,000	Army Corps of Engineers			Directed Action for Cache Creek Settling Basin Study	This study is being conducted by the Army Corps to assess the potential for increasing sediment deposition and mercury removal in a proposed flood control structure at the mouth of Cache Creek. Project not begun; was not awarded a contract but is in the process of applying for a new one.	
31	Delta	SR			31 C. Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed.	ERP-02-C06-A	Apr-03	Mar-06	2,668,091		2,668,091	Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 204 funded	This project evaluates mercury from different sources and their relative importance in contributing to methylmercury contamination in biota.	
31	Delta	SR			31 C. Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed.	ERP-02-C06-B			1,213,121			Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 13 funded	This project evaluates mercury from different sources and their relative importance in contributing to methylmercury contamination in biota.	
31	Delta	SR			31 C. Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed.	ERP-02-C03-D	May-02	Sep-04	400,000	0	400,000	California Department of Conservation	Douglas Craig		Department of Conservation, Abandoned Mine Lands Unit Mine Remediation Assessment and Field Investigations of the Middle Yuba River and other Watersheds	Source, transport, inventory, mapping and speciation of mercury. This project inventories and assesses abandoned mine sites throughout the watershed. It ranks and prioritizes sites for remediation.	
31	Delta	SR			31 C. Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed.	ERP-02-P40	Jul-03	Jun-06	2,262,567			U.S. Geological Survey	Mark Marvin-DiPasquale		Evaluation of Mercury Transformations and Trophic Transfer in the San Francisco Bay Delta: Identifying Critical Processes for Ecosystem Restoration Program	Source, transport, inventory, mapping and speciation of mercury. This project evaluates the speciation of mercury and its bioavailability	
31	Delta	SR			31 C. Status of determining source, transport, inventory, mapping and speciation of mercury in Cache Creek watershed.	CSP-01-C01	??-01	??-02	395,500		395,500	Dept. of Water Resources	Ted Somer		Science Program Directed Action for Ecological evaluation of Yolo Bypass to support floodplain restoration	Research. Project 50% complete. Most of research has been done.	
31	Delta	SR			31 D. Status of participation in Stage 1 remediation (drainage control) of mercury mines in Cache Creek watershed	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	Status of participation in Stage 1 remediation (drainage control) of mercury mines in Cache Creek watershed. Subtask 5C1: Assessment of the Feasibility of Remediation of Mercury Mine Sources in the Cache Creek Watershed This project evaluated a number of specific mine sites in the Cache Creek watershed to determine extent of mercury contamination, loads to the waterbody and feasibility of cleanup.	
31	Delta	SR			31 D. Status of participation in Stage 1 remediation (drainage control) of mercury mines in Cache Creek watershed	ERP-02-P40	Jul-03	Jun-06	2,262,567			U.S. Geological Survey	Mark Marvin-DiPasquale		Evaluation of Mercury Transformations and Trophic Transfer in the San Francisco Bay Delta: Identifying Critical Processes for Ecosystem Restoration Program	This project will evaluate mercury concentrations at multiple levels in the foodweb, which may contribute to an understanding of how mercury is affecting different populations.	

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
31	Delta	SR			31 E. Status of determining sources of high levels of bioavailability mercury in the Cache Creek Watershed	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	Subtask 1C: Mercury Loads to the Sacramento-San Joaquin Delta from the Cache Creek Watershed and the Yolo Bypass. Subtask 1D: Special Storm Event Study of Mercury Loading in Cache Creek, Subtask 5A: Source Bioavailability and Mine Remediation Feasibility in the Cache Creek Watershed, Subtask 5B Mercury Bioaccumulation and Trophic Transfer in the Cache Creek Watershed, Subtask 5C1: Assessment of the Feasibility of Remediation of Mercury Mine Sources in the Cache Creek Watershed. This project provided significant information on loads of mercury from Cache Creek and the contribution of the mine sites to the mercury loads. Significant unknowns include the extent of mercury contamination in stream bed and bank sediments and its ability to mobilize, particularly during storm events. Factors such as speciation of mercury, presence of sulfides, redox conditions, availability of organic carbon, structure of the trophic web have all been identified as potentially affecting bioavailability of mercury.
31	Delta	SR			31 E. Status of determining sources of high levels of bioavailability mercury in the Cache Creek Watershed	ERP-02-C06-A	Apr-03	Mar-06	2,668,091		2,668,091	Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 204 funded	This project evaluates mercury from different sources and their relative importance in contributing to methylmercury contamination in biota.
31	Delta	SR			31 E. Status of determining sources of high levels of bioavailability mercury in the Cache Creek Watershed	ERP-02-C06-B			1,213,121			Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 13 funded	This project evaluates mercury from different sources and their relative importance in contributing to methylmercury contamination in biota.
31	Delta	SR			31 E. Status of determining sources of high levels of bioavailability mercury in the Cache Creek Watershed	ERP-02-C03-D	May-02	Sep-04	400,000	0	400,000	California Department of Conservation	Douglas Craig		Department of Conservation, Abandoned Mine Lands Unit Mine Remediation Assessment and Field Investigations of the Middle Yuba River and other Watersheds	Determine sources of high levels of bioavailable mercury. This project inventories and assesses abandoned mine sites throughout the watershed. It ranks and prioritizes sites for remediation.
31	Delta	SR			31 E. Status of determining sources of high levels of bioavailability mercury in the Cache Creek Watershed	CSP-01-C01	??-01	??-02	395,500		395,500	Dept. of Water Resources	Ted Sommer		Science Program Directed Action for Ecological evaluation of Yolo Bypass to support floodplain restoration	Research. Project 50% complete. Most of research has been done.
31	Delta	SR			31 E. Status of determining sources of high levels of bioavailability mercury in the Cache Creek Watershed	ERP-02-P40	Jul-03	Jun-06	2,262,567			U.S. Geological Survey	Mark Marvin-DiPasquale		Evaluation of Mercury Transformations and Trophic Transfer in the San Francisco Bay Delta: Identifying Critical Processes for Ecosystem Restoration Program	This project evaluates the processes that convert mercury to methylmercury, making it bioavailable, and determines how it is transferred in the foodweb in different habitat types.

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 32 -- ROLLED UP SUMMARY

MILESTONE 32 -- Conduct the following mercury evaluation and abatement work in the Delta (from Phase II Report): · Determine methylation (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.		PROJECTS REVIEWED - ERP-97-C05, ERP-99-B06, ERP-02-C06A, ERP-02-C06B, ERP-02D-C12, ERP-02-P62, ERP-02-P40		SUMMARY -- ERP has made substantial investments for research projects to understand mercury sources, transformations, and factors controlling the methlation/demethylation and bioaccumulation processes. Two studies have been completed, and four more studies are just beginning that will evaluate sources, processes and effects. However, at this time there are still significant knowledge gaps in understanding mercury transformations, bioaccumulation and effects to fish and wildlife. These significant gaps make it impossible to determine potential impacts of ecosystem restoration work at this time. The mercury strategy also provides additional information on what is known, and a framework for future investigations to study this issue.				AGENCY NOTES --	NOTES CONT'D --
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MULTI SPECIES CONSERVATION STRATEGY MILESTONE 32 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
32	Delta	SR	Conduct the following mercury evaluation and abatement work in the Delta (from Phase II Report): · Determine methylation (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.		32 A. Status of determining methylation (part of bioaccumulation) process in Delta.	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	Subtask 1A: Methyl Mercury Budget for the Freshwater Side of the Sacramento-San Joaquin Delta Estuary Task 4: Mercury and Methyl Mercury Flux Rates: This project provided water quality data on loads of mercury and methylmercury to the Delta for two years of sampling, giving a simplistic mass balance estimate of sources of methyl mercury. The project also evaluated methylmercury flux rates from sediment in several different habitats during several seasons. More studies are needed to understand the factors that influence methylation rates and entry into the food chain.
32	Delta	SR			32 A. Status of determining methylation (part of bioaccumulation) process in Delta.	ERP-02-C06A	Apr-03	Mar-06	2,668,091		2,668,091	Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 204 funded	Tasks 4 and 5 of this project investigate sediments as sources of methylmercury in the Delta and investigates different processes and factors that control methylmercury production. Task 4: Delta Wide Monitoring and Characterization (Sediment studies of different ecosystems, benthic flux chambers) Task 5 Process oriented studies
32	Delta	SR			32 A. Status of determining methylation (part of bioaccumulation) process in Delta.	ERP-02-C06-B			1,213,121			Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 13 funded	Tasks 4 and 5 of this project investigate sediments as sources of methylmercury in the Delta and investigates different processes and factors that control methylmercury production. Task 4: Delta Wide Monitoring and Characterization (Sediment studies of different ecosystems, benthic flux chambers) Task 5 Process oriented studies
32	Delta	SR			32 A. Status of determining methylation (part of bioaccumulation) process in Delta.	ERP-02-P40	Jul-03	Jun-06	2,262,567			U.S. Geological Survey	Mark Marvin-DiPasquale		Evaluation of Mercury Transformations and Trophic Transfer in the San Francisco Bay Delta: Identifying Critical Processes for Ecosystem Restoration Program	This project evaluates the processes that convert mercury to methylmercury, making it bioavailable, and determines how it is transferred in the foodweb in different habitat types.

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
32	Delta	SR			32 B. Status of determining sediment mercury concentration in areas that would be dredged during levee maintenance or conveyance work in the Delta	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	<i>Task 4: Mercury and methyl mercury in sediments ..This project evaluated 233 sediment samples from the bay-delta. NOTE: This milestone may not be very relevant to restoration for the following reasons: 1. areas to be dredged will have this material removed so it will no longer result in exposure to biota 2. RWQCB always requires testing of the sediment before giving a dredging permit 3. Sediments in channels move from place to place, particularly during high flow events, 4. Sediment mercury concentrations are only slightly correlated to methyl mercury production, other factors may have greater influence.</i>
32	Delta	SR			32 B. Status of determining sediment mercury concentration in areas that would be dredged during levee maintenance or conveyance work in the Delta											
32	Delta	SR			32 C. Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta.	ERP-99-B06	Sep-00	Sep-03	4,062,058		4,062,058	San Jose State University Foundation - Moss Landing Marine Lab	Kenneth Coale		CALFED Mercury Project: An Assessment of Ecological and Human Health Impacts of Mercury in the San Francisco Bay – Sacramento – San Joaquin Delta Watershed (California)	<i>Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta. Task 1, Task 4 This project provides some basic mass balance data to give perspective to different sources of mercury and methyl mercury. The sediment flux studies indicate that wetlands have increased methylation rates. This project provides some preliminary information that indicates that wetland restoration could significantly increase methylation rates and biotic exposure. More studies are needed to determine the relative contribution of different types of wetlands and the factors that control methylation and bioaccumulation. In addition, a monitoring program is needed to determine if there are any quantifiable changes in methylation and exposure during restoration activities. This milestone also affects other regions, as mercury contamination is widespread in the soils and gravels of the tributaries where restoration is planned.</i>
32	Delta	SR			32 C. Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta.	ERP-02-C06-B			1,213,121			Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 13 funded	<i>Tasks 4 and 5 investigate methyl mercury production in different habitats and investigates several processes in mercury cycling. Task 2 puts these into perspective with other sources of mercury. Task 2: (Prop 13 contract) Mass Loading. Task 4: Delta Wide Monitoring and Characterization (Sediment studies of different ecosystems, benthic flux chambers). Task 5 Process oriented studies</i>
32	Delta	SR			32 C. Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta.	ERP-02-C06A	Apr-03	Mar-06	2,668,091		2,668,091	Dept. of Fish and Game; San Jose State University Foundation	Mark Stephenson, Chris Thompson		Transport, Cycling and Fate of Mercury and Monomethyl Mercury in the San Francisco Delta and Tributaries - An Integrated Mass Balance Assessment Approach- Prop 204 funded	<i>Tasks 4 and 5 investigate methyl mercury production in different habitats and investigates several processes in mercury cycling. Task 2 puts these into perspective with other sources of mercury. Task 4: Delta Wide Monitoring and Characterization (Sediment studies of different ecosystems, benthic flux chambers) Task 5 Process oriented studies Task 2: (Prop 13 contract) Mass Loading</i>
32	Delta	SR			32 C. Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta.	ERP-02D-P62			1,656,569		1,656,569	San Francisco Bay Institute	Donald Yee		Mercury and Methylmercury Processes in North San Francisco Bay Tidal Wetland Ecosystems	<i>NO CONTRACT STILL UNDER DEVELOPMENT. This project provides some important process-level investigations on mercury cycling in wetlands and specifically looks at how different environmental variables affect methyl mercury production and bioaccumulation.</i>

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
32	Delta	SR			32 C. Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta.	ERP-02D-C12			5,337,012		5,337,012	U.S. Fish and Wildlife Service	Tom Suchanek		Mercury in San Francisco Bay-Delta Birds: Trophic Pathways, Bioaccumulation and Ecotoxicological Risk to Avian Reproduction	<i>NO CONTRACT STILL UNDER DEVELOPMENT. This study will provide information on existing conditions and effects to avian populations.</i>
32	Delta	SR			32 C. Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta.	ERP-02-P40	Jul-03	Jun-06	2,262,567			U.S. Geological Survey	Mark Marvin-DiPasquale		Evaluation of Mercury Transformations and Trophic Transfer in the San Francisco Bay Delta: Identifying Critical Processes for Ecosystem Restoration Program	<i>This project evaluates the processes and factors that convert mercury to methylmercury, making it bioavailable, and determines how it is transferred in the foodweb in different habitat types.</i>
32	Delta	SR			32 C. Status of determining the potential impact of ecosystem restoration work on methyl mercury levels in lower and higher trophic level organisms in the Delta.	ERP-97-C05	Jul-98	Sep-98	546,171		546,171	University of California, Davis	Darell Slotton		The Effects of Wetland Restoration on the Production of Methyl Mercury in the San Francisco Bay Delta System	<i>This project looked at methylation in wetlands and determined that wetlands do increase net methylation and bioaccumulation. More studies are needed to determine if there are controllable factors to reduce methylation in wetland environments, as well as a monitoring program.</i>

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 33 -- ROLLED UP SUMMARY

MILESTONE 33 -- 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	PROJECTS REVIEWED - ERP-97-C12, ERP-97-N01, ERP-97-N20, ERP-98-C06		SUMMARY -- One project has been completed to develop the diazinon and chlorpyrifos hazard assessment criteria for toxicity. One project has been completed to support the development and implantation of a TMDL for diazinon, to assess and reduce diazinon inputs from urban stormwater runoff in Sacramento County. Three projects have been funded to evaluate and implement pesticide reduction practices for both urban stormwater and agriculture. Three projects have been funded to evaluate effects of pesticides on aquatic life. One project that developed BMPs for pesticide reductions in agriculture also monitored for effectiveness of various techniques. Recent results from studies indicate that pyrethroids are causing significant toxicity to benthic organisms in 25-60% of the waterbodies tested (particularly creeks and drainages). Other studies have also shown that very low concentrations of organophosphate pesticides may interfere with sensory cues needed for salmonid migration. Lab studies of salmon with sublethal exposures to pyrethroids showed significant increased susceptibility to mortality from	SUMMARY continued -- disease. More investigations are needed to evaluate episodes of both water and sediment toxicity from pesticides, including pyrethroids, as well as potential effects from sublethal exposures that may affect aquatic populations. There are significant efforts by other organizations to address pesticide issues, including the ag drainage program and TMDL development at the Regional Board, PRIZM grants from USEPA, and other efforts by USDA and local groups to reduce pesticide usage and impacts from pesticides. See milestones 49, 80, and 107 for additional projects that address this milestone at a landscape level.	AGENCY NOTES --	NOTES CONT'D --
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MULTI SPECIES CONSERVATION STRATEGY MILESTONE 33 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
33	Delta	Water Quality	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.		33 A. Status of the development of diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations.	ERP-97-N01	Aug-98	Jan-01	663,500	none	663,500	Sacramento Stormwater Management Program	Larry Nash		Assessment and Implementation of Urban Use Reduction of Diazinon and Chlorpyrifos	This project consists of a multi-phase program to identify, evaluate, and control the toxicity of urban runoff caused by elevated levels of diazinon and chlorpyrifos. Quarterly report in e-room says 100% complete. Research; project completed.
33	Delta	Water Quality			33 A. Status of the development of diazinon and chlorpyrifos hazard assessment criteria with CDFG and the Department of Pesticide Regulations.	ERP-98-C06	Aug-98	Jun-99	67,753	0	67,753	CDFG	Brian Finlayson		Water Quality Criteria for Clorpyrifos and Diazinon	Develop hazard assessment criteria for diazinon and chlorpyrifos. Brian Finlayson, DFG. Implementation. Project complete.
33	Delta	Water Quality			33 B. Status of actions taken in support of development and implementation of a TMDL for diazinon.	ERP-97-N01	Aug-98	Jan-01	663,500	none	663,500	Sacramento Stormwater Management Program	Larry Nash		Assessment and Implementation of Urban Use Reduction of Diazinon and Chlorpyrifos	This project consists of a multi-phase program to identify, evaluate, and control the toxicity of urban runoff caused by elevated levels of diazinon and chlorpyrifos. Quarterly report in e-room says 100% complete. Research; project completed.
33	Delta	Water Quality			33 C. Status of the development of BMPs for dormant spray and household uses.	ERP-97-C12	Aug-98	Jul-01	957,781	none	957,781	UC Davis	Frank Zalom		Evaluation of Alternative Pesticide Use Reduction Practices	The project is designed to identify, promote, and monitor alternative practices to reduce biological impacts of pesticides on the water quality of all priority aquatic habitats identified by CALFED. E-room final report. Research; project completed.
33	Delta	Water Quality			33 C. Status of the development of BMPs for dormant spray and household uses.	ERP-97-N01	Aug-98	Jan-01	663,500	none	663,500	Sacramento Stormwater Management Program	Larry Nash		Assessment and Implementation of Urban Use Reduction of Diazinon and Chlorpyrifos	This project consists of a multi-phase program to identify, evaluate, and control the toxicity of urban runoff caused by elevated levels of diazinon and chlorpyrifos. Quarterly report in e-room says 100% complete. Research; project completed.

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
33	Delta	Water Quality			33 C. Status of the development of BMPs for dormant spray and household uses.	ERP-97-N20	Jul-98	Jun-01	1,680,631	none	1,680,631	Community Alliance with Family Farmers	Judith Redmond		Implementing Program to Reduce the Use of Pesticides and Fertilizers in the Sacramento and San Joaquin Watersheds	The project objectives: 1) Plan and implement and intensive media campaign to enlist mainstream farmers in CAFF's pesticide reduction programs; 2) Continue to coordinate BIOS in San Joaquin, Madera and Colusa Communities through the 1999 growing season; 3) Oversee the transition of BIOS projects to local leadership starting in the fall of 1999; 4) Use the Lighthouse Farm Network to offer consistent technical support to farmers. Marcia Gibbs, Community Alliance with Family Farmers (CAFF). Implementation; project completed. Addresses pesticide reduction and water quality. The primary stressor addressed by the project was water quality from agricultural, non-point source contaminants and increased nutrient inputs. The project reduced the use of pesticides that have been shown to degrade water quality. Farmers that enroll in BIOS have been shown to cut by 90% their use of diazinon. The project also decreased the use of other organophosphate insecticides.
33	Delta	Water Quality			33 D. Status of determining the ecological significance of pesticide discharges.	ERP-97-C12	Aug-98	Jul-01	957,781	none	957,781	UC Davis	Frank Zalom		Evaluation of Alternative Pesticide Use Reduction Practices	The project is designed to identify, promote, and monitor alternative practices to reduce biological impacts of pesticides on the water quality of all priority aquatic habitats identified by CALFED. E-room final report. Research; project completed.
33	Delta	Water Quality			33 D. Status of determining the ecological significance of pesticide discharges.	ERP-97-N01	Aug-98	Jan-01	663,500	none	663,500	Sacramento Stormwater Management Program	Larry Nash		Assessment and Implementation of Urban Use Reduction of Diazinon and Chlorpyrifos	This project consists of a multi-phase program to identify, evaluate, and control the toxicity of urban runoff caused by elevated levels of diazinon and chlorpyrifos. Quarterly report in e-room says 100% complete. Research; project completed.
33	Delta	Water Quality			33 D. Status of determining the ecological significance of pesticide discharges.	ERP-97-N20	Jul-98	Jun-01	1,680,631	none	1,680,631	Community Alliance with Family Farmers	Judith Redmond		Implementing Program to Reduce the Use of Pesticides and Fertilizers in the Sacramento and San Joaquin Watersheds	The project objectives: 1) Plan and implement and intensive media campaign to enlist mainstream farmers in CAFF's pesticide reduction programs; 2) Continue to coordinate BIOS in San Joaquin, Madera and Colusa Communities through the 1999 growing season; 3) Oversee the transition of BIOS projects to local leadership starting in the fall of 1999; 4) Use the Lighthouse Farm Network to offer consistent technical support to farmers. Marcia Gibbs, Community Alliance with Family Farmers (CAFF). Implementation; project completed. Addresses pesticide reduction and water quality. The primary stressor addressed by the project was water quality from agricultural, non-point source contaminants and increased nutrient inputs. The project reduced the use of pesticides that have been shown to degrade water quality. Farmers that enroll in BIOS have been shown to cut by 90% their use of diazinon. The project also decreased the use of other organophosphate insecticides.
33	Delta	Water Quality			33 E. Status of actions taken in support of implementation of BMPs.	ERP-97-C12	Aug-98	Jul-01	957,781	none	957,781	UC Davis	Frank Zalom		Evaluation of Alternative Pesticide Use Reduction Practices	The project is designed to identify, promote, and monitor alternative practices to reduce biological impacts of pesticides on the water quality of all priority aquatic habitats identified by CALFED. E-room final report. Research; project completed.

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
33	Delta	Water Quality			33 E. Status of actions taken in support of implementation of BMPs.	ERP-97-N20	Jul-98	Jun-01	1,680,631	none	1,680,631	Community Alliance with Family Farmers	Judith Redmond		Implementing Program to Reduce the Use of Pesticides and Fertilizers in the Sacramento and San Joaquin Watersheds	The project objectives: 1) Plan and implement and intensive media campaign to enlist mainstream farmers in CAFF's pesticide reduction programs; 2) Continue to coordinate BIOS in San Joaquin, Madera and Colusa Communities through the 1999 growing season; 3) Oversee the transition of BIOS projects to local leadership starting in the fall of 1999; 4) Use the Lighthouse Farm Network to offer consistent technical support to farmers. <i>Marcia Gibbs, Community Alliance with Family Farmers (CAFF). Implementation; project completed. Addresses pesticide reduction and water quality. The primary stressor addressed by the project was water quality from agricultural, non-point source contaminants and increased nutrient inputs. The project reduced the use of pesticides that have been shown to degrade water quality. Farmers that enroll in BIOS have been shown to cut by 90% their use of diazinon. The project also decreased the use of other organophosphate insecticides.</i>
33	Delta	Water Quality			33 F. Status of monitoring program to determine effectiveness of BMPs	ERP-97-C12	Aug-98	Jul-01	957,781	none	957,781	UC Davis	Frank Zalom		Evaluation of Alternative Pesticide Use Reduction Practices	The project is designed to identify, promote, and monitor alternative practices to reduce biological impacts of pesticides on the water quality of all priority aquatic habitats identified by CALFED. <i>E-room final report. Research; project completed.</i>

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 34 -- ROLLED UP SUMMARY																		
MILESTONE 34 -- 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).						PROJECTS REVIEWED - ERP-98-B07, ERP-98-B14, ERP-01-C07, ERP-02-P35		SUMMARY -- Selenium sources in the watershed include irrigation return water, runoff and groundwater inputs from naturally occurring soil selenium in the San Joaquin Valley and from refineries in the San Francisco Bay. Two projects have been funded to evaluate sources, fate and transport, bioaccumulation and ecological effects of selenium in the aquatic ecosystem. Three of these projects have been funded to develop treatment feasibility studies and treatment technologies to reduce selenium and salinity inputs in the San Joaquin River watershed. Two additional projects were funded to support the planning, development and operation of a real-time water quality management program. The ERP has provided grant funds directly to SJVDIP (BCP process) to improve coordination of agricultural drainage issues in the SJR. ERP and DWQP staffs coordinate with the RWQCB on TMDL issues for salinity (affects selenium) in the SJR. See milestones 34, 50, and 108 for additional projects that address this milestone at a landscape level.							AGENCY NOTES --		NOTES CONT'D --	
MULTI SPECIES CONSERVATION STRATEGY MILESTONE 34 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY																		
MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments		
							START DATE	END DATE										
34	Delta	SR			34 A. Status of 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).	ERP-98-B07	Aug-98	Dec-01	1,589,000	none	1,589,000	U.S. Geological Survey	Samuel Luoma		Assessment of the Impacts of Selenium on Restoration of the San Francisco Bay-Delta Ecosystem	PORTION OF MILESTONE ADDRESSED: Resolve knowledge gaps and use models and monitoring to aid management of Se controversies that might impede the ecosystem restoration process. Samuel Luoma, U.S. Geological Survey. Monitoring/Research. Project completed.		
34	Delta	SR			34 A. Status of 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).	ERP-98-B14	Sep-98	Sep-02	1,149,000	none	1,149,000	UC Berkeley	William J. Oswald		Irrigation Drainage Water Treatment for Selenium Removal: Panoche Drainage District Demonstration Facility	Tryg J. Lundquist. Implementation. Demonstration project for the treatment of wastewater to reduce selenium and nitrogen. Project completed. The pilot project was a successful scale up of a laboratory conceptual model for reducing selenium and nitrogen found in agricultural drainage water. It continues to function and provide further research information in regards to treatment of agricultural drainage water. Related projects include: the State Water Resources Control Board approved \$500,000 loan from the Agricultural Drainage Management Program for the Pacheco Water District the Canal Lining Project. The Project will conserve up to 507 acre feet of irrigation water annually and reduce selenium and salinity loading to the San Joaquin River. The SWRCB (Resolution No. 97-004), approved a \$1.0 million State Revolving Fund loan to the Pacheco Water District for an Irrigation System Improvement Project. The Project will promote irrigation efficiency, improved management, and water reclamation and conservation practices for the District.		
34	Delta	SR			34 A. Status of 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).	ERP-01-C07	Jul-01	Jun-04			2,600,000	USGS	James Cloern		Transport, Transformation, and Effects of SE and Carbon in the Delta of the Sacto-SJ Rivers: Implications for Ecosystem Restoration	Development of hydrodynamic models to evaluate SE and C transport, SE sediment record, laboratory studies of SE transformations by phytoplankton. Donna Podger. Monitoring. 74% completed.		

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 35 -- ROLLED UP SUMMARY

MILESTONE 35 -- 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 storm water runoff and discharges to reduce PCB and organochlorine pesticides.		PROJECTS REVIEWED - ERP-97-N20		SUMMARY -- Organochlorine pesticides are no longer used in this watershed. However, they are extremely persistent and tend to bind strongly to the sediment. Therefore, efforts to reduce sediment inputs will also reduce inputs of organochlorine pesticides. One project has been funded to reduce sediment and fertilizer usage in this watershed. See milestones 51, 81, and 109 for additional projects that address this milestone at a landscape level.			AGENCY NOTES --	NOTES CONT'D --
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MULTI SPECIES CONSERVATION STRATEGY MILESTONE 35 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
35	Delta	Water Quality	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 storm water runoff and discharges to reduce PCB and organochlorine pesticides.		35 A. Status of participation in the implementation of USDA sediment reduction program in behalf of reducing organochlorine pesticide inputs to streams.	ERP-97-N20	Jul-98	Jun-01	1,680,631	none	1,680,631	Community Alliance with Family Farmers	Judith Redmond		Implementing Program to Reduce the Use of Pesticides and Fertilizers in the Sacramento and San Joaquin Watersheds	The project objectives: 1) Plan and implement and intensive media campaign to enlist mainstream farmers in CAFF's pesticide reduction programs; 2) Continue to coordinate BIOS in San Joaquin, Madera and Colusa Communities through the 1999 growing season; 3) Oversee the transition of BIOS projects to local leadership starting in the fall of 1999; 4) Use the Lighthouse Farm Network to offer consistent technical support to farmers. Marcia Gibbs, Community Alliance with Family Farmers (CAFF). Implementation; project completed. Addresses pesticide reduction and water quality. The primary stressor addressed by the project was water quality from agricultural, non-point source contaminants and increased nutrient inputs. The project reduced the use of pesticides that have been shown to degrade water quality. Farmers that enroll in BIOS have been shown to cut by 90% their use of diazinon. The project also decreased the use of other organophosphate insecticides.
35	Delta	Water Quality			35 B. Status of the implementation of sediment reduction BMPs on agricultural lands and other specific sites to reduce organochlorine pesticides	ERP-97-N20	Jul-98	Jun-01	1,680,631	none	1,680,631	Community Alliance with Family Farmers	Judith Redmond		Implementing Program to Reduce the Use of Pesticides and Fertilizers in the Sacramento and San Joaquin Watersheds	The project objectives: 1) Plan and implement and intensive media campaign to enlist mainstream farmers in CAFF's pesticide reduction programs; 2) Continue to coordinate BIOS in San Joaquin, Madera and Colusa Communities through the 1999 growing season; 3) Oversee the transition of BIOS projects to local leadership starting in the fall of 1999; 4) Use the Lighthouse Farm Network to offer consistent technical support to farmers. Marcia Gibbs, Community Alliance with Family Farmers (CAFF). Implementation; project completed. Addresses pesticide reduction and water quality. The primary stressor addressed by the project was water quality from agricultural, non-point source contaminants and increased nutrient inputs. The project reduced the use of pesticides that have been shown to degrade water quality. Farmers that enroll in BIOS have been shown to cut by 90% their use of diazinon. The project also decreased the use of other organophosphate insecticides.

[illegible]

[illegible]

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
36	Delta	SR			36 F. Participate in remediation of mine sites as part of local watershed restoration and Delta restoration.	ERP-01-N21	Oct-01	Jan-03	60,000	none	60,000	University of Nevada, Reno	Dr. Manoranjan Misra		Large-Scale Pilot Demonstration of Passivation Technology For Restoration of Newton Copper Mine	Participate in remediation of mine sites as part of local watershed restoration and Delta Restoration. Study passive techniques for treating acid mine drainage (AMD). <i>Donna Podger, California Bay Delta Authority. Project completed.</i>

MULTI SPECIES CONSERVATION STRATEGY MILESTONE 37 -- ROLLED UP SUMMARY																
MILESTONE 37 -- Conduct the following unknown toxicity work (from Phase II Report): · Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.					PROJECTS REVIEWED - ERP-97-C06, ERP-97-N09, ERP-98-C07, ERP-98-C08, ERP-99-N08, ERP-01-N22, ERP-02-P42		SUMMARY -- One 1997 study did 3 species toxicity testing at several monitoring locations in the Delta and found toxicity in 4 samples out of 29. Chlorpyrifos was identified as the cause of toxicity in one sample. A 1999 study on pyrethroids found sediment toxicity in 42% of locations sampled on at least one occasion, with severe toxicity in 14% of the sites (all Central Valley sites). Pyrethroid concentrations were identified as the cause of toxicity in many instances, but did not explain all of the toxicity observed. Several more studies are underway to develop methods for toxicity identification evaluations (TIE), as well as additional monitoring for toxicity throughout the watershed. A multi-agency group has developed a "Strategy for Toxicity of Unknown Origin" that includes recommendations on future actions to monitor, identify and reduce episodes of toxicity in the watershed. In general, recent monitoring data has shown that toxic events from OP pesticides may be declining as control measures are put in place. However, new pesticides, such as pyrethroids are gaining in popularity and may incr				SUMMARY continued -- toxicity and affect benthic organisms throughout the watershed. Additional studies need to be done to determine the spatial and temporal extent of toxic events, methods for identifying toxicants need further development. Once toxicants are identified, control programs need to be implemented to reduce affects to waterbodies. Currently, there are activities to reduce pesticide usage and inputs to waterbodies from both urban and agricultural sources. Some activities have been funded by CBDA (see pesticide milestone), but there are also significant efforts by other organizations including the Regional Boards, USEPA, and NRDC. See milestones 53, 83, and 111 for additional projects that address this milestone at a landscape level.			AGENCY NOTES --		NOTES CONT'D --
MULTI SPECIES CONSERVATION STRATEGY MILESTONE 37 -- EVALUATION OF INDIVIDUAL PROJECTS REVIEWED TO FORMULATE THE ROLLED UP SUMMARY																
MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
37	Delta	SR	Conduct the following unknown toxicity work (from Phase II Report): Conduct appropriate studies to identify unknown toxicity, and develop management actions as appropriate.		37 A. Status on conducting appropriate studies to identify unknown toxicity	ERP-97-C06	Jul-98	Jun-01	437,326	none	437,326	UC Davis (Bodega Bay)	William A. Bennett		Contaminant Effects on Smelt	Research and monitoring of listed species. William Bennett, UCD Bodega Bay. Research / Monitoring. Project completed.
37	Delta	SR			37 A. Status on conducting appropriate studies to identify unknown toxicity	ERP-97-N09	Jan-98	Jan-00	100,000	none	100,000	San Francisco Bay Keeper	Marsha Mather-Thrift		Monitoring of Delta Contaminants	Conduct appropriate studies to identify unknown toxicity. Bill Jennings, Deltakeeper. Monitoring. Project completed.
37	Delta	SR			37 A. Status on conducting appropriate studies to identify unknown toxicity	ERP-98-C07	Sep-98	Nov-02	400,000	0	400,000	State Water Resources Control Board	Karen Larsen		Fathead Minnow Toxicity Study in the Sacramento River	Monitoring and research of fathead minnows. Karen Larsen, State Water Resource Control Board. Monitoring; project completed.
37	Delta	SR			37 A. Status on conducting appropriate studies to identify unknown toxicity	ERP-98-C08	Jun-01	Nov-02	500,000	0	500,000	State Water Resources Control Board	Karen Larsen		Algae Toxicity Study	Monitoring and research. Karen Larsen. Monitoring; project completed.
37	Delta	SR			37 A. Status on conducting appropriate studies to identify unknown toxicity	ERP-01-N22	Sep-98	Jun-01	530,000	120,000	650,000	Central Valley Regional Water Quality Control Board	Karen Larsen		Rainbow Trout Toxicity Monitoring	Research and monitoring of rainbow trout. Karen Larsen, State Water Resource Control Board. Monitoring; There have been contract delays. The work has not yet started.
37	Delta	SR			37 A. Status on conducting appropriate studies to identify unknown toxicity	ERP-02-P42	Oct-02	Sep-05	800,000	60,000	860,000	US Geological Survey	Kathryn Kuivila		Pyrethroid Insecticides: Analysis, Occurrence, and Fate in the Sacramento and San Joaquin Rivers and Delta	Studying the unknown toxicity of Pyrethroids. Kathryn Kuivila, US Geological Survey. Monitoring/Research. Note: Project is a landscape project. Project is about 1% completed.

MS Number	REGION	Project Type	Milestone	ERP Targets taken from ERPP Vol 2	MS Components or Questions for field personnel	ERP PROJECT NUMBERS	CONTRACT		CALFED Award	Cost Share	Total Project Cost	Applicant	Principal Investigator	Quantifiable Units	Project Name	Comments
							START DATE	END DATE								
37	Delta	SR			37 A. Status on conducting appropriate studies to identify unknown toxicity	ERP-99-N08	Mar-00	Mar-03	1,706,670	155,010	1,861,680	University of California, Berkeley	Donald P. Weston, Ph.D.		Assessment of Pesticide Effects on Fish and their Food Resources in the Sacramento-San Joaquin Delta	The field work is designated to: 1) Document pesticide concentrations in surface waters in a temporally-intensive manner. Document the exposure duration and frequency for resident organisms so laboratory-based toxicity tests can be designed and interpreted accordingly. 2) Compare toxicity of surface waters to a standard species, <i>Ceriodaphnia dubia</i> , with toxicity to several other resident species for which testing protocols will be developed. 3) Determine the pesticide responsible for observed toxicity through Toxicity Identification Evaluation. 4) Determine the principal prey organisms in the diet of juvenile salmon, to develop toxicity tests for these critical species, and determine how the diet of the fish may change following a pesticide exposure event. 5) Develop and conduct in situ toxicity testing for surface water monitoring. 6) Collect field data on dissolved organic matter and pesticide mixtures that will help design and interpret our laboratory testing on these same topics. Donald Weston UC Berkeley. Research. Project completed.
37	Delta	SR			37 B. Status on development of management actions to address identified unknown toxicity.	ERP-97-C06	Jul-98	Jun-01	437,326	none	437,326	UC Davis (Bodega Bay)	William A. Bennett		Contaminant Effects on Smelt	Research and monitoring of listed species. William Bennett, UCD Bodega Bay. Research / Monitoring. Project completed.
37	Delta	SR			37 B. Status on development of management actions to address identified unknown toxicity.	ERP-98-C07	Sep-98	Nov-02	400,000	0	400,000	State Water Resources Control Board	Karen Larsen		Fathead Minnow Toxicity Study in the Sacramento River	Monitoring and research of fathead minnows. Karen Larsen, State Water Resource Control Board. Monitoring; project completed.
37	Delta	SR			37 B. Status on development of management actions to address identified unknown toxicity.	ERP-98-C08	Jun-01	Nov-02	500,000	0	500,000	State Water Resources Control Board	Karen Larsen		Algae Toxicity Study	Monitoring and research. Karen Larsen. Monitoring; project completed.
37	Delta	SR			37 B. Status on development of management actions to address identified unknown toxicity.	ERP-01-N22	Sep-98	Jun-01	530,000	120,000	650,000	Central Valley Regional Water Quality Control Board	Karen Larsen		Rainbow Trout Toxicity Monitoring	Research and monitoring of rainbow trout. Karen Larsen, State Water Resource Control Board. Monitoring; There have been contract delays. The work has not yet started.