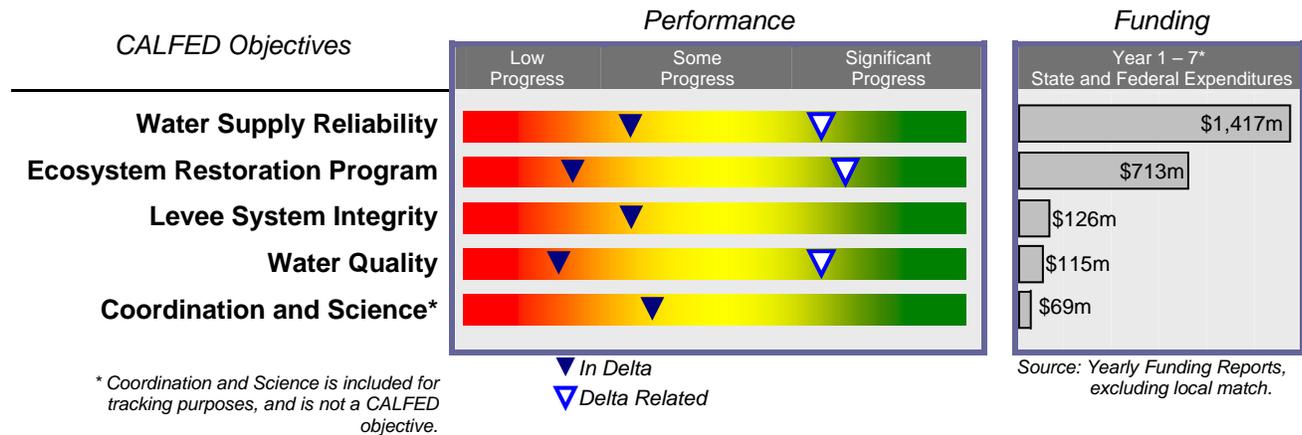


CALFED Bay-Delta Program Program Performance Assessment *Executive Summary* *Final Draft as of June 20, 2007*

In 2006, the CALFED Public Advisory Committee (BDPAC) created the Program Performance and Financing Subcommittee (Subcommittee). Creation of this Subcommittee reflects a commitment to develop a manageable set of quantified goals and a system of tracking program status to guide future resource investments and to determine whether the Program is accomplishing its goals. This report has been developed with the Subcommittee to provide an assessment of CALFED accomplishments and shortcomings to date in a form that is intended to be accessible to the public.

The CALFED Program Performance At-a-Glance figure summarizes accomplishments related to the broad goals of the CALFED Program. The performance rating scale is intended to present current progress toward achievement of the original CALFED goals. In many cases, the assessments are organized by 'In Delta' and 'Delta Related' activities. This assessment organization is used to better delineate progress that is directly related to the Delta, compared with those actions taken outside the Delta that ultimately impact the Bay-Delta system. While many of the actions are still a work in progress, the Subcommittee concluded that, overall, actions taken outside the Delta show more progress toward meeting CALFED goals than those within the Delta.

CALFED Program Performance At-a-Glance



Water Supply Reliability Program: Although some key projects lagged behind, CALFED has accomplished the majority of its water supply goals during Stage I. In fact, more water has been reliably delivered during CALFED than in the years preceding the program. The accomplishments are impressive; however, the challenges are also great. Despite past successes, future water supply reliability is in jeopardy. The overall performance noted above is indicative of several currently uncontrolled factors already reducing water supply reliability, including:

- ✓ Climate change and sea level rise
- ✓ Decline of important aquatic species and rise of invasive species
- ✓ Adverse impacts associated with Delta export pumps

Ecosystem Restoration Program (ERP): Key accomplishments, mostly upstream, include significant investments in fish screens, temperature control, improvements in fish passage and habitats, and significant habitat protection and restoration efforts. These efforts have resulted in an improved outlook for some species. However, the ERP has also experienced setbacks in a few key areas:

- ✓ Native species in the Delta continue to decline. Mounting evidence exists that Delta exports utilizing through-Delta infrastructure may be

Accomplishments Snapshot:

- ✓ 1 million acre-feet (MAF) new water
- ✓ 4.1 MAF water transferred
- ✓ 1.6 MAF water – fish protection
- ✓ 15% increase in water to south of Delta agriculture

Accomplishments Snapshot:

- ✓ 82 fish screens installed/improved
- ✓ 55k acres agricultural land protected
- ✓ 130k acres habitat protected/restored
- ✓ Dams/barriers removed for fish

detrimental to fisheries.

- ✓ One area of debate is the impact to native species of variable salinity regimes. The topic will be discussed in future workshops. At present, it appears that variable changes in Delta salinity may impact Delta smelt and other native species, but cause significant problems for water used in, and exported from, the Delta for agricultural and drinking water uses.
- ✓ Non native species remain a major threat to the Delta's ecological health and the state's water supply.

Levee System Integrity: This program has been significantly under-funded in CALFED's first seven years. As a result, some important activities have not moved forward. Some progress has been made in improving levee integrity in some areas. The Delta Emergency Response Plan and Delta Risk Management Strategy are underway and contributing to the following better understanding of Delta levee stability.

- ✓ Stabilizing Delta levees is complex and will require significant continuous expenditure.
- ✓ Catastrophic levee failure is estimated at 2-in-3 probability of occurrence within 50 years; this is more likely to affect the functions of the Delta than originally estimated.
- ✓ Sea level rise may overwhelm Delta levees.

Water Quality Program: Since the ROD was signed, regulatory water quality standards in the Delta continue to be met. However, beyond those standards, little improvement in drinking water quality has occurred. The CALFED agencies are re-evaluating whether or not it is possible to achieve water quality improvements beyond regulated standards using through-Delta conveyance. Key future considerations include the following:

- ✓ Given potential factors such as climate change and population growth in and near the Delta, future assurances that water from the Delta will continue to produce safe drinking water at levels of acceptable risk will require improvements built upon the principles of multiple-barrier protection, both in the management of the Delta and through improvements in drinking water treatment technologies.
- ✓ Actions taken to benefit Delta fish may cause significant water quality problems for water used in, and exported from, the Delta.

Coordination and Science: The Resources Agency coordinates with the CALFED implementing agencies and oversees the CALFED Program. CALFED staff work with the implementing agencies to coordinate Program planning and annual reporting and ensure that stakeholders and the public are involved. Science and research conducted as part of the CALFED Science Program have led to significant changes in how the Bay-Delta system is managed. Program tracking staff compile and report on the cross-cut budget and program accomplishments.

Key Lessons Learned:

- ✓ It is essential that actions taken under the CALFED Program be linked to the accomplishment of one or more of its objectives and that an effective tracking system be implemented.
- ✓ Growing scientific evidence indicates that the Delta is a dynamic system and cannot be sustained as it is currently managed.
- ✓ Furthering ecosystem health requires recognition that actions to benefit one species may be detrimental to others. Continued reliance on through-Delta conveyance for significant exports is likely not sustainable.
- ✓ Changing future conditions likely will lead to decreased water supply reliability in the Delta and declines in important fish populations.

Accomplishments Snapshot:

- ✓ \$60 million in Delta levee maintenance subventions
- ✓ 1.4 million cubic yards of dredge material used to stabilize Delta levees

Accomplishments Snapshot:

- ✓ Reduced salinity and improved water quality in the San Joaquin River
- ✓ More than \$2.25 billion spent on new technology for drinking water treatment
- ✓ \$76 million in source control projects targeted to improve water quality have been implemented through a competitive grant program

Accomplishments Snapshot:

- ✓ Public Involvement
- ✓ Scientific Research and Independence
- ✓ Coordination

BDPAC Program Performance and Financing Subcommittee

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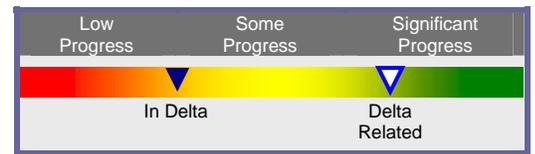
As of June 20, 2007

CALFED Bay-Delta Program Water Supply Reliability Program Performance

Water Supply Reliability Goal: Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system.

Summary of Progress: Since the Record of Decision (ROD) was signed, more water has been reliably delivered than in the years of crisis that led to the establishment of the CALFED Program. New groundwater storage and recycling projects have made significant progress in the last seven years, with new

water supplies projected at 687,000 to 860,000 acre-feet. Altogether, including storage projects in the Program and others implemented by stakeholders, groundwater and surface water storage capacity south-of-Delta has been increased by more than 4 million acre-feet. Favorable hydrology and implementation of projects to increase operational flexibility have resulted in meeting the target of 65 to 70 percent of contract amounts for water deliveries to the Central Valley Project (CVP) south-of-Delta water users in each year since the ROD was signed. As a result of implementing the Environmental Water Account, there have been no conflicts between fish and water supply that have resulted in uncompensated water supply reductions since the signing of the ROD.



For the last seven years, the state has had improved, more reliable water supplies. Despite these major improvements, the Delta's water supply may be less reliable in the future than it is today due to the decline of some native species, climate change, recent court decisions, and other factors. In urban areas, major investments in water use efficiency, reclaimed water and other local resources, and local storage, have helped stabilize demand for Delta exports. Some important native species in the Delta, including the Delta smelt, have continued to decline, and some are at an all-time low. Scientific research is providing increasing evidence that the export pumps in a through-Delta conveyance system may have an adverse effect on some Delta species. As a result, increases in Delta pumping capacity defined in the ROD have not moved forward and there is doubt regarding whether existing levels of exports can be sustained. Water conservation grant programs that help local communities reduce their demands on the Delta have not been fully funded at the level originally expected. Surface storage projects in the ROD that can capture surplus flows at times when the risk to the environment is low have been significantly delayed and, to date, cost-sharing partners for these projects have not been identified.

Increasing conflicts in the Delta between environmental and water supply and quality objectives are creating significant risks to water supply reliability after more than a decade of relative stability.

Funding: In Stage 1, CALFED planned to invest more than \$5.5 billion in projects supporting the Water Supply Reliability objective. To date, program funding has totaled approximately \$3.2 billion comprising the following:

<i>Program Element</i>	<i>Expenditures to Date (millions)¹</i>			
	<i>State</i>	<i>Federal</i>	<i>Local</i>	<i>Total</i>
Water Use Efficiency	\$315	\$133	\$865	\$1,313
Surface Storage ²	\$76	\$55	-	\$132
Groundwater	\$304	-	\$863	\$1,167
Environmental Water Account	\$324	\$35	-	\$359
Conveyance	\$116	\$34	\$93	\$243
Water Supply	\$28	-	-	\$28
Water Transfers	\$2	\$1	-	\$3
<i>Totals:</i>	\$1,165	\$ 258	\$1,821	\$3,245

¹ Source: Yearly Funding Reports. Local amounts are estimates attributable to CALFED and are a portion of the total local investment that contributes to the Bay-Delta system.

² Includes \$14 million for (SLLP) San Luis Low Point Improvement Project.

Strategy: One of the primary goals of CALFED was to improve the reliability of California’s water supply within the context of highly variable hydrology and the competing needs of fish and wildlife and water users. In addition to hydrology, actions taken in Stage 1 assume that water supply reliability is predicated on the following factors:

- Clear and consistent implementation of all regulatory decisions and project operations.
- Flexibility, water use efficiency, and interagency cooperation to avoid water supply/fish/water quality conflicts where possible.
- Investment in infrastructure to improve storage and conveyance capacity.

In Delta

Reliable Deliveries to Agricultural Contractors



Approach: Increase water delivered to Central Valley Plan (CVP) south of Delta agricultural water contractors by 15 percent of existing contract totals to 60 to 75 percent in normal hydrology years.

Implementation of Joint Point of Diversion, operational flexibility, interagency cooperation, and other cooperative water management actions were projected to result in an increase of CVP water for south-of-Delta agricultural water service contractors of 15 percent (or greater) of existing contract totals to 65 to 70 percent in normal years. This normal year supply improvement may not be achieved in all years due to annual hydrologic variability and its impact on carryover storage conditions.

ROD Expectations: 15 percent increase in normal water years to 65 to 70 percent.

Status: As a result of Delta improvements and favorable hydrology, this water delivery target was met from 2000, when the ROD was signed, through 2006. During 2007, however, adverse hydrology and growing Delta conflicts could threaten achievement of this goal.

As a result of actions taken under the CALFED Program, the water supply target defined in the ROD has been met through high levels of cooperation between regulatory and water project agencies and favorable hydrology.

Environmental Water Account (EWA)



Approach: The EWA was created to address two problems: declining fish populations and unreliable water supplies. Its purpose is to better protect fish by making it possible to modify water project operations in the Bay-Delta and still meet the needs of water users. To accomplish that, the EWA buys water from willing sellers or diverts surplus water when safe for fish, then banks, stores, transfers, and releases it as needed to protect fish and compensate water users. For example, EWA managers might coordinate with water project operators to curtail pumping at specific times to avoid harming fish, and then provide water to cities and farms to compensate for the reduced pumping. *This program is also discussed within the Ecosystem Restoration Program section of the report.*

ROD Expectations: 380 TAF of water set aside each year to ensure sufficient availability to meet fishery protection and restoration/recovery needs as part of the overall ERP.

Status: The EWA has been very successful at eliminating conflict between protection of Delta fish and export water supply. From 1995 through 2006, no conflicts between fish and water supply occurred that resulted in uncompensated water supply reductions.

Each year the environmental water account has undergone an independent scientific review. Based on the outcome of these reviews, it is still unclear whether the EWA is providing significant benefits to important fish populations or if the investments could provide greater benefits elsewhere.

Over the past seven years, approximately \$156 million was spent to purchase a little over 1 MAF of water from sellers and to obtain other assets to replace approximately 1.6 MAF of water for fish protection measures taken in the Delta at key times of the year while maintaining water deliveries. Changing conditions appear to be threatening water supply reliability during 2007 for the first time in over a decade. Considerable delays have occurred in the long-term Environmental Impact Report (EIR) and a lack of federal authorization for a long-term EWA program; these are key issues that must be resolved if the program is to continue.

Water transfers – Permit Streamlining and Public Information



Approach: The CALFED water transfer program was intended to encourage the development of a more effective water transfer market that facilitates water transfers and streamlines the approval process while protecting water rights, environmental conditions, and local economic interests.

ROD Expectations: Anticipated activities included the following: complete measurement and monitoring of available facilities for water transfers by March 2005. Review of existing and proposed legislation for improving contracting processes and permit streamlining by end of 2007.

Status: In the first seven years of the CALFED Program, more than 4.1 MAF of water was transferred to EWA, the Department of Water Resources (DWR) Dry Year Program, and to various urban and agricultural water supply agencies. The state Legislature cut all funding for the CALFED Water Transfer program in 2005; this action did not impact the water transfers; instead, the funding cut resulted in shutting down the On-Tap Web site and water transfer clearinghouse that provided public information regarding water transfers. Consequently, the ability of the public to provide input to the transfer market was adversely impacted.

Increase Permitted Delta Pumping Capacity



Approach: The State Water Project (SWP) Banks Pumping Plant has an existing installed capacity of 10,300 cfs. Flow pumped through Banks is limited to 6,680 cfs, except in July-September when an additional 500 cfs is allowed for the EWA and during winters when San Joaquin River flow is above 1,000 cfs.

The ROD called for an increase in SWP pumping from the current limit of 8,500 cfs from March 15 to December 15; and to modify existing pumping criteria from December 15 to March 15 to allow greater use of SWP export capacity by June 2003. By December 2007, increasing the SWP capability to 10,300 cfs, screening the intake facility, and installing permanent operable gates.

Increasing permitted flows has the potential to provide increased water supply reliability and increased water deliveries to SWP and CVP contractors and for environmental uses south of the Delta. Increased pumping capacity could also benefit fisheries by allowing greater pumping when it is safer, thereby reducing pumping during periods of stress. These improvements have not been implemented due to concerns over the fishery impacts of through-Delta operations.

ROD Expectations: 8,500 cfs by 2003, 10,300 cfs by 2006.

Status: As a result of the delay in identifying the appropriate method to screen the SWP intake facility, increasing the SWP export limit to 10,300 cfs was deferred and the South Delta Improvements Program was redesigned to combine increasing the export limit to 8,500 cfs and installing permanent operable gates. A draft EIR/EIS was released in October 2005 and the final EIR/Environmental Impact Statement (EIS) was completed in December 2006. No preferred alternative is identified for the operation at the 8,500 cfs limit but a four-gate configuration is identified as the preferred alternative for the gates. Because of the decline of the Delta pelagic fish populations, a decision to increase the export limit has been deferred. The installation and operation of the permanent operable gates, and the associated dredging, is being pursued by DWR and the U.S. Bureau of Reclamation (USBR). A decision to construct the gates will not be made until the related biological opinions are completed. The federal Endangered Species Act (ESA) consultation may be combined with re-consultation for the CVP and SWP. If this occurs, the schedule for operating the permanent gates will be delayed by at least 1 year, from 2009 to 2010.

During the preparation of the environmental documents for the South Delta Improvements Program, a decision was made to split the environmental documentation on the structural and operational components of the South Delta Improvements Program. Scientific research is providing increasing evidence that the export pumps are having a significant adverse effect on some Delta species. Because of the decline of Delta species, the operational component of increasing permitted pumping is on hold.

The Draft EIS/EIR for South Delta Improvements Program was released in October 2005. The final EIS/EIR was certified in December 2006. This document covers only the structural components of the South Delta Improvements Program – primarily the operable gates.

Conveyance Program: Continue to Move Water Through Delta Channels



Approach: The Delta conveyance program in the ROD proposed continuing to move water through the existing, but somewhat modified Delta channels.

ROD Expectations: Implement the South Delta Improvements Program, improve the Tracy and Clifton Court fish screens, plan and prepare to implement a through-Delta project and North Delta flood control project, and study a screened diversion from the Sacramento River to the Central Delta.

Status: None of the ROD expectations have been fulfilled to date. Planning documents have proceeded for the South Delta Improvements Project but are substantially behind schedule. Final environmental documents have yet to be certified for any program. Some progress has occurred for the Frank's Tract Project; however, even if approval is given to proceed, this may not solve long-term fundamental Delta conveyance problems.

Although a subject of debate, current science appears to suggest that increasing fluctuations in Delta salinity at times may impact native fisheries. At present, it appears this changed salinity cannot be achieved with the through-Delta facility, except with large reductions in water supply. UC research has indicated for more than two years that the Delta is unlikely to maintain its current configuration for more than several decades. This topic will be discussed in future workshops.

Delta Related

Increase Groundwater Storage By 500,000 To 1 MAF



Approach: California can increase its water supply reliability and flexibility, and reduce dry-year demand, overdraft, and subsidence through coordinated management and use of groundwater and surface water supplies. Groundwater management includes identifying basin management strategies, planning and conducting groundwater studies, and designing and constructing groundwater projects.

ROD Expectations: Aggressive implementation in Stage 1.

Status: Development of groundwater storage in California has been very successful. DWR is working with local agencies is making demonstrated progress toward meeting this target.

Sixty-two groundwater storage and recharge grants and loans for feasibility studies, pilot projects, and construction were awarded for a total of \$205 million. 22 have been completed. An additional \$45 million in state grant funds was awarded for conjunctive use development in Southern California. The Local Groundwater Assistance Program awarded \$27.8 million for 129 projects. Coupled with local cost shares, total investments in groundwater storage totaled more than \$1 billion. When completed, it is estimated that the projects will deliver between 300,000 and 350,000 AF of yield per year.

Surface Storage



Approach: Surface storage remains one of the best potential tools in California's water systems to provide operational flexibility. Changes in both global and regional climates are likely to increase the importance of surface storage to meet the state's future flood control and water supply needs.

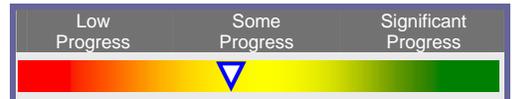
ROD Expectations: All planning and permitting completed before the end of Stage 1. Construction started on In-Delta, Los Vaqueros expansion, and Shasta before the end of Stage 1.

Status: Work continues on surface storage investigations for four of five potential projects. DWR and USBR released an update of the CALFED Bay-Delta Program Surface Storage Investigations Progress Report in May 2006. The In-Delta Storage Project State Feasibility Study Report was completed in 2006. Feasibility and environmental studies are underway for the Shasta Lake Water Resources Investigation. Studies for the North-of-the-Delta Off-stream Storage project and Los Vaqueros Reservoir Expansion project are expected to be completed in calendar year 2008. Upper San Joaquin River Basin Storage investigations will be completed in calendar year 2009.

Deadlines included in the ROD were unrealistic and the state and federal agencies are moving forward with completing the necessary studies to determine the priority and implementability of the five projects under consideration. The lack of adequate funding has also been a key factor in the delays. Concerns by water contractors over potential future conveyance restrictions in the Delta resulting from Pelagic Organism decline issues and the unwillingness of beneficiaries to commit to funding until conveyance issues are resolved further slows the progress on these projects.

It is worth noting that two major surface storage projects (Diamond Valley Lake in Riverside County and Los Vaqueros Reservoir in Contra Costa County) were built during the past decade. These projects were financed solely by local agencies and were developed outside the CALFED process. In 2004, the voters of Contra Costa County voted to approve moving forward with the Los Vaqueros expansion. Altogether, including both projects assisted by CALFED and those developed independently, groundwater and surface storage capacity south-of-the-Delta has increased by more than 4 MAF.

Water Conservation



Approach: Working with the stakeholders and other technical experts, CALFED agencies developed estimated ranges of potential water savings that could be achieved during Stage 1. These water savings could be generated as follows:

- 520 to 688 TAF in the urban sector
- 260 to 350 TAF in the agricultural sector

These estimates were not intended as targets because focusing on potential water savings alone ignores the substantial contribution that water use efficiency investments can make to other CALFED program goals. The CALFED agencies have relied on a competitive grant/loan program as the mechanism to ensure cost-effective investments in water use efficiency.

ROD Expectations: Accelerate implementation of conservation actions to achieve water savings estimates during Stage 1.

Status: In the first seven years of the program, 366 agricultural and urban water conservation, recycling, and desalinization projects were funded for a total of \$1.3 billion in local, state, and federal funds. The agricultural and urban grant recipients reported that they expected the projects to potentially yield 90,000 AF of water when completed. Desalinization recipients reported they expect their projects to yield 35,500 AF when completed.

The Water Use Efficiency Program has not been able to implement the level of investment originally envisioned, primarily due to lack of funding. Discussions have occurred regarding potentially making more progress using both an incentive and a regulatory approach. Despite less-than-anticipated funding, major urban water suppliers in Southern California have committed to meeting growing needs for water through water use efficiency and local resource investments.

Recycling



Approach: Water reclamation provides additional opportunities to reduce water demand in a relatively cost-effective and environmentally benign manner, with multiple benefits for efficiency, dry-year reliability, and discharge water quality.

ROD Expectations: Estimated 225 to 310 TAF of water made available through water reclamation projects by the end of Stage 1.

Status: Recycling has been well funded and is on target for the projected expected water yield. Water recycling grant recipients reported expected project yields of 387,000 to 510,000 AF when projects are complete.

Lessons Learned:

- **Continued water supply reliability:** Emerging science suggests water supplies may not be as reliable during the next decade without a change in strategy. This science is implicating adverse impacts to water supply activities that continue to rely on through-Delta conveyance. This could adversely affect project operations, the delivery of water to replenish south-of-Delta storage, and the transport of water from sellers upstream of the Delta to buyers downstream. Continued progress on water supply reliability will require strategies to deal with these emerging risks.
- **Better understanding of the Delta:** Much has been learned about the Bay-Delta system. Actions to date have furthered the knowledge of Delta hydrodynamics and the understanding of the Delta as a tidal, not a riverine system. Future challenges are also clearer; climate change, sea level rise, and regional climate change are likely to have a substantial effect on the functions of the Delta.
- **Improved participation in water use efficiency needed:** Water use efficiency has not been fully implemented and must be more successful in the future. Low participation has occurred in the agricultural community, and it is questionable whether incentive-based conservation alone can achieve the level of conservation that may be necessary in the future.
- **Public input:** Water transfers are an important part of a balanced water market. Public involvement and input is a key component to this process. The action by the legislature to cut funding did not directly impact the water transfers; however, it did adversely impact the ability of the public to gain access to water transfer information and participate.
- **Funding:** The lack of adequate funding has been a key factor in the delays related to water supply reliability actions.

BDPAC Program Performance and Financing Subcommittee

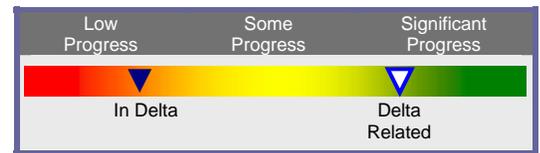
FINAL DRAFT

As of June 20, 2007

CALFED Bay-Delta Program Ecosystem Restoration Program Performance

Ecosystem Restoration Goal: Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.

Summary of Progress: Numerous important projects have been implemented under the Ecosystem Restoration Program (ERP). The areas upstream of the Delta with the greatest level of investment are showing some of the best results. Significant investments in fish screens, temperature control, fish passage improvements upstream of the Delta, and improvements in upstream habitats have resulted in an improved outlook for most salmon populations throughout the Central Valley. The recent settlement of long-standing legal disputes on the San Joaquin River has the potential to improve upper San Joaquin River salmon populations.



The ERP agencies have been successful at acquiring and protecting important lands in the Delta and along its tributary rivers and streams. To date, more than 130,000 acres of habitat targeted for important species have been enhanced, protected, or restored. Most of the protection has occurred through easements working with local land owners and communities. Protection of agricultural lands remains a high priority for the CALFED agencies because it provides significant habitat values, including open space and protection from development. More than 54,000 acres of agricultural lands have been protected for their habitat values through the CALFED ERP.

Efforts have been less successful in the Delta where native species, including the Delta smelt, continue to decline, and some remain at an all-time low. Funding and research efforts have been refocused to resolve the declining populations of important Delta species. Research indicates some of the management actions taken to protect salmon may be in conflict with actions to protect Delta smelt. In addition, although a subject of debate, it appears that variable changes in Delta salinity may impact Delta smelt and other native species while also causing significant problems for water used in, and exported from, the Delta for agricultural and drinking water uses. Growing evidence suggests risks to fisheries from a through-Delta water supply system that often reverses flows in Old and Middle Rivers and diverts water from the mainstems of the Sacramento and San Joaquin Rivers into the interior Delta.

The Delta is one of the most invaded ecosystems in the world. Non native species compete with native species and can alter the ecosystem so dramatically that native species cannot survive. The use of the Delta for conveyance and export water is dependent on a healthy ecosystem. Non native species remain a major threat to the Delta's ecological health and the state's water supply.

Funding: In the last seven years, CALFED planned to invest more than \$1 billion in ERP projects. To be successfully implemented, the ERP was intended to have at least \$150 million from dedicated funding sources annually through Stage 1. To date, program funding has totaled approximately \$1 billion. This funding has comprised the following:

- 538 projects funded
- 281 projects completed, or approximately 52 percent of the total

Strategy: One of the cornerstones of the CALFED ERP has been the development of a common vision or single “blueprint” for ecosystem restoration. The blueprint was intended to ensure that ERP implementing agencies were all working toward common goals. To achieve its objectives, the ERP identified more than 600 programmatic actions and 119 milestones in all regions of the Bay-Delta watershed. To date, the blueprint has been implemented through a large number of competitive and directed grants and through work accomplished by the agencies. In 2004, the implementing agencies conducted a comprehensive review of the ERP and found that nearly 80 percent of the 119 ecosystem milestones had been met or exceeded; additional review is currently underway to assess the progress of the ERP.

In-Delta

In-Delta Fish and Aquatic Habitat in the Delta



Approach: The use of the Delta for conveyance and export water is dependent on a healthy ecosystem. The ERP was designed to result in healthy populations of protected species.

ROD Expectations: Restore 2,000 acres of tidal perennial aquatic habitat and 15 miles of Delta sloughs during Stage 1.

Status: In 2003, Sacramento Splittail, an important native species in the Delta, was removed from the threatened species list. Despite efforts taken, some resident aquatic species in the Delta, including the Delta smelt, continue to decline, with populations remaining at an all-time low. Funding and research efforts have been refocused on resolving the declining populations of important Delta species. Over the longer term, it may not be possible to achieve significant population increases on in-Delta fisheries without major changes in Delta infrastructure or substantial reductions in diversions from the Delta.

Terrestrial Habitat in the Delta



Approach: Healthy terrestrial ecosystems contribute to healthy aquatic ecosystems and provide important habitat areas for waterfowl. The ERP has focused on the protection of habitat corridors to help sustain natural processes, reduce risks, and help protect and recover important species.

ROD Expectations: Restore 16,350 acres of terrestrial habitat. Establish 12,000 acres of wildlife-friendly agriculture during Stage 1.

Status: More than 12,000 acres of terrestrial habitat in the Delta has been enhanced, protected, or restored, including the acquisitions of Staten Island and McCormick Williamson Tract. Terrestrial habitat on Liberty and Prospect Islands is providing some terrestrial and aquatic habitat values through natural restoration processes. An additional 11,000 acres of agricultural land has been permanently protected in the Delta. Scientific research indicates the original approach to restore shallow water habitat, emergent marsh, and other tidally influenced habitats in the Delta may need to be revisited. Early efforts to restore these habitat types have raised concerns over colonization by invasive species and water quality issues related to mercury and organic carbon.

Environmental Water Account (EWA)



Approach: The EWA was created to address two problems—declining fish populations and unreliable water supplies. Its purpose is to better protect fish by making it possible to modify water project operations in the Bay-Delta and still meet the needs of water users. To accomplish its purpose, the EWA buys water from willing sellers or diverts surplus water when safe for fish, then banks, stores, transfers, and releases it as needed to protect fish and compensate water users. For example, EWA managers might coordinate with water project operators to curtail pumping at specific times to avoid harming fish, and then provide water to cities and farms to compensate for the reduced pumping. *This program is also discussed within the Water Supply Reliability section of the report.*

ROD Expectations: 380 total acre-feet (TAF) of water set aside each year.

Status: The environmental water account has not been successful at reversing the decline of important Delta species including Delta smelt. It is uncertain whether EWA actions are having any favorable impact on Delta species in a system that continues to rely on through-Delta conveyance. Actions taken to protect anadromous species have had a positive influence on the species, but actions outside the Delta have been far more effective in improving populations than the EWA actions in the Delta. Each year the environmental water account has undergone an independent scientific review. Based on the outcome of these reviews, it remains unclear whether the EWA is providing significant benefits to important fish populations that reside in the Delta or if those investments could provide greater benefits elsewhere.

Over the past seven years, approximately \$156 million was spent to purchase a little over 1 million acre-feet (MAF) of water from sellers and obtain other assets to replace approximately 1.6 MAF of water for fish protection measures taken in the Delta at key times of the year while maintaining water deliveries.

Invasive Species



Approach: Implement an invasive species program, including prevention, control, and eradication. Prevent the establishment of additional non native invasive species and reduce the negative ecological and economic impacts of established non native species in the Bay-Delta estuary and its watershed.

ROD Expectations: Implement an invasive species program, including prevention, control, and eradication.

Status: Significant invasive species research has been performed on invasive species under the CALFED Program. Invasive species in terrestrial areas have the potential to render habitat areas unusable by native species. Research and limited eradication have been performed on non native cordgrass (*Spartina* sp.), Purple Loosestrife, pepperweed (*Lepidium latifolium*) and giant reed (*Arundo donax*).

The Departments of Fish and Game and Water Resources have partnered on a northern pike containment project at Lake Davis. Northern pike are ferocious predators that could significantly disrupt the Delta and its tributary ecosystems. This project has successfully captured northern pike from the outfalls of Lake Davis, preventing them from entering the downstream ecosystems.

Non native invertebrates have become established in the Delta with a high potential for more species being introduced. These species affect the Delta food web and native vertebrate species. The ERP agencies have funded research and education on ballast water that is a significant contributor of non native species. Research has been funded on Chinese mitten crab and most recently work is being performed on zebra muscle prevention and a rapid response plan. Recent research suggests that greater variations in salinity and other factors in the Delta could be a major factor in discouraging the propagation of some invasive species.

DELTA RELATED

Anadromous Fish and Aquatic Habitat Upstream of the Delta



Approach: The ERP was designed to result in healthy populations of protected species including anadromous fish that are dependent on the Delta to access their upstream habitats. For anadromous fish, the ERP identified improvements to fish passage through modifications or removal of the following locally owned dams: diversion dams on Butte Creek; eight Pacific Gas & Electric Company diversion dams on Battle Creek; McCormick-Saeltzer Dam on Clear Creek; Woodbridge Dam on Mokelumne River; and Clough Dam on Mill Creek.

ROD Expectations: Achieve recovery and sustain large populations of specific at-risk native species in the Delta and Suisun Bay, and Marsh; recover and sustain specific native at-risk species in the Bay-Delta estuary and its watershed; enhance or conserve native biotic communities in the Bay-Delta estuary and its watershed.

Status: Salmon populations in some streams including winter run salmon on the Sacramento River and spring run salmon on Butte Creek, both of which were at an all-time low in the early 1990s, have seen significant improvement as a result of ERP actions taken. In spite of improvements, significant concern remains about winter run salmon due to lack of habitat diversity.

Actions taken to improve salmon populations included installation and improvement of 82 fish screens, dams removed on Deer and Mill Creeks, with eight more targeted on Battle Creek, numerous barriers and weirs removed on Butte Creek, habitat protection, and replacement of spawning gravel. Operations at the USBR's Red Bluff diversion dam have been substantially modified due to fisheries considerations in the past. However, significant issues about fish passage remain at this structure.

Terrestrial Habitat Upstream of the Delta



Approach: Terrestrial and aquatic habitats are linked at the water's edge. The ERP has focused on the protection of habitat corridors to help sustain natural processes, reduce risks, and help protect and recover important species. The ERP targeted protection and restoration of the Sacramento River meander corridor as part of the Sacramento River Conservation Area, including easement or purchase of an additional 15,000 acres, revegetation, and restoration of stream meander function by the end of Stage 1.

ROD Expectations: Carry out large-scale restoration projects on selected streams and rivers; restore habitat in the Delta, San Pablo Bay, Suisun Bay and Marsh, and the Yolo Bypass.

Status: Habitat improvements have included land acquisition, habitat restoration, gravel replenishment, and fish passage projects. More than 50,000 acres of seasonal wetlands in the Sacramento River Region and approximately 500 acres of fresh emergent wetland in the San Joaquin River region have been restored. Land has been acquired and protected on the Sacramento River in cooperation with the Sacramento River Conservation Program and as an expansion of the San Joaquin National Wildlife Refuge. More than 54,000 acres of agricultural land has been permanently protected largely through easements, including the recent establishment of the 4,235-acre Llano Seco Ranch Conservation Easement. This acquisition includes active agricultural lands, as well as native habitats supporting native wildlife and at least six threatened and endangered species.

Construction of Fish Screens



Approach: Many of the early actions funded through the ERP involved the consolidation of water diversions and the design and construction of fish screens to prevent the entrainment of fish. Additionally, the ROD called for the design and construction of new fish screens at the state and federal pumping facilities related to increased Delta exports.

ROD Expectations: Assist local interests in fish screening actions. Improve fish passage through modifications or removal of specified dams; support studies for introduction of wild Chinook salmon and steelhead to the upper Yuba River.

Status: Similar to the activities described above, fish screens have also contributed to significant habitat improvements. More than 140 diversions have been consolidated or screened throughout the Delta and its watershed. Investments in fish screens have been highly successful in improving fish populations. It is recommended that this program continue as additional screen needs are identified.

The ROD called for substantial investments in fish screens in the south Delta. In 2005, an agency and stakeholder group recommended and the state and federal agencies concurred, that the CALFED Program not proceed with significant investments in new fish screens at the Delta pumping facilities, rather that additional research be accomplished and other actions taken that were thought to provide greater benefits to fish populations.

Environmental Water Program (EWP)



Approach: The EWP was intended to improve salmon spawning and juvenile survival in upstream tributaries by purchasing up to 100 TAF per year by the end of Stage 1.

ROD Expectations: Purchase up to 100 TAF annually by the end of Stage 1.

Status: Little progress has been made on purchasing water rights for fish in important spawning tributaries. Water in the tributaries remains an important component of the ERP, and continued work in this area is recommended.

Lessons Learned:

- **Need to clarify future direction:** The program should further clarify the goals, objectives, and measures that are to guide the future work. The program has had hundreds of non-prioritized actions with no quantified intermediary objectives to help guide those investments. While individual expenditures often produced positive results, overall expenditures were not focused. Consequently, as actions proceed in the BDCP, Delta Vision, and other arenas, it will be essential to identify a manageable number of quantified intermediate ecological goals and objectives to better focus overall expenditures and establish priorities for project implementation.
- **Need to improve prioritization of funding:** More of the ERP budget should be spent on directed actions tied to policy issues that are designed to accomplish the limited number of quantified goals and objectives; less of the ERP budget should be allocated through the Proposal Solicitation Process (PSP).
- **Better understanding of the Delta system and impact of management actions:** The Delta water system is and will continue to be intensively managed into the future. These management actions have helped to considerably improve the knowledge of the Delta as a dynamic system. For example, although an area of current debate, research appears to suggest that a variable salt regime may impact native species in the Delta. Management actions, however, can also have adverse impact. Entrainment at the pumps, for example, has been found to be a significant factor for Delta species. Care should also be taken to balance actions with an understanding that actions taken to benefit one species may in fact be detrimental to others.
- **Better understanding of linkages – restoration, species, and water quality:** Restoration of shallow water habitat in the Delta can result in colonization of exotic species, adverse water quality, and human health impacts from organic carbon and mercury. As a result, the habitat targets for shallow water habitat in the Delta have been deferred and may be dropped.

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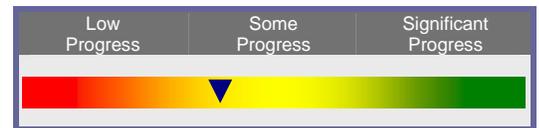
As of June 20, 2007

CALFED Bay-Delta Program Levee Program Performance

Levee Goal: Reduce the risk to land use and associated economic activities, water supply, agriculture and residential use, infrastructure, and the ecosystem from catastrophic breaching of Delta levees.

Summary of Progress: The Levee System Integrity Program has been substantially under funded in the first seven years, creating a significant risk of causing the overall CALFED Program to be declared out of balance.

Funding earmarked for levee improvements in Propositions 13 and 50 was actually used to replace the state's share of levee maintenance, which was originally provided by annual state budget allocations. As a result, levee maintenance programs were funded, but long-term levee improvements defined under the CALFED ROD were under funded. The maintenance funding, which is used to reimburse local maintenance districts for eligible expenditures has reduced the rate of catastrophic levee failure during this period. In 2006, Propositions 1E and 84 were passed, authorizing \$275 million for Delta flood control projects and more than \$3 billion in additional funding for flood control projects statewide, including those associated with the Delta. It is anticipated that these funds will be used to begin to improve Delta levees to manage increasing stresses anticipated from seismic events and global warming.



Substantial progress has been made on the reuse of dredge material to help stabilize Delta levees and on improvement of the Delta Emergency Response Plan. Also, once contracting problems were overcome, the Levee Risk Analysis was conducted and resulted in the Delta Risk Management Strategy, which is now underway and showing promise of providing important information on statewide risks associated with Delta levee failure.

Funding: Projected Levee Program expenditures in Stage One were anticipated to be \$444 million. Actual program funding was approximately \$145 million, of which federal interests contributed less than \$1 million. Of the state's contribution of approximately \$125 million, approximately \$60 million was spent to reimburse local districts for about 50 percent of their expenditures on levee maintenance.

Strategy: The Levee System Integrity Program provides long-term protection for multiple Delta resources by maintaining and improving the integrity of the extensive Delta levee system. Substantial efforts were proposed during Stage 1 to rebuild certain levees to standards that exceed base-level protection. The five main parts to the Levee System Integrity Program include:

- Delta Levee Base Level Protection Plan - Improve and maintain existing Delta levees to meet the Army Corps of Engineers PL 84-99 levee standard.
- Delta Levee Special Improvement Projects - Enhance flood protection for key islands that provide statewide benefits to the ecosystem, water supply, water quality, economics, infrastructure, etc.

- Delta Levee Subsidence Control Plan - Implement best management practices to correct subsidence adjacent to levees and coordinate research to quantify the effects and extent of inner-island subsidence.
- Delta Levee Risk Assessment - Quantify the major risks to Delta resources from floods, seepage, subsidence, and earthquakes, evaluate the consequences, and develop recommendations to manage the risk.
- Delta Levee Emergency Management and Response Plan.

Maintain the Existing Level of Flood Projection Provided By Delta Levees



Approach: The Delta Levees subventions program has a two-fold purpose, to provide funding for local agencies in the Delta to conduct levee maintenance and to complete levee improvements to Base Level Protection. Ongoing levee maintenance protects the integrity of Delta levees and helps identify structural problems before they result in levee failure. Levee improvements to Base Level Protection are accomplished by local agencies at significant savings and without accruing new liability for the state.

ROD Expectations: Ongoing; it is a reasonable expectation that Delta levees receive adequate funding for maintenance.

Status: By June 2007, approximately \$60 million will have been spent on Delta Levee Subventions. Propositions 1E and 84 both contain funds, which can be spent on this program to provide sufficient funding to reach base level protection and to offset approximately \$21 million in carryover of outstanding subventions payments for past maintenance. The Department of Water Resources is in the process of determining the best approach to manage the \$21 million carryover.

Increase Flood Protection Provided by Delta Levees. Improve 200 Miles of Levee to PL 84-99 Level of Protection in Stage 1



Approach: The ROD called for increasing and maintaining the height and width of all 1,100 miles of levees in the Legal Delta to PL 84-99 standards over the 30-year program. At the time the ROD was signed, it was estimated that 580 miles of levee met or exceeded this standard.

ROD Expectations: 200 miles improved by December 2007.

Status: Since 2000, 45 miles of Delta levees have been improved to PL 84-99 standards. Significant new funding from Propositions 84 and 1E are targeted toward improving flood protection in the Delta. Because of continued subsidence of existing Delta levees, it is uncertain if the 580 miles of levee that met the PL-84 standard seven years ago continue to provide that level of flood protection. Significant new technology and understanding are available to assess levee stability. Magnetic anomaly surveys are underway for Delta levees, which will be used to detect areas of seepage or other structural problems that could result in levee failure.

Develop Best Management Practices for Reuse of Dredge Material - Reuse Dredge Material to Repair and Restore Delta Levees



Approach: Significant portions of the Delta are below sea level and continue to subside, especially in the central and western Delta. The ROD identified actions to stabilize subsided Delta islands including modification of land management activities and construction of stability berms. The ROD specifically called for the development of best management practices for the reuse of dredge material by 2001 and the development of a program to reuse dredge material to repair Delta levees and restore habitat with a target of 2 million yards of dredge material applied in Stage 1.

ROD Expectations: Risk Management Strategy to be developed by 2001.

Status: An adequate amount is understood about controlling subsidence on Delta islands. Research indicates the area 500 feet from the landside toe of the levee is the most critical to maintain levee stability. The dredge material reuse program has been successful where implemented in increasing the mass of Delta levees, which is consistent with increased levee stability. In Stage 1, 1.36 million cubic yards of dredged material was used for levee stability and habitat development. A dredge materials re-use study has been completed but best management practices are not required and have not been broadly implemented at this time. The U.S. Army Corps of Engineers, in cooperation with other agencies, is working with dredge material issues as part of a long-term management strategy.

Assess Risks to Delta Levees and Develop a Risk Management Strategy



Approach: The ROD called for the development of a Delta Risk Management Strategy that identifies risks to Delta levees, evaluates consequences, and recommends actions by 2001.

ROD Expectations: The ROD indicated the Risk Management strategy would be developed by 2001.

Status: Seismic Risk Management Analysis has been completed. Results highlight flood risk from earthquakes to levees in the Delta and significant statewide economic impacts. The Delta Risk Management Strategy (DRMS) called for in the ROD was significantly delayed, primarily due to contracting and funding problems. The DRMS was initiated in March 2006. The risk analysis portion has been made available to the public. The final report will be available in September 2007. The Independent Science Board will then review the report to evaluate the effort. The report will provide an assessment of the major risks to statewide resources resulting from floods, seepage, subsidence, climate change, and earthquakes. DRMS is also expected to evaluate the consequences and develop recommendations to manage the risks.

Lessons Learned:

- **Better understanding of levee failure risk:** Risk of catastrophic levee failure in the Delta is better understood and more likely to affect the functions of the Delta than originally thought. Scientific research is indicating a 2-in-3 chance of catastrophic levee failure within the next 50 years.
- **Stabilizing Delta levees is very difficult and costly:** Stabilizing the Delta requires importing mineral soils from areas outside the Delta. Adding mineral soils for additional height can actually result in subsidence of the levee structure from the additional weight. Serious consideration must be given to the cost effectiveness of stabilizing levees.
- **Sea level rise may overwhelm Delta levees:** Most Delta levees have small margins of safety. Regional climate change is likely to result in more frequent severe flood events in the Delta, and sea level rise may overtop existing levees.
- **Funding:** Ongoing funding is essential to ensure key actions to support Delta Levee integrity and emergency response.

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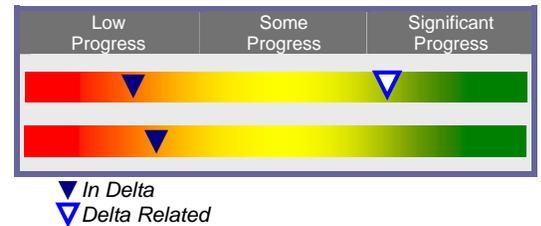
CALFED Bay-Delta Program Water Quality Program Performance

Water Quality Goal: Provide good water quality for all beneficial uses.

Summary of Progress: The CALFED Water Quality Program set as the goal the continuous improvement of Delta water quality for all uses, including in-Delta, drinking water, environmental, and agricultural uses. Since the Record of Decision (ROD) was signed, drinking water quality standards at the tap have generally been met, but little or no improvement has occurred in general to Delta source water quality. To date, \$76 million in source control projects targeted to improve drinking water quality have been implemented through a competitive grant program.

Advances in treatment technology have allowed water users to remain in compliance in spite of an increasingly challenging water quality and regulatory environment.

Drinking Water Quality
Environmental Water Quality



The CALFED agencies were uncertain at the time the ROD was signed whether it would be possible to achieve the desired water quality improvements using through-Delta conveyance and built in an assessment at the end of Stage 1 to re-evaluate water quality progress. If water quality targets beyond regulated water quality standards are not being met, the ROD calls for consideration of additional conveyance actions, including an isolated facility.

The CALFED water quality plan included actions such as source water and treatment technology that were intended to provide a level of water quality needed to meet more stringent drinking water quality standards than currently in place. As described in this document, several factors have made it difficult for the program to reach the desired level of water quality leaving the Delta thus placing an undesirable load upon water treatment plants downstream. Moreover, there remains concern that the science of human health risk assessments of very low-level chemical contaminants is still inexact, and despite meeting strict regulatory standards, risks to human health from drinking water remain an issue to the public. Given prospective factors such as population increase and climate change, future assurances that water from the Delta will continue to produce safe drinking water at levels of acceptable risk will require improvements built upon the principles of multiple-barrier protection, both in the management of the Delta and through improvements in drinking water treatment and distribution technologies.

Mercury has been an area of environmental water quality focus. Research has resulted in a better understanding of how methylmercury enters the Bay-Delta system, impacts the environment, and risks human health. It is now understood that actions taken to improve or increase shallow water habitat in the

Delta may cause significant adverse impacts related to the methylization of mercury and an increase in organic carbon.

Funding: CALFED Agencies proposed investing approximately \$950 million during Stage 1 in water quality programs. Of this investment, more than \$500 million was planned to come from state and federal sources and the remainder from local sources. Actual spending during Stage 1 has approximated \$115 million.

Strategy: The ROD proposed Program actions in four broad categories to address the drinking water quality concerns of the more than 24 million Californians who rely on Delta water. These actions were intended to:

- Enable users to capture higher-quality Delta water for drinking water purposes
- Reduce contaminants and salinity that impair Delta drinking water quality
- Evaluate alternative approaches to drinking water treatment to address growing concerns over disinfection byproducts and salinity
- Enable voluntary exchanges or purchases of high-quality source waters for drinking water uses

Stage 1 was intended to begin work on this strategy, which would be completed in later stages. None of these individual actions were intended to ensure adequate supplies of good-quality drinking water for California; rather these actions were to be pursued, in conjunction with other CALFED actions such as conveyance and storage improvements, to generate significant improvements in drinking water at the tap.

The agency approach to implementing this strategy included implementation of treatment technology improvements and source control measures through a competitive grant process and the implementation of the South Delta Improvements Program, in conjunction with other conveyance projects.

Drinking Water Quality

Achieve 50 ug/L Bromide and 3 mg/L Total Organic Carbon



Approach: Average concentrations at Clifton Court Forebay and other southern and central Delta drinking water intakes should be 50 ug/L and 3 mg/L or agencies should be able to achieve an equivalent level of public health protection (see ELPH on the following page).

ROD Expectations: No schedule adopted for Stage 1.

Status: No significant improvement has been made for these constituents at the drinking water intakes.

Restore Franks Tract



Approach: Identify alternatives for optimizing fish habitat, levee stability, and Delta water quality improvements through a restoration project at Franks Tract.

ROD Expectations: Determine scope and feasibility by December 31, 2002, and begin implementation by December 31, 2007.

Status: An initial study indicated little fish habitat value but significant water quality improvement potential. Recent studies by U.S. Geological Survey (USGS) and others indicate potential large benefits to Delta smelt through flow restrictions in False River that also provide, at other times, water quality improvements in the Central and South Delta. This project has been moved from the Ecosystem Restoration Program (ERP) to the Water Quality Program and is investigating several pilot project alternatives are being investigated for implementation starting in 2008.

Permanent Operable Barriers



Approach: As part of the South Delta Improvements Program, permanent operable barriers would be installed to ensure delivery of water of adequate quantity and quality to agricultural diverters within the South Delta.

ROD Expectations: Barriers operable by December 1, 2007.

Status: Draft EIS/EIR circulated for public review in December 2005 with the comment period ending in February 2006. The final EIS/EIR was completed in December 2006. Note: Recent regulatory findings may result in indefinite delay; these actions have created significant levels of conflict between fish and water quality.

Reduce Agricultural Drainage in the Delta – Early Implementation Projects at Veale and Byron Projects



Approach: Reduce agricultural drainage in the Delta to minimize elevated salinity and other constituents of concern to drinking water at urban intakes in the South Delta prior to completion of the installation of permanent barriers.

ROD Expectations: Complete prior to installation of operable barriers.

Status: The Old River and Rock Slough Water Quality Improvement Projects implemented by the Contra Costa Water District with funding from Department of Water Resources (DWR) and state water contractors has been completed. The purpose of these projects was to minimize elevated salinity and other constituents of concern to drinking water at urban intakes in the South Delta. The projects are now being monitored to determine the actual improvements. Initial monitoring indicates improved water quality and improved ability of the State Water Project (SWP) and Central Valley Project (CVP) to meet water quality standards. Agricultural drainage in other areas of the Delta has not yet been addressed.

Achieve Equivalent Level of Public Health Protection (ELPH)



Approach: Use a cost-effective combination of alternative source waters, source control, and treatment technologies to improve drinking water quality.

ROD Expectations: No schedule adopted for Stage 1.

Status: The program awarded grants to support the development of four pilot regional drinking water quality plans, which provided examples of potential regional actions to improve drinking water quality. Significant resources would be required to evaluate the effectiveness and costs of regional ELPH alternatives. An assessment is currently underway to summarize and evaluate existing information on potential drinking water quality improvement actions from the source to the treatment plant and their costs. Significant concern exists that, in the future, through-Delta conveyance may limit the ability to improve the quality of water diverted for drinking water use. More stringent drinking water standards and/or degradation of Delta water quality may make treatment costs prohibitive.

Address San Joaquin Valley Drainage Problems



Approach: The intent of this milestone was to improve downstream water quality by finalizing a State Basin Plan Amendment and total maximum daily load (TMDL) for salinity in the lower San Joaquin River and begin implementation of appropriate source control measures.

ROD Expectations: Finalize State Basin Plan Amendment and TMDL for salinity in the lower San Joaquin River by the end of 2001. Implement appropriate source control measures by the end of 2003.

Status: The State Water Resources Control Board has approved a TMDL to control salt and boron discharges into the lower San Joaquin River. An interagency group has formed to implement an alternative solution to prescribed load reductions; its key recommendations are funded and being implemented. It is expected that the salt and boron water quality objectives will be met, in addition to improvements in low dissolved oxygen levels in the Stockton Deep Water Ship Channel. The reduction in San Joaquin River loads designed to improve water quality for agriculture and aquatic life will also improve drinking water quality at the South Delta urban intakes.

Implement Source Controls in the Delta and Its Tributaries



Approach: Establish a comprehensive drinking water policy and monitoring program for the Delta and upstream tributaries and implement appropriate source control measures (e.g., advanced wastewater treatment and local drainage practices).

ROD Expectations: Establish a comprehensive drinking water policy by the end of 2004. Implement source control measures by December 1, 2006.

Status: The Central Valley RWQCB is working with agency and stakeholder representatives to develop a comprehensive drinking water policy for the Delta and upstream tributaries. To date, a water quality monitoring database and conceptual models for drinking water constituents of concern have been developed. Technical work is on track to support development of a drinking water policy by the end of 2009.

The program has awarded \$76 million in competitive grants during the first seven years for source control improvements in the Delta and upstream tributaries and to control runoff in the California Aqueduct and similar conveyances. Many of the funded projects are research or planning studies, so measurable water quality improvement may not be evident. In addition, lack of an overall strategy or source control priorities resulted in scattered project implementation. The relationship of specific projects to quantified improvements is unclear.

Invest in treatment Technology Demonstration Projects



Approach: Support demonstration projects and evaluate opportunities for full-scale implementation of technology.

ROD Expectations: Initiate demonstration projects by the end of 2007.

Status: The program has invested more than \$2.25 million in five treatment technology demonstration projects. An additional two projects and \$2.1 million have been identified for possible funding this year.

Outside of the CALFED program, local and regional agencies have invested hundreds of millions of dollars on new treatment technologies. The 2005 CALFED Water Quality Program Assessment Report found that "this ROD commitment has essentially been fulfilled."

Environmental Water Quality

Mercury



Approach: Mercury, a heavy metal, bioaccumulates in the Bay-Delta system. Drainage from abandoned mines and native mercury sources in the Coast Range contribute significant amounts of elemental mercury into tributaries and rivers that flow to the Delta. Chronic exposure to mercury through the food chain can adversely affect growth and reproduction, including in humans. The CALFED strategy for mercury includes:

- Reduce the amount of mercury coming into the Delta system through source control, primarily mine remediation.
- Reduce the methylization of elemental mercury in the Delta through management actions in the Delta.
- Reduce the human health risk through education.

The ROD called for an assessment of the potential need for additional fish contamination monitoring and consumption advisories in the Bay-Delta watershed and funding for additional monitoring, testing, analysis, outreach, pollution prevention, and implementation of best management practices, as appropriate, by the end of Stage 1.

ROD Expectations: Significant progress by December 2007.

Status: In 2004, a mercury strategy was adopted by the California Bay-Delta Authority. Research has been conducted to determine the presence and concentration of mercury in the Delta as well as potential sources. Further research on mercury methylization has resulted in a better understanding of how methyl mercury can enter the Bay-Delta system, its effects on the environment, and its potential risk to human health. The creation of shallow water habitat in the Delta can result in the creation of methyl mercury. This understanding has resulted in a change in how and where shallow water habitat is established in the Delta.

DHS has implemented a program to notify and warn people fishing in the Delta of the potential human health risk. Warning signs are printed in several languages.

Low Dissolved Oxygen



Approach: Low dissolved oxygen conditions in the San Joaquin River near Stockton block salmon migration and otherwise harm the aquatic ecosystem. The CALFED approach was to investigate methods to reduce constituents causing the problem, complete a TMDL, and implement control measures included in the TMDL.

ROD Expectations: Implementation of TMDL control measures by the end of 2002.

Status: A phased TMDL was adopted in 2005, but before the TMDL can be finalized (scheduled for 2009) more research is needed to better understand sources and impacts of oxygen-depleting constituents. The TMDL also determined that the dredged geometry of the Stockton Deep Water Ship Channel (DWSC) and water operations that reduce flow through the DWSC were equally important contributing factors to the impairment, and made recommendations to various CALFED agencies to address those non-load-related impacts. To date, an experimental aeration device has been installed near Stockton by the DWR. Aeration may be one of several actions eventually needed for a full solution.

Pesticides and Toxicity



Approach: Pesticides can affect fish species targeted for restoration by reducing food supply, increasing susceptibility to disease and predation, and interfering with reproduction. Monitoring of Central Valley rivers, streams, and Delta waters and sediments has shown the presence of potentially toxic levels of several pesticides. Testing using fish and other aquatic organisms has also indicated varying amounts of toxicity. The Regional Water Quality Control Board is developing pesticide TMDLs for several water bodies. In many cases, the cause of toxicity in a sample cannot be identified. Further research into methods for identifying the agents responsible for this “unknown toxicity” has been proposed.

ROD Expectations: Significant progress by December 2007.

Status: TMDLs and actions to restrict pesticide use have significantly reduced ambient concentrations of some pesticides. Voluntary programs to reduce pesticide use such as Integrated Pesticide Management (IPM) and organic farming have also helped reduce pesticide use. However, pesticides used as replacements have also been implicated in aquatic toxicity. Toxicity in water column samples is less frequent but is still found on a regular basis. Some evidence exists that contaminants are affecting the health of Delta fish and toxic substances have not been eliminated as a contributing factor in the pelagic organism decline. Further research into the impacts of pesticides and other toxic substances is underway.

Selenium



Approach: Selenium, like mercury, bioaccumulates through the food chain and may be harmful to birds and fish. The developmental impacts of selenium at Kesterson Wildlife Refuge and other parts of the San Joaquin Valley are well known. Selenium is naturally occurring at high concentrations in parts of the Central Valley but can be mobilized and concentrated by irrigation and drain management practices. Selenium has been addressed by regulating the discharge of agricultural drainage, particularly from the west side of the San Joaquin Valley. The CALFED agencies have applied significant resources to develop methods for removing selenium and managing agricultural drainage.

ROD Expectations: Significant progress by December 2007.

Status: Implementation of a regulatory program to gradually eliminate selenium discharges from the west side of the San Joaquin Valley has generally been successful. Selenium discharges have been greatly reduced; however, selenium concentrations in the San Joaquin River and the Delta continue to be at levels of concern to biologists. Chronic exposure to selenium may be affecting fish species of concern, such as the newly listed Green Sturgeon, and water birds in the Bay-Delta system.

Lessons Learned:

- **Significant work outside the Delta:** The ROD quantified a goal of 50 micrograms per liter for bromide and 3 milligrams per liter for total organic carbon with the caveat that actions could be taken outside the Delta if they provided an equivalent level of public health protection.
While expenditures outside the Delta on water treatment and other actions were substantial (although largely unrelated to CALFED), a means of translating these actions into a meaningful, quantified contribution to the CALFED water quality goals was never established.
- **Controversy between Water Quality and Ecosystem Restoration:** Although an area of debate, there appears to be controversy between drinking water quality and ecosystem restoration related to variable salinity, mercury, and organic carbon. The current science suggests that native species may be impacted by a variable salinity regime.
- **Better understanding of human health risks:** The science of human health risk assessments of very low-level chemical contaminants is still inexact, and despite meeting strict regulatory standards, risks to human health from drinking water remain an issue to the public. Focused research by USEPA, Department of Health Services (DHS), drinking water utilities, and others is

advancing the understanding of human health risks of drinking water contaminants, while DHS and EPA continue to consider changes to drinking water standards based on toxicity and risk studies and other factors.

- ***Management improvements:*** Given prospective factors such as population increase and climate change, future assurances that water from the Delta will continue to produce safe drinking water at levels of acceptable risk will require improvements built upon the principles of multiple-barrier protection, both in the management of the Delta and through improvements in drinking water treatment and distribution technologies.

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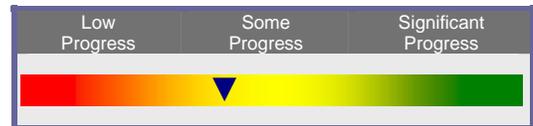
FINAL DRAFT

As of June 20, 2007

CALFED Bay-Delta Program CALFED Coordination and Science Program Performance

Coordination and Science Program Goal: Through integrated science, communication, and strategic planning, the Program supports the coordinated implementation of the CALFED Record of Decision (ROD), specifically the improvements in water supply reliability, ecosystem health, water quality, and levee stability of the Bay-Delta system.

Summary of Progress: CALFED staff within the Resources Agency coordinates Program planning, annual reporting, and budgeting/performance tracking. They ensure stakeholders and the public are involved, while also maintaining focus on environmental justice issues. Staff are also responsible for implementing the CALFED Science program. Scientific research spanning all program areas has led to a deeper understanding of the Bay-Delta and significant changes in how the system is managed.



Funding: Stage 1 funding for this program has totaled approximately \$235 million, including:

- \$164 million, Science Program
- \$71 million, CALFED Coordination Activities

Strategy: This mission will be fulfilled through:

- Interagency Coordination
- Authoritative Science
- Measurable Performance
- Informed and Transparent Decisions
- Effective Communication
- Inclusive Public Involvement

Oversight and Coordination



Approach: During the last seven years, the California Bay-Delta Authority has provided independent oversight of the CALFED Program. However, while intended to provide independent oversight, the Authority Board has no true authority to influence the direction of the Program. The Little Hoover Commission recommended eliminating the Authority but also indicated that the Legislature should replace it with an independent oversight body to provide expert guidance to policymakers. In 2006, the California Bay-Delta Authority was reorganized to provide program management support to the Secretary for Resources and the CALFED implementing agencies. The functions of the CALFED office include strategic planning, program and fiscal tracking, communications, science, and

administration.

ROD Expectations: Coordination and integration of all efforts related to the Bay Delta.

Status: The CALFED 10-Year Action Plan, released in April 2006, proposed reconstituting the California Water Commission to provide independent external oversight over the CALFED Bay-Delta Program. While this proposal was not supported by the Legislature, the California Bay Delta Authority staff and budget were reorganized as part of the 2006-2007 budget process. The majority of the staff were integrated into the Resources Agency with some staff being assigned to several of the implementing agency departments. The ERP implementation has been fully transferred to the Department of Fish and Game. Independent oversight of the CALFED Program must be revisited as part of a broader long-term governance proposal once CALFED End of Stage 1 decisions are made and Delta Vision is complete.

Public Involvement and Communications



Approach: One of the successes of the CALFED Program has been its extensive public involvement processes. The CALFED public processes allow interested stakeholders to understand and provide input as the program is implemented, conflicts are resolved, and decisions are made. The Little Hoover Commission, as part of its CALFED independent review in 2005 and the CALFED 10-Year Action Plan, called for CALFED to develop and implement a comprehensive communication strategy to target outreach efforts to stakeholders, legislators, and the public.

ROD Expectations: High level of transparency and public involvement.

Status: As part of the 2006-07 budget process, the Legislature chose to limit the role of CALFED in communications and outreach. All funding and staffing were decreased for communications activities except for the previously established public processes associated with the BDPAC and the California Bay-Delta Authority. In December 2006, the BDPAC subcommittees were restructured to match the four CALFED objectives instead of individual program elements and a new subcommittee on Program Performance and Finance was established. While the BDPAC subcommittees remain active, uncertainty over the future governance structure and direction of the CALFED Program has resulted in diminished interest and attendance at the overall BDPAC and Authority meetings. Vacancies on both committees have made achieving a quorum difficult. Stakeholders and the public appear to be focused on other public processes such as those associated with Delta Vision.

Strategic Planning



Approach: Strategic planning must review the progress made by the Program, the progress the Program must achieve, and identify the direction of the Program; communicate with implementing agencies so they can update annual plans achieve the Program goals; review progress toward goals; and adjust the Program plans when necessary. The CALFED implementing agencies are required to prepare annual Program Plans under the California Bay-Delta Act of 2003.

ROD Expectations: Implementing agencies will work toward a set of common goals.

Status: In response to the need to communicate clear goals and objectives across the Program, the CALFED 10-Year Action Plan centralized strategic planning within the Resources Agency. CALFED staff in the Resources Agency work with the implementing agencies to coordinate Program planning and annual reporting. Each year, the CALFED staff coordinates the preparation of program plans by the implementing agencies. While the California Bay-Delta Act of 2003 requires the implementing agencies to prepare Program Plans, there is no consequence for not completing the Plans. Accordingly, in the past the implementing agencies have put a minimal level of effort into the CALFED Program Plans. Beginning in 2008, Program Plans will be linked to the Delta Strategic Plan and actions in the Program Plans will be tied to quantifiable performance measures, along with a direct linkage between the actions proposed and the expected outcomes.

Science



Approach: The Science Program provides scientific assistance and support to the implementing agencies through a variety of means, including the use of Science Advisors and technical review panels. Outside scientific advice and review play a critical role in the implementation of CALFED program elements and are crucial components of making science open and accountable. In addition, the CALFED Science Program invests grant funding in projects that advance the understanding of complex scientific issues related to the Bay-Delta and provide assistance to policy makers and resource managers in implementing the future direction of the CALFED Program.

ROD Expectations: Implementing agencies make use of the best scientific information in planning and implementing the program.

Status: The Science Program has provided independent review at several levels, including review of proposals, priority issues, and programs. In addition, the Science program assists the implementing agencies by providing science advisors who are subject matter experts that provide advice and technical support in dealing with complex resource and system management problems. Recent independent review has focused on emerging priority issues including OCAP Biological Opinion Review, IEP's POD work plan, CALSIM II, and San Joaquin Review.

In 2004 and 2006, the Science Program implemented its first and second broad call for research proposals covering cross-program needs and future change. Investments in research have led to significant changes in management of the Bay-Delta system. The Science Program will continue to support ongoing science communication activities such as the electronic scientific journal dedicated to Bay-Delta and watershed issues and biennial CALFED Science Conferences. There will be an increased emphasis on investments for synthesis of technical and scientific information with a focus on providing the scientific context for upcoming decisions on CALFED Program implementation.

Program Tracking



Approach: The implementing agencies are responsible for developing performance measures, monitoring, and reporting Program progress. Performance measures will be used to assess progress toward Program goals and inform adaptive management of the Bay-Delta system.

ROD Expectations: Implementation action will be tracked, monitored, and progress reported at least annually.

Status: The CALFED 10-Year Action Plan indicated that implementing agencies would develop and use performance measures to evaluate the effect of their program actions and determine whether they are achieving program element goals and the overall CALFED objectives. The CALFED implementing agencies are measuring and reporting on Program performance relative to:

- The four overall CALFED objectives
- Specific program element goals
- Individual project actions

Implementing agencies that are responsible for Program, and project-level implementation will coordinate with Resources Agency CALFED staff to identify, collect, and report appropriate information for measuring project and Program performance and to assess the success in fulfilling the Program's mission and goals.

As part of the 2006-2007 budget process, the California Bay Delta Authority staff and budget were reorganized with a portion of the staff being assigned to the Resources Agency to support Program Performance and Tracking. The Program tracking function assists with the development of performance measures, cross-cut reporting including funding information for all programs within CALFED, and serving as a liaison with Legislative Analyst's Office and the Legislature.

Environmental Justice



Approach: The CALFED Program and its implementing agencies are committed to seeking fair treatment of people of all races, cultures, and incomes, such that no segment of the population bears a disproportionately high or adverse health, environmental, social, or economic impact resulting from CALFED's programs, policies, or actions.

ROD Expectations: Environmental Justice will be considered and implemented as part of all Program actions.

Status: The CALFED Program initially used a centralized approach, providing training in environmental justice issues for Program and implementing agency staff and managers, as well as opportunities for members of the environmental justice communities to interact with implementing agencies. A needs assessment was conducted of CALFED agencies and staff to ascertain environmental justice training and technical assistance. Based on that assessment, developed and conducted a tailored training program to provide education and technical assistance to CALFED program managers and staff.

The CALFED restructuring process, as well as an internal evaluation, led to the conclusion that the most effective way to implement environmental justice is to make its principles a part of each project and program undertaken by the specific CALFED implementing agencies. A section on environmental justice implementation was incorporated into each of the annual Program Element work plans. The CALFED implementing agencies have developed an environmental justice framework that calls for each implementing agency to hire or assign responsibility for environmental justice within its own staff, to work with the environmental justice community to develop and report indicators and performance measures and to report these semi-annually to the CALFED governing body as well as the general public. To ensure more governance presence, increased minority representation on the Bay-Delta Public Advisory Committee.

CALFED staff began work with agencies to identify and acquire demographic, environmental, land use, water and other related information by watershed within the CALFED solution area and to use demographic methods and GIS data to identify low-income populations, underrepresented communities, Tribes or others potentially impacted by CALFED projects and programs.

Although some progress has been made in training and understanding the population, no progress has been made on recommendation to develop an environmental justice impact assessment methodology and guidance for CALFED programs that could be incorporated into CEQA, NEPA, and Title VI compliance.

Lessons Learned:

- **Future planning:** One component the ROD accomplished extremely well was planning for change and build in review as part of moving forward. Future planning should also plan for change and building in flexibility.
- **Broad participation:** Stakeholders, public, and the agencies must be involved from the beginning. Lack of opportunities to participate and be heard result in distrust and opposition. The stakeholder role for the future must be further defined as part of a long-term governance decision.
- **Governance:** For long-term governance of the Delta to be effective, the appropriate authority must accompany oversight responsibilities.
- **Performance and tracking:** It is essential that expected outcomes from individual projects be quantified. Individual projects should be linked to the accomplishment of one or more goals and objectives both within and outside of the Delta, and an effective tracking system should be implemented to determine whether goals are being achieved and appropriate modifications are being taken. If not mandated, tracking Program performance and the use of quantifiable performance measures is very difficult.
- **Decision-useful information:** Information or data alone may not be that helpful to policy and decision makers. To be most useful, information and data must be synthesized and summarized.