Executive Summary

One of the central tenets of the California Bay-Delta Program (CALFED Program) is to improve the status of covered species of flora, fauna and their habitats. The commitment to improve the status of covered species is accompanied by a commitment that there would be no requirement for uncompensated reductions in water supply exports south of the Delta beyond those required to meet the regulatory baseline. These regulatory commitments are embodied in the CALFED Programmatic Record of Decision (ROD) and the Conservation Agreement Regarding Multi-Species Conservation Strategy (Agreement) signed in 2000. Although the Agreement expires in 2030, the regulatory commitments within the Agreement expire on September 30, 2004, unless extended by mutual agreement among the 10 signatory agencies.

> The goal of the ERP is to improve aquatic and terrestrial habitats and natural processes to support stable, self-sustaining populations of diverse and valuable plant and animal species through an adaptive management process.
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The program-level regulatory commitments made available through the CALFED Program can be extended with an amendment to the Agreement after a review of the Environmental Water Account (EWA) and an evaluation of progress towards substantially implementing a set of actions called "milestones." Regulatory agencies recognized it would be premature to evaluate Ecosystem Restoration Program (ERP) actions in terms of recovery after the first 4 years of the ERP, and so developed a list of milestones that could be assessed during the early years of the program. Evaluating the EWA and progress towards substantially implementing milestones also fulfills a regulatory requirement to reinitiate section 7 consultation under the Federal Endangered Species Act (FESA).

This document serves both purposes: it lays the foundation for an amendment to the Agreement, and it is the biological assessment for reinitiation of section 7 consultation under FESA. With submittal of this assessment to the Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Game (collectively hereafter referred to as the ERP Implementing Agencies), the CALFED agencies are requesting the issuance of supplemental biological opinions on or before September 30, 2004, such that the supplemental opinions can serve as the basis for extending the Agreement by the same date.

As part of assuring programmatic compliance for the CALFED Program with FESA, California Endangered Species Act (CESA), and California Natural Community Conservation Planning Act (NCCPA), the ERP Implementing Agencies agreed on a common list of 119 milestones that, if achieved, would constitute adequate implementation of the ERP, Water Quality Program, and Multi-Species Conservation Strategy (MSCS) through Stage 1 (first 7 years of the CALFED Program). The ROD calls for the annual expenditure of $150 million through Stage 1 and the mid-stage 1 evaluation of progress in substantially implementing milestones. The ERP Implementing Agencies are responsible for carrying out the ERP in coordination with the California Bay-Delta Authority (Authority) and are thus the primary authors of this assessment. The ERP Implementing Agencies listed all 119 milestones assembled by ecological region, listed contracts or grants awarded in those

regions, determined the progress in meeting each milestone based on implementation of the program, and identified gaps and focus areas for the remainder of Stage 1.
Another part of the evaluation included the *draft CALFED ERP Milestones: Parsing and Rationales document* (Parsing Document). The Parsing Document was the result of an ERP Science Board (ERPSB) review of the milestones and its determination that many of the milestones were multi-issue and often listed a series of goals within each milestone. The ERPSB recommended parsing the milestones based on milestone objectives so they could be better understood. The ERPSB also recommended that the agencies document the rationale supporting each milestone and describe potential mechanisms for how achievement of the milestones would potentially benefit covered species. The ERPSB also has been involved in this milestones review process and will be providing input on its content and conclusions.

All of the milestones categorized as "under evaluation" are water quality or contaminants related. This is true for all of the geographic regions. They remain under evaluation because they need to be reviewed and scientifically vetted to more appropriately address the issues to which they pertain. In their current state, many of the water quality milestones are difficult to assess because they involve expansive, complicated, and evolving issues that require long-term solutions and continuous improvement. Future regional planning efforts will vet these milestones so the degree of implementation can be more fully understood. Most of these milestones also are supported by the activities of water quality agencies and watershed groups, and their progress is not fully accounted for in this document. In general, however, preliminary research results for water quality milestones indicate that water quality issues are impacting species although the magnitude of the impact is unknown. Preliminary results indicate impacts that include interferences for migration (dissolved oxygen, pesticides), reproductive effects to fish and birds (mercury, selenium, organochlorine pesticides), and both sediment and water column toxic episodes (pesticides, toxicity of unknown origin). Work has begun to address source control or other management options to reduce impacts from many of these issues.

The understanding of several large complex water quality problems has been improved over the past 4 years, and resulted in the development of strategies for future actions to find the most effective solutions. A "mercury strategy" document was developed to provide a framework for future mercury investigations. Coordination efforts and over $20 million in ERP mercury research projects are contributing to implementation of the mercury strategy, so there is an expectation that significant progress would be made in the next few years on evaluating ecological effects, effects of restoration, and potential management actions to reduce mercury exposure. ERP has funded three multi-region projects to reduce pesticide inputs, and three multi-region projects to investigate unknown toxicity, which are currently in progress. In addition, there are three projects specific to the Sacramento Region to assess or develop methods to reduce pesticide inputs to waterways.

Our findings by ecological region are:

Delta and Eastside Tributaries Region (Delta Region). There are 37 milestones within the Delta Region, 24 (65 percent) of which are on schedule for completion, 1 (3 percent) of which is ahead of schedule, 6 (16 percent) of which are under evaluation, and 6 (16 percent) of which are behind schedule.

Notable progress has been made with respect to improving the understanding of the Delta hydrodynamics and the refinement of water operations models. Additional work is still needed to increase the scientific understanding of what flow conditions and processes are required to support all life stages of anadromous and estuarine fish species and to support lower trophic level ecological processes. Continued interaction among ERP Implementing Agencies and water management agencies is also essential for addressing fishery needs at water management facilities. This interaction should include improving coordination of environmental water management tools such as EWA, the ERP Environmental Water Program (EWP), and the Central Valley Improvement Act's Water Acquisition Program (WAP).

There are several large-scale restoration and resource management projects in the Delta Region currently in the planning phase. Continued planning and subsequent implementation of these projects within an adaptive management context will greatly contribute to fulfilling remaining habitat- and processes-related milestones for the region. Meeting milestone components for specific species may require additional research to determine essential life history information. All implemented projects should be monitored to assess performance and to inform other planning and implementation efforts.

Suisun Marsh and North San Francisco Bay Region (Bay Region). There are 16 milestones within the Bay Region, 9 (56 percent) of which are on schedule for completion, 6 (38 percent) of which are under evaluation, and 1 (6 percent) of which is behind schedule.

Through grants provided within this region, there have been significant gains in North Bay aquatic and wetland habitats and Jepson Prairie vernal pools. Such investments need to be secured by cooperating with key partners in implementing these projects and supporting monitoring and adaptive management of these projects as they are completed. Additional effort is needed to restore riparian habitats in creeks and rivers that are tributaries to these areas. Listed plant information acquired through these projects can provide a more adequate basis for assessing these species' recovery in restored marshes and vernal pools. Such information can also inform actions to rebuild their populations in these areas.

In Suisun Marsh, near term activity will emphasize completion of the Suisun Marsh Charter Group's *Habitat Management, Preservation, and Restoration Plan for Suisun Marsh.* Ecosystem research and pilot scale restorations are also needed to guide the larger scale marsh restoration that will carry out the Charter Group's plan. Actions to substantially implement the Delta Region water management milestones can help attain the ERP's vision for providing more natural freshwater outflows to Suisun Marsh and the Bay. Bay Region water quality milestones should be pursued in coordination with other regions and through water quality management actions of the Regional Water Quality Control Board and the San Francisco Bay Regional Monitoring Program. Special ERP emphasis may be warranted for studies regarding the extent and impact of low dissolved oxygen conditions in Suisun Marsh and actions to reduce fine sediments and associated contaminants that flow into the Napa and Petaluma rivers, Sonoma Creek, and other Suisun-North Bay tributaries.

Sacramento River Basin Region (Sacramento Region). There are 30 milestones within the Sacramento Region, 20 (66 percent) of which are on schedule for completion, 2 (7 percent) of which are ahead of

schedule, 6 (20 percent) of which are under evaluation, and 2 (7 percent) of which are behind schedule.

There has been considerable progress on numerous milestones, although unlike in other regions, very few can be considered completed at this time. A few of the milestones need some reconsideration and others will need additional analysis given that numerous tributaries are listed under each milestone. Considering the broad nature of a number of the milestones for this area, an assessment by watershed would assist on focusing next steps. Coordination with associated programs such as the EWP and CVPIA's Anadromous Fish Screen Program are particularly important in this region.

San Joaquin River Basin Region (San Joaquin Region). There are 28 milestones within the San Joaquin Region, 17 (61 percent) of which are on schedule for completion, 1 (4 percent) of which is ahead of schedule, and 4 (14 percent) of which are behind schedule. Another 6 (21 percent) milestones are under evaluation including assessment of other regulatory programs with authority over water quality and pollution issues.

Most of the milestones related to habitat improvements appear to be on schedule, and it is necessary to continue monitoring with detailed accounting of various habitat types and agricultural practices and ecosystem response. About 3,985 acres of upland were restored using grants from the North American Wetlands Conservation Act (NAWCA), and the milestone requiring 100 acres of fresh emergent wetland habitat being restored or created has been met. Follow-up monitoring is necessary for both. Riparian and floodplain habitat restoration has received much attention. Milestones related to fresh emergent wetland habitat should be scientifically vetted as a suite to assure that the target acreages by region and as a basin are appropriate. A priority in the San Joaquin Basin Ecological Management Zone (EMZ) should include plans to increase suitable habitat for delta coyote thistle by at least 20 percent or to increase the number of populations and individuals by at least 10 percent through habitat management and protection. Efforts to establish new riparian brush rabbit populations should be monitored and evaluated.

Although much of the funding and effort expended thus far targets improvements to the instream temperature and fluvial geomorphic processes, these are elements which link to other needs and stressors that have yet to be addressed. There is still much to do; specifically, a program addressing all aspects of temperature modeling, integration of temperature modeling and management to a basin scale, and instream sediment budgets are necessary for all three tributaries to the San Joaquin River. Although numerous plans, studies, engineering and feasibility projects were undertaken, there needs to be an effort to complete current projects and to evaluate all the actions to determine priority actions and future needs. While there are a few contracts which address breaching San Joaquin River levees and acquiring significant land, it is necessary to determine if these contracts provide the necessary San Joaquin River floodplain habitat between the mouth of the Merced River and Vernalis.

The San Joaquin Basin EMZ milestone achievements related to stressor reductions due to dams and structures are still in the critical, but early, stages of planning and design; physical actions to enhance fish passage are on schedule. While there is an agreement to purchase water on the Stanislaus River, similar programs should be established for the remaining tributaries. Several habitat or geomorphic

actions were undertaken to improve instream habitat or geomorphic function, which also improves fish passage, and initial stages for screening the Patterson Irrigation District diversion are underway. There are contracts supporting feasibility studies to restore steelhead migration into upper watershed areas, but these were delayed due to access problems to the targeted river reach.

Development of water resources in the San Joaquin River Basin resulted in large-scale changes in the aquatic ecosystems, including fish populations. Preliminary results from ERP-funded contracts indicate that water quality issues are impacting species although the magnitude and impacts are unknown. Further, the linkages between water quality and habitat degradation have not been fully addressed.

The understanding of water quality problems in the San Joaquin River has improved over the past 4 years and resulted in the development of strategies for future actions to find the most effective solutions. The ERP provided funding for eight water quality projects for the San Joaquin Region for approximately $11.3 million. These projects have focused predominantly on selenium, dissolved oxygen and pesticides. ERP funded three multi-region contracts to reduce pesticides inputs, and three multi-region projects to investigate unknown toxicity, which are currently in progress.

Research Milestones. There are 8 milestones within the Research category, 5 (67.5 percent) of which are on schedule for completion, and 3 (37.5 percent) of which are behind schedule.

Progress thus far includes: (1) a better understanding of the conditions necessary to establish riparian vegetation on the Sacramento and San Joaquin rivers; (2) completion of several instream flow studies to determine the flows necessary to support anadromous and estuarine fish species; (3) completion of an initial phase of experimental introductions of Sacramento perch into nontidal perennial aquatic habitats; and (4) substantial work towards assessing the impact of hatchery practices on naturally spawning populations of Chinook salmon and steelhead. While milestones addressing the above issues have progressed as planned, none of those milestones are considered fully accomplished, as Stage 1 is only half-completed. Additional work will be necessary to fulfill the milestones that are currently on schedule towards completion.

Regarding the three milestones which are behind schedule, one of the tools the ERP Implementing Agencies and the Authority has is to consider these for future grant dollars. Perhaps the most critical need is the development of a Comprehensive Long-term Monitoring Program designed to fulfill monitoring and assessment mandates for CALFED's ERP, Water Quality and Watershed programs. Such a program must include species inventories and range-wide distributional surveys for covered plants and animals. An effort to develop this program is a high priority for the ERP, and the effort can only succeed in coordination with the Science Program.

Overall Milestone Findings

Of the 119 milestones, 75 (63 percent) are on schedule for completion, 4 (3 percent) are ahead of schedule, 24 (20 percent) are under evaluation, and 16 (14 percent) are behind schedule. This evaluation took place at about midway through Stage 1. Thus, the ERP Implementing Agencies would expect to have accomplished about half of our projected actions. With 66 percent of the milestones either on or ahead of schedule, the ERP Implementing Agencies find that at least half of

expected actions have indeed been completed. This does not necessarily indicate that half of the milestones are completed (e.g., each milestone could be half-completed for this to be true).

The six water quality milestones repeated in all four geographic regions of the program were classified as "under evaluation" because the ERP has little jurisdiction or regulatory control of these issues. Thus, the above statistics describing milestones achievement are conservative. It is more appropriate to consider the water quality milestones separately from the other milestones. Excluding the 24 water quality milestones, the milestones accomplishments are as follows: 79 (83 percent) of 95 milestones are on (75) or ahead (4) of schedule and 16 milestones (17 percent) are behind schedule. The ERP will continue to work with other State and Federal agencies that are responsible for the topics of these 24 repeated water quality milestones that are more global or landscape in scope.

As discussed above, there are select milestones which have not been addressed as fully as some others, and it is those milestones to which we intend to give first priority in the future. In general, the ERP Implementing Agencies will address weaknesses in the program through the remainder of Stage 1 by doing the following:

1. Focusing the upcoming Proposal Solicitation Package (PSP) on monitoring with the intent of showing more clearly the results of the beneficial actions of the ERP. This PSP will be developed in close coordination with the Science Program and is expected to be complemented by the Science Program PSP.

2. Focusing a future PSP on the gaps identified in this assessment. Results from this assessment will guide selection of proposals so milestones needing further work will be addressed appropriately.

3. Where gaps still remain following upcoming PSPs, directing actions to ensure that milestones will be substantially achieved by the end of Stage 1.

4. In cooperation with other CALFED agencies, developing a comprehensive monitoring plan by July 2005, as described in the draft Memorandum of Understanding Regarding CALFED Bay-Delta Program Activities in the Delta.

Efficacy of the Environmental Water Account and Conclusions

The Environmental Water Account (EWA), one of the tools within the CALFED Water Management Strategy, was established to provide water for the protection and recovery of at-risk fish species beyond water available through existing regulatory actions related to the operations of the State Water Project (SWP) and the Central Valley Project (CVP) (CALFED 2000). It is based on the concept that flexible management of water can achieve fish and ecosystem benefits more efficiently than a completely prescriptive regulatory approach (CALFED Multi-Species Conservation Strategy 2000). The purpose of the EWA is to provide protection to the at-risk fish species of the Bay–Delta estuary through environmentally beneficial changes in SWP and CVP operations at no uncompensated water cost to the projects' water users. This approach to fish

protection requires the acquisition of alternative sources of project water supply, called "EWA assets," that are to be used to augment stream flow or Delta outflow or to modify exports, to provide fish benefits, and to replace the regular project water supply interrupted by the changes to project operations for EWA purposes. The EWA is intended to provide sufficient water, combined with the benefits of implementing ERP and the environmental protection provided by the regulatory baseline, to address CALFED Program's fish protection and restoration/recovery goals.

Although the EWA has not achieved the full funding level envisioned in the ROD, it has acquired sufficient water to implement most of the desired fish actions in its first 3 years. EWA actions have taken place predominantly in the Delta. Where a valid technical basis exists, increased funding could potentially allow the EWA to implement more upstream actions and make some water available for experiments. EWA has been successful in creating a forum for broader discussion of fish protection actions, fostering cooperation between Agency staff and stakeholders and decreasing the potential for conflict over limited resources.

EWA has successfully reduced the direct effects of water export on Delta fish and protected the State and Federal projects from supply impacts due to excessive incidental take of at-risk fish species. However, because of the short time period of EWA implementation, insufficient data exists to fully evaluate the efficacy of EWA actions with respect to fish protection and recovery. Additional investigation is warranted, and some is already underway, to answer several remaining questions, including (1) the impact of incidental take on survival, abundance and distribution of fish populations, (2) how much environmental water is needed to accomplish CALFED Program's recovery goals, and (3) how the EWA can best be used to contribute to fish species recovery.

Several elements are identified as necessary to improve EWA implementation and the evaluation of EWA actions. These include storage and conveyance capacity, reliable funding enabling long-term water purchase contracts, a commitment to the monitoring and science investigations used to guide and evaluate EWA actions, and additional work on developing and using various types of models to understand the value of EWA and its contribution to achieving CALFED goals.

The CALFED Lead Scientist convenes a Review Panel to provide an independent technical review of the EWA at the end of every water year. The EWA agencies work with the CALFED Science Program to coordinate and implement this annual technical review of the EWA. The Science Program also convenes annual species-focused workshops for the EWA to assist in their preparation for the review and to provide a forum for communication among scientists involved in monitoring and research on the fish species of concern as well as for those involved in water management and regulatory decision making. The Science Program appointed science advisors for the EWA to facilitate the annual species workshops and make suggestions to the Lead Scientist on the specific charge for the EWA Review Panel and the agenda for the annual Review Panel session. The Review Panel does not provide conclusions or findings with respect to the validity of the EWA, judge the actions of the EWA agencies, or make decisions on whether or not to continue with the EWA or any other environmental water program. The Review Panel exchanges information with agency staff, stakeholders and the public regarding the state of the science that applies to the EWA concepts, actions and the technical basis for actions, and provides a written report to the Lead Scientist detailing its recommendations, including the extent to which EWA actions incorporate established science, ways to incorporate new science, and areas for further work.

Conclusion

Based on this assessment, the ERP Implementing Agencies find that substantial implementation of the milestones is progressing as envisioned in the ROD and EWA is functioning as intended during the first 4 years of the program. Thus, the ERP Implementing Agencies recommend that the program-level regulatory commitments within the Conservation Agreement Regarding the MSCS be extended through the remainder of Stage 1.