

drainage. In addition, the current program states that local agencies will use subsidence control alternatives, where appropriate, to reduce long-term maintenance and improvement costs.

### 2.3.5 PROPOSED PROGRAM

CALFED will implement a subsidence control and monitoring program. Subsidence control measures will be incorporated into base level and special improvement projects. Subsidence monitoring would begin with an evaluation of existing soils and their distribution in the Delta, and a determination of land surface elevation. Efforts would be directed to areas on and adjacent to the levees, within the ZOI. From a new, continually updated database, a target list of levees and islands being affected by subsidence could be maintained. Monitoring would allow subsidence control to be adaptively managed as levees are rehabilitated. This monitoring effort would be coordinated through CALFED's Comprehensive Monitoring and Research Program (CMARP).

In addition, because the linkages of inner-island subsidence to CALFED objectives needs more study, the Levee Program recommends that CMARP quantify the extent and effect of inner-island subsidence. CALFED may implement grant projects to develop best management practices (BMPs) that restore interior island elevations.

## 2.4 DELTA LEVEE EMERGENCY MANAGEMENT AND RESPONSE PLAN

The goal of the Delta Levee Emergency Management and Response Plan (Emergency Management Plan) element is to enhance existing emergency management response capabilities in order to protect critical Delta resources in the event of a disaster. More focused analysis and documentation of specific targets and actions will occur in subsequent efforts.

### 2.4.1 INTRODUCTION

The existing emergency response capabilities need to be continuously refined, and funding needs to be increased. The Emergency Management Plan will build on existing state, federal, and local agency emergency management. It will propose specific actions that will improve response flexibility to ensure that appropriate resources are available and properly deployed, and provide for effective disaster recovery measures.

Table 7 lists implementation objectives, targets, and actions associated with the Emergency Management and Response Plan element.

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**Table 7. Implementation Objectives, Targets, and Actions Associated with the Delta Levee Emergency Management and Response Plan**

Implementation Objective	Target	Action
Enhance emergency response capabilities and resource allocation	Develop the capability to efficiently respond to multiple concurrent levee breaks within the Delta	Implement a comprehensive reconstruction, repair, and maintenance program for Delta levees so that a viable Delta levee industry can be reestablished, with a fleet of specialized equipment
		Review, clarify, and refine command and control protocol; develop an Integrated Response Plan in conformance with SEMS/ICS
		Define agency responsibilities to ensure environmental compliance
		Purchase materials in advance and place in strategic locations
		Execute pre-negotiated contracts with contractors for forces and equipment to respond with short notice
		Clarify program eligibility, inspection, documentation, dispute resolution, auditing, and reimbursement procedures
Develop a stable funding source for emergency response	Provide funding for a well-defined Disaster Assistance Program	Prepare cost estimates
		Identify beneficiaries to provide equitable distribution of costs
		Develop funding sources
Notes:		
ICS = Incident Command System.		
SEMS = Standardized Emergency Management System.		

## 2.4.2 BACKGROUND

The most recognizable threat to Delta islands and resources is inundation due to winter flood events. Other potential disasters that threaten these same resources include seismic events and levee failure during low-flow periods.

Current emergency response procedures could be streamlined to reduce delays in mobilizing resources. A quick response can prevent costly levee failures. In addition, the tendency to focus emergency response measures on those sites facing imminent failure can result in neglecting actions that could prevent threatened sites from escalating into emergencies.

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## 2.4.3 CURRENT PROGRAM

The Governor's Office of Emergency Services (OES) coordinates state agency responses. When an incident appears to potentially exceed the resources of the local responsible agency, emergency personnel conduct on-site evaluations to determine what, if any, additional emergency support is warranted. Cities and counties can proclaim local disaster events and, in general, local or maintaining agencies are first in line for responsibility to address disaster events. Although certain agencies may have resources to provide initial emergency action, typically they cannot provide a sustained effort during a large disaster event. Most local agencies do not have the resources to address major disaster events, and existing agreements may provide a means for sharing additional resources from surrounding areas. The federal government provides financial assistance through FEMA under a presidential declaration of disaster; however, other federal agencies such as the Corps may provide assistance or resources under existing authorities.

The existing emergency management structure is designed to coordinate activities of multiple state, federal, and local agencies with varying responsibilities to provide emergency assistance in the event of a disaster. The Standardized Emergency Management System (SEMS) provides a framework for coordinating state and local government emergency response in California, using the Incident Command System (ICS) and mutual aid agreements. SEMS facilitates setting priorities, cooperation among agencies, and the efficient flow of resources and information.

## 2.4.4 PROPOSED PROGRAM

CALFED plans to build on the existing emergency response system. CALFED's Emergency Response Subteam determined that an effective Delta levee emergency response program should be concentrated in seven areas:

- Funding;
- Response by state and federal agencies;
- Availability of flood fight resources;

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CALFED plans to build on the existing emergency response system.

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- Integrated response;
- Clarification of regulatory procedures;
- Clarification of program eligibility, inspection, documentation, auditing, and reimbursement procedures; and
- Dispute resolution.

## ***Funding***

The vulnerability of the levee system can be reduced by implementing an integrated and comprehensive reconstruction, repair, and maintenance program for Delta levees and channels, as described and recommended under the Levee System Integrity Program. Implementation can be accomplished only by supplementing local funding capability through state and federal cost-sharing at adequate and consistent levels so that a viable Delta levee building industry can be re-established.

## ***Response by State and Federal Agencies***

- DWR's authority to respond should be clarified and expanded to include all instances where levees or other flood control structures are in danger of failure, regardless of whether the danger is due to storms, floods, earthquakes, rodents, vessel impacts, or any other cause. The funding for support of DWR's efforts should be ample and clearly committed for a comprehensive emergency response.

The role of the Corps also should be clarified and confirmed, to eliminate delay in response and avoid any dispute concerning whether the local and state responses are sufficient.

- DWR should be given the mandate, authority, and funding to carry out the repair of damage to Delta non-project levees due to floods, storms, and levee failure incidents—including de-watering flooded areas. All FEMA and OES funds related to such work should go directly to DWR. The balance of the cost would be paid by DWR through the special Water Code 128 funding.

## ***Availability of Flood Fight Resources***

### ***Specialized Equipment and Operators***

A revitalized levee maintenance industry under the Levee System Integrity Program will establish a fleet of specialized equipment essential to a rapid emergency response but will not ensure its availability during emergencies that can widely range in geographic extent. Pre-emergency contracting for specialized equipment will secure the availability of the equipment and experienced operators and will establish the pricing for emergency services.

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### *Matériel Stockpiles*

DWR (Central District) has established stockpiles for flood fight matériel (such as sandbags, plastic, stakes, light equipment, and pumps) at locations in the north and west Delta. This program needs to be expanded to include rock and sand stockpiles, and to include key locations in the central and south Delta. Additionally, the program should include assurance of a supply or stockpiling of drain rock and riprap.

### *Manpower*

Formalizing arrangements with the California Department of Forestry and Fire Prevention, as well as with the California Conservation Corps and the State Prison System, for emergency assistance should be considered.

### *Integrated Response*

A detailed response plan should be developed for the Delta that would allow an immediate, simultaneous response to a serious incident by all levels of government within a single integrated organizational structure. The plan would identify common needs and functions of all agencies (for example, housing, food, transportation, supplies [including rock and sand], equipment, and contracted services) and would assign the most capable agency or jurisdiction to perform each action on behalf of all agencies. The detailed response plans would provide the basis for pre-identifying and assigning specific responsibilities for each agency, as well as the level of resources that the individual local agency would be expected to provide in response to the emergency. With detailed assignment of responsibilities, an organizational structure for the "area command" could be delineated to ensure that the "incident commands" were coordinated.

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### *Clarification of Regulatory Procedures*

Although both state and federal laws suspend environmental regulation during emergencies, some clarifications are desirable.

- A consistent definition of "emergency" should be developed for response and regulatory activities. It is especially important that the defined duration of the emergency be consistent for both purposes.
- Mitigation measures that are expected during post-emergency recovery work should be defined, to rapidly define and implement "appropriate" mitigation and to avoid unnecessary delays of post-emergency recovery work.

## ***Clarification of Program Eligibility, Inspection, Documentation, Auditing, and Reimbursement Procedures***

The requirements of state and federal programs need to be standardized to be consistent with one another, be well communicated to the local agencies without delays, and avoid changes or re-interpretation during the reimbursement process.

### ***Dispute Resolution***

A binding arbitration procedure, conducted by knowledgeable but impartial arbiters, should be established. The procedure should encompass state and federal programs.

## **2.5 DELTA LEVEE SEISMIC RISK ASSESSMENT**

The goal of the Delta Levee Seismic Risk Assessment element is to identify the risk to Delta levees from seismic events and develop recommendations to reduce levee vulnerability and improve their seismic stability. A Seismic Subteam was formed to assess the seismic risk to Delta levees. This subteam, composed of seismic experts and geotechnical engineers with experience in the Delta, evaluated levee fragility and assessed the seismic vulnerability of the current levee system. The subteam's seismic risk assessment is included in Appendix G of this report.

### **2.5.1 INTRODUCTION**

The vulnerability of the Delta levee system to failure during earthquakes is a concern. Although levee failure from a seismic event has never been documented, the Delta has not experienced a significant seismic event since the levees reached their current size. However, levee failures from a seismic event may result in multiple levee failures on more than one island.

Table 8 lists implementation objectives, targets, and actions associated with the Delta Levee Seismic Risk Assessment.

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