CALFED Bay-Delta Program

Levee System Integrity Program
Multi-Year Program Plan (Years 6-9)

(State FY 2005-2006 to 2008-2009, Federal FYs 2006-2009)

Implementing Agencies:
Department of Water Resources
Department of Fish and Game
United States Army Corps of Engineers

March 2005

CALIFORNIA
BAY-DELTA
AUTHORITY

Goals, Objectives, and Targets

Objective and Goals:

> "The overall Levee Program objective is to reduce the risk to land use and associated economic activities, water supply, infrastructure, and ecosystem from catastrophic breaching of Delta levees. Levee Program actions focus primarily on the legal Delta as defined in the Water Code …The goal is to provide long-term protection for multiple Delta resources by maintaining and improving the integrity of the Delta levee system. In addition, the Levee Program aims to integrate ecosystem restoration and Delta conveyance actions with levee improvement activities." (CALFED Levee System Integrity Program Plan, July, 2000, page 1-5). This same goal of protecting resources and integrating ecosystem restoration applies to the Suisun Marsh levee system.
>
> Currently, the Habitat Management, Preservation, and Restoration Plan for the Suisun Marsh (Suisun Marsh Plan) is under development with an estimated completion date of Fall 2006. The actions in the Suisun Marsh Plan will include components of the CALFED Ecosystem Restoration Program, Water Quality Program, and the Levee System Integrity Program to achieve a common goal of providing long-term protection of the water supply and ecosystem benefits.

Achieving this objective is being undertaken through a cooperative effort among the Department of Water Resources (DWR), the Department of Fish and Game (DFG), U.S. Army Corps of Engineers (COR), participating local reclamation districts (RD), and Suisun Resource Conservation District (SRCD).

This Program Plan is fully included in the Delta Improvements Package.

The CALFED Record of Decision (ROD) identified five commitments for the Levee System Integrity Program:

1. Provide Base Level Protection.

   Provide funding to help local reclamation districts reconstruct all Delta levees to a base level of protection (the PL 84-99 standard).

2. Implement Special Improvement Projects.

   Provide funding for projects that enhance flood protection beyond base level protection on levees that have particular importance in the system. Priorities include protecting public benefits such as water quality, the ecosystem, life and personal property, agricultural production, cultural resources, recreation, and local and statewide infrastructure.

3. Implement a Levee Subsidence Control Plan.

   Develop "best management practices" to control and reverse subsidence and work with local districts and landowners to implement cost-effective measures.

4. Implement a Levee Emergency Management and Response Plan.

Enhance the emergency management response capability of local, State, and Federal agencies to rapidly respond to levee emergencies.

5. Perform a Delta Levee Risk Assessment.

   Quantify the risks to Delta levees, evaluate the consequences, and develop a strategy and recommendations to minimize the threat. Recognized major risks to Delta levees include earthquakes, floods, seepage, and subsidence.

The ROD description of the Delta Levees component contained two primary activities, Base Level Protection and Special Improvements. The relationship to the DWR's Delta Levee Subventions and Special Projects, has been confusing. To assure this program plan remains consistent with the CALFED Bay-Delta Program Finance Plan (finance plan) the new terminology will be incorporated into this plan. As defined in the finance plan:

Levee Maintenance is to provide funding for levee maintenance and improvement to base level protection only with priority for funding being on local flood protection benefits and will continue to rely on a locally-driven subventions program to distribute the State cost share. Funding is included for full mitigation of habitat impacts resulting from levee maintenance activities.

Levee Improvements is to provide funding for levee improvements over an existing level of protection. This includes, and may exceed the PL 84-99 level of protection. It is similar to the DWR's existing special projects program in that funding is based on priority areas that will provide multiple benefits such as flood protection, water quality, ecosystem restoration, water supply reliability, and transportation benefits. As with the existing special projects program, this activity provides funding for full mitigation of habitat impacts resulting from levee improvements and provides funding for habitat enhancements for both levee maintenance and levee improvements.

Other Components is a new category that includes the Delta Risk Management Strategy (DRMS), subsidence control, emergency response, beneficial reuse of dredged material, program management, oversight, and coordination.

Delta Risk Management Strategy

The DRMS has the objective of evaluating ongoing and future risk of levee failure; identifying the probable consequences; and identifying levee maintenance and upgrades that are necessary and economically justified. Data gained from this critically important study will help establish priorities for near-term and long-term actions that will reduce the risk associated with catastrophic levee failure in the Delta.

Suisun Marsh Levee System

The ROD focused on the Delta's levees and the decision to include the Suisun Marsh levee system occurred post-ROD. Therefore, to assure this program plan also remains consistent with the finance plan, the program plan will include the five commitment categories tailored to the Suisun Marsh

- Provide Base Level Protection.

  Provide funding to participating local levee maintaining agencies to reconstruct selected Suisun Marsh levees to a suitable base level of protection.

- Implement Special Improvement Projects.

Provide funding for projects that enhance protection beyond base level protection for key levees that protect public benefits such as water quality, life and personal property, and local and statewide infrastructure.

- Implement a Levee Subsidence Control Plan.

  Develop "best management practices" to minimize the risk to levee integrity from land subsidence.

- Implement a Levee Emergency Management and Response Plan.

  Enhance the emergency management response capability of local, State, and Federal agencies to rapidly respond to levee emergencies.

- Suisun Marsh Levee Evaluation.

  The Delta Risk Management Strategy will include Suisun Marsh and the output of that assessment will be included in the Suisun Marsh Plan (SMP) .

Targets:

Following are the ROD Elements and Stage 1[1] Actions. Actions for Stage 1 and beyond in the Suisun Marsh will be developed during preparation of the SMP

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Levee System Integrity Program and Stage 1 Actions

Element	Stage 1 Action	Current Plan
Base Level Protection (PL84-99) Levee Maintenance Levee Improvements	200 Additional Miles None None	Minimize Risk of Levee Failure Delta-Wide Minimize Risk of Failure through levee maintenance Improve Flood Protection and Levee Stability.
Special Improvements beyond PL84-99 Levee Improvements	None	Improve levee stability on critical Delta islands as funding allows Improve levee stability on islands providing multiple benefits
Levee Subsidence Control Plan Other Components	None	Continue multiple studies Continue Subsidence Control Studies and Support
Levee Emergency Response Plan Other Components	Dec 2000 None	Plan is in place; work is continuing Continue Development and Testing of Emergency Response System
Delta Risk Management Strategy Other Components	End of Stage 1 None	Contract Phase 1 is near completion Incorporate Risk Management with the Comprehensive Program Evaluation

[1] CALFED Stage 1 refers to the first 7 years of the CALFED Program which correspond to State Fiscal Years 2000-01 through 2006-07.

The goals of the Levee System Integrity Program contained in the ROD were well founded when developed. However, the DRMS will reevaluate the ROD goals to determine if they remain valid.

Levee maintenance is necessary to attain base level protection and preserve the existing Delta levees in their current configuration. Without maintenance, these structures will erode, settle, and, ultimately fail. In time, the Delta would become an inland sea. Preventing the formation of this inland sea requires regular attention from reclamation district staff and others.

Levee improvement will enlarge the existing levees and improve flood protection for the many assets in the Delta. Improvements will include the PL 84-99 standard (Base Level Protection) and may exceed this standard for islands with critical need.

As a result of the weak soils existing in the Delta achieving base level protection will require many years to strengthen the foundation, followed by an increase in levee height. The steps include placement of a significant volume of fill over compressible foundation soils, waiting until the foundation gains strength, then building a stabilizing berm, lastly, increasing the crest elevation. The additional fill will stress the foundation and likely result in cracking, settlement, and substantial seepage. The work must be done carefully and the effects on levee stability must be fully analyzed. Achieving base-level protection requires careful concern for these fragile structures and must be done deliberately so as not to damage the very system the program is intended to preserve and strengthen. Attaining these goals can be accomplished only with, adequate and consistent funding. This will require through the Department of Water Resources will program reauthorization and associated funding effective July 1, 2006.

Improvements beyond the PL84-99 standard will follow or complement the completion of Base Levee Protection provided the program is extended and funding is available. The CALFED Levee System Integrity is currently working to minimize the risk of levee failure on critical islands by improving levee stability on selected important islands to the extent funding allows.

Program actions using the current limited and variable funding are targeted at preserving the progress achieved to date and minimizing the risk of levee failure rather than achieving a set quantity of miles of levee improved to the PL84-99 standard. This approach of reducing risk is the logical method of continuing to achieve the State's legislative intent, to preserve the Delta as it exists, while working toward the CALFED goal of achieving Base Level Protection. The program will only continue with preservation and incremental improvements during the current and upcoming year due to inadequate funding.

If and when State and federal funding levels improve there will be a need for the corresponding local capability to cost share to meet CALFED objectives. The ability of the local reclamation districts to cost share a larger program, as envisioned in the ROD, remains in question. The local costs should be assessed to others benefiting from the Delta's levees including the boating public, water exporters, habitat communities, and other users. Social and urban development stresses are also an ongoing issue within the Delta.

Subsidence control remains an elusive goal. Like other CALFED programs, contracting and funding constraints have stalled ongoing studies and threaten new studies or projects. A full year of study on subsidence was lost to contracting difficulties and only recently has an extension of the subsidence study been possible. A set of best management practices continues to be a future objective.

The emergency response plan was tested and proved during the response to the Upper Jones Tract Levee failure which occurred on June 3, 2004. The cause of this failure is unconfirmed. The emergency response system worked; however,

we continue developing emergency plans to refine and improve the overall response capability. Emergency Response/ Preparedness is an ongoing activity that will continue in order for it to remain effective.

A Delta risk management study was initiated to analyze the seismic risk to Delta levees, quantify the risk to Delta export facilities, and develop a strategy for reducing and managing these risks. The study has produced significant work products including an improved hydraulic model of the Delta, an evaluation of the emergency response system, and a definition of typical breach configurations. Early results of this study have shown there is a need to examine current policies for preserving and improving the Delta and Suisun Marsh.

The Levee System Integrity Program, through the Department of Water Resources' Subventions and Special Flood Control Projects (DWR Delta Levees Program) and the Department of Fish and Game's Delta Levee Habitat Improvement Program (DFG Delta Levee Habitat Improvement Program) preserve the existing configuration of the Sacramento – San Joaquin Delta levees and has initialized the DRMS.
The Delta Risk Management Strategy will explore many facets of the existing Delta infrastructure and ecosystem including risk factors, hydrodynamics, beneficial uses, and risk reduction strategies. The outcome of the DRMS will be better policy to guide the use of program funds to obtain reasonable goals. The DRMS study is commencing with phase 2 of the levee risk assessment which will analyze the effects of multiple levee failures on through Delta conveyance and water quality. An extension of the levee risk assessment for time and funding is being processed for Phase 2.

The DWR Delta Levees Program the DFG Delta Levee Habitat Improvement Program must ensure that all expenditures of funds are consistent with net long-term habitat improvement and provide a net benefit for aquatic species in the Delta. The levee program has a demonstrated ability to achieve ecosystem and conveyance benefits by working cooperatively with local reclamation districts. This program provides benefits to the Ecosystem Restoration, Water Quality, and Water Supply Reliability programs.

The Levee System Integrity Program conducts regular public outreach through monthly meetings of the Delta Levees and Habitat Advisory Committee and the California Bay-Delta Public Advisory Committee, Levees and Habitat Subcommittee. These meetings provide opportunities for public input to program priorities, schedules, grants, and actions. These are effective forums for public input to the CALFED process and provide both stakeholders and the public at large an opportunity to affect program outcomes. The Delta Levees and Habitat Advisory Committee and the California Bay-Delta Public Advisory Committee, Levees and Habitat Subcommittee are effectively coordinating the Levee System Integrity Program Element with other CALFED Programs. .

The mission of the CALFED Bay-Delta Program is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta System. This is accomplished by working with the Agency Coordination Team (ACT) establishing broad goals and objectives for the overall CALFED Program, including Levee System Integrity, assuring integration among program elements, tracking performance, and obtaining necessary funding. This relationship among the Authority, committees, implementing agencies, and local interests will continue.

Future program plans will continue to reflect the goals, objectives, and direction promulgated by CBDA for the Levee System Integrity Program. Once adequate, consistent funding is provided, the Department and local reclamation districts, working with other local and federal interests, will achieve the Stage 1 objectives in approximately 10 years.

Accomplishments

Provide Base Level Protection - Maintenance

During Fiscal Year 2004-05 the program worked cooperatively with levee maintaining agencies in the Delta to maintain more than 600 miles of eligible project and non-project levees in the Sacrament – San Joaquin Delta. Maintenance includes routine annual maintenance, emergency response, repairs to restore the levee crest, slope protection, levee patrolling, restoration of slips and scarps, and the associated engineering and construction costs. Any impacts to habitat were fully mitigated.

Provide Base Level Protection – Levee Improvement

Improved more than 43 levee miles for stability and overtopping. Improvements include bringing selected sections to the PL 84-99 standard. Significant projects were undertaken on Sherman, Bradford, and Jersey Islands and Webb Tract. Continuing consolidation of the foundation will reduce this amount over time. Additional work of note was performed on McDonald and Quimby Islands. This work was fully mitigated, resulting in no net loss of habitat

Special Improvement Projects – Levee Improvement

Special improvement projects are projects which raise the levee crest above the PL 84-99 standard. The Department of Water Resources currently give a high priority to funding projects that raise deficient levees on critical islands. There have been no improvements to date that exceed the PL 84-99 Delta-Specific standard.

Net Habitat Improvement: The Levee Program uses Special Improvement Project funds to provide net habitat improvement (enhancement).

To date, the Program has created about 33 acres of riparian and wetland habitat and 16,000 linear feet of Shaded Riverine Aquatic Habitat on Decker, Twitchell, Grand, Staten, Tyler, and Little Tinsley islands; and Holland, Webb, and McCormack-Williamson tracts. The Program is planning significant habitat enhancement on Meins Landing, Dutch Slough, Sherman Island, and McCormack-Williamson Tract .

All Other Components – Beneficial Reuse

Continued work on developing general permit terms and conditions with the Regional Water Quality Control Board (RWQCB) for dredging projects .

This process is stalled and the beneficial reuse portion of the program is in danger of being eliminated due to increasing difficulty in meeting RWQCB permit requirements and the high costs associated with receiving and monitoring of the material prior to its reuse.

Reused over 1,145,000 cubic yards of dredge material to increase levee stability.

Continued efforts to amend the Suisun Marsh Preservation Agreement and develop a long-term plan for levee protection consistent with regulatory permit requirements and endangered species protection. Working on purchase of lands on Mein's Landing to provide enhancement as well as mitigation for unavoidable disturbance to species on Van Sickle Island.

All Other Components - Subsidence Control Plan

The Department of Water Resources continued working with the USGS on a demonstration project on Twitchell Island to determine relationships between biomass accumulation, sediment deposition, and water management and to delineate priority areas on the island for subsidence control.

The Department of Water Resources' contract for developing the Strategic Framework for Reversing the Effects of Subsidence in the Sacramento-San Joaquin is being renewed. The contractor plans to restart his studies in summer of 2005, pending contract approval.. The broad-scale study of subsidence solutions will continue as program funding allows.

An expanded subsidence reversal demonstration project is in planning for implementation in the west Delta.

All Other Components - Emergency Management and Response Plan

The Department of Water Resources implemented emergency response activities for the flooding of Upper and Lower Jones Tract. The breach was successfully closed, wave wash protection installed to protect the interior of the levee, and pump out was effected through activation of the emergency response plan developed within the Delta Levees Program. The Department participated in additional emergency actions which occurred on Twitchell Island, Van Sickle Island, Bradford Island, and on Simmons-Wheeler Island in the Suisun Marsh. Program staff continues to work with local levee maintaining agencies to provided funds and technical support for emergency measures necessary to prevent overtopping, erosion, and flooding of Delta and some Suisun Marsh islands.

All Other Components - Delta Levee Risk Assessment

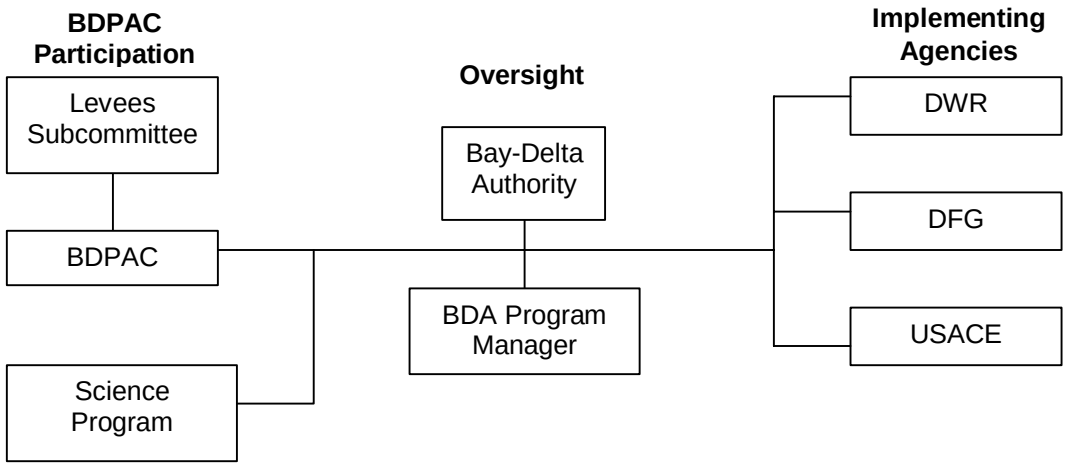
The Levee Risk Assessment (LRA) Contract for Seismic Risk Management Analysis has commenced and Phase 1 tasks are nearing completion. The results of the Phase 1 study have highlighted additional risk potential from the current configuration of levees in the Delta. To more fully address this risk and establish policy that will address it, the program will engage in a Delta Risk Management Strategy that will incorporate and expand phase 2 of the LRA contract The LRA study involves completing the analysis of risk to conveyance facilities resulting from multiple Delta levee failures. This work requires contract extension and adjustments to both scope and funding. These extensions will be pursued within the program. Ultimately, the study, when completed, will document the risk of levee failure anywhere in the Delta and provide insights that will help to form policy regarding preservation of the Delta as it now exists.

Tasks finished, behind, on schedule

The Stage 1 goals for Levee System Integrity are included in the table on page 2. Each of the actions, except beneficial reuse, is significantly behind schedule. Though contracting difficulties can account for some of the delay in certain elements, it is the absence of adequate, sustained matching funds from the State and federal government sources that is the primary cause for this program's delay.

The current progress toward achieving Base Level Protection is falling behind because the available funding is used for maintenance, in an effort to preserve the levees for future enlargement. Over the past 5 years the local agencies have been spending the funds available for levee improvements to pay the pro-rata charge and cost share on maintenance. Many of the levee improvements obtained in the program have been funded entirely through local monies. When taken in the aggregate, Levee System Integrity has provided only about 50% of the cost of achieving the maintenance and improvements to the levee system, not the 75% indicate in many CALFED documents. By supporting local districts at the 50% rate, rather than at the 75% rate has the effect of diminishing the levee improvement obtained from overall program funds, using it in maintenance, rather than achieving the goals stated in the ROD.

Program Structure



Agency	Roles and Responsibilities
California Bay-Delta Authority	• Oversight
Department of Water Resources	• Program management • Subventions • Special projects • Subsidence • Emergency response • Beneficial reuse • Risk assessment • Suisun Marsh
U.S. Army Corps of Engineers	• Program management • Base Level Protection and Special improvements • Emergency response • Beneficial reuse
Department of Fish and Game	• Program management • Subventions environmental review • Special projects environmental review • Preserving/Improving net Delta habitat

Major Activities

Funding for the Levee System Integrity Program has varied significantly over the years of Stage 1. The ROD provided a theoretical budget and corresponding targets that would allow the program to achieve base level protection for 200 additional miles of Delta levee and accomplish other goals. However, the historic funding received within the program is approximately 30% of the ROD targets. This funding level has sustained the program, albeit at reduced efficiency and future funding levels are uncertain. This uncertainty has required that some goals be revised downwards and schedules be extended. Funding as proposed in the 10-year Finance Plan will have the COE taking over major portions of program implementation from DWR. Current priorities include:

- Funding maintenance activities to preserve the existing levees, protect individual islands, and provide a base upon which to build when funding is increased.
- Continuing ongoing study of subsidence and economical methods to reverse it.
- Continuing the Delta Risk Management Strategy to increase understanding of the risks to levee structures present in the Delta and how best to manage that risk.
- Continuing improvements to the emergency response system.
- Reducing participation in Beneficial Reuse to those activities that are economically justified.
- Making improvements to levee stability as opportunities arise and to the extent allowed by available funding.
- Continuing to provide net habitat improvement benefits as available funding allows.
- Begin a comprehensive assessment of the Suisun Marsh levee system as a component of the SMP.

Provide Base Level Protection – Levee Maintenance

The CALFED Program element of Base Level Protection is implemented incrementally with significant planning, coordination, contracting, scientific investigation, and cost sharing with local agencies. The Subventions Program works closely with these agencies and other local interests to provide regular levee inspections by qualified private engineering firms, timely repairs, re-establishment of crest elevation lost to consolidation, and incremental enhancements to stability that will, over time, result in attaining the CALFED goals, provided that there is adequate, consistent, and timely funding. The Subventions Program also provides significant habitat improvements in the Delta.

Local support is strong for the Subventions Program as evidenced by cost sharing of not less than 25%.

Schedule: This is an annually recurring program and will continue for the duration of available funding to support the work.

Subventions Program – Continue to provide financial assistance to local agencies for preservation and rehabilitation of non-project Delta levees and project levees within the primary zone consistent with no net habitat loss and long-term habitat improvement. Achievement of Base Level Protection is possible over time with sufficient program funding.

Schedule: The ROD schedule is significantly delayed by funding shortfalls, limitations on local cost share funding, shortage of materials, and other problems. The program is preserving options for the future by continuing the maintenance and incremental improvement of the existing levees to the level allowed by available funding.

Suisun Marsh Levee Maintenance – Work with interested parties to define funding needs and work within CALFED to obtain baseline allocations that will begin to provide financial assistance to local agencies for preservation and rehabilitation of Suisun Marsh levees consistent with no net habitat loss and long-term habitat improvement. Achievement of Base Level Protection is possible over time with sufficient program funding.

Schedule: Ongoing

Implement Special Improvement Projects – Levee Improvements

USACE Studies: The existing Federally funded Sacramento and San Joaquin Delta, Special Study, is an ongoing Feasibility Study being undertaken by the State Reclamation Board and Department of Water Resources. The study is investigating the Delta and was to be updated this past year. The North Delta Improvements Project team developed a draft Project Management Plan outlining a 3-year study and the expenditure of $5.4M. However, in September 2003, due to the State's fiscal situation, it was decided to postpone amending the existing Feasibility Cost Share Agreement (FCSA) to include North Delta. The USACE, Reclamation Board, and DWR will re-initiate this effort on North Delta and the Special Study when the state's fiscal conditions allow. Cosumnes and Mokelumne Rivers Feasibility Study is a Federally funded study of groundwater recharge and ecosystem restoration. Several attempts to find a local sponsor to utilize the BDA matching state funds were made unsuccessfully. However, in January 2004,CBDA approved a request for a grant proposal amendment to allow a group of Sacramento and San Joaquin water users to become the lead rather than partner with the USACE. The USACE is ready to imitate the Feasibility Study when these users or CBDA initiates a combined NEPA /CEQA investigation of alternatives. USACE's work on Prospect Island Section 1135 project was formally stopped when CBDA was unsuccessful in obtaining additional construction funding for this tidal marsh restoration project. The USBR has decided to surplus the lands rather than waiting for an additional year(s) of funding. The construction plans and specifications are completed and can be utilized if the project is reinitiated, or if others are interested in purchasing the island and implementing the project. HR-2828 promises a total of $90 Million for support of Levee System Integrity. A preliminary study on use of the funds is due to congress 120 days after an allocation is provided..

HR-2828 authorized a total of $90 Million for support of Levee System Integrity. A preliminary study on use of the funds is due to congress 180 days after appropriations are allocated to fund staff time necessary to compile the report.

The Delta Islands Reconnaissance study will compliment the Delta Risk Management Strategy for the levees that DWR is preparing.

Schedule: In 2005, the USACE initiated Reconnaissance Studies on North Delta and Delta Islands and Levees. Negotiations are underway with the non-federal sponsors to initiate a Feasibility study in FY2006. Funding for FY2006 contains minimal funds for the USACE to support CALFED programs.

Habitat Development: The Levee System Integrity Program incorporates significant improvements to Delta and Suisun Marsh habitat. The program has restored a portion of Decker Island to tidal marsh, it has active projects on Bradford, Medford, Sherman, and Jersey Islands within the Delta and on Meins Landing in the Suisun Marsh. Planning is ongoing for habitat improvement projects on McCormack Island and at Grizzly Island. Levee System Integrity Program projects work with local agencies to achieve habitat enhancements at favorable prices.

Schedule: Ongoing

Suisun Marsh Levee Improvement Projects – Work with interested parties to define funding needs and work within CALFED to obtain baseline allocations that will begin to provide financial assistance to local agencies improving Suisun Marsh levees.

Schedule: Ongoing

Other Components - Implement a Levee Subsidence Control Plan

Subsidence reversal has been studied for several years on Twitchell Island under the CALFED Levee System Integrity Program. Studies have shown that it is possible to stop subsidence by shallow flooding.

An additional study on dispersing silts and soils on fallen aquatic plants continues to be stalled due to contracting difficulties. The DWR is working to restore these contracts and continue this study.

Ultimately, subsidence reversal best management practices must reflect the outstanding scientific investigations that lead to the best implement able practices that can be applied directly adjacent to levees as fully coordinated with the outcome of the risk assessment study and cost sharing with local agencies.

Subsidence reversal has been studied for several years on Twitchell Island under the CALFED Levee System Integrity Program. Studies have shown that it is possible to reverse subsidence by shallow flooding. However, problems associated with taking land out of agriculture, poor quality of the resulting young "peat soil", and production of THM precursors require additional study before recommending a specific subsidence reversal plan. This study of peat growth continues with support from the program for maintenance of the ponds.

An additional study on dispersing silts and soils on fallen aquatic plants continues to be stalled due to contracting difficulties. The DWR is working to restore these contracts and continue this study.

Ultimately, subsidence reversal best management practices must reflect the outstanding scientific investigations that lead to the best implement able practices that can be applied directly adjacent to levees as fully coordinated with the outcome of the risk assessment study and cost sharing with local agencies.

Schedule: DWR is working to extend the contracts for subsidence reversal. Studies are ongoing to determine methods of subsidence reversal that are compatible with existing Delta activities. Current methods for subsidence reversal preclude much of the agriculture in the Delta and create water quality problems with THMs.

Reuse of Dredge Material – The continued reuse of dredge material to increase levee stability and habitat enhancement has become more restrictive due to increasingly rigorous water quality standards. Again this year the Central Valley Regional Water Quality Control Board has made a finding that increase costs and limits the reuse of dredged material for levee stability or habitat improvements. Costs for acquiring and reusing dredged material exceed the cost of purchasing commercial borrow for Levee System Integrity Program projects. Continuation of this portion of the program is being reevaluated to determine if it is cost effective for the program.

Schedule: This element is on schedule achieving approximately 60% of the ROD commitment. The program remains committed to use available dredged material to strengthen levees wherever it is allowed and proves to be cost effective

Suisun Marsh Levee Subsidence Control – Work with interested parties to obtain funding for pilot projects in the Suisun Marsh such as tidal wetlands restoration,muted-tidal, or alternative seasonal diked wetlands management strategies to assess subsidence reversal. Also continue economically justified reuse of dredge material in the Suisun Marsh.

Schedule: Ongoing

Other Components -Implement a Levee Emergency Management and Response Plan

The program's involvement with the local levee maintaining agencies and the 6 counties with Delta jurisdiction proved valuable during the recent failure of the Upper Jones Tract levee on June 3, 2004. The supplies of flood fight materials purchased by the Levee System Integrity Program were utilized along with a version of the Delta Area Command. The emergency response organization was staffed, at various times, by the local agency and their engineer in cooperation with more than 40 federal, state, and local governmental agencies. Notable help was provided by Governor Arnold Schwarzenegger and President Bush. In addition, several private contractors, the American Red Cross, and other non-government participants were involved.

CALFED's Levee System Integrity Program will continue our leadership role and work to fully develop this SEMS-compatible flood fight capability with the cooperation of the local agencies and the State OES.

The program's implementing agencies continue to work independently and with Delta reclamation districts to develop a model for mutual cooperation and conduct of future flood fights in compliance with SEMS. Though the distribution of the sample emergency response plan was significantly delayed by action at Upper Jones Tract, Twitchell Island, and Van Sickle Island, we remain committed to working on sample emergency response plans for dissemination to the 62 reclamation districts to foster the development of a coordinated Delta-wide response.

The first few hours of any flood fight are critical to saving the structure and what it protects from inundation. In the interest of having supplies on hand when needed, the program will renew its plan for 2006 to locate up to ten truck and helicopter-transportable flood-fight boxes, complete with basic supplies, throughout the Delta, pending adequate funding and contracting authority.

Schedule: Emergency management and response are ongoing functions that are refined, practiced and improved on an annual cycle. The program remains committed to continue these activities for the duration of available funding.

Delta-wide Asset Management System – Continue work on formal agreements for establishing mutual aid during flood fights between six Delta counties and the state Office of Emergency Services.

Schedule: The plan is largely in place; work will continue to maintain relationships, preserve effective communications, and exercise the Delta-wide asset management system.

Standardized Emergency Management System (SEMS) - Organize teams and conduct exercises with various reclamation districts, Delta Area Command, Flood Operations Center, Department of Forestry and Fire Prevention, and Civilian California Conservation Corps to encourage continuing enhancement of specific SEMS-compatible emergency response plans.

Schedule: Teams are organized; training continues and must be ongoing.

Pre-positioned Assets – Acquire and distribute 10 flood fight boxes and materials, including 100,000 sandbags, plastic sheeting, wood stakes, and hand tools to key areas.

Schedule: Completion Summer 2006

Suisun Marsh Levee Emergency Management and Response Plan – Work with interested agencies to enhance local coordination and support existing activities. Continue development of this Suisun Marsh Levee Emergency Management and Response Plan..

Schedule: Emergency management and response are ongoing functions that are refined, practiced and improved on an annual cycle. The program remains committed to continue these activities for the duration of available funding

Other Components Perform a Delta Levee Risk Assessment

The contract to accomplish the Delta Levee Risk Assessment and Management Strategy was awarded. The contractor is conducting a phased risk management analysis, with the goal of developing a prioritized list of actions that can be implemented to mitigate the risks and/or consequences of Delta levee failure. The Phase 1 work is near completion. Contract modifications are needed to extend time, modify scope, and increase funding to complete this study. Phase 2 will be fully incorporated in the Delta Risk Management Strategy and will, in part, assess the risk of multiple levee failures and its effect on the water supply resulting from seismic action. It will quantify resulting consequences, and articulate a strategy to manage the risk. Later phases will expand upon the initial analysis by addressing additional assets and/or risks. Limitations on contracting authority continue to threaten this activity and are likely to terminate the contract without producing final products. The modification of the scope of this contract will include an evaluation of the Suisun Marsh levees to determine the consequences of failure, develop recommendations for either protection or breeching, and assess strategies to minimize the threat.

Schedule: Ongoing

Risk Assessment Study –Contract was awarded. Levee Risk Assessment Team was formed and study is ongoing. Contracting limitations may terminate this action before final results are obtained.

Schedule: Completion is dependant on contract actions.

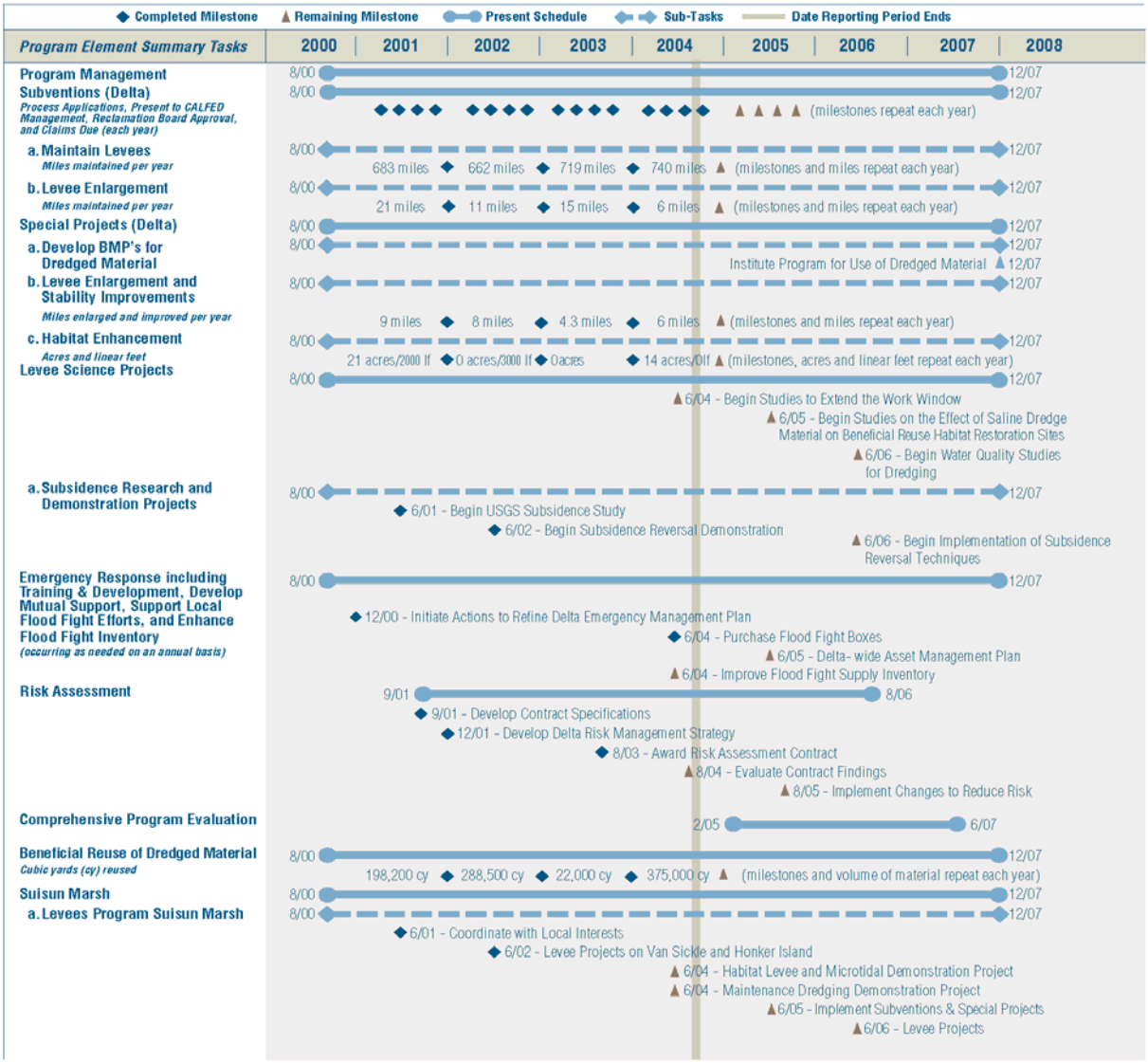
Special Improvement Projects- Levee Improvements

Habitat Improvement: The California Bay-Delta Levee System Integrity Program provides significant improvements to Delta habitat. The program has restored a portion of Decker Island to tidal marsh, it has active projects on Bradford, Medford, Sherman, and Jersey Islands within the Delta and on Meins Landing in the Suisun Marsh. Planning is ongoing for habitat improvement projects on McCormack Island and at Grizzly Island. The Levee System Integrity Program projects work with local agencies to achieve habitat enhancements at favorable prices.

Schedule: Ongoing

Schedule

LEVEES



Integrating Science, Environmental Justice, and Tribal Relations

Science:

Studies and research: Subsidence processes and reversal analyses are ongoing in the program and will continue, as funding allows.

Analysis of existing data: Data gathered from past ecosystem enhancements is used to revise current designs and improve on overall performance.

Science Communication: Staff Environmental Scientists and engineers from the program have participated in CALFED science presentations, meetings with stakeholders, and other groups to expand the knowledge base of interrelationships existing in the Delta and Suisun Marsh.

Monitoring (including for Performance Measures): Monitoring has been conducted outside the program and results of others efforts used to adjust current designs.

Peer review: Independent technical review of proposals and products (including articles, reports, recommendations, studies, or other products).

Use of Science Boards and technical experts: Program and project level review of ongoing and proposed actions; identification of knowledge gaps and information needs to help set program priorities. Can include work by science consultants.

Cross-program science coordination: Delta Levees Staff have taken the lead on several ERP Science grants, including Flooded Islands, and Subsidence Reversal projects. We are cooperating with others to complete LiDAR surveys of the entire Delta.

Estimated funding for science portion of this activity: Approximately $6 million of program funds will be used to pay costs associated with the Comprehensive Program Evaluation. Additional funding is provided on an annual basis for subsidence studies, developing GIS data, and completing habitat enhancement projects. Future funding for these efforts is highly dependant upon receipt of State funding.

Levee System Integrity

Major program activities, Years 6-9	Studies and research	Analysis of existing data	Science Communication	Monitoring	Peer review	Use of Science Boards and technical experts	Cross-program coordination (note which program)	Estimated funding for science portion of this activity
Levee Maintenance								
Levee Enlargement								
Habitat Development								
Dredge Reuse								
Comprehensive Program Evaluation								
Emergency Preparedness and Response								

Proposed strategy for developing a "science-based" approach to Levee System Integrity Program actions
Continue Subsidence studies and subsidence reversal studies on Twitchell Island.
Offer "science questions" relevant to levee system integrity to researchers.
Seek independent peer reviews from the California Bay-Delta Authority Science Program and stakeholders
Continue the Levee Risk Analysis contract.
Test engineering techniques for use in monitoring Delta Levees including electro-magnetic anomaly detection and electrical conductivity monitoring.
Use results of the Levee Risk Analysis to guide adaptive management

Science Questions
The current list of science questions were generated by the Delta Levees and Habitat Advisory Committee and arose from ongoing issues associated with levee maintenance and improvement activities. The Levee Program staff and the Bay Delta Public Advisory Committee (BDPAC) Levee Subcommittee will reconsider the original questions and develop a revised list in coordination with the California Bay Delta Science Program.
1. How effective are the existing work windows?
2. What is the definition of shallow water habitat?
3. How should the effectiveness of restoration efforts on riparian, wetland, and aquatic habitat be monitored and evaluated?
4. Are all the waters of the legal Delta critical habitat for the Delta Smelt?
5. What are the chances of success of net habitat enhancement projects in different locations?
7. Under what conditions is it appropriate to use rock placement to improve fish and wildlife habitat?
8. How can dredged materials be incorporated into levee and habitat projects in a manner that complies with RWQCB requirements?

Environmental Justice:

By preserving and enhancing levee stability, the Levee Program is promoting the fair treatment of people of all races, cultures, and incomes living and working in the Delta. The levees protect the homes and jobs of all communities equally. Through its environmental enhancements the Levee Program also improves opportunities for subsistence hunting and fishing.

Tribal Relations:

There currently are no federally recognized tribes in the Delta region. However, if a federally recognized tribe is identified in the future, the Levee Program will, with assistance from CBDA's tribal coordinator, actively engage their governments in the planning and development of Delta region projects.

Public Involvement and Outreach

Delta Levees and Habitat Advisory Committee meetings are held monthly to promulgate program information, address deficiencies, and discuss issues. These meetings are highly effective in surfacing issues, gaining consensus, and providing a base for making program changes.

CALFED Levees and Habitat Subcommittee meetings are conducted monthly and deal with issues specific to CALFED including funding, program plan, annual report, cross element coordination, and others.

Cross-Program Relationships

Ecosystem Restoration Program – The Levee System Integrity Program has achieved notable success in preserving existing habitat and developing new habitat in the Delta and Suisun Marsh. There are additional opportunities to improve the amount, type and quality of ecosystem enhancement improvements through cooperation with other CALFED elements. The Ecosystem Restoration Program has common goals and objectives with the Levee System Integrity Program and partnership with them will facilitate net habitat improvements in the Delta The USACE continues to support efforts and funding for the Prospect Island Construction project and the Cosumnes and Mokelumne Rivers Feasibility Study. The USACE supports the ongoing Feasibility Reports prepared in association with the State Reclamation Board and DWR for Hamilton City and the Delta Special Studies.

Conveyance Program – The Delta levees are the borders of the channels for the water conveyance systems through the Delta. State-wide water conveyance abilities can be affected if a Delta or Suisun Marsh levee fails. A strong Levee System Integrity Program assures the viability of through-Delta conveyance; the program will remain strong as long as adequate, timely, and consistent funding is available. Levee System Integrity Program staff is committed to work with Conveyance Program staff to target critical projects and implement effective solutions. The USACE continues to support efforts and funding for the North Delta Improvements Project whenever a state or local partner wants to initiate the work.

Water Quality Program – The Delta and Suisun Marsh levees restrain the daily chloride contamination of export water for more than 23 million Californians and 7,000,000 acres of farmland due to tides. Water quality is preserved through preservation of the Delta's levees and improvement in water quality is a natural by-product of the maintenance, preservation, and improvement of the Delta and Suisun Marsh levee systems. Also, modification of selected levee systems within the Delta and Suisun Marsh can result in significant improvements to water quality. Levee System Integrity Program staff is committed to work with Water Quality Program staff to implement projects that are mutually beneficial.

Water Supply Reliability – Perhaps the weakest link in the delivery system for export water is the conveyance through the Delta. Without improvements to the Delta levees there is a continuing risk of levee failure that results in "flushing" fresh water from storage out to sea in order to preserve the salinity levels essential for export. A single levee failure on Brannan-Andrus Island in 1972 required more than 500,000 acre feet of fresh water to reduce salinity levels in the Delta and restore suitable water quality. The Upper Jones Tract levee failure required much less, but, still took _____ acre feet to prevent salt intrusion into the central Delta. . Through consistent levee maintenance, restoration, and improvements the risk of levee failure is reduced and the water supply is protected. Levee System Integrity Program staff is committed to work with Water System Reliability Program staff on projects of mutual benefit to both programs.

Solving the complex issues facing the Delta and Suisun Marsh requires extensive integration. For example, achieving levee element goals in isolation does not address hydrodynamic changes which can affect water quality, tidal marsh restoration, or fish migration. Furthermore, projects to address seismic risk, potential THM precursor reductions and water supply conveyance needs will require modifications to the levee system to be consistent with those needs.

Stage 1 Funding

Levee System Integrity Funding ($ in millions)	Program Year									Total
	1	2	3	4	5	6	7	Stage 1 Subtotal	8	
State	$29.2	$13.7	$3.6	$21.6	$21.4	$18.5	$0.4	$108.4	$0	$108.4
Federal	$0	$0.2	$0.2	$0.3	$0.2	$0	$0	$0.9	$0	$0.9
Local/Water User	$4.7	$3.3	$3.3	$3.4	$3.4	$3.4	$3.4	$24.9	$3.8	$28.7
Actual & Expected Funding	$33.9	$17.2	$7.1	$25.3	$25.0	$21.9	$3.8	$134.2	$3.8	$138
Estimate of Full Funding Needs										
Original ROD	$33.0	$36.0	$38.0	$42.0	$85.0	$105.0	$105.0	$444		

1. CALFED Year 6 corresponds to California Fiscal Year 2005-06.

2. The "Actual & Expected Funding" shown is for Delta levees only; it does not include funding in the Suisun Marsh. The ROD values do include funding for the Suisun Marsh starting with $10 Million per year in Years 2,through 4, then $50 million annually through Year 7.

3. The actual, historical reclamation district contribution for maintenance costs is significantly higher than shown for "Local/Water User". It has been approximately 50% of the total expenditures due to the historically unreliable commitment of State funding for the program. It should, also, be noted that the proposed funding levels in years 7 and 8 will still be insufficient to complete the total level of improvement envisioned in the CALFED Record Of Decision.

Stage 1 Funding by Task

Levee System Integrity Funding ($ in millions)	Program Year									Total
	1	2	3	4	5	6	7	Stage 1 Subtotal	8	
Subventions (Including local share)	$17.5	$10.0	$4.8	$13.8	$13.7	$12.2	$3.2	$75.2	$3.0	**$78.15**
Special Improvement Projects (Including local share)	$14.6	$7.0	$2.0	$11.2	$11.0	$9.4	$0.3	$55.5	$0	**$55.45**
Other Components	$0.8	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$2.6	$0.8	**$3.4**
Actual and Expected Funding	**$33.9**	**$17.2**	**$7.1**	**$25.3**	**$25.0**	**$21.9**	**$3.8**	**$133.2**	**$11.8**	**$137**
Estimate of Full Funding Needs										
Original ROD										

Geographic Distribution

Levee System Integrity Projects are contained in the six counties making up the legal Delta and Suisun Marsh.