

# CALFED Bay-Delta Program

## Levee Systems Integrity Program Plan Year 8 (State FY 2007-2008; Federal FY 2008)

### Implementing Agencies:

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

# Introduction

This Program Plan discusses the Levee Integrity System Program (LISP) managed by the Department of Water Resources – Delta Levees Program (DWR) and identifies activities which are related to the CALFED Program goals and objectives and are planned to be completed during the State Fiscal Year (FY) 2007-2008 and Federal FY 2008. The Plan also describes the accomplishments made during the previous year.

## Priorities

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The priorities established for the Levee System Integrity Program (LSIP) are designed to respond to the CALFED objectives and Records of Decision (ROD). Generally, existing programs will continue and remain the same as last year; however, changes will be made to better meet the objectives of the program. Additional emphasis and resources will be directed towards completing the Delta Risk Management Strategy (DRMS) and coupling that effort with the Delta Vision Process. The completion target for DRMS is no later than Fall 2007. The ROD goals for LSIP are provided below followed by a discussion of the program's relationship to the Finance Plan. A summary of LSIP targets to meet the program's priorities are provided at the end of this section.

The LSIP goals and objectives are to protect life and properties; they are to reduce the risk to land use and associated economic activities, water supply, infrastructure, and ecosystem from catastrophic breaching of Delta levees. Levee Program priorities focus primarily on the legal Delta as defined in the Section 12220 of California 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 integrates ecosystem restoration and Delta conveyance actions with levee improvement activities.

A similar program is also proposed for Suisun Marsh whereby the protection of resources and integration of ecosystem restoration would be applied to the Suisun Marsh levee system to the extent it is eligible for funding and included in the Levee System Integrity Program. 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 2007. 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 the goals and objectives listed above 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 maintaining agencies (LMA) and Suisun Resource Conservation District (SRCD). Achieving these goals within a restricted resources means that significant effort is required to prioritize projects to meet as many of the objectives possible.

This Program Plan is consistent with the Delta Improvements Package.

## Delta Levee System Integrity and the Record of Decision

The CALFED Record of Decision (ROD) identified five commitments for the Levee System Integrity Program and these commitments remain program priorities. Below is a listing of ROD commitments and a description of Program priorities as they relate to each commitment.

### **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).*

In order to comport with the ROD commitments, providing base level of protection will continue to remain the Program's highest priority. The Delta Levee Maintenance Subventions Program (Subventions Program) was funded at \$7 million in FY 06-07 and may receive up to \$25 million in FY 07-08; this portion of the program will provide funds for maintenance activities to 64 local maintaining agencies. The Subventions program will fund 75 percent of activities related to maintenance, fish and wildlife wildlife habitat, recreation opportunities, and Hazard Mitigation (HMP), categories 1, 2, and 3. It also provide funds for activities related to the PL 84-99 levee standard; because of the availability of Proposition 84 funds to the Subvention program we anticipate receiving higher number of applications for works related to PL 84-99 standard this year. Delta Levee Special Flood Control Projects (Special Projects) was funded at \$6.4 million in FY 06-07 and may also receive up to \$25 million in FY 07-08.

### **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.*

Because of funding for FY 06-07, no projects designed to meet flood protection needs beyond base level were funded this year. Since the DRMS results are not complete, DWR plans to embark on projects that will not conflict with DRMS priorities. Therefore, no projects beyond base level protection are proposed for FY 07-08.

### **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.*

The Program continues to fund on-going subsidence research projects on Twitchell Island. In cooperation with DWR, the USGS is developing a long range research program to analyze the efforts of the conversion of land use to wetland. LSIP has obligated funds for a wetlands/subsidence research project on Sherman Island. This project will monitor subsidence control associated with improvements on an existing 307 acre parcel on Sherman Island and is a cooperative effort between Reclamation District 341, Ducks Unlimited, and the Department.

### **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.*

DWR is in the process of formulating an emergency preparedness, management, and response plan for the Delta. The Federal-State Flood Operation Center (FOC) has initiated a comprehensive plan in examining various scenarios, involving single and multiple levee breaches in the Delta, in an effort to protect water supply and quality through the State Water Project. Delta Levees Protection staff is planning to have continuous coordination with staff from FOC and assist them to examine other catastrophic scenarios including a single and multiple breaches of the levees in the Delta.

#### **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 of catastrophic levee failure. Recognized major risks to Delta levees include earthquakes, floods, seepage, and subsidence.*

LSIP staff put significant effort towards getting the Delta Risk Management Strategy (DRMS) initiated this year for this high priority work. An RFQ was released in November of 2005. URS Corporation/JBA was selected to conduct the DRMS effort in December 2005. A contract with URS Corporation/JBA was written in early 2006 and was approved by the Department of General Services in March 2006. The work was separated into two phases. Phase 1 was to identify the risks to Delta levees from earthquake, floods, subsidence, climate change (including sea level rise), and a combination of these events for 50, 100, and 200-year into the future. Once the risks were identified, then the economics and environmental consequences to the Delta and State were also determined. The Draft Phase 1 report was submitted in April 2007, and a Final Phase 1 report will be ready in August 2007. Phase 2 is to look at ways to reduce or mitigate the risks identified in Phase 1. The Draft Phase 2 report is due in early August 2007 and the final report is expected in November 2007.

#### **Delta Levee System Integrity and the Calfed Program Finance Plan**

The ROD description of the Delta Levees component contained two primary activities; Base Level Protection and Special Improvements. The relationship between these two activities and DWR's Subventions Program and Special Projects deserves more clarity. To assure this program plan remains consistent with the CALFED Bay-Delta Program Finance Plan (Finance Plan) the terminologies described above has been incorporated into this plan.

#### **Delta Levee Maintenance and Subventions Program**

As defined in the finance plan, Levee Maintenance is intended to provide maintenance and structural improvements to base level protection standard, as defined in ROD. This category corresponds well with DWR's existing Subventions Program. The priority for funding is to preserve and improve local flood protection benefits. The Subventions Program will continue to rely on a locally-driven efforts and initiatives and will reimburse local agencies in accordance with the Procedures and Guidelines approved by the Reclamation Board (Board) in 1988. Levee maintenance funding includes cost-shared reimbursement for full mitigation of habitat impacts resulting from levee maintenance activities.

#### **Levee Improvement and Special Projects**

The goal of the Levee Improvements component of the LSIP is to build levees beyond an existing level of protection. This includes levee improvements that may exceed the PL 84-99 (ROD's base level) protection standard. It is similar to the DWR's existing Special Projects; 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. Special Projects provides reimbursement opportunities for mitigation of impacts to habitat resulting from levee improvements. Unlike the Subventions Program, it provides for habitat enhancement for both the levee maintenance and levee improvement components of the program.

#### **Other Components**

Other Components as described in the Finance Plan is a category that includes DRMS, subsidence control, emergency preparedness and response, beneficial reuse of dredged material, mitigation and net habitat enhancement, program management, oversight, and coordination.

### **Delta Risk Management Strategy**

The primary objective of DRMS is to evaluate ongoing and future risks associated with levee failure in the Delta and Suisun Marsh. It will identify the probable consequences of levee failure and the benefits of levee maintenance and rehabilitations necessary to maintain the system at its current level of protection and economic justifications to reduce controllable risk. Data gained from this critically important study will help establish the priorities for near-term and long-term actions that will reduce the risks associated with catastrophic levee failure in the Delta and Suisun Marsh.

### **Suisun Marsh**

Levees in the Suisun Marsh are included in the ROD and discussed within the scope of the LSIP. The task is to evaluate the levees in the Suisun Marsh and determine if need repair or improvements in order to accomplish CALFED objectives (e.g., ecosystem restoration and water quality.) Inclusion of the Suisun Marsh levee system in the LSIP does not mean that CALFED agencies have made commitments to accept responsibility or provide any assistance for maintaining the stability of this levee system; however, this does not preclude any existing CALFED Agency agreements and commitments for Suisun Marsh levee maintenance or improvements.

The ROD focuses on the Delta levees and recommended a study to determine if the Suisun Marsh levees should be included as a LSIP action; this evaluation is being performed as part of DRMS. However, to assure the LSIP Plan remains consistent with the DRAFT CALFED 10-Year Finance Plan, the LSIP will show the five commitment categories tailored to the Suisun Marsh. These categories are as follow:

- **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. This level of protection will most likely will not include PL84-99 standard.

- **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 preparedness, management, and response capability of local, State, and Federal agencies to rapidly mobilize during a flood related emergencies.

- **Suisun Marsh Levee Evaluation**

DRMS will consider the risks associated with levee failure in the Suisun Marsh and make the results available for inclusion in the **Suisun Marsh Plan (SMP)**.

Full implementation of the Suisun Marsh portion of the CALFED Levee System Integrity Program awaits completion of the Suisun Marsh Charter, independent funding and authority in the Water Code or other law for the program authorization. At this time, LSIP activities in the Marsh will be limited to the Program authorities established by AB 360.

## Delta Levee System Integrity and Targets

To meet the priorities established for LSIP a series of targets were established for the program. Table 1 provides a description of the ROD Elements and Stage 1<sup>1</sup> Actions for the Delta. Actions for the Suisun Marsh will be developed during preparation of the SMP.

**Table 1 - Delta Levee System Integrity Program and Stage 1 Actions**

ROD Element		
	Stage 1 Action	Current Plan
Base Level Protection (PL84) <i>Levee Maintenance</i>  <i>Levee Improvements</i>	<b>200 Additional</b>  <i>None</i>	<b>Minimize Risk of Levee Failure Delta-Wide</b> <i>Minimize Risk of Failure through levee maintenance by encourage LMAs to take advantage of the program.</i> <i>Improve Flood Protection and Levee Stability.</i>
Special Improvements beyond PL84 <i>Levee Improvements</i>	<b>None</b> <i>None</i>	<b>Improve levee stability on critical Delta islands as funding allows</b> <i>Improve levee stability on islands providing multiple benefits</i>
Levee Subsidence Control Program <i>Other Components - Subsidence</i>	<b>None</b> <i>None</i>	<b>Continue multiple studies</b> <i>Continue Subsidence Control Studies and Support</i>
Levee Emergency Response <i>Other Components - Emergency Response</i>	<b>Dec 2007</b> <i>None</i>	<b>Plan formulation is in progress</b> <i>Continue development of a plan and testing of emergency Preparedness &amp; response</i>
Delta Risk Management Strategy <i>Other Components DRMS</i>	<b>End of Stage</b> <i>None</i>	<b>Phase 1 has been submitted and the results from Phase 1 will be used in the Phase 2 report, which looks at ways to reduce risks in the Delta.</b>

The goals of the Levee System Integrity Program contained in the ROD were well founded when developed. However, the DRMS, as it is incorporated into the Delta Vision Process, will reevaluate those goals to determine if they remain valid.

In the interim while the DRMS study is being completed, the program will continue to implement levee maintenance, levee improvement, and other components.

<sup>1</sup> CALFED Stage 1 refers to the first 7 years of the CALFED Program which correspond to State Fiscal Years 2000-01 through 2006-07.

## Levee Maintenance Targets

Levee maintenance work is necessary to attain base level protection and to preserve the existing Delta levees in their current configuration. Without a well funded maintenance program, these levee 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 monitoring, repair, and restoration from the Delta reclamation districts and other cooperating agencies.

Levee maintenance has required a cooperative effort among local agencies, DWR, DFG, USACE, and regulating agencies. This approach has evolved over the 30+ years that the Delta Levees Program has been in existence and has resulted in a levee system that is better able to resist the effects of high water and high winds.

## Levee Improvement Targets

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 base level protection standard and may exceed this standard for islands with critical need. Improving levees to the PL84-99 standard will require slow progress over time. The soils in the Delta are weak and achieving base level protection will require many years to strengthen the foundation and increase the levee height. The necessary steps to improve the levees to the PL84-99 standard include placement of a significant volume of fill over compressible foundation soils, waiting until the foundation gains strength, then building a stabilizing berm, and, finally, increasing the crest elevation. The additional fill will stress the foundation and could result in cracking, settlement, and seepage if not done properly. The work must be done carefully and the effects on levee stability must be fully analyzed. Achieving base-level protection will require careful concern for these fragile structures and must be done deliberately so as not to damage the very system we intend to preserve and strengthen. Attaining levee improvements can be safely accomplished only with careful planning and slow progress; this requires long-term adequate and consistent funding.

Improvements beyond the PL84-99 standard, where appropriate, will follow or complement the completion of Base Level Protection provided the program is extended and funding is available. The results of DRMS will enable the Department to prioritize future work beyond PL84-99.

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 attaining a set quantity of miles of levee improved to the PL84-99 standard. This approach of reducing the risk of levee failure 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.

Passage of Propositions 1E and 84 brings additional funds to the Delta Levees Program; however, the need for the corresponding local capability to cost share to meet CALFED objectives still exists. The ability of the local maintaining agencies to share the cost of a larger program, as envisioned in the ROD, remains in question. To be consistent with the concept of beneficiary pays, the local costs should be assessed not only to levee maintaining agencies, but, also to others benefiting from the Delta's levees including the boating public, water exporters and other users. Social and urban development stresses are also an ongoing issue within the Delta.

## Subsidence Control Targets

Subsidence control remains elusive. Like other CALFED programs, contracting and funding constraints have stalled ongoing studies and threaten new studies or projects. However, plans are being developed to implement a large-scale demonstration project on Sherman or Twitchell Island, that uses the state of knowledge to slow or reverse subsidence. A set of best management practices continues to be a future objective.

### **Emergency Response Targets**

The emergency response plan was tested and proved during the response to the Upper Jones Tract Levee failure which occurred on June 3, 2004. It was again tested during the recent December/January storms and then again in April 2006. The emergency response system worked well; however, we continue developing emergency plans to refine and improve the overall preparedness and response capability. Emergency preparedness and response is an ongoing activity that must be continually refined in order for it to remain effective.

DWR staff is working with local agencies, Delta counties and other stake holders to formulate an emergency preparedness and response plan in order to be better prepared for a catastrophic situation involving single or multiple levee breaches. The plan will reaffirm the program commitment to assure protection of life and properties, water reliability and quality. Additionally, DWR has received approximately \$1 million of Federal funds under the Hazard Mitigation Grants Program (HMGP) to address Delta levee investigation issues. The funding is supporting electro-magnetic anomaly survey of the levees in the Delta to look for zones of high seepage, voids, or artifacts buried in the levee.

### **Levee Risk Assessment**

A levee risk assessment study was initiated to quantify the risk to Delta export facilities resulting from multiple seismic-induced failure of Delta levees, and to 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 levees in the Delta and Suisun Marsh. That initial study has been expanded and modified to become the DRMS.

The DRMS is exploring many facets of the existing Delta infrastructure and ecosystem including risk factors, hydrodynamics, beneficial uses, state economics and risk reduction strategies. The outcome of the DRMS will become part of the Delta Vision Process which will include any recommendations involving policy decisions to guide the use of program funds intended to improve the performance of the Delta levees. The DRMS study is commencing with phase 2 of the levee risk assessment and is analyzing the effects of multiple levee failures on through-Delta-conveyance and water quality among other things.

### **Net Habitat Enhancement**

The Water Code requires that program expenditures are consistent with a net long-term habitat improvement program and have a net benefit for aquatic species in the Delta. The CALFED Levee System Integrity Program ensures that this requirement is met for all projects under the Subventions Program as well as the Special Projects. The LSIP consistently provides ecosystem benefits through DWR and DFG staff working with local maintaining agencies to minimize

environmental impacts, mitigate all unavoidable impacts, and construct enhancement projects that are designed to improve habitats throughout the Delta.

## Public Outreach

The LSIP 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 and through participation in occasional workshops throughout the year. These meetings and workshops provide opportunities for public input to program priorities, schedules, 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.

# Accomplishments

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The following is the highlights of the program accomplishments made in State FY-06/07 and Federal FY 07. It lists each of the activities accomplished in the current year and describes the progress made or expected to be made through the end of the fiscal year.

Activity undertaken related to CALFED Goals and Objectives and status of that activity.

### **Provide Base Level Protection – Levee Maintenance**

During Fiscal Year 2006-07 the program continued to work cooperatively with levee maintaining agencies in the Delta to preserve more than 650 miles of eligible project and non-project levees in the Sacramento – San Joaquin Delta. Maintenance includes routine annual maintenance, habitat mitigation, emergency response, repairs to restore the levee crest, slope protection, levee patrolling, repair of slips and scarps, and the associated engineering and construction costs. Unavoidable impacts to habitat were fully mitigated or formal agreements were made to do so.

### **Provide Base Level Protection – Levee Improvement**

Through cooperative effort among local, state, and federal interests the program has improved more than 45 levee miles for stability and overtopping since Year 1. Improvements during FY 2006 -07 include rehabilitating selected sections of levee crest. Significant projects were undertaken on New Hope Tarct and Bethel, Bradford, Jersey and Twitchell Islands. Continuing consolidation of the foundation will reduce the crest elevation of these levees over time and additional work will be required before the levee sections will stabilize at the upgraded standard. The electromagnetic anomaly survey of delta levees continued under a grant from FEMA/OES. A 50-acre habitat mitigation site on Bradford Island was planted with native species to offset impacts associated with significant levee improvement projects on the island. A significant amount of levee rehabilitation work was completed in the Suisun Marsh to repair levees damaged from the storms of December 2005 and January 2006.

### **Special Improvement Projects – Levee Improvement**

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Special improvement projects are projects which will raise the levee crest above the PL 84-99 standard. This is to be completed only on islands with broad statewide significance. The Department of Water Resources has completed no projects of this nature and is currently giving a high priority to funding projects that raise deficient levees on critical islands to more modest standards. The existing backlog of deficient levee sections has taken all available funding.

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#### **Net Habitat Enhancement**

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The cooperative efforts of the LSIP have resulted in the creation of approximately 33 acres of riparian and wetland habitat along with 16,000 linear feet of Shaded Riverine Aquatic habitat in the Delta. Islands where this habitat enhancement has occurred include Decker, Twitchell, Webb Tract, and McCormack Williamson Tract. The Program has significant other habitat enhancement projects planned for Meins Landing, Dutch Slough, and Sherman Island. Purchase of Meins landing was finalized in 2005 and will eventually provide 666 acres of land for the restoration of tidal estuary in Suisun Marsh and help to offset impacts of levee projects on Van Sickle Island. The plan for restoration at Meins landing is being coordinated with the Suisun Marsh Plan. The administrative draft EIR for enhancement at Dutch Slough was initiated in 2006 and is expected to be completed in 2007. Dutch Slough, which encompasses 1,166 acres, will restore a large contiguous area of intertidal habitat. A project to continue to create setback levees on Sherman Island and to restore about 2000 linear feet of tidal lands and SRA along this reach was permitted in 2007 and will be constructed summer/fall of 2007..

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#### **Subsidence Control Plan/Beneficial Reuse of Dredged Material**

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Subsidence and the methods leading to its reversal have been studied for several years on Twitchell and Sherman Islands under grants from the CALFED Levee System Integrity Program. These studies have shown that it is possible to stop subsidence by shallow flooding and that it is possible to begin reversing its effects by growing aquatic plants. As part of the DRMS work, both farm-size rice growing project and carbon sequestration project were studied. The rice growing project is being evaluated by CALFED Independent Science Board; however, the carbon sequestration is too costly to implement. Additional studies in-progress show promise for further increases in land surface elevation through dispersing silts and soils over the fallen aquatic plants.

While these methods may hold some promise for the future, there is a continuing loss of 35,000 cubic yards of peat soils daily resulting from business as usual, including pumping the islands to keep them dry. However, the Department of Water Resources recognizes the ongoing problem of subsidence and will establish a leadership role in its control and reversal on islands and in areas they own.

Larger scale subsidence control and subsidence reversal demonstration projects will provide real opportunities to determine suitable best management practices to minimize the loss of organic soils and reverse the subsidence trend. Commencing in 2006, the Department embarked on a cooperative effort with Ducks Unlimited, Reclamation District 341 to modify management of an existing duck club on Sherman Island to maximize subsidence reversal. In addition, the Department continued working with the USGS on a demonstration project on Twitchell Island to determine relationships among biomass accumulation, sediment deposition, and water management and to delineate priority areas on the island for subsidence control.

The Department continued its efforts associated with the beneficial use of dredged material. Bradford Island received 56,000 cubic yards of dredged material. To date, about 1.4 million cubic yards of dredged materials has been obtained for beneficial uses.

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### **Emergency Management and Response Plan**

The Department of Water Resources implemented emergency response activities for the flooding associated with the storms of December 2005 and January 2006. Flood fight efforts in the Delta were affected through activation of the emergency response plan developed within the Delta Levees Program. The Department participated in emergency actions in various parts of the state. LSIP participated in emergency actions in the Delta on Bacon, Bethel, Bouldin, Bradford, Jersey, Sherman, and Twitchell Islands, and Hotchkiss Tract in the Delta and Simmons- Wheeler, Honker Bay and Van Sickle Island in the Suisun Marsh. Overtopping of islands in the Marsh occurred. No levees were lost in the western Delta; however, the program spent nearly one half of its Special Project's budget on flood damage repair. Program staff continues to work with local levee maintaining agencies to provide funds and technical support for emergency measures necessary to prevent overtopping, erosion, and flooding of Delta and some Suisun Marsh islands. DWR is formulating a comprehensive plan addressing preparedness and response in the event of a catastrophic levee failure.

### **Delta Levee Risk Assessment**

The ROD presented its Preferred Program Alternative that described actions, studies, and conditional decisions to help fix the Delta. Included in the Preferred Program Alternative Stage 1 implementation was the completion of a Delta Risk Management Strategy (DRMS) that would assess major risks to the Delta resources from floods, seepage, subsidence and earthquakes. DRMS would also evaluate the consequences and develop recommendations to manage the associated risk. Based on this need a Request for Qualifications was advertised in November 2005 and URS Corporation of Oakland, California was the successful applicant. The contract with URS is for a three year period from February 2006 to January 2009 for a sum of six million dollars. The draft Phase 1 report has been submitted, and the draft Phase 2 report will be submitted in August 2007. In compliance with the requirements of AB 1200, the DRMS report will be submitted to the Legislature by 1 January 2008.

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The Stage 1 goals for Levee System Integrity are described under the Priorities section. 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 their funds that were available for levee improvements to pay the pro-rata charge and cost share on maintenance.

Where the program has obtained significant levee improvements, many of these improvements were obtained in great extent through local funds. 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. By supporting local districts at the 50% rate, rather than at the 75% rate specified in Calfed documents, the program is less able to achieve the goals stated in the ROD.

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## Activity

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Major activities for LSIP include Levee Maintenance, Levee Improvement and Other Components listed previously. These activities are all carried out through a cooperative effort among the Delta maintaining agencies, using local funds and additional funds provided by the state and federal governments through the program. It is these additional program funds that provide the means for accomplishing the major levee work, conducting the studies, paying for development of emergency response functions, and other program attributes. The funding for LSIP should be consistent, at a level that provides incremental improvement; however, it has varied significantly over the years. 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. The historic funding received within the program is approximately 30% of the ROD targets. This funding level has preserved the Delta, but denied it the improvements promised in the ROD. The uncertainty in program funding has required that some goals be revised downwards and schedules be extended. This funding uncertainty is more problematic for project planning in the coming years.

Proposition 50 (approved by the voters in 2002) provided \$70 million for Delta Levees. Currently, funding associated with Prop 50 is running out. Proposals for significant increases in funds for flood protection included in the Governor's proposed Bond measure will be on the November ballot as Proposition 1E. Another proposed Bond (Proposition 84) on the ballot is proposing an additional \$275 million for Delta flood control projects. This means the LSIP must plan for uncertainty. A significant change in the program will result if one or both of these bond measures are approved by the voters and the LSIP staff is in the initial planning stages for such changes in funding. There is also an opportunity for the Corps of Engineers to assume a greater role in the Delta levees program if money associated with the Delta Long-Term Management Strategy and the Delta Island Feasibility Study are approved by Congress.

In Year 8 (State fiscal year 2007-08) the program will continue to follow well established priorities, although there will be a significant increase in local assistance available.

### Levee Maintenance

The Subventions Program will provide funding for maintenance activities to preserve the existing levees, protect individual islands, provide mitigation for habitat impacts, and provide a base upon which to build when funding is increased.

The Special Projects Program funding will be used to make improvements to critical levee stability, and to fund the "Other Components" portion of the CALFED LSIP. This funding assures habitat mitigation for project impacts, habitat enhancement for both Subventions and Special Projects, implementation of beneficial reuse projects, and improvements to the emergency response.

### Levee Improvements

Though some improvements are obtained with local funding only, program funding for levee improvements above the PL84-99 standard will wait until the critical levee needs are resolved through DRMS and the Delta Vision Process.

### Other Components

State operations funding will allow researchers to continue the ongoing study of subsidence and economical methods to reverse it.

The Governor's budget has \$3 million set aside to implement DRMS. This means that, contrary to last year, no funds will be redirected from local assistance to support the Delta risk assessment work.

Staff of DWR and local agencies will continue making improvements in supplies, planning, coordination effort and other means to make improvements to the emergency response system.

Current year funding available for Beneficial Reuse of Dredged Material will come from the Special Projects Program budget and is limited to participation in a Delta Long-Term Management Strategy for beneficial reuse of dredged material and other activities that are economically justified.

Special Projects funding will continue to be used to provide net habitat enhancement benefits as available funding allows.

Staff from DWR and DFG has begun a comprehensive assessment of the Suisun Marsh levee system and associated habitat mitigation and enhancement projects as a component of the SMP using funding provided by the involved departments.

Table 2 describes specific activities under each program component scheduled for Year 8.

**Table 2 - LSIP Activities – Year 8**

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**Activity: Provide Base Level Protection – Levee Maintenance**

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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.

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 net habitat improvement. Achievement of Base Level Protection is possible over time with sufficient program funding.

Local support is strong for the Subventions Program as evidenced by the historic cost sharing of 50% and not less than 25%.

Expected Deliverables: The Subventions Program will provide reimbursement for approximately 67 reclamation districts for levee maintenance and stability improvements.

Schedule: This is an annually recurring program and will continue for the duration of available funding to support the work. The ROD schedule is significantly delayed by funding shortfalls, limitations on local cost share funding, shortage of materials, and other problems.

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Cost: There is approximately \$5.1 million available for the Subventions Program unless the program is reauthorized (see below.) If the Program is continued then next year's budget will be approximately \$6.4 million.

Potential Problems: The Program sunset on 1 July 2006 and the Subventions program is limited to a maximum of \$2 million from the General Fund and reimbursement is limited to 50%. DWR staff believes the \$2 million General Fund reimbursement could be augmented with available Bond funds and Delta Flood Protection Funds. AB 798 (Wolk) would reauthorize the program and is currently under consideration by the Legislature as an Urgency measure.

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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

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#### **Activity: Implement Special Improvement Projects – Levee Improvements**

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USACE Studies: - CALFED Levee Stability Program: PL 108-361 authorizes a total of \$90 million for support of Levee System Integrity. Delta interests responded to the USACE request for levee stability proposals by submitting 54 potential projects totaling more than \$1 billion in estimated costs. The USACE evaluated the proposals and prioritized potential projects according to USACE environmental, economic, and other implementation criteria. In May 2006, USACE completed a Report to Congress with the priority list identifying levee stability projects in the Delta. There has been no decision by the Congress to determine future actions and appropriations.

Schedule: Ongoing

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#### **Activity: Implement a Levee Subsidence Control Plan/ Beneficial Reuse of Dredged Material**

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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 Tri Halo Methane precursors (carcinogenic substances) 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 practicable alternatives 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.

Deliverables: 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. DWR is also working with Ducks Unlimited, RD 341 and possibly SRCD to study subsidence reversal at an existing Duck Club on Sherman Island. Current methods for subsidence reversal preclude much of the agriculture in the Delta and create water quality problems with THMs.

Suisun Marsh Levee Subsidence Control – Continue to 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, the program will continue economically justified reuse of dredge material in the Suisun Marsh.

Schedule: Ongoing

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Reuse of Dredge Material – The continued reuse of dredge material to increase levee stability and for habitat enhancement has become more restrictive due to increasingly more stringent water quality criteria. Costs have increased and the reuse of dredged material for levee stability or habitat improvements is limited. 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.

Deliverable: DWR continues to participate in the Delta Long Term Management Strategy (LTMS) and reuse clean dredged material for levee rehabilitation.

Schedule: Ongoing - This element is on schedule achieving approximately 70% 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.

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#### **Activity: Implement a Levee Emergency Management and Response Plan**

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Emergency Response - The program's continued involvement with the local reclamation districts and the 6 counties with Delta jurisdiction proved valuable during the New Year's storms of 2006. 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. A state of emergency was declared by Governor Arnold Schwarzenegger and President Bush. A second state of emergency was declared by the Governor as a result of the April storms.

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. 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. Special Projects funded nearly \$3 million in emergency response and flood damage repairs in the Delta as a result of the January storms. In the interest of having supplies on hand when needed, the program will renew its plan for 2007 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.

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Deliverable: 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.

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#### Emergency Response (continued)

Deliverable: 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.

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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 2007

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

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#### **Activity: Delta Risk Management Strategy**

Delta Risk Management Strategy: The Delta Risk Assessment contract was awarded in 2003 and Phase 1 work has been completed. Preliminary results of this study have shown the state to be at significantly elevated risk from specific multiple failure scenarios. To better understand the nature and magnitude of this risk the original study has been revised into the Delta Risk Management Strategy. This new contract was awarded in the fall of 2005. This 3-year contract was approved by DGS on 6 March 2006 to URS Corporation for \$6 million. It will incorporate the results of Phase 1 of the Delta Risk Assessment and expand that report to provide a comprehensive understanding of Delta hydrodynamics, risks associated with seismicity, emergency response capabilities, operational constraints, benefits and impacts of alternative actions on the Delta ecosystem, and other aspects associated with catastrophic levee failure. The results of this study will be used to form the basis of multiple agency support for specific actions in the Delta to reduce the controllable risk from levee failure and support ecosystem health. It will quantify resulting consequences, articulate a strategy to manage the risk and will become a major component of Delta Vision Process (DVP). The scope of this contract will consider the Suisun Marsh levees to determine the consequences of failure. Agencies involved with the Suisun Marsh will use information from this study to develop recommendations for the disposition of Marsh levees, and assess strategies to minimize the threat.

Upon completion, the DVP and results of the DRMS study will play a significant role in the planning and implementation of the LSIP.

Schedule: Inventory of Assets/Trends – December 2006 (Delta Vision Process Assessment Report)

Risks & Consequences – (Draft Phase 1 Report) January 2007

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State	\$29.2	\$13.7	\$3.6	\$21.6	\$21.4	\$18.8	\$19.4	\$127.7
Federal	\$0	\$0.2	\$0.2	\$0.3	\$0.2	\$0.2	\$0.0	\$1.1
Local Contribution	\$4.7	\$3.3	\$3.3	\$3.4	\$3.4	\$3.4	\$3.4	\$31.7
<b>Actual &amp; Expected Funding</b>	<b>\$33.9</b>	<b>\$17.2</b>	<b>\$7.1</b>	<b>\$25.3</b>	<b>\$25.0</b>	<b>\$22.4</b>	<b>\$22.8</b>	<b>\$160.5</b>
<b>Estimate of Full Funding Needs</b>								
<b>Original ROD (Delta Only)</b>	<b>\$33.0</b>	<b>2.0</b>	<b>\$28.0</b>	<b>\$32.0</b>	<b>\$35.0</b>	<b>\$55.0</b>	<b>\$55.0</b>	<b>N/A</b>

1. Federal funds reflect President's budget for the U.S. Army Corps of Engineers (USACE). Federal appropriations beyond Year 6 are unknown. The USACE may have \$90 million available under HR 2828, however no funds have been appropriated to date.
2. Local funding is estimated at approximately \$3 million annually.
3. Water user funding includes State Water Project funds that are collected from state water contractors but are budgeted and appropriated through the state government
4. 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 Subventions expenditures due to the historically unreliable State funding for the program.

Historically, Delta Levees Program budget has been limited to no more than \$12 million a year with some years as low as \$2 million. However, with the passage of Proposition 84 significant increase in the funding for this program is included in the Governor's FY 2007-08 Budget and is anticipated to be approved. The proposed budget for Delta Levees Program for FY 2007-08 is about \$58 million, of which each component of the program, namely Subvention and Special Projects, can receive up to \$25 million. Ten million dollars of the \$25 million for Subvention Program may be allocated to levee maintenance works only; the remaining \$15 million can be spent on levee rehabilitation.

The budget for the following years is not known at this time; however, DWR has requested eve larger budget for the program for the following out years.

### **Stage 1 Budget by Task**

The table below shows the funding breakdown between Subventions and Special Projects. The Water Code requires a 50:50 split in funding between these two components of the program. The discrepancies in the split are attributed to a significantly higher percentage contribution from the local reclamation districts associated with the Subventions program.

**TABLE 5: LSIP Funding by Component**

1. Ranges of funding are shown for year seven based on the AB 360 program sunset date of July 1, 2006. Unless the program is reauthorized, there is only \$5.1 million available for Subventions (\$2 million General

<b>Levee System Integrity Funding (\$ in millions)</b>	<b>State FY 2000 -01</b>	<b>State FY 2001 -02</b>	<b>State FY 2002 - 03</b>	<b>State FY 2003 -04</b>	<b>State FY 2004 -05</b>	<b>State FY 2005 -06</b>	<b>State FY 2006 -07</b>	<b>TOTAL</b>
Subventions (Including local share)	\$17.5	\$10.0	\$4.8	\$13.8	\$13.7	\$11.2	\$8.1-\$9.4	\$79.1
Special Improvement Projects (Including local share)	\$15.6	\$7.0	\$2.0	\$11.2	\$11.0	\$7.6	\$6.8-\$8.1	\$62.5
Other Components	\$0.8	\$0.3	\$0.3	\$0.3	\$0.3	\$3.6	\$3.0	\$8.6
<b>Total</b>	<b>\$33.9</b>	<b>\$17.2</b>	<b>\$7.1</b>	<b>\$25.3</b>	<b>\$25.0</b>	<b>\$22.4</b>	<b>\$19.2</b>	<b>\$150.2</b>
<b>Actual and Expected Funding</b>	<b>\$33.9</b>	<b>\$17.2</b>	<b>\$7.1</b>	<b>\$25.3</b>	<b>\$25.0</b>	<b>\$22.4</b>	<b>\$19.2</b>	<b>\$150.2</b>
<b>Estimate of Full Funding Needs</b>								
<b>Original ROD (Delta Only)</b>	<b>\$33</b>	<b>\$26</b>	<b>\$28</b>	<b>\$32</b>	<b>\$35</b>	<b>\$55</b>	<b>\$55</b>	<b>\$264</b>

Fund plus \$3.1 million other funds) plus an estimated \$3 million in local cost share for a total of \$8.1 million. If the program is extended, there will be \$6.4 million available for subventions plus an estimated \$3 million in local cost share for a total of \$9.4 million. Special projects will range between \$8.1 million if the program is not reauthorized to \$6.4 million (50:50 split) if the program is extended.

2. \$3 million dollars from the Program's operation budget will be used to fund DRMS in year 7.