

*INTERDEPARTMENTAL DRAFT*

April 2014

California Department of Water Resources  
*FLOOD EMERGENCY RESPONSE PROGRAM*

# Delta Flood Emergency Management Plan



PUBLIC SAFETY

ENVIRONMENTAL STEWARDSHIP

ECONOMIC STABILITY



**Interdepartmental DRAFT**

**Department of Water Resources Delta  
Flood Emergency  
Management Plan**

**April 2014**



## Foreword

The Delta Flood Emergency Management Plan (DFEMP) has been drafted with the recognition that the Sacramento-San Joaquin Delta is an important and complex region that offers a multitude of benefits to the State of California, but is susceptible to catastrophic damage in the event of earthquakes, floods, and other threats.

The Delta's 1,100 miles of levees protect productive farmland and important energy and transportation infrastructure. The Delta serves as a key link in the State's water supply system and is a vital ecosystem for fish and wildlife. Much of the Delta land is below sea level and flood risk is continuously high. As sea levels rise and Delta lands continue to subside, the risks continue to increase.

A multitude of local, State, and federal agencies, utilities, residents, and advocacy groups have interests in the Delta and its many resources, and as a result, there are numerous initiatives and programs underway to protect and enhance its valuable assets. This Plan is just one element of this complex and changing set of initiatives that currently includes:

- Formulation of the Delta Plan, led by the Delta Stewardship Council
- Formulation of the Bay-Delta Conservation Plan, including long-term solutions to habitat degradation and water supply reliability concerns, led by the California Department of Water Resources (the Department)
- Efforts to manage Delta lands consistent with wise floodplain management and protection of agricultural resources, led by the Delta Protection Commission
- Ongoing efforts to maintain and strengthen Delta levees, led by local reclamation districts and supported by the Department's Delta Levees Subventions and Special Projects programs
- Numerous efforts to improve Delta habitat quality involving a multitude of agencies, non-governmental entities, and for-profit organizations
- Ongoing investments in Delta highways, utilities, farms, and businesses at all levels, fueled in part by proximity to its navigable network of channels, the Bay Area, Sacramento, and Stockton
- Investments in emergency response and management, including training, public education, risk assessment, flood fight materials and supplies depots, communications infrastructure, and interagency collaboration to improve flood fight coordination

While this Plan focuses primarily on the concept of operations for Delta flood emergency preparedness, response, and recovery, its relationship to the multitude of other ongoing initiatives is carefully considered, as described in Chapter 1.

This Plan provides a concise, but flexible blueprint for guiding Delta flood emergency management. It serves as a checklist to ensure that important flood management elements are

not overlooked, and a manual to help set priorities and allocate resources under emergency conditions when there is not enough time to conduct detailed fact-finding and economic analyses from scratch. Finally, the Plan provides reference information and specific procedures that can be incorporated into training programs and then used effectively in Delta flood emergencies.

All long-term plans need to be updated from time to time to remain useful. This is particularly true of the Delta Flood Emergency Management Plan (DFEMP), given the importance, the complexity, and the rapid pace of change in the Delta and the multitude of initiatives underway to improve its function. The Department is committed to collaboration with all interested parties to ensure that future emergency preparedness, response, and recovery operations are swift, efficient, and effective.

Mark Cowin

Director

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# Acronyms and Abbreviations

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AB	Assembly Bill
ALERT	Automated Local Evaluation in Real Time
BDCP	Bay-Delta Conservation Plan
Cal EMA	Former name, California Office of Emergency Services, see Cal OES
Cal Fire	California Department of Forestry and Fire Protection
Cal Guard	California National Guard
Cal OES	Governor’s Office of Emergency Services, formerly Cal EMA
Cal Trans	California Department of Transportation
CCC	California Conservation Corps
CDCR	California Department of Corrections and Rehabilitation
CDEC	California Data Exchange Center
CDFW	California Department of Fish and Wildlife
COM	Communications
ConOps	Concept of Operations
CNRFC	California-Nevada River Forecast Center
CVFPB	Central Valley Flood Protection Board, formerly the State Reclamation Board
CWC	California Water Code
CUEA	California Utilities Emergency Association
CVP	Central Valley Project
Department	California Department of Water Resources (DWR)
Delta	Sacramento-San Joaquin River Delta
DETR	Delta Emergency Response Tool
DFEMP	Delta Flood Emergency Management Plan (this report)
DFM	Division of Flood Management

DFS	Division of Fiscal Services
DMAC	Disaster Management Area Coordinator
DOC	Department Operations Center
DOE	Division of Engineering
DOF	California Department of Finance
DRMS	Delta Risk Management Strategy
DSOD	Division of Safety of Dams
DWR	California Department of Water Resources (Department)
EAP	Emergency Action Plan
EOC	Emergency Operations Center
EPM	Emergency Preparedness Manager
EPSM	Emergency Preparedness and Security Manager
ER	Emergency Response
FEAT	Flood Emergency Action Team
FEMA	Federal Emergency Management Agency
FEMS	Flood Emergency Management System
FEOM	Flood Emergency Operations Manual, DWR (2013)
FESSRO	FloodSAFE Environmental Stewardship and Statewide Resources Office
FFS	Flood Fight Specialist
F-CO	Forecast-Coordinated Operations
FOC	Flood Operations Center
ICP	Incident Command Post
ICS	Incident Command System
ICT	Incident Command Team
IT	Information Technology
JOC	State-Federal Joint Operations Center
LIFO	Last In First Out
LMA	Local Maintaining Agency

MACS	Multi-agency Coordination System
MARAC	Mutual Aid Regional Advisory Committee
MOU	Memorandum of Understanding
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NWS	National Weather Service
OA	Operational Area
OCO	Operations Control Office, SWP
O&M	Division of Operation and Maintenance
POC	Project Operations Center
RASS	Response and Security Section, DFM
RD	Reclamation District
Reclamation, USBR	U.S. Bureau of Reclamation
REOC	Regional Emergency Operations Center
RIMS	Response Information Management System
SB	Senate Bill
SEMS	Standardized Emergency Management System
SOC	State Operations Center
SPFC	State Plan of Flood Control
SWC	State Water Contractors
SWP	State Water Project
U/S	Upstream
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WREM	Water Resources Engineering Memorandum



# 1 Introduction

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## 1.1 Purpose

Vigilance, preparedness, and rapid responses to levee emergencies can often avert levee failures and their costly consequences. Local Maintaining Agencies (LMAs) are responsible for maintaining, patrolling, and responding to levee emergencies, but State and federal agencies are often called upon to provide assistance. Given its authorities, mission, and capabilities, the California Department of Water Resources (Department, DWR) has the lead role in the State's flood emergencies, and as such, is often called upon to render assistance during Sacramento-San Joaquin Delta (Delta)<sup>1</sup> levee emergencies. The Department may also be asked to assist in the recovery of flooded islands, including: 1) reconstructing breached and damaged levees, 2) dewatering, and 3) repair of infrastructure.

Given the Delta's location and importance, a multitude of local, State, and federal agencies have interests in, and exert various degrees of authority over, Delta resources and activities. Therefore, an effective emergency preparedness, response, and recovery plan needs to be well coordinated among these agencies. Accordingly, the Department is working with local emergency responders and State and federal agencies responsible for flood emergencies to prepare a Delta Multi-Agency Flood Emergency Operations Plan. The document will integrate Delta flood emergency plans prepared by these participants.

This Delta Flood Emergency Management Plan (DFEMP) is the Department's contribution to the Delta Multi-Agency Flood Emergency Operations Plan. The purpose of this plan is to define the Department's policies and actions relating to Delta flood emergencies, especially relating to potential or actual failure of Delta levees.

## 1.2 Scope

The Plan applies to the entire Department organization and includes the possible actions and coordination between the Division of Flood Management's (DFM) Flood Operations Center (FOC), the Department Operations Center (DOC), and the State Water Project's Project Operations Center (POC), as well as all other elements of the Department's emergency hierarchy. The plan specifically supports established statewide emergency planning documents and procedures.

The scope of the plan covers preparedness, response, and recovery actions that the Department may take before, during, and after a Delta flood emergency. The plan provides the Concept of Operations (ConOps) for the Department's involvement in flood emergency actions within the Delta. ConOps is a distillation of extensive experience from past flood emergencies, combined with careful thought about how to further improve effectiveness in the future. ConOps helps the Department's emergency responders quickly develop an

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<sup>1</sup> As defined in Section 12220 of the California Water Code.

understanding of how their duties and contributions fit in with the Department's efforts as a whole, and in turn, how the Department's activities contribute to the coordinated multi-agency emergency activities. The plan provides specific procedural guidance on what to do, where to find analytical tools, data, and resources, and how to evaluate rapidly unfolding emergency events.

The DFEMP also provides an important discussion on the Department's evolving policy framework for determining the scope of the Department's involvement in Delta levee emergencies. While the Department is committed to assisting local agencies in preparing for and responding to Delta levee emergencies, its primary role is to protect the State's interests in public safety, water supply reliability, economic stability, and environmental quality. Furthermore, the Department's available emergency response and recovery funding is limited and must be specifically augmented by reallocations or additional appropriations during major emergencies. Therefore, it is important for Department staff to evaluate the extent of the State's interest, the anticipated costs, and the potential for cost-sharing among beneficiaries when determining the extent of the Department's participation in recovery operations.

### **1.3 Background**

The Delta has been the focal point for a wide variety of flood and water-related issues for many years. As the largest estuary on the west coast of North America, the Delta supplies water to over 25 million people and approximately 3 million acres of agricultural land. The Delta encompasses 70 major islands and tracts, with some 700,000 acres protected by levees. It provides habitat for more than 500 species of fish and birds, including several that are rare and endangered. Many islands and tracts are protected by local levees that are subject to increased erosion, overtopping, and subsidence that threaten public safety and water supply quality during any major flooding.

Levees protect many land areas, near and below sea level, from a water surface that is normally well above the land area being protected. Therefore, the levees are acting as dams year-round rather than as typical levees that hold back water only infrequently. These deep floodplains are not only dangerous for Delta inhabitants, but can create large logistical problems when recovering from a flood. These levees provide a network of channels that direct movement of water through the Delta. Virtually all assets and attributes of the Delta are dependent upon this levee system.

Since the adoption of the Jackson Plan in 1910, the authorization of the Central Valley Flood Protection Board (CVFPB) in 1911 (formerly the Reclamation Board), and the authorization of the federal Sacramento River Flood Control Project in 1917, the State has played a key role in regulating levee construction and partnering with the U.S. Army Corps of Engineers (USACE) in the construction, operation, and maintenance of levees in California.

The present Delta levee system includes about 1,100 miles of levees composed of approximately 350 miles of Project levees and 750 miles of non-Project levees.

Project levees are those levees that are part of the State-federal flood protection system in the Sacramento-San Joaquin Valley of California. These are levees of federally authorized

projects for which the State has provided assurances of cooperation to the federal government and are considered part of the State Plan of Flood Control (SPFC). The *State Plan of Flood Control Descriptive Document* (DWR, 2010) provides detailed information on project levees throughout the Central Valley. While these Project levees have been turned over to LMAs for maintenance, the CVFPB and the Department inspect, regulate, and ensure the proper maintenance of these levees, which are generally constructed to higher standards than non-Project levees. If local agencies are unable or unwilling to meet these standards, the Department creates State maintenance areas to perform the operation and maintenance instead. For example, the Department’s Sacramento Maintenance Yard operates and maintains Maintenance Area 9 on the east bank of the Sacramento River in the north Delta.

Non-Project levees, built and improved by Delta reclamation districts to protect islands and tracts, were originally constructed without assistance of federal and State governments. These levees are not part of the State-federal flood protection system, but because they protect the majority of the land area and assets in the Delta, they have special status in the California Water Code – they are under the jurisdiction of public agencies (reclamation districts) and are eligible for State assistance due to their acknowledged benefits to the State. Since the CVFPB has jurisdictional authority throughout the drainage basin of the Central Valley, any encroachment, or project on or near the Sacramento and San Joaquin Rivers or their tributaries must also be approved by the CVFPB. The CVFPB makes sure that there are no negative hydraulic, geotechnical, or other structural impacts associated with the approved alterations, encroachments, or projects.

## 1.4 Relation to Other Department Delta Programs

An encyclopedic discussion of the multitude of programs, projects, and policies affecting the Delta is beyond the scope of this report. However, a brief discussion of how the DFEMP relates to other department activities in the Delta provides important context.

### 1.4.1 State Water Project (SWP)

The State Water Project (SWP), authorized in 1959 by the Burns-Porter Act and funded through bonds authorized in 1960, releases water from Lake Oroville, down the Feather and Sacramento rivers to the Delta. The SWP then pumps it from the south and west Delta to service areas in the North Bay, South Bay, San Joaquin Valley, and southern California. The SWP relies on the integrity of the Delta levee system for the efficient conveyance of export water through the Delta. As a result, the Department, which operates the SWP, has a direct and enduring interest in ensuring the integrity of the Delta levee system, including responding effectively to emergency conditions that could lead to levee damages and failures.

Since the SWP began operating in 1967, the



Department has continued to work with other federal, State, and local agencies to improve water supply reliability and water quality while concurrently addressing concerns about in-Delta impacts. Significant improvements in the Delta include the completion of the North Bay Aqueduct (1988), the installation of the Suisun Marsh Salinity Barrier (1988), installation of four additional pumps at the Harvey O. Banks Delta Pumping Plant (1991), the Temporary Barriers Program (initiated 1987), and various agreements, operational changes, and environmental restoration projects.

#### **1.4.2 Bay-Delta Conservation Plan**

The concurrent efforts to improve SWP reliability and reduce its impacts on the Delta environmental resources have been carried forward in a series of programs. The Bay-Delta Conservation Plan (BDCP), initiated in October 2006, is the most recent planning effort designed to achieve the co-equal goals of improving water supply reliability and Delta environmental quality. The plan includes a range of alternatives, including several potential options for diverting water from the Sacramento River and transporting it to the Banks Delta Pumping Plant via tunnels deep under the Delta. The draft plan also proposes an extensive habitat restoration program, with over 100,000 acres of habitat protection, enhancement, or creation. The draft environmental documentation for this proposed plan was released for public review and comment in 2013. BDCP and DFEMP are compatible planning efforts, given the State interest in Delta levees and the critically important resources they protect.

#### **1.4.3 Delta Levees Subventions Program**

Since 1973, the Department has administered the Delta Levees Subventions Program (Way Bill, Senate Bill (SB) 541), which provides financial assistance to Delta LMAs responsible for maintaining non-Project levees. It is authorized to reimburse LMAs up to 75 percent of the annual cost of levee maintenance after the LMAs expend \$1000 per mile, within specific constraints. While the actual reimbursements have historically been less than 75 percent due to State budget limitations, this program has substantially contributed to the improvement in the reliability of the Delta levee system. The declining rate of levee failures over time may in part be due to the beneficial effects of this program.

#### **1.4.4 Delta Levee Special Flood Control Projects**

Beginning in 1988, with the passage of the Delta Flood Protection Act (SB 34), the Department has established the Delta Levees Special Flood Control Projects Program. This program provides financial assistance to local LMAs for rehabilitation of levees in the Delta. Subsequently, SB 1065, and Assembly Bill (AB) 360 have expanded upon the program and extended its authorization. Since the inception of the program, more than \$100 million has been provided to local agencies in the Delta for flood control and related habitat projects. The program presently focuses on flood control projects and related habitat projects for eight western Delta Islands--Bethel, Bradford, Holland, Hotchkiss, Jersey, Sherman, Twitchell, and Webb; and for the towns of Thornton and Walnut Grove. The levees protecting these areas have been substantially improved under this program.

#### **1.4.5 Flood and Tide Forecasting**

The Department, through DFM, cooperates with the National Oceanic and Atmospheric Administration (NOAA) to operate the California-Nevada River Forecast Center, which collects, stores, and disseminates hydrologic data, evaluates river conditions, and issues flood forecasts, including Delta tide forecasts 1) Annual Delta Astronomical-based Forecasted Tides and 2) Near-term Adjusted Tide Forecasts). DFM has developed extensive infrastructure and expert staff to manage flood forecasting and flood operations.

#### **1.4.6 Delta Risk Management Strategy**

Over the past two decades there has been increasing interest in quantifying the risk of levee failures in the Delta, the assets at risk, the consequences of flooding to those assets, and ways to improve and prioritize emergency preparedness, response, recovery, and mitigation actions. The Delta Risk Management Strategy (DRMS), Phase 1 Study (2009) has been the most comprehensive effort to date to evaluate and quantify the various sources of risk to the Delta levee system, and the likely consequences, both physical and economic, of levee failures. The DRMS Phase 2 Study (2011) built on Phase 1 by evaluating a range of risk reduction scenarios. The DRMS studies were conducted under the direction of the Department and the California Department of Fish and Wildlife (CDFW) as authorized and directed by AB 1200 (Laird, 2005).

#### **1.4.7 Jones Tract Levee Failure Response and Recovery**

On June 3, 2004, a portion of the levee protecting Upper Jones Tract, in the south Delta, failed without warning, resulting in the flooding of both Upper Jones Tract and Lower Jones Tract. The Department took a lead role in the subsequent multi-agency flood response and recovery efforts, which included placement of erosion protection on 16 miles of interior levee embankment, raising and armoring the Trapper Slough levee on the south side of the island, closing the levee breach, and pumping out the island. The island was fully dewatered within 6-1/2 months of the initial levee breach. The Department and other emergency response agencies carefully analyzed the multi-agency flood response and recovery efforts, leading to the preparation of the Department's *After Action Report, 2004 Jones Tract Flood Incident* (DWR, December 2004). The Department made many improvements in its emergency response procedures and equipment as a result. A recent Department report, *2004 Jones Tract Flood Event, an Evaluation of Emergency Response and Recovery, Draft Report*, (DWR 2013) reviewed the policy framework in place at the time of the incident and recommended that the Department clearly establish a response and recovery framework in which the State's interest in response and recovery is considered at each stage to help determine the nature and extent of the Department's participation. The DFEMP is consistent with that proposed policy framework.

#### **1.4.8 FloodSAFE California**

The 2005 Gulf Coast devastation caused by Hurricane Katrina brought flood risk to the forefront, and contributed to the passage of Proposition 1E and Proposition 84 in November 2006. These bond measures together authorized \$4.9 billion for integrated flood management improvements in California, of which \$4.3 billion is allocated for FloodSAFE

implementation. In 2006, the Department launched FloodSAFE, a multi-faceted program to improve public safety. This program builds on the long-term legacy of flood control and flood risk reduction measures in California. FloodSAFE includes a broad range of initiatives that are integrated and coordinated to ensure that current and future actions are properly prioritized, include both structural and non-structural measures, provide multi-objective benefits, improve system flexibility, and improve long-term system sustainability.

In 2013, the Department established a local assistance program to help Delta emergency response agencies improve their preparedness and response capabilities. A local assistance program provided \$5 million for Delta communication interoperability to improve the emergency responders' capacity to communicate efficiently among each other during emergencies. Another \$5 million in local assistance programs was established to improve flood readiness at the local level.

#### ***1.4.9 Central Valley Flood Protection Plan (CVFPP)***

On June 29, 2013, The Central Valley Flood Protection Board unanimously adopted the Central Valley Flood Protection Plan (CVFPP), a comprehensive new framework for systemwide flood management and flood risk reduction in the Sacramento and San Joaquin River Basins. The adoption of the CVFPP, as modified by Board Resolution 2012-25, fulfills a legislative mandate outlined in the Central Valley Flood Protection Act of 2008 to approve the plan by July 1, and provides conceptual guidance to reduce the risk of flooding for about one million people and \$70 billion in infrastructure, homes and businesses with a goal of providing 200-year (1 chance in 200 of flooding in any year) protection to urban areas, and reducing flood risks to small communities and rural agricultural lands.

The CVFPP proposes a systemwide investment approach for sustainable, integrated flood management in areas currently protected by facilities of the State Plan of Flood Control (SPFC). The CVFPP will be updated every five years, with each update providing support for subsequent policy, program, and project implementation. It will propose actions to improve flood protection in the Central Valley including areas in the Delta protected by project levees.

#### ***1.4.10 Delta Flood Emergency Management Plan (DFEMP)***

Among the various FloodSAFE initiatives, the Department is developing this DFEMP, which includes both structural and non-structural elements. A key structural element was established in 2008, under the Delta Emergency Rock and Transfer Facilities Project, when the Department placed stockpiles of large quarry rock at the Port of Stockton and near Rio Vista to have materials on hand to quickly respond to Delta levee emergencies. See Figure 3-1 for map locations of these facilities.

In 2013, building on the emergency rock projects, the Department followed up by issuing a draft Initial Study and Mitigated Negative Declaration to establish two new material storage and transfer facility sites. One would be located at West Weber Avenue in Stockton and another at Brannan Island State Recreation Area (BISRA). The proposed project would also modify the existing material storage facility at Rio Vista, establish new flood fight supply

facilities at all three locations, and make site preparations to support Incident Command Posts at Stockton's West Weber Avenue and BISRA.

The Department will maintain stockpiles of rock, sand, and soil at the existing and proposed transfer sites so that materials can be delivered quickly in response to Delta levee emergencies. If these materials are depleted during an emergency, the Department will restore the stockpiles, as needed, in preparation for future events.

This DFEM Plan document focuses on the non-structural elements of Delta flood emergency preparedness, response, and recovery operations. It is consistent with the State's long-term interest in the integrity of the Delta as summarized in the previous paragraphs, founded on a legacy of more than 100 years of State involvement in the development and protection of the Delta. The evolving policy framework guiding the Department's involvement in Delta emergency preparedness, response, and recovery is informed by lessons of the past, such as the *2004 Jones Tract Flood Event, an Evaluation of Emergency Response and Recovery, Draft Report* (DWR, 2013).

This Plan assumes that the Department's Delta Flood Emergency Facility Improvement Project to establish additional materials stockpiles and emergency command facilities in the Delta will be executed, thereby substantially improving the Department's emergency response and recovery capabilities. It is therefore particularly important that the Department implements this plan, which establishes a clear Concept of Operations, defines emergency response and recovery procedures, identifies decision support data and tools, and provides a framework for determining the reasonable extent of the Department's involvement in future emergency operations.

## 1.5 Plan Organization

This plan is organized into the following sections:

**Section 1 - Introduction.** This section provides introductory material to help the reader understand the purpose of the plan and its organization.

**Section 2 – Concept of Operations.** This section provides an overview of the three-phase approach the Department will take to prepare for, respond to, and recover from Delta flood emergencies. It describes Department and partner agency responsibilities and authorizations.

**Section 3 – Preparedness.** This section provides an overview of measures implemented by the Department to be ready for potential Delta flood emergencies.

**Section 4 – Response.** This section provides an overview of actions the Department may take in the event of a Delta flood emergency to meet its mission and emergency response objectives. Much of the response process is already part of established POC and FOC operational procedures.

**Section 5 – Recovery.** This section describes actions that the Department may take after levees fail and flooding of Delta islands or tracts occurs.

**Section 6 – Glossary and References.** This section defines key terms and provides an annotated bibliography of reference material that may be helpful during an emergency.

This document is supported by three technical supplements as summarized below. In addition, DFM prepared and regularly updates detailed information on authorities, policies, procedures, staffing, equipment, and supplies, which is needed to operate effectively under emergency conditions. These documents are prepared and updated in separate, but carefully coordinated efforts to ensure the coherence of the Department's emergency preparedness activities.

**Supplement A – Preparedness and Response Action Sheets.** This supplement contains compressed instructions for staff manning the FOC, POC, and DOC for preparedness, response, and recovery phases of an emergency event.

**Supplement B – Maps and Important Delta Information.** This supplement includes important maps and detailed information on Delta islands and tracts.

## 2 Concept of Operations

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This Concept of Operations (ConOps) describes the assumptions, policies, and actions taken to manage flood emergencies in the Delta. It sets forth the Department's strategy for planning for and acting during emergencies in the Delta. This ConOps is described in greater detail in the subsequent sections and supplements to this report.

### 2.1 Situation

Quick, efficient, and appropriate action can only be accomplished by activating a clear and effective command and control structure when a Delta flood emergency develops. Quick action can often keep damaged levees and other facilities from failing, thus averting the catastrophic consequences and increased costs associated with Delta islands flooding. However, the Delta is a large estuary with a multitude of channels and islands where access for inspections, flood fighting, and recovery operations is often difficult.

Several local, State, and federal agencies, operating within a patchwork of authorities, exercise their responsibilities for various aspects of emergency preparedness, response, and recovery. This can potentially lead to confusion, duplication of effort, and ineffective responses. In addition, responsibilities for, and expertise about, various aspects of the Department's Delta programs are distributed among various units of the Department. Thus, in crafting an effective Delta emergency strategy for the Delta, the Department must address both external and internal coordination challenges, as described in this Plan.

#### 2.1.1 Setting

The Delta levees protect many lands near and below sea level. They shape a network of channels that direct the movement of water through the Delta (Figure 2-1). The normal daily channel water surface is above the land area being protected with water pressure constantly on the levees. In most cases levee crests serve as access around islands. Thus, levee failure can disrupt transportation.

Figure 2-2 shows the locations of project and non-project levees within the Delta (as defined in *Section 12220 of the California Water Code*) and Suisun Marsh.

Levees and the Delta islands and tracts that they protect hold varying degrees of State interest. Some levees are part of the network of levees that convey water through the Delta. Other levees protect large populations, transportation/utility corridors, or other infrastructure important to the State and its economy. Delta levees are important to:

- **Public Safety, such as:**
  - Human life, health, and dwellings
  - Water and wastewater treatment plants

- Water quality (control salinity intrusion), conveyance, and water supply systems
- **Environmental Stewardship, such as:**
  - Fish and wildlife habitat and migration corridors
  - Overall ecosystem health
  - Recreation
  - Cultural, historical, and aesthetic assets
- **Economic Stability, such as:**
  - Water supply aqueducts and pumping plants
  - Businesses and property
  - Highways and railroads
  - Transmission lines (electric and petroleum) and natural gas storage
  - Agriculture and livestock
  - River corridors for commercial and recreational navigation

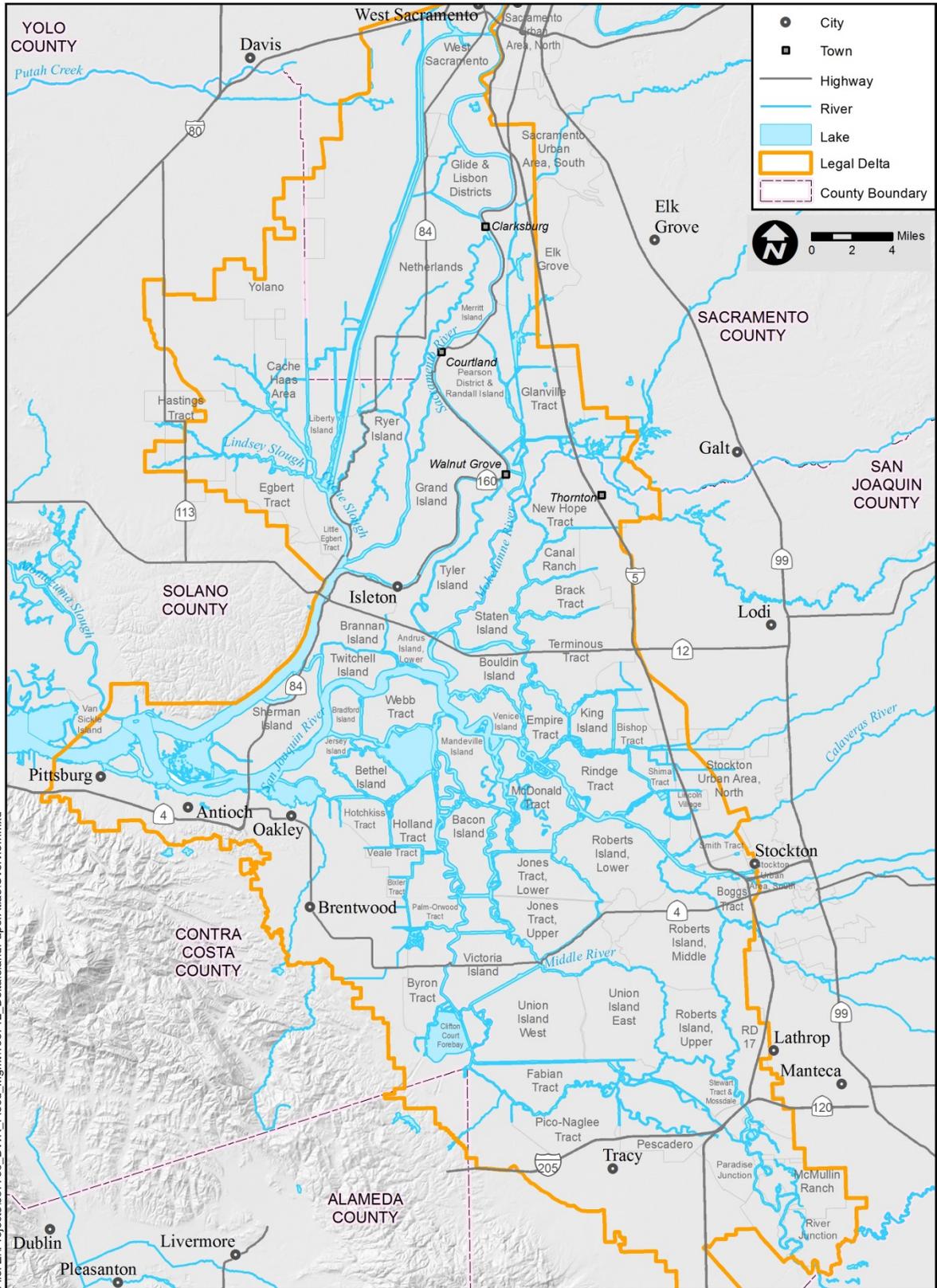


Figure 2-1 Sacramento-San Joaquin Delta

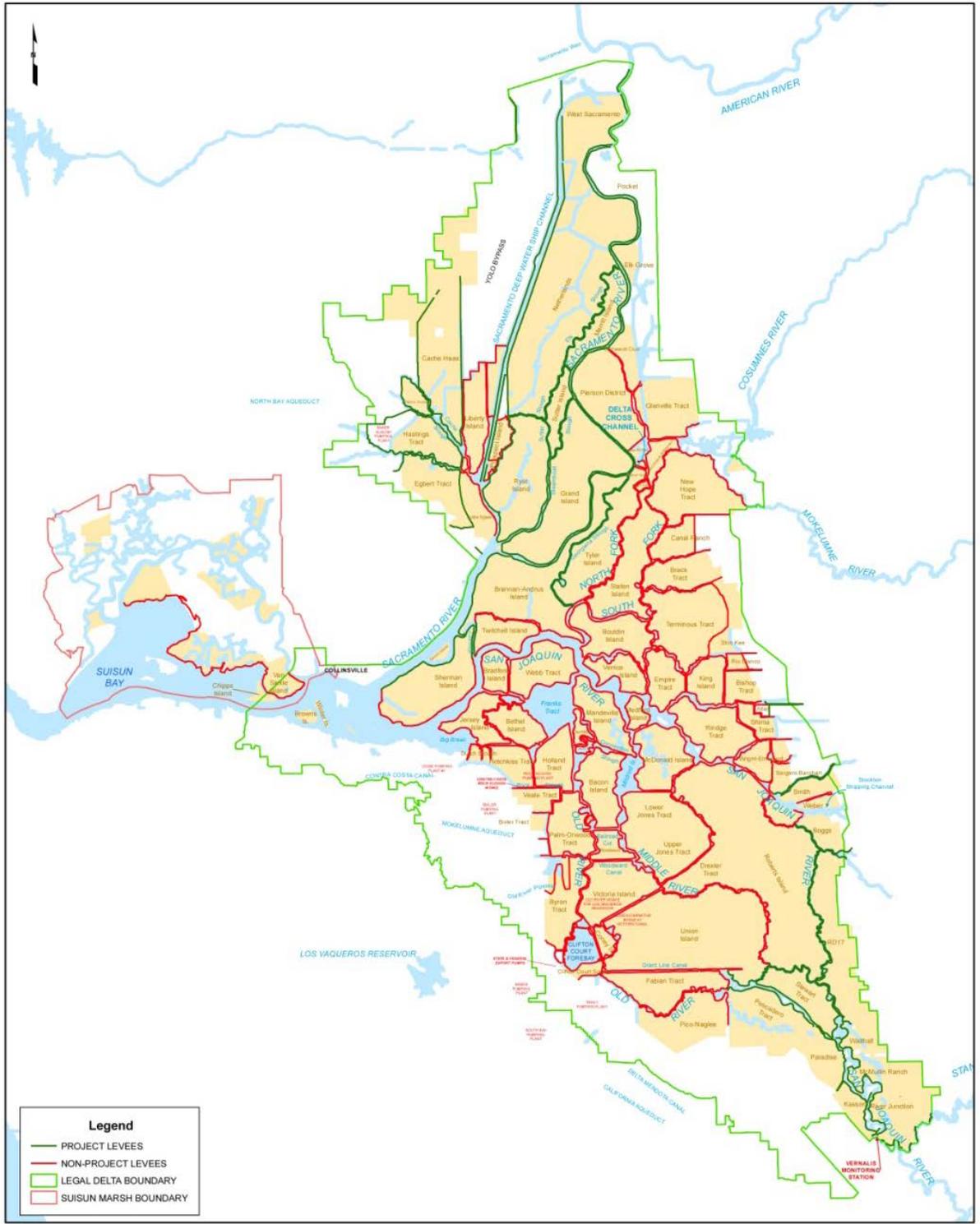


Figure 2-2 Delta and Suisun Marsh – Project and Non-project Levees

### 2.1.2 Managing Flood Risks

The Department manages flood risk through various approaches. To reduce flood hazards and reduce vulnerability to flood, projects are implemented that strengthen flood management facilities. However, knowing that the threat of flood may always remain, the Department must also implement a robust flood emergency response and floodplain management programs that reduce impacts of flooding when it occurs.

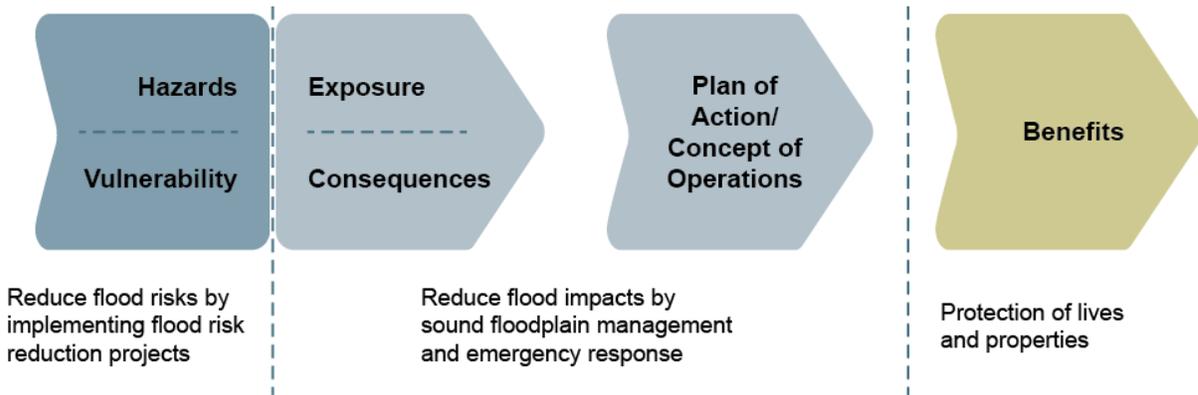


Figure 2-3 Managing Flood Risks Approach

- **Hazards** – the events; such as storms, earthquakes, or other mechanisms that place stress on the flood management system
- **Exposure** – the people, property, infrastructure, water supply facilities, environment, and other things that are within the floodplain or that could be negatively impacted by levee failures
- **Vulnerability** - how often an area is expected to flood and the likely depth and duration of the flooding. The probability of occurrence of flooding can be predicted with varying degrees of accuracy. Flood risk reduction projects can reduce vulnerability to floods
- **Consequences** – the potential threat to human life and damage estimates from a given flood event, or a series of flood events over time. Consequences of flooding can be reduced by implementing flood risk reduction measures and effective management of residual risks

The center portion of Figure 2-3 depicts the Department’s preparation of a plan of action or ConOps to alleviate the problems associated with flooding. The DFEMP is the plan aimed specifically at the Department’s actions surrounding a flood emergency within the Delta. The BDCP is an example of a plan that will lead to improvements in Delta levees and a resultant reduction in flooding potential as illustrated in the left hand portion of Figure 2-3.

The right portion of the figure represents the resultant benefits that can be expected from implementing the action plan(s). Actions to improve Delta levees will lower the vulnerability to flooding. Other action plans may include items such as land use planning that can reduce the exposure to flooding. The DFEMP provides better preparedness for potential flooding and promotes improved response and recovery efforts when they are needed.

The four components for the Delta on the left side of Figure 2-3 are described in more detail below.

#### 2.1.2.1 Hazards

Hazards to Delta levees include high flood inflow to the Delta, high tides, wind waves, earthquakes, undetected problems such as burrowing animals and accidents. In addition, future changes such as sea level rise, increases in flood inflows to the Delta due to climate change, land subsidence, and other stressors can increase stress to the levee system.

There is advanced warning of flooding in the Delta because forecasts of inflow are available. Releases from upstream reservoirs are known. Predictions allow some preparation for the flooding event. In contrast, a major earthquake will occur suddenly.

#### 2.1.2.2 Exposure

Delta levees provide a wide array of local and statewide benefits. People, property, livestock, agriculture, and critical infrastructure (such as lifeline utilities, highways, and railroads) are dependent on levees to keep land areas that support these structures and functions from flooding. Water supplies for in-Delta uses and for export use outside of the Delta are dependent on the network of levees to maintain Delta water quality and water conveyance. In addition, these land and water areas provide important habitat functions for many California native plants and animals, including threatened and endangered species.

Delta Islands, to varying degrees, preserve water quality in the Delta. Leaving a single island flooded may result in minor water quality consequences or benefits, but leaving the same island flooded along with other flooded islands may result in an unacceptable impact on Delta water quality in the long-term. The loss of the supply of freshwater hurts livelihoods and the State economy. It is estimated that the economic losses resulting from a major earthquake that causes multiple levee failures could be measured in the tens of billions of dollars (DWR, 2009).

#### 2.1.2.3 Vulnerability

Delta levees are vulnerable to failure from many mechanisms and depend on the condition of the many levee segments. Potential for under seepage, through seepage, slope instability, erosion, overtopping, and other unforeseen events contribute to levee fragility, which increases with water depth. Levee fragility analysis evaluates the probability of failure of levee reaches for each stressing event, considering for all modes of failures that may occur during the event.

A flooded island can threaten adjoining islands. Due to historic meandering of channels through the Delta over thousands of years, there are old sand layers beneath the channels and levees that link subsided islands and can carry water from a flooded island to a non-flooded island. This increases the maintenance required to keep the seepage from endangering levee stability on adjoining islands.

High water events can occur over several weeks (notice events) while seismic events could cause levee damage and failure within a few minutes (no-notice events). If an earthquake

causes failure of multiple levees, significant portions of other levees are also damaged and are in danger of failing later by seepage, high tides, wind wave actions, or aftershocks.

The documentation for the Delta Risk Management Strategy (DRMS - DWR, 2009) includes available information on levee vulnerability.

#### 2.1.2.4 Consequences of Levee Failures

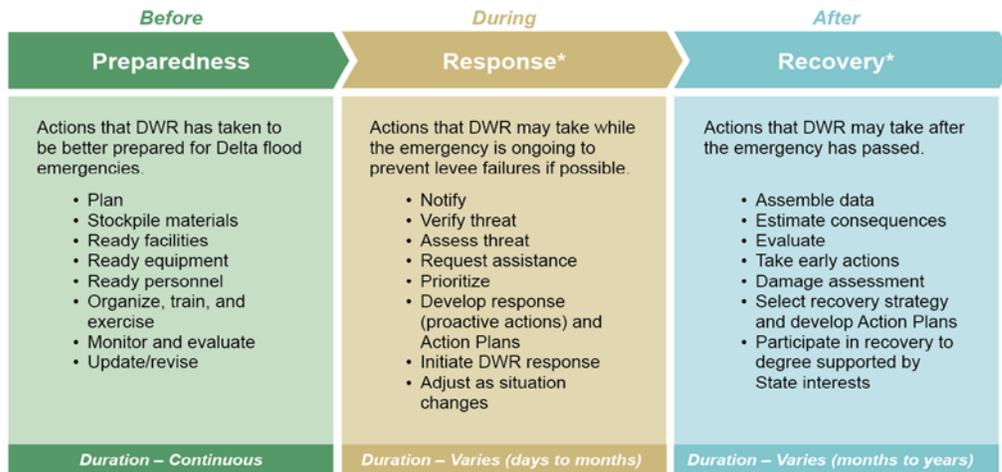
Over the long term, the consequences of Delta levee failures depend on the hazards, the exposure, and the vulnerability, all of which can change over time. Knowing the probability of island flooding can help planning for the implementation of projects that could reduce the probability of flooding. While probabilities of flooding are important for planning, they are unimportant once a real flood event occurs and islands and tracts are flooded. For example, if five islands/tracts are flooded from an event, the Department's actions do not vary if the event had a 1-in-20 annual chance of occurrence or a 1-in-100 annual chance of occurrence.

## 2.2 Mission

For this Plan, the Department's mission is, in cooperation with local, State, and Federal agencies, to prepare for and respond to flood emergencies in the Delta, to respond to the threat of flooding of Delta islands/tracts through flood fight actions, and to assist in stabilizing damaged levees and in recovery of flood control facilities to the degree that the recovery supports the State's interests in the Delta.

## 2.3 ConOps Phases

For execution of this Plan, the ConOps is divided into three distinct phases – *Preparedness, Response, and Recovery*. Figure 2-4 presents common Department actions for each of these three phases.



\* Response and Recovery emergency operations are to be conducted in accordance with the Standardized Emergency Management System (SEMS)

**Figure 2-4 Three Phases of Concept of Operations**

It should be noted that Cal OES and FEMA both include a *Mitigation* phase in their planning in addition to the three phases covered by this Plan. Mitigation is the effort to reduce risk of flooding and reduce loss of life and property by lessening the impact of disasters when they occur. The Department performs its mitigation work through various risk reduction programs outside of this Plan, and includes programs such as Delta Subvention Program, Delta Special Projects Levee Repair Program, ecosystem restoration activities, and many other programs. Most of these programs provide financial assistance to local agencies for improving flood management in the Delta.

LMAs, local governments, OAs, and federal agencies also have emergency operations plans and established actions that must integrate and be compatible with the Department’s DFEMP.

For each of the three phases included in the ConOps, the Department recognizes that all levees are not of equal importance to the State. Legislation, fund source, funding availability, local and federal participation, priorities, and other influences will guide where resources should be directed.

## 2.4 Department Executive Management Objectives for this Plan

Executive management has established Department-wide objectives for execution of this Plan. The following objectives for Delta flood emergency management include effective flood emergency preparedness, response, and recovery:

### Preparedness

Executive management’s preparedness objectives seek to enhance the Department’s readiness to respond to Delta flood emergencies that could potentially lead to loss of lives and property and disruption of the SWP. Management objectives for preparedness include:

- Plan for a wide range of possible flood emergencies from various potential triggering events
- Maintain readiness of emergency personnel, facilities, equipment, and materials. Train personnel and conduct exercises
- Develop and maintain readily accessible data and evaluation tools for real-time use during Delta flood emergencies
- Keep plans and resources current, considering changing conditions – maintain this Plan as a living document, updating annually or as necessary.
- Define roles and responsibilities
- Develop and maintain relationships and agreements with partner emergency response agencies
- Develop and train for execution of scalable flood fight actions; conduct exercises
- Assist LMAs in maintaining stockpiles of materials, training, plans, etc.

### **Response**

Executive management's response objectives are focused on DWR staff and management. Within limits of available resources, they seek to ensure protection of lives and property, continue operation of the SWP, and provide assistance to islands/tracts facing the threat of, or actual levee failure. Management objectives for response are:

- Ensure safety of Department emergency response staff
- Prioritize resources and resolve resource allocation issues among Department emergency operations centers
- Ensure Department EOCs operate under a SEMS organization and in close coordination with other emergency response agencies
- Develop action plans based upon objectives and associated strategies
- Empower the various operations center managers with the authority to modify actions as necessary depending on real-time changing conditions, such as consideration of access or worker safety
- Empower the FOC Director to allocate available resources as necessary between the Delta and areas outside the Delta that may be experiencing flood emergencies
- Provide real-time and forecast hydrologic and hydraulic information to emergency response agencies
- When requested, provide technical information and assistance to local agencies for threatened levees and flood control facilities
- Provide flood fight assistance to threatened non-project levees and stabilization of damaged levees, when requested
- Ensure timely response to State Plan of Flood Control (project) levee threats

- Prioritize responses based on State interests in the various islands and tracts, when resources are limited
- Coordinate PL 84-99 requests for USACE federal emergency response assistance
- Communicate and coordinate with the Regional Emergency Operations Center (REOC), LMAs, Operational Areas, and USACE
- Perform timely real-time evaluations/modeling of flooding impacts to Delta water quality
- Coordinate reservoir releases and pumping operations as needed
- Take action to minimize disruption to SWP operations
- Ensure that adequate accounting is prepared and maintained as required for Federal Emergency Management Agency (FEMA) reimbursement

### **Recovery**

Executive management’s recovery objectives provide assistance to LMAs to help in the recovery of Delta islands/tracts consistent with State interests, recognizing that some Delta islands/tracts with limited State interest may receive relatively minimal assistance.

Management objectives for recovery include:

- Offer technical advice and/or assistance to local agencies that have experienced levee failures
- Implement timely and necessary actions to mitigate effects of levee failures, when possible
- Maintain or resume operation of SWP facilities
- Participate in recovery of flooded islands/tracts only to the degree that the recovery would support or enhance State interests

## **2.5 Department SEMS Command Structure**

The Department follows the Standardized Emergency Management System (SEMS) during flood emergency response activities. It also clearly defines internal roles and responsibilities, coordinates with other agencies, conducts and participates in training, and stockpiles flood fight supplies and equipment.

By standardizing the control structure, participant roles, responsibilities, and nomenclature, SEMS allows individual agencies to act individually or in multi-agency teams when responding to emergencies at any scale, from localized incidents to major State disasters. In addition, SEMS is very similar to, and consistent with NIMS, used by federal agencies in responding to emergencies. Both systems are built on Incident Command System (ICS) protocols. The SEMS command structure and reporting is shown in Figure 2-5. For additional details on ICS, see *DWR Incident Command System Field Operations Guide* (DWR, 2012)

## 2.6 Department Authorities

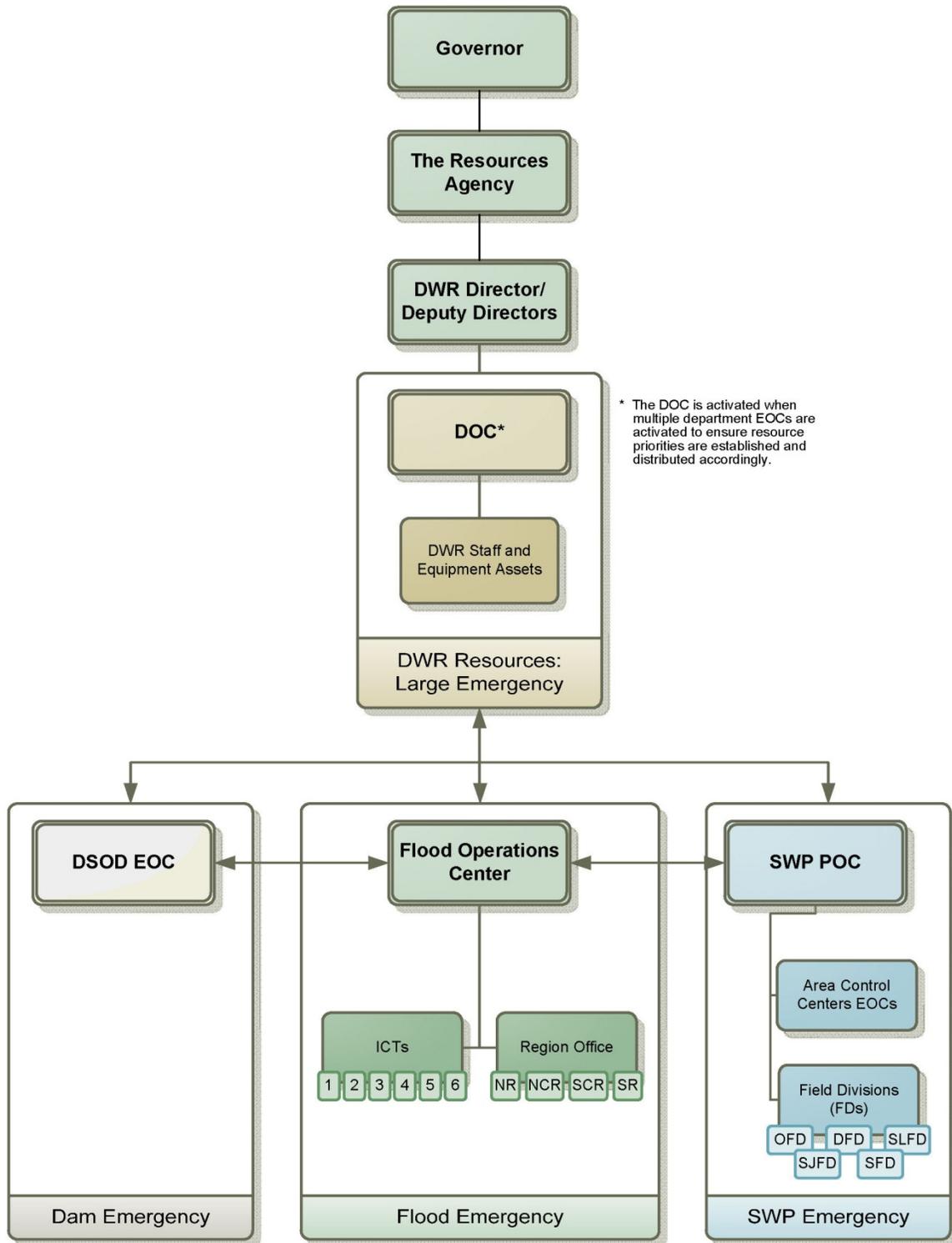
The State's primary emergency response authority is established by the California Emergency Services Act (*Government Code Section 8550, et seq.*). The Department's primary authorities to respond to flood emergencies in the Delta are set forth in the authorizing language for the Delta Levees Programs and in *Water Code Section 128*. *Section 128* states:

*In times of extraordinary stress and of disaster, resulting from storms and floods, or where damage to watershed lands by forest fires has created an imminent threat of floods and damage by water, mud, or debris upon the occurrence of storms, the department may perform any work required or take any remedial measures necessary to avert, alleviate, repair, or restore damage or destruction to property having a general public and state interest and to protect the health, safety, convenience, and welfare of the general public of the State.*

These and other Departmental emergency authorities have been summarized by the Office of the Chief Counsel (DWR, 2000).

Several existing plans set the broad processes and protocols for statewide emergency actions for California. The need for more detailed guidance specifically for the Delta prompted the Department to build upon the existing plans by preparing this DFEMP. The major statewide plans that support this plan are:

- State of California Emergency Plan (Cal EMA, 2009); available at: <http://www.calema.ca.gov/PlanningandPreparedness/Pages/State-Emergency-Plan.aspx>
- Administrative Orders
- Standardized Emergency Management System (Cal EMA); foundation, regulations and guidelines available at: <http://www.calema.ca.gov/planningandpreparedness/pages/standardized-emergency-management-system.aspx>
- DWR Emergency Response Plan (DWR, 2006 in revision)
- State-Federal Flood Operations Center Flood Emergency Operations Manual (DWR, 2013 in revision)
- Water Resources Engineering Memorandum No. 63a (DWR, 2013), which establishes policy and procedures for the Department's emergency preparedness, response, and recovery activities statewide
- Final Report of the Governor's Flood Emergency Action Team (FEAT) [www.water.ca.gov/historicaldocs/irwm/feat-1997/fcsic2.html](http://www.water.ca.gov/historicaldocs/irwm/feat-1997/fcsic2.html)



**Figure 2-5 DWR SEMS Command Structure and Organization Reporting**

## 2.7 Department Organizational Role and Responsibility During Emergencies

### 2.7.1 Department Emergency Operations Centers

The Department’s emergency flood preparedness, response, and recovery responsibilities are ultimately the responsibility of the Director. The responsibility for prioritizing and allocating Department resources in a large emergency is delegated to and carried out by the Emergency Preparedness and Security Manager, an Executive-level position within the Department.

<b>FOC, POC, &amp; DOC Management</b>	
<b>FOC manages flood emergencies</b>	Always engaged, involved, and activated for flood threats or flood events occurring statewide
<b>POC manages the SWP emergencies</b>	Always activated for SWP operations including emergency operations
<b>DSOD manages dam emergencies</b>	Activated only for Dam Safety emergencies
<b>DOC manages DWR resources during major emergencies</b>	Activated only for major emergencies to provide command/control for DWR assets and activities

The Department’s flood emergency management activities are directed by the FOC, a part of the Division of Flood Management. Emergencies involving the SWP are coordinated and directed by the Division of Operations and Maintenance through POC. In large emergencies a DOC will help prioritize and allocate Department resources. Incident Command Teams (ICTs) are directed by either the Flood Operations Center or the Project Operations Center and carry out the activities at the emergency sites.

### 2.7.2 Department Operations Center (DOC)

The DOC is managed by the Department’s Emergency Preparedness and Security Manager (EPSM) who reports directly to a Deputy Director. The DOC, through its EPSM, has overall responsibility for coordination of Department staff and equipment to meet the needs of the FOC and POC. During major emergencies requiring high-level coordination, the DOC is activated as a separate command unit. For smaller emergencies and under circumstances where the Department’s assets are not taxed, the DOC is inactive.

**Emergency Operations Center**  
 An Emergency Operations Center (EOC) is where centralized emergency management can be carried out. SEMS allows for EOCs to be established at four levels: local government, operational area, regional, and State.

In large emergencies, when multiple incidents must be managed (i.e., SWP emergencies and flood emergencies) with competing needs among FOC, POC, and the Division of Safety of Dams (DSOD) for scarce Department resources, DOC takes a lead role in assessing, allocating, and providing resources for competing emergencies.

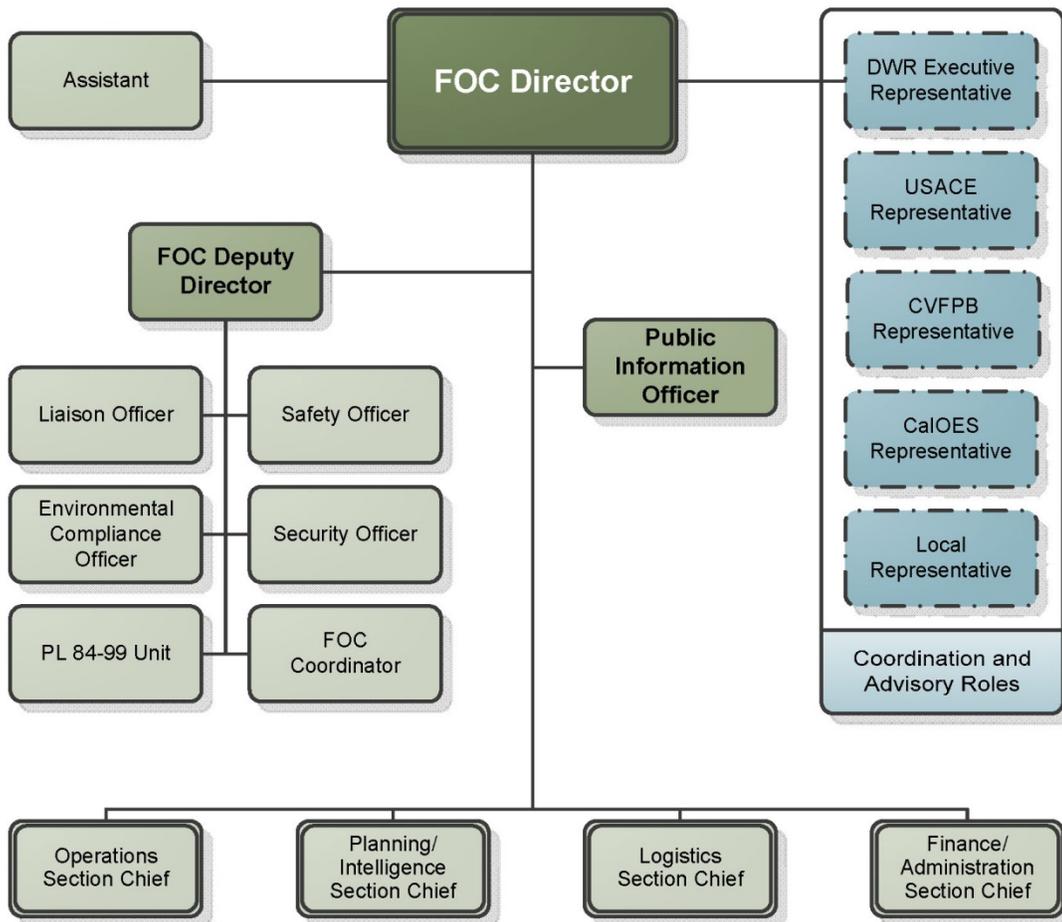
During emergencies when the DOC is activated, a SEMS organization structure is established. The DOC Director (usually the EPSM) coordinates and reports emergency management activities to the Department's executive team, and initiates coordination with the California Office of Emergency Services (Cal OES).

The DOC plays the role of coordinator in many emergency management activities in the Department, including:

1. Coordination and cooperation with Cal OES on development and implementation of SEMS at the State level
2. Collaboration and coordination with other emergency response agencies (local, State, and federal) that may affect the Department's operations
3. Coordination with Cal OES Regional Administration as needed
4. Encouragement of a harmonious working relationship among Department Managers, Flood Response Managers, SWP Emergency Response Managers, and DSOD. Such a relationship facilitates:
  - a. Updating emergency plans and procedures in EOCs consistent with SEMS and that the ICS is used by the Department for emergency response
  - b. SEMS training by all Department personnel who may have emergency management assignments
  - c. Support efforts that develop documentation for disaster assistance funding
  - d. Coordinating damage assessment teams and ensuring all damage assessment reports are promptly sent to Cal OES

### **2.7.3 Flood Operations Center (FOC)**

During flood emergencies, the FOC manages all flood emergency response actions for the State. The FOC Director is the ultimate lead for emergency management and coordination during flood emergencies. Coordination among the key State, federal, tribal, and local agencies occurs through the FOC, located within the State-Federal Joint Operations Center (JOC) in Sacramento. FOC not only coordinates with other local, State (Cal OES), and federal agencies, it coordinates with the media. FOC procures material resources, acquires personnel support from other Department divisions, and fills key ICS roles as needed. Figure 2-6 shows the FOC SEMS organization.



**Figure 2-6 Flood Operations Center SEMS Organization Chart**

The FOC Director takes on predetermined Incident Command roles as defined in DWR’s Emergency Response Plan.

The historic success of the FOC is greatly aided by the co-location of the FOC, the POC, the California Nevada River Forecast Center (CNRFC), the National Weather Service (NWS) Sacramento Office, and the U.S. Bureau of Reclamation’s Project Operations Center at the JOC. The co-location of these agencies at the JOC encourages cooperation, sharing of information, and mutual support. Collecting and disseminating information includes providing alert warnings and situational awareness.

Two types of flood declarations may be made depending on the state of the developing emergency:

- **Flood Alert** - Forecasts of sustained storm patterns resulting in a high water flood threat, the need for coordinated field operations, or requests for technical or direct support from local agencies may lead the FOC Director to declare a Flood Alert to

officially activate the FOC under SEMS. Personnel within DFM expand their regular duties to meet these needs. Additional Department personnel, equipment, materials, and financial resources may be needed to respond to sustained severe storms or flooding. The Department Director or, with delegation, the EPSM may issue a Flood Mobilization to meet this need

- **Flood Mobilization** - Sustained severe storms, flood threats, and flooding may require further Department personnel, equipment, material, and financial resources for an extended period. To meet this need, the Department Director or, with delegation, the EPSM may, upon the recommendation of the FOC Director, declare a flood emergency that will mobilize all the assets of the Department. A Flood Mobilization declaration authorizes FOC to use any Department personnel in accordance with WREM#63a (DWR, 2013). When a Flood Emergency is declared, a Flood Mobilization declaration memorandum must be prepared and approved and distributed by the DWR Director

While evacuations are beyond the scope of the FOC's responsibilities the FOC is also mindful of the fact that local agencies are responsible for making decisions about whether, when, and how to evacuate people during flood emergencies. The FOC provides support for the responsible local agencies by disseminating hydrologic information and flood forecasts, responding to requests for flood fight assistance, and other assistance as appropriate

#### **2.7.4 Project Operations Center (POC)**

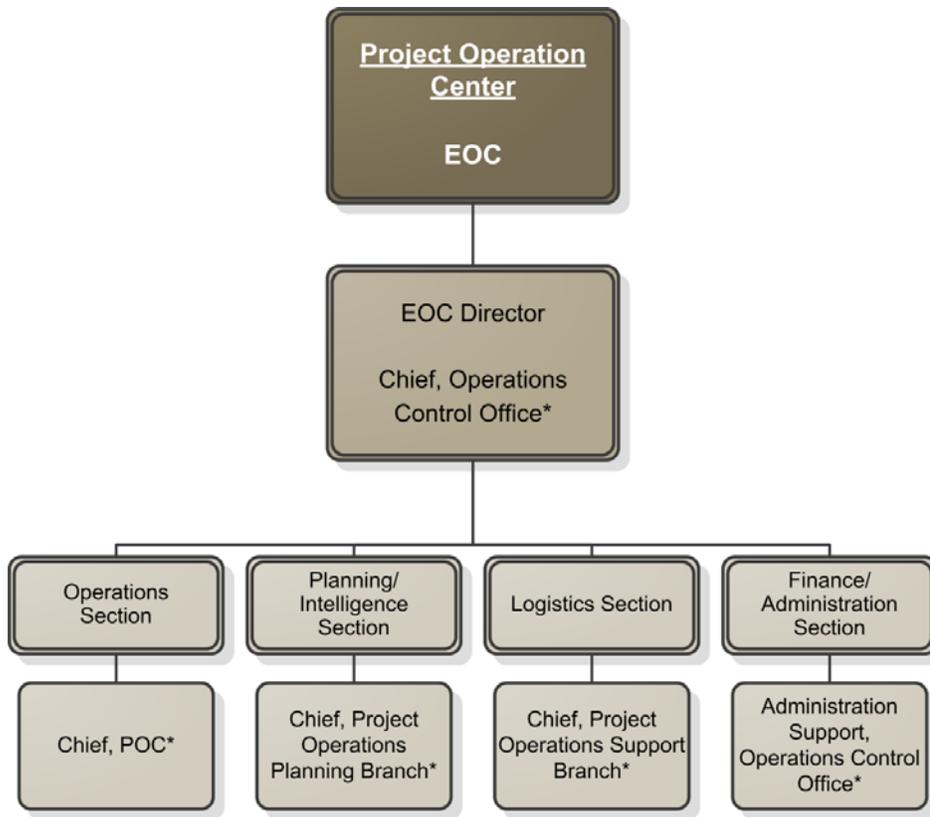
During State Water Project emergencies, the POC becomes the Emergency Operations Center for the SWP and the POC managers take on the Incident Command roles. The POC manages emergencies affecting the State Water Project. The POC SEMS organization is presented in Figure 2-7. An emergency management plan is being developed by the POC.

During Delta flood emergencies, POC managers provide support to the FOC by coordinating State and federal project operations and river releases, and by coordinating within the Division of Operation and Maintenance to provide resources to the FOC as requested by the FOC Director.

#### **2.7.5 Division of Safety of Dams**

DSOD manages the emergency activities and response for any emergencies involving State jurisdictional dams. DSOD offices become DSOD's Emergency Operations Center. DSOD Field and Design Branch personnel take on Incident Command roles. During flood emergencies, DSOD managers provide support to FOC by providing liaisons and coordination actions between their operations, as well as the POC and DOC.

In the event of a severe Bay Area earthquake, DSOD's resources may be stretched. DSOD may need to promptly inspect more than 100 dams and possibly supervise emergency repairs on many (Figure 2-8). This may result in a conflict or requirement to share critical Department engineering and geological resources (DOE) with the other EOC's.



\* These are Department of Water Resources' position titles. Depending on the needs, branches and units will be established as an emergency develops.

**Figure 2-7 Project Operations Center SEMS Organization Chart**

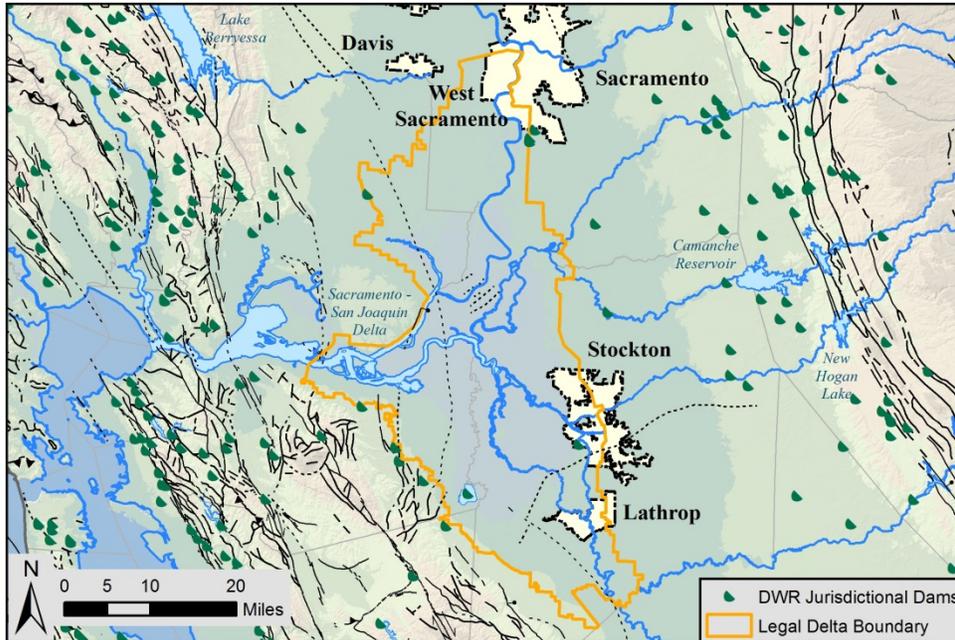


Figure 2-8 DSOD Jurisdictional Dams adjacent to the Delta with known faults.

### 2.7.6 Department Organizations: Emergency Roles and Responsibilities

During emergencies, the normal DWR roles, responsibilities, and employee duties can be superseded by the coordinated leadership provided by these Department divisions.

While all Departmental staff and resources can be called into service in a State emergency, the following units play key roles in responding to Delta flood emergencies under the direction of the FOC (and DOC and POC in major disasters):

- **Division of Flood Management (DFM):** Performs flood data collection and dissemination, flood forecasting, flood operations, reservoir operations coordination, field investigations of incidents, and coordination of flood fights. Coordinates with local emergency responders and State and federal agencies as needed during the emergency
- **Division of Engineering (DOE):** Provides geotechnical advice and engineering assistance, emergency repair design, and execution of emergency repair contracts under Public Contracts Code §10122
- **Division of Operations and Maintenance:** Provides mobile equipment, including heavy equipment for flood fight and repair activities, staff resources, SWP emergency operations, and water project-related activities
- **Division of Safety of Dams (DSOD):** Monitors dams statewide for safety, evaluates and orders dam safety measures
- **Division of Fiscal Services:** Works with State agency staff to coordinate emergency response funding, as well as manage Department funds to ensure that emergency response activities are properly funded and accounted for

- **Division of Integrated Regional Water Management, Regional Offices:** Performs flood data collection, technical assistance, and coordination with local agencies
- **FloodSAFE Environmental Stewardship and Statewide Resources Office (FESSRO):** Oversees Delta Levees Program, administration of Delta Flood Protection Fund emergency expenditures by local agencies under Water Code §12994, and in collaboration with Division of Environmental Services (DES), provides environmental technical support
- **Division of Environmental Services (DES):** In collaboration with FESSRO, provides technical assistance and regulatory support regarding minimizing environmental impacts and coordinates with responsible resource agencies to address permitting and environmental impact/mitigation issues
- **Executive Division:** Provides coordination with Natural Resources Agency, Governor’s Office, Legislature, Central Valley Flood Protection Board, Department of Finance, U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, U.S. Environmental Protection Agency, and the Federal Emergency Management Agency to ensure overall emergency response policy coherence. This Division also provides public media outreach, addresses legal concerns that arise during emergencies, and ensures that Department emergency expenditures are reimbursable by FEMA

The State-Federal Flood Operations Center Flood Emergency Operations Manual (DWR, 2013) includes more detail regarding the organization of the Department.

## 2.8 Multi-Agency Coordination

In SEMS, Unified Command provides multi-agency support and coordination at the field level when an incident grows in complexity or multiple incidents occur in the same period. The Multi-Agency Coordination System (MACS) is a component of SEMS that allows all levels and disciplines of government to work together more efficiently and effectively. The primary function of MACS is to coordinate activities above the field level and to prioritize the incident demands for critical or competing resources. MACS consists of a combination of elements: personnel, procedures, protocols, business practices, and communications integrated into a common system.

The Sacramento-San Joaquin Delta Multi-Hazard Coordination Task Force Report (CalOES, January 2012) recommended the development of an Interagency Unified Command Organizational Framework for all jurisdictions and agencies operating in the Delta and the development of a Delta Multi-Agency Coordination System. Participation in the development of the Delta MACS shall include levee maintaining agencies, cities, operational areas, state and federal agency resources.



### 3 Preparedness



The Department is committed to maintaining and improving its readiness and capacity to effectively respond to flood emergencies in the Delta region. Significant planning and investment to prepare for Delta flood emergencies have been conducted and are ongoing. The Department’s *Emergency Response Plan* (DWR, 2006) provides a variety of foundational preparedness activities to maintain readiness for flood emergencies in the Delta and statewide.

**Preparedness**  
Preparedness includes the planning and other actions that make DWR ready to respond to and recover from actual flood emergencies when they occur.  
Preparedness anticipates the range of potential Delta flood emergencies so that procedures are in place for action prior to a real-time Delta flood emergency.

This DFEMP is a key element of the Department’s preparedness. It outlines a framework for those preparedness activities. More detailed information can be found in Supplement A.

Emergency preparedness is critical in maintaining and improving the Department’s ability to effectively respond to and mitigate the impacts of Delta flood emergencies. Unlike the response and recovery components of this Plan, which only occur in the event of an emergency, preparedness is an ongoing effort that relies on careful planning and Department-wide implementation. The Department understands that preparedness efforts can dictate the success the Department is likely to have in responding to emergencies, and can have the greatest impact on limiting costs and losses from such disasters. The success of the Department’s preparedness effort depends upon the activities being implemented throughout the Department on a year-round basis. These activities also require commitment from staff across the Department and reliable funding.

Delta preparedness activities are conducted and coordinated throughout the Department consistent with Executive management objectives described in Chapter 2, Concept of Operations. The subsections below highlight Delta-specific preparedness activities for each of the Department Emergency Operations Centers. Additional details for some of the listed activities are contained in *Supplement A*. The majority of preparedness activities for Delta flood emergencies are conducted by the FOC.

#### 3.1 Hydrology and Flood Operations Office: Flood Operations Center (FOC)

The FOC staff within the FOB has primary responsibility in preparing for Delta flood emergencies.

### 3.1.1 Personnel

When ordered by the Department Director in a Flood Mobilization Memorandum, all Department personnel become available for work assignments during a Delta flood emergency. Personnel with specialized expertise in the Delta are identified by the FOC and included on the rosters for Emergency Response Teams. This provides personnel who have sufficient training and expertise to staff needed emergency operations on a 24-hour basis. These include flood fight specialists (FFS) that can be sent to the field to assist LMAs. The FOC also has ready access to technical experts in water resources, geotechnical analyses, environmental, surveying, levee inspections, modeling, levee construction, feasibility studies, and the ecosystem.

The FOC conducts the following activities for personnel preparedness:

- Maintains Department FOC Emergency Response Teams rosters for staff with Delta expertise (*Logistics Plan/ Position documents*), including Flood Fight Specialists and Delta Technical Experts
- Maintains Incident Command Teams – The Department has six fully identified incident command teams. These teams coordinate the Department's field operations during an incident. Pre-identified teams with Delta expertise can have additional training and equipment experience and be put through regular drills and exercises to improve the Department's ability to respond to a variety of events. The Department's Incident Command Teams operate according to the Department's Incident Command System Field Operations Guide (December 2012)

### 3.1.2 Training

Training helps FOC staff and management maintain familiarity with this DFEMP so implementation is as efficient as possible:

- **Flood Academy** - the Department's Flood Academy resources lists Department employees, their training status, and their qualifications for flood emergency assignments
- **SEMS/NIMS** - All Department employees shall receive at least eight hours of training to include SEMS, NIMS. All Department employees are required to renew their certification every five years
- **Incident Command System** - Training includes courses ICS 100/200/700/800
- **Administrative** - Procedures include DWR 208 Emergency Daily Time Sheet Basics
- **Delta-specific training** - The DFM managers will be trained for Delta-specific emergency activities as needed
- **Flood Fight Methods** - All Department employees are provided a copy of the publication, *Emergency Flood Fighting Methods* (DWR, 2012) (available at: [http://www.water.ca.gov/floodmgmt/docs/flood\\_fight\\_methods.pdf](http://www.water.ca.gov/floodmgmt/docs/flood_fight_methods.pdf)) and encouraged to review it annually before the start of the flood season. Include flood fight in the annual DFM Appraisal and Development process

- **Safety** - Before being deployed on a flood fight site, Department employees receive a safety orientation. Training and instruction on flood fight methods may occur in real-time during a flood fight or as part of the Department's pre-season training program
- **New Employee Orientation** - New employees with the FOC will be directed to read this Plan and discuss it with their direct supervisors as part of their on-the-job orientation to their FOC position
- **Preparedness and Response Classes** - All FOC employees are required to review this Plan each year before August 31 and to attend a one-hour preparedness and response class conducted by the FOC before September 30 (in preparation)
- **Site Visits** - Delta visits help Department staff become familiar with Delta layout and transportation constraints and provide orientation to ER stockpile facilities

### **3.1.3 Exercises**

A number of exercises are regularly planned and scheduled by DFM to keep personnel ready to respond to a flood emergency. These exercises typically include personnel from the Department and other agencies. Exercises can be regional, state-wide, or Delta-specific, depending on design. FOC exercises should typically have a Delta component so that Delta-specific issues can be considered. The Purpose of these exercises is to improve readiness of emergency response personnel and not to educate the general public.

After Action Reports and improvement plans should be incorporated into any exercise and subsequently used as a basis for improving preparedness, response, and recovery from Delta flooding events.

### **3.1.4 Facilities**

The FOC maintains facilities for use during Delta flood emergencies. They store materials, supplies, and equipment, provide materials transfer for marine-based operations and provide command space. Maps, addresses, and phone numbers for each facility are contained in the DWR Flood Fight Materials Management Plan. Together these facilities minimize logistical delays in procurement and distribution of material and personnel during emergency response activities. These facilities include:

- **Flood Operations Center** - The State-Federal Flood Operations Center, located at 3310 El Camino Avenue in Sacramento, houses information, guides actions and stages personnel resources
- **Warehouses** – Warehouses hold materials, supplies, and equipment for use during an emergency. The DWR Flood Fight Materials Management Plan (FFMMP) provides a general inventory of each site and estimate of material shelf-life. Current warehouses (see Figure 3-1 and Tables 3-1 and 3-2) are located at:
  - Brannan Island, State Recreation Area - Pre-Deployment Containers
  - Twitchell Island Warehouse - Warehouse with a forklift and flood fight supplies
  - Sacramento Maintenance Yard - Warehouse and pre-deployment containers
  - Delta Field Division, Byron - Pre-deployment containers Forklifts, crane, trucks

- Stockton - 1404 West Weber – includes muscle wall
- Sacramento - North Market Street
- **Flood Fight Materials Stockpiles and Transfer Sites** – The Department has stockpiled several hundred thousand tons of emergency response materials at two stockpile sites in the Delta at Rio Vista and the Port of Stockton. The Port of Stockton facility includes a conveyor system for transferring quarry rock to barges. The sites can be used for stockpiling materials, transferring materials to barges, trucks, and helicopters for delivery to emergency sites, and locating ICPs. The Department intends to maintain stockpiles of quarry rock, sand, and soil at the existing and proposed transfer sites, so that materials can be delivered quickly in response to Delta levee emergencies. If these materials are depleted during an emergency, the Department intends to restore the stockpiles in preparation for future events. The Department is planning to establish at least two additional sites, which would be used to load rock onto barges for flood fighting, channel closure, and breach repairs. These sites would allow access to rock from foothill quarries or other sources to supplement rock that is typically supplied from the quarry in San Rafael operated by the Dutra Group. These multiple sources for delivery reduce material constraints, especially in the event of many flooded island/tracts. These transfer facilities would significantly reduce emergency response times and potentially speed up restoration of Delta exports and in-Delta water use that are negatively affected by saltwater intrusion during multiple levee failures
- **Staging Areas** – The waterside transfer facilities and the rock stockpile sites can also be used as staging areas during an emergency. In addition, temporary staging areas may be established depending on the location and nature of the emergency.

**In addition, temporary facilities can be set up to manage the emergency response:**

- **Incident Command Post(s)** – An Incident Command Post (ICP) is a field command center directing the response to an incident(s). An ICP may be located in existing office space or mobile facilities depending on the location of the emergency. Multiple ICPs may be needed depending on the areal and geographic extent of the emergency

**Table 3-1 Locations and General Inventory of Flood Fight Materials (FFMMP of November 2013)**

<b>Current Locations and Inventory of Materials</b>											
*Location	Last Update	Storage Facilities		Storage Description	Sandbags (ea)	Plastic Sheeting (rolls)	Twine (cases)	Wooden Stakes (each)	Buttons (each)	Geotextile Fabric (rolls)	Muscle Wall (each)
		WHS	Storage Units								
Eureka Flood Center, Fortuna CCC	9/15/2011	0	4	Storage Units	52,000	149	15	800	39,050	0	0
Sutter Maintenance Yard	6/20/2013	0	23	Storage Units	435,000	441	528	70,620	54,575	281	0
Sacramento Maintenance Yard	6/19/2013	1	17	Storage Units	276,000	1,038	44	23,850	21,475	137	0
				Warehouse	217,000	122	690	18,000	94,350	0	0
West Sacramento Mobile Equipment Yard	6/19/2013	0	12	Storage Units	80,000	360	20	21,600	0	0	0
North Market Warehouse, Sacramento	10/14/2013	1	0	Warehouse	199,000	0	520	90,000	125,000	0	744
Twitchell Island Warehouse, Sacramento	11/7/2013	1	0	Warehouse	226,400	291	188	10,027	52,900	95	0
Brannan Island State Recreation Area	6/21/2013	0	5	Storage Units	72,500	351	392	9,240	17,940	84	0
Stockton Warehouse	10/14/2013	1	0	Warehouse	164,000	500	160	0	123,600	0	0
Delta Field Division	3/1/2013	0	6	Storage Units	33,000	110	34	0	500	296	0
Rancho Cucamonga	1/10/2013	0	3	Storage Units	48,000	214	20	2,340	0	0	0
San Luis Field Division	2/29/2012	0	8	Storage Units	34,000	80	24	2,000	8,000	0	0
Southern Region, Los Alamitos	1/9/2013	0	4	Storage Units	186,050	234	31	2,650	2,550	50	0
				<b>Total:</b>	<b>2,022,950</b>	<b>3,890</b>	<b>2,666</b>	<b>251,127</b>	<b>539,940</b>	<b>943</b>	<b>744</b>

\*See individual inventories for latest updates for each material storage location

**Table 3-2 (From FFMMP, November 2013)**

<b>*Life Expectancy of Major Flood Fight Materials</b>		
Description	Life expectancy	Units
Sandbags	5-10	years
Sandbags (moist)	1-3	years
Plastic Sheeting	Unknown	years
<b>Buttons</b>	<b>Unknown</b>	<b>years</b>
Twine	Unknown	years
Geotextile Fabric	3 – 5	years

**From Table 9 – Life Expectancy of Flood Fight Materials**

\*Values based upon general research and general assumptions.

This table should be used for approximation purposes only.



### 3.1.5 Tools

The following is a list of tools used by, or available to, the FOC:

- **Delta Emergency Response Tool (DERT)** – DFM has developed a tool to allow quick evaluation of actual or probable levee failures in the Delta. The tool estimates the time and cost of recovering flooded Delta islands/tracts and the resultant water quality and impacts (likely duration of disruptions and quantity of lost water) on water exports. The tool allows quick evaluation of a number of recovery strategies that helps resource management
- **Delta Hydrodynamic Models** – DFM has access to the Department or external modelers that can be called on to evaluate Delta hydrodynamic conditions using much more detailed analyses than provided by the DERT. Models such as DSM2 and RMA2 are finite element models that provide a full-featured hydrodynamics/water quality modeling system of the full Bay-Delta estuary
- **Real-time Hydrologic Data** – See the California Data Exchange Center (CDEC) for current hydro-meteorological data and related information. CDEC data is available at <http://cdec.water.ca.gov/>
- **Flood Emergency Management System (FEMS)** – Real-time flood information database being developed for DFM will put all flood related information on one platform
- **Technical Services** – Quick access to GIS, bathymetry, photography/videography, photogrammetry, surveying, aerial reconnaissance, and other services allows for more rapid evaluation of the emergency situation and aids decisions on deployment of resources
- **Real-Time and Forecasted Data** – The FOC has first-hand access to real-time and forecasted storm, hydrologic, hydraulic (flow timing and stages), and water quality data through operations of the JOC. These are essential in determining action plans for response and recovery
- **Delta Island Maps and Facts** – Supplement B contains maps and important data for each Delta Island or tract. The information includes:
  - **Maps of Delta Islands and Tracts.** Three maps for each island/tract include topography, critical infrastructure, and historic levee repairs and improvements
  - **Islands Fact Sheets.** These include detailed tables with pertinent information for each island/tract, such as population, access, and LMA contact information

### 3.1.6 Resources

Efficient management of available resources during a Delta flood emergency is the responsibility of the FOC Director. As mentioned previously, when resources are inadequate or there are conflicts over their deployment, the DOC will decide on resource allocation.

The following is a list of resources that are available to the Department:

- **Information Technology (IT) and Communications** – Preplanning for equipment, services, procedures, backup resources, etc., provides for timely and uninterrupted IT and communications during an emergency. DFM annually updates inventories of radio frequencies, cell phone numbers, and other details necessary to support reliable communication with field personnel during an emergency. Such communications are essential for the safety of the personnel and the efficient reporting of actual conditions that affect decision making for response and recovery. Details may be found in the *Flood Operations Emergency Communications Plan* or the *Handheld Communications Equipment Handbook*
- **Equipment** – Field personnel must be allocated necessary gear, vehicles, light/heavy construction equipment, communications devices such as cell phones, satellite phones, and laptop computers
- **Material/Supplies** - Field personnel must have access to existing materials, supplies, and stockpiles. An important part of preparedness is to be sure that these stockpiles are inventoried and restocked so they are available for use during a flood emergency. Deployment and management plans aid the overall resource management
- **Contracts** – Pre-arranged contracts provide the FOC with the ability to immediately receive resource and technical assistance from emergency response partner agencies, private businesses, and consultants during emergencies. Standing contracts for barges, rock, technical consultants, etc., reduce the time to mobilize for an emergency. The Department has at least three mechanisms to activate consultant technical assistance and other contractors during a Delta flood emergency:
  1. Both the DOE and DFM have consultants with Delta, flood evaluation, and engineering expertise under contract. The efforts of these contractors can be redirected to assist with a flood emergency if needed
  2. If the Governor declares an emergency, DOE can write new contracts to hire additional consultants within a few hours to days
  3. The Department also has the ability to advertise and select qualified consultants in advance of an emergency for use during an emergency
  4. Approved vendor (purchase orders)
- **Construction Services** – DOE has emergency contracting ability for the Department and can provide some construction services, including construction management for repairs and other emergency work
- **Agreements** - Pre-arranged agreements with LMAs provide for more rapid Department assistance. For recovery actions, agreements specifying State, federal, and local cost-sharing and State hold-harmless provisions need to be in place before active recovery work begins
- **Services/Suppliers** - The Department can access needed services from vendors. Examples of services include aerial and ground surveys

### **3.1.7 Plans and Procedures**

The following is a list of plans and procedures that supplement this DFEMP by providing specific plans and information for various aspects of emergency preparedness, response, and recovery:

- Flood Emergency Operations Manual (FEOM) describes the responsibilities of DWR and cooperating federal, State, and local agencies at the FOC to prepare for and respond to high water and flood emergencies, statewide
- Flood Emergency Management System (FEMS) is an information management system that will be used for the deployment of trained staff to various flood response activities; tracking resources for each incident and real-time tracking; and reporting of incident costs for proper cost recovery from FEMA
- Flood Operations Emergency Communications Plan and the Handheld Communications Equipment Handbook outline various communications systems available to Department flood response personnel during an emergency. They include Smart phone, radios, satellite communication trailers, e-mail, and other systems with protocol and step-by-step instructions for their use
- Logistics Plan, including Delta Transportation, establishes the protocols and procedures for getting needed resources and materials, to aid preparedness, response, and recovery operations
- Delta ER Security, Health and Safety Plan is necessary for any field operation. This Health and Safety Plan must be specific for the location and environment of the Delta
- Flood Fight Materials Management Plan inventories available materials and supplies stockpiled around the state and in the Delta and provides protocols to obtain them for flood response activities
- Resource Requests – Provision and Acquisition are procedures and forms (ICS 213RR) designed to provide the complete information needed to describe, order, and deliver materials needed primarily for response and recovery from flood emergencies
- Environmental Impact and Mitigation Procedures carefully outline the steps needed to avoid, deal with, and properly document any environmental impacts and mitigation prior to, during and after flood related field work
- Emergency Documentation and Recordkeeping Procedures (Legal, FEMA reimbursement, etc.) outline procedures that must be taken to provide adequate documentation to allow FEMA reimbursement of flood emergency costs
- Agreements for Local Assistance must be completed before the State and the Department can proceed with emergency response and recovery work for an LMA. The LMA must hold the State harmless and agree that the State can conduct the proposed work on their behalf. The LMA must sign an agreement with the Department per a resolution of the LMA Board or other mechanism prior to commencement of any State work

### **3.1.8 Coordination and Outreach**

The following is a list of activities the DFM takes to prepare the FOC for efficient coordination and outreach:

- Internal Coordination (cross-training/exercises, meetings/briefings, ICT Roundtables, management briefings, etc.). In addition the Department divisions periodically meet to discuss Delta issues
- Interagency Coordination and Agreements. The Department coordinates its emergency preparedness and response activities with many local, State, and federal agencies including executing Memoranda of Understanding (MOUs) and Memoranda of Agreement (MOAs), Mutual Aid Agreements, Preseason Coordination Meetings, the Mutual Aid Regional Advisory Committee (MARAC), Automated Local Evaluation in Real Time (ALERT) user groups, USACE coordination meetings, Disaster Management Area Coordinators (DMACs), the California Utilities Emergency Association, cross-training/exercises, FOC Emergency Service Coordinators, Cal OES, Department of Parks and Recreations, etc.
- Governor's Office Briefings on a 24-hour basis as needed
- Education and Outreach – disaster preparedness events, workshops, California Flood Preparedness Week, various flood related publications (Directory of Flood Officials, Flood Fight Methods Handbook, Emergency Contact Card, Levee Threat Monitoring Guidelines, etc.)
- Outreach to LMAs, including outreach on levee inspections, flood fight training, LMAs reporting, grants information and reporting standards

### **3.2 SWP Operations Control Office: Project Operations Center (POC)**

During flood emergencies POC managers provide support to the FOC by coordinating State and federal project operations and river releases, and by coordinating within the Division of Operations and Maintenance to provide resources to the FOC as requested by the FOC Director. Therefore, POC preparedness for Delta flood emergencies focuses on ensuring that the lines of communication are open when the FOC needs assistance.

The POC has prepared procedures and plans for potential emergencies on the SWP. Since these emergencies may occur concurrently with Delta flood emergencies, the POC is prepared to assign resources to assist with emergency activities in the Delta or repair of SWP facilities.

The POC preparedness plans and procedures for dealing with SWP emergencies include:

- State of California Emergency Plan
- Department Emergency Response Plan (2006)
- Department Administrative Order

- Delta Field Division EAPs
- *An Assessment of DWR's SWP Emergency Preparedness and Recommendations for Improvement* (DWR, October 2012)

Preparedness activities that the POC is engaged in to maintain its readiness to respond to State Water Project emergencies also helps POC staff prepare to assist the FOC during Delta flood emergencies as directed by the DOC. In addition, POC general preparedness may provide readily available resources to assist other units in Delta emergencies:

- Personnel – many have extensive experience in the Delta
- Technical services
- Access to rapid activation of Delta hydrodynamic models
- Monitoring of Delta water conditions
- Communications (equipment, services, procedures, backup resources, etc.)
- Equipment (vehicle, light/heavy equipment)
- Materials/supplies
- Operational control of State reservoirs and pumping plants
- Coordinated operations with federal facilities

### **3.2.1 Personnel**

When directed to do so by the Director in a Flood Mobilization Memorandum, all Department personnel become available for work assignments during a flood emergency. As with the FOC, personnel may be assigned to the POC.

On behalf of the POC, O&M management maintains rosters of staff for various incident command (SEMS) staffing positions.

### **3.2.2 Training**

On behalf of the POC, O&M Management ensures that staff on the available roster has the following training:

- SEMS and NIMS (All Department employees shall receive at least 8 hours of training to include SEMS and NIMS)
- ICS 100/200/700/800
- DWR 208 Emergency Daily Time Sheet Basics
- Safety training is provided to staff on the roster

### **3.2.3 Exercises**

For general flood exercises, POC's staff that are on rosters participate in the Forecast-Coordinated Operations (F-CO) portion of the flood exercises and sends representatives to the exercise. For Delta-specific exercises, POC staff may include USBR Central Valley Project (CVP) Operations in the exercise to help drill for possible Delta flood event activities in coordinating SWP and CVP actions.

### **3.2.4 Facilities**

Division of Operations and Maintenance facilities include the following:

- Joint Operations Center (JOC)
- Delta Field Division
- Incident Command Posts, as needed
- Clifton Court Forebay
- Staging Areas
- Other locations

Division of O&M management ensures these facilities are suitable for a comprehensive response and recovery from a Delta Flooding event.

### **3.2.5 Tools**

Division of O&M staff and management are familiar with and have access to Delta modeling and specifically the Delta Emergency Response Tool (DERT). The tool allows quick evaluation of a number of recovery strategies that help management of resources.

### **3.2.6 Resources**

Division of O&M staff ensures that the following resources are available and are suitable for deployment:

- Designated O&M Stock-piled material sites
- Equipment (trucks, cranes, backhoes, etc.)

### **3.2.7 Plans and Procedures**

Plans and procedures that are up-to-date and available to Division of O&M emergency staff include:

- Delta Field Division Emergency Action Plan (EAP)
- POC Emergency Operations Manual (EOM)

### **3.2.8 Coordination and Outreach**

Division of O&M staff coordinates and provides outreach before the emergency:

- Internally with DFM staff, Field Division ICTs, and DOE staff
- Externally with USBR staff and State Water Contractors (SWC)

### **3.3 Department Operations Center (DOC): Department Executive**

Chapter 2, Concept of Operations, describes the broad responsibilities of the DOC during emergencies. Since the DOC is activated only for significant emergencies, DWR Executive, through the Emergency Preparedness and Security Manager (EPSM), performs activities so the DOC is prepared for Delta flood emergencies. Primarily, the DOC needs to be able to provide high-level coordination and to take a lead role in assessing needs, allocating resources for competing emergencies and requesting assistance from other agencies, as needed. Actions taken by the EPSM to prepare the DOC include:

- Sets DWR Executive management objectives (Chapter 2) for Department activities to respond and recover from a Delta flood emergency
- Maintains lines of communication with Cal OES, the Natural Resources Agency, Governor’s Office, the Legislature and other organizations, as required
- Considers potential emergency scenarios to help plan for resource allocation between Delta levees, SWP facilities, and other areas of the state that may experience concurrent emergency events
- Maintains liaisons with water agencies, municipalities, county departments, and State agencies to facilitate emergency response plan development, response effort coordination, and exchanges of personnel and equipment during flood emergencies in the Delta
- Provides assistance in securing additional funding for use during emergencies

#### **3.3.1 Personnel**

When directed by the Department Director in a Flood Mobilization Memorandum, all Department personnel become available for work assignments during a flood emergency. On behalf of the DOC, the EPSM:

- Maintains a roster of personnel to perform DOC functions during a Department emergency
- Ensures that proper language is included within all employee position descriptions (Form 525) for their emergency status and work
- Makes sure that DOC personnel have periodic safety training, including work stress issues
- Verifies personnel know the role and authority of the DOC

#### **3.3.2 Training**

On behalf of the DOC, the EPSM sees that rostered staff has the following training:

- SEMS and NIMS (All Department employees shall receive at least 8 hours of training to include SEMS and NIMS.)
- ICS 100-800
- DWR 208 Emergency Daily Time Sheet Basics

### **3.3.3 Exercises**

On behalf of the DOC, the EPSM and rostered staff participate in, or send representatives to, exercises sponsored by others (FOC, POC).

### **3.3.4 Facilities**

DOC facilities are normally at Department Headquarters, The Resources Building, 1416 9<sup>th</sup> Street, Sacramento, California. However, for prolonged emergencies the DOC staff and function may be housed at the JOC, 3310 El Camino Avenue, Sacramento.

### **3.3.5 Plans and Procedures**

The EPSM ensures implementation of and conformance to the protocols and procedures outlined in WREM 63a.

### **3.3.6 Coordination and Outreach**

The DOC provides coordination and outreach during the emergency with the Governor's Office, the Natural Resources Secretary and his/her staff and Deputies, the Director, and if requested the Department of Finance (DOF) or other State agencies as needed. To enhance preparedness, DOC staff would aid in building relationships, especially during major emergency exercises, that would be needed during a major flood emergency.

### 3.4 Preparedness Improvements

The following improvements are anticipated to be implemented over the next three years:

**Table 3-3 Near-Term Preparedness Improvements**

Proposed Improvement	Status	Completed By
<b><i>Delta-Specific</i></b>		
Complete additional assessments to improve the effectiveness of Delta flood emergency management over time	In progress	DFM
Finalize or update the Department Delta-specific rosters for each EOC	In progress	Each EOC
Finalize a model to allow real-time evaluation of conditions resulting from actual and potential levee failures (DERT)	In progress	DFM-Flood Operations Branch
Obtaining additional waterside transfer facilities to allow loading barges with levee repair material	In progress	DFM-Flood Operations Branch
Advertise and select qualified consultants, and negotiate contracts with consultants that could provide assistance to the Department during a flood emergency. These may include consultants with expertise in: <ul style="list-style-type: none"> <li>○ Delta hydrodynamics modeling to conduct real-time water quality impact assessments</li> <li>○ Delta levee geotechnical analysis to conduct rapid assessments of levee stability</li> <li>○ Levee design, construction, and repair to respond to threatened and damaged levees and to recover from levee failure incidents</li> </ul>	On-going	DFM and other Divisions
Prepare and keep an up-to-date list of vendors for services and materials	On-going	DFM-Flood Operations Branch

<b>Proposed Improvement (Continued)</b>	<b>Status</b>	<b>Completed By</b>
Develop a policy to further clarify State interests in various Delta islands and tracts	In progress	DFM and Department Exec
Develop a water delivery contingency plan for use in emergencies to lessen the impact of water outages that result from Delta flooding.	In development	O&M-Operations Control Office
<b>Statewide</b>		
Finalize or update the Department emergency response rosters	In progress	DFM, O&M, DOE
Develop/finalize Resource Tracking Tool	In progress	DFM
Update Flood Center	In progress	DFM
Finalize Flood Fight Logistics Plan	In progress	DFM-Response and Security Section
Maintain a Flood Emergency Management System (FEMS) to help effectively manage flood events from the beginning to finish, including tracking and recording costs associated to events for proper FEMA cost recovery	In development	DFM-Flood Operations Center
Prepare agreements with materials vendors	In development	DFM

The long-term preparedness improvements listed in Table 3-4 are actions that may take more than three years to be implemented by the Department.

**Table 3-4 Long-Term Preparedness Improvements**

<b>Proposed Improvement</b>	<b>Status</b>	<b>Completed By</b>
Working with LMAs and OAs to define potential response and recovery scenarios relating to local levees. Assisting Delta LMAs in receiving SEMS and NIMS training	In development	DFM-Flood Operations Branch
Assisting Delta LMAs in preparing before the event and in keeping accurate records on compliance necessary to qualify FEMA disaster assistance and California disaster assistance following a flood emergency	In development	FESSRO
Assisting Delta LMAs in keeping accurate records during an evolving flood emergency	In development	FESSRO

### **3.5 Plan Review and Update**

Following an annual exercise, the FOC Director will consider the need to update or refine portions of this plan based on observations made during the exercise. The purpose of this frequent review is to keep the plan as up-to-date as possible. In addition, the FOC Director will conduct a detailed review of the plan every two years. In this review, special attention will be given to be keeping maps, contact information, vendors, and contracts current.

The Department will use observations made during exercises and recommendations from after-action analyses to adjust procedures contained in this plan. Any modifications that do not warrant update of the plan shall be included in supplements to this plan, as appropriate.

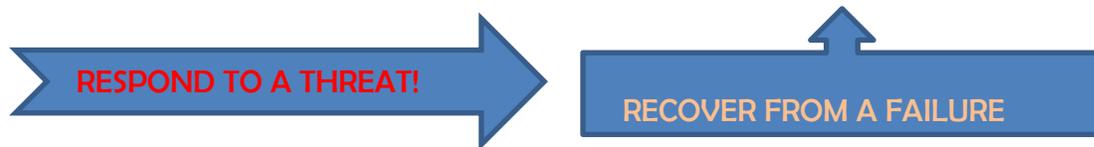
## 4 Response



Under FloodSAFE California, the Department conducts a wide array of programs and actions in cooperation with other agencies to help prepare for and respond to flood emergencies. These include maintaining flood system information, monitoring weather conditions, reservoir storage, and stream flow and stages disseminating public information, maintaining gaging networks, and conducting climate trend analyses, to name a few. This section does not provide a comprehensive discussion of all of these activities; it is focused on the Department’s response actions when faced with Delta flood threats. It describes the Department’s approach to the evaluation, prioritization, and coordination of response activities required to ensure that they are rapid, efficient, and appropriately prioritized. These activities ultimately lead to the deployment of trained staff, equipment, and materials to conduct and assist in flood fighting and other measures intended to minimize levee damage and to prevent levee failure. **This section applies to levees that are in danger, but have not failed.**

**Response**  
Response includes actions that DWR will take as long as a threat of Delta levee failure exists. Response ends when the threat subsides and the levees are considered stable in the near term.

Levee threats may build slowly with rising water stages (a notice event) or occur suddenly from earthquake shaking or other sources (a no-notice event).



Response requires adaptation to real-time changing conditions based on available information and a measure of professional judgment, considering that decisions often must be made on incomplete information and without extended periods of analysis. Since the Department is responsible for flood response in other areas of the State, response within the Delta will be prioritized as necessary given other threats outside of the Delta.

This response plan will be utilized during a flood emergency in the Delta. The following procedures are in addition to those documented in the FEOM, Sections 5B, 6, and 7 of the WREM 63a (2013) and the Department’s Emergency Response Plan.

### 4.1 Overview – Roles of the Department’s Emergency Operations Centers in Flood Emergency Response

The Department relies on three primary EOCs, as needed, during emergency response operations. These EOCs are DOC, POC, and the FOC. They each have unique, but complementary roles in Delta flood emergency response activities.

In Delta levee emergencies, such as when levees are damaged and are at risk of failure, these EOCs facilitate rapid flood fight response and mitigation measures, which is the key to averting or minimizing the subsequent consequences of islands and tracts flooding.

#### **4.1.1 Flood Operations Center (FOC)**

The FOC sets the priorities for flood fight response and serves as the focal point for coordinating the flow of operational information with other emergency response agencies, to and from the field, and with other units in the Department, especially Executive Division and the Public Affairs Office. It evaluates the status of incidents in the field, and sets priorities among them, then allocates supplies, equipment, and personnel accordingly. It provides liaison personnel to the Cal OES Regional Emergency Operation Center/State Operation Center (REOC/SOC) upon request by Cal OES. During flood emergency response activities the FOC has the responsibility for assigning trained staff from other units in the Department to emergency response activities as needed. It plays a critical role in the early phase of emergency response activities when levees may have been damaged, but can be prevented from failing with timely interventions such as placement of wave wash protection, temporary flood walls, and similar measures.

During flood emergency response operations, the FOC coordinates its field resources with all activated Operational Areas (OAs) to evaluate, on an ongoing basis, whether LMA, county, and State resources can adequately meet the emergency response needs. If the combined resources at the local and State levels are insufficient, the FOC will prepare a request for USACE emergency response assistance under PL 84-99 for the Director's signature (See Supplement A for more detail on this process). The FOC also facilitates field coordination with, and provides technical expertise for, the LMA in incidents that involve USACE.

In the event that LMA and OA resources and regular State resources are inadequate for an effective emergency response and USACE declines to respond under PL 84-99, the FOC coordinates with Cal OES to obtain additional support from other State agencies.

#### **4.1.2 Project Operations Center (POC)**

The POC, with real-time operational control over the SWP, focuses on assessing actual and potential impacts to SWP facilities, then assessing the likely direct and indirect impacts on SWP delivery capabilities. It can rapidly alter SWP operations to minimize impacts. The POC would direct and coordinate primary activities to make adjustments in operations in coordination with the CVP, such as making or requesting changes in reservoir releases and Delta pumping, increasing reservoir releases and limiting Delta exports to limit salt water intrusion into the Delta, deploying staff and equipment to accurately assess field conditions, and repairing damaged equipment such as pumps, gates, and electrical transmission facilities. The POC may deploy O&M staff and equipment to assist in non-SWP emergency response activities in the Delta as requested by the FOC or the DOC. The POC may also make available O&M Delta Field Division facilities for use as a staging area and ICP to support the FOC as needed.

### **4.1.3 Department Operations Center (DOC)**

The DOC is the Department's Executive-level emergency operations center. Unless activated as a separate entity, the powers and responsibilities of the DOC normally reside with the FOC in a flood emergency. Under extraordinary emergency response conditions, the DOC is activated as a separate and distinct unit,

Once activated, the DOC serves as the point of contact for executive-level coordination with the Resources Agency, the Governor's Office, Cal OES, USACE, FEMA, DOF, and the Legislature. In doing so, it provides support for both the FOC and the POC, which are primarily focused on monitoring, coordinating, prioritizing, and resourcing emergency response EOC and field activities.

It works to achieve high-level policy coherence among State agencies and with federal agencies, seeks State funding and federal cost sharing for emergency response activities, and provides timely, focused briefings for key emergency decision-makers.

The DOC will be activated as a separate unit during major flood or earthquake events, when multiple levee damage and failure sites will require major emergency response efforts to limit loss of life, island flooding, damage to infrastructure, and water supply impacts. The DOC will coordinate the allocation of limited departmental resources between the FOC and the POC to ensure that such requests and needs are quickly and efficiently addressed.

The DOC has the additional function of ensuring overall departmental staff safety and the continuity of its business functions (i.e., execution of the Business Resumption Plan) in the event of damage to departmental facilities.

### **4.1.4 Division of Safety of Dams (DSOD)**

DSOD manages the emergency activities and response for any emergencies involving State jurisdictional dams. DSOD offices become DSOD's Emergency Operations Center. While few jurisdictional dams are within the Delta, there are many in the Bay Area that could be affected by an earthquake or others in Northern California that might be affected by a significant flooding event at the same time that the FOC is responding to flooding threats in the Delta. DSOD engineers may be called on to promptly inspect affected dams and supervise any emergency work on those structures during the emergency. This may lead to a competing need for Department resources.

The DSOD response includes evaluating which dams have potentially been impacted by an event, mobilizing field inspection teams (ICT's) to evaluate the condition of the dams, evaluating repair plans, supervising emergency repairs, and coordinating that information with the FOC, DOC, and POC as necessary. After DSOD needs have been assessed, DSOD may be able to supply some limited personnel resources to the FOC for coordination and technical support. DSOD staff deployment is not dependent on the FOC, but is coordinated as much as possible. Personnel safety is the first priority; no people should be unnecessarily placed at risk.

Delta emergency response is conducted and coordinated within the Department consistent with the Executive management objectives described in Chapter 2, Concept of Operations.

The subsections below highlight Delta-specific response activities for each Emergency Operations Center within the Department. These activities are organized by the three phases of response discussed in Chapter 2.

## 4.2 Activation

Activation is the process of assembling resources, coordinating with involved parties, and generally readying the department to respond to a flood emergency. The activation phase encompasses the first few hours to days following awareness of a flood emergency.

In a **high-water (or ‘Notice’) event**, when there are forecasts of sustained storm patterns and early warning of flood potentials, the Department’s FOC staff disseminates weather and flood systems status information, makes high-water notification calls to local agencies, coordinates with its emergency response partner agencies (such as National Weather Service and Cal OES), and communicates with the media. This early phase of activity, commonly referred to as Situational Awareness, is underway before the occurrence of any incidents requiring immediate emergency response. High Delta inflow and high tides with wind waves are the triggering events that most often require the Department’s response assistance in the past.

On the other hand, an **earthquake (or other ‘No-Notice’) event**, will provide no warning, yet require rapid activation. Table 4-1 lists the common types of incidents that can trigger a flood emergency.

The following activities start immediately upon awareness of a potential flood emergency.

**Table 4-1 Type of Event**

<p align="center"><b>Potential Flooding or ‘Notice’ Event</b></p>	<p align="center"><b>Earthquake or Other Unexpected or ‘No-Notice’ Event</b></p>
<p><b>High Delta Inflow</b> - Levee endangering events from high inflow to the Delta normally come with at least several days of warning. State and federal meteorologists and hydrologists at the JOC monitor and make projections of water flows and stages that may threaten Delta levees. The FOC has information on rising water stages in the Delta before notifications of threatened levees may be reported. Levee erosion, overtopping, and seepage resulting in boils are predominate threats.</p>	<p><b>Earthquakes</b> - Ground shaking from earthquakes will occur without warning. Depending on the location, magnitude, and duration of the earthquake, several levees may fail and many miles of levees could be damaged. Levee crests may slump and allow water overtopping. Levees may sustain internal damage that creates seepage paths. There may be damage to SWP facilities. Deformations in levee cross sections are a substantial threat to levee integrity. Non-flooded islands with damaged levees will likely require DWR response to stabilize levees.</p> <p><b>Undetected problems.</b> Undetected problems may occur with or without warning. Foundation problems, levee instability, and animal burrows are examples. In some cases, seepage or boils on the land side may provide an indication of a developing problem. In other cases, problems can surface without warning. These problems often become evident during high tides. Undetected problems generally occur at one location at a time, threatening a single island or tract.</p>
<p><b>High Tides</b> - High Tides can generally be forecast to provide some warning of conditions that may threaten levees. Conditions can persist for several hours and repeat with additional tidal cycles</p>	<p><b>Accidents</b> - Accidents come without warning, but are generally isolated to a single levee segment. An example of an accident is a ship running into a levee.</p>
<p><b>Wind Waves</b> can threaten different Delta locations depending on wind speed, duration, direction, and wind fetch for various levee segments. Levee erosion and overtopping are predominate threats. Tides and Wind threats often combine.</p>	<p><b>Intentional Threats to Levee Integrity</b> - Like undetected problems, intentional disruption (vandalism/terrorism) of levee integrity is likely to come without warning and generally be isolated to a single levee segment.</p>

**4.2.1 FOC Activation Activities**

The FOC has the primary responsibility for responding to Delta flood emergencies.. Supplement A provides detailed information on FOC response activities. FOC activation activities include:

- Evaluate the situation: Collect and analyze all available information about the flood emergency
- Activate FOC (Flood Alert) and SEMS Roster in accordance with the process set forth in the FEOM
- Notification: Department's Executive, Cal OES, CCC, Cal Trans, Cal Fire, or other partner agencies as appropriate; LMAs, OAs, USCG, USACE, CVFPB, CHP, USBR, etc.
- Coordination: NWS, USACE, LMAs, OAs, POC, DOC, DSOD, USCG etc.
- Develop Initial FOC Action Plans based on information from FFS when possible

Initial actions and deployment must consider personnel safety first. No personnel should be placed in danger and no personnel should knowingly or unnecessarily remain in danger or at risk. To that end, the FOC should know the location of all personnel, their intended routes, and their expected schedule and compare that with dangerous conditions identified from intelligence gathering efforts.

#### **4.2.2 POC Activation Activities**

The role of the POC during a Delta flood response is to ensure the continued functioning of the SWP and to coordinate its efforts with the FOC. The Division of O&M manages SWP facilities, including its pumping and hydroelectric plants, dams, reservoirs, aqueducts and buildings. O&M staff located at the Delta Field Division is primarily responsible for the operation and maintenance of the SWP facilities in the Delta, including both routine and emergency repairs, and can be deployed to assist the FOC in accordance with emergency priorities. The POC activation activities for response include:

- Gather information on actual and potential damage to SWP facilities and impacts on SWP Operations
- Monitor reservoirs, river stages, river and tide forecasts, water quality, and water exports as part of ongoing activities
- Activate the POC based on Emergency Response Plan (Appendix C-1 of the Department Emergency Response Plan)
- Assemble emergency response and field inspection staff based on the Delta Field Division Emergency Action Plan
- Coordinate with the Delta Field Office - implement an inspection plan based on the nature of the event, reported information, and likely flood damage

#### **4.2.3 DOC Activation Activities**

Chapter 2, Concept of Operations, describes the broad responsibilities of the DOC during emergencies. If activated as a separate emergency operations center, the DOC provides high-level coordination and takes a lead role in allocating limited resources among competing emergency resource needs. Activation actions taken by the DOC for response include:

- Activate the DOC and assemble the personnel in accordance with the DOC SEMS Roster
- Review information received from the FOC, POC, and others on the Delta flood emergency
- Request clarifications and additional information as necessary
- Depending upon the magnitude of the event, coordinate internally among the Department’s Executives, Cal OES, the Governor’s Office, the office of the California Natural Resources Secretary, and mutual aid agencies. Brief Governor’s Office as necessary on a 24-hour basis. Given the importance of major utilities crossing the Delta, coordinate with the California Utilities Emergency Association (CUEA) and impacted utilities that play a key role in the oversight of critical infrastructure
- Assess the needs of the EOC’s and coordinate the allocation of Department’s resources
- Take action to ensure continuity of the Department’s business operations

### **4.3 Damage Identification and Verification**

An important step before deploying any resources to an emergency situation is to assess the damage from the event and verify the emergency requires some level of response. Further, this damage identification is needed to analyze what kind of response is appropriate, what is the quantity of resources to handle the situation, and what is the complete regional or statewide picture so that resources are being committed appropriately over the entire impacted landscape.

#### **4.3.1 FOC Damage Identification Activities**

The FOC has the primary responsibility for responding to Delta flood emergencies.

- Assess/identify potential threats – move to FOC Deployment Activities (below) if lives, property, or critical infrastructure are threatened. Assess damage and extent of the emergency incident based upon initial reports from information supplied by LMAs, OAs, media reports, instrumentation, law enforcement, first responders, and citizen reports.

For “no-notice events,” such as earthquakes that happen without warning, information gathering on the status of levees and islands may require aggressive or proactive actions by the FOC. Air reconnaissance, dispatching of inspectors to assess damage and phone surveys of LMA representatives may all be needed to help establish a complete picture of the emergency.

For “noticed events,” such as slow rise flooding, where LMAs and emergency staff have been engaged in levee patrols and where the information network has been established during the initial stages of the event, information on damage is expected to be monitored by the LMA and passed on to the FOC as a regular course. The LMA in that instance is the first line reconnaissance.

- Verify reported threats and concerns by dispatching flood fight specialist(s) to the sites
- Develop action plans based on information from FFS when possible

#### **4.3.2 POC Damage Identification Activities**

- Assess/identify potential threats and actual damage to SWP and SWP operations
- Verify reported threats and concerns by dispatching O&M staff to site
- Develop action plans based on available information from O&M staff, FOC, or others when possible

#### **4.3.3 DOC Damage Identification Activities**

- Coordinate with FOC and POC to obtain information on damage from the event
- Coordinate with Cal OES and other State, federal, and government agencies to pass on damage assessment and verification information from FOC and POC as needed

### **4.4 Deployment**

Deployment is the process of moving tools, supplies, equipment, and response staff to the emergency sites where they are needed. The objective of emergency resources management is to: (a) maximize efficient resource use while maintaining cost-effectiveness and resource safety, (b) consolidate control of single resources for more effective communications activity, (c) instill resource accountability, and (d) ensure that resources are deployed as rapidly as feasible. Effective emergency resource management enhances the benefit of mutual-aid agreements and improves inter-operability.

Deployment may begin within a few minutes of notification of a flood emergency and continue for several days.

#### **4.4.1 FOC Deployment Activities**

- Initial actions and deployment must consider personnel safety first
- Respond to requests for local technical assistance
- Assess need for and recommend Flood Mobilization if warranted
- Deploy FFS, other specialists, ICTs
- Obtain Agreements for Local Assistance - Before the State and the Department can proceed with emergency response and recovery work for an LMA, the LMA must hold the State harmless and agree that the State can conduct the proposed work on their behalf. The LMA must sign an agreement with the Department per a resolution of the LMA Board or other mechanism prior to commencement of any State work
- Establish ICP(s) - as necessary based upon situation and action planning coordination with emergency response partners
- Conduct aerial reconnaissance if appropriate
- Use the *Threat Level Evaluation Process* (DWR, undated) to identify potential levee threats and make an initial determination of immediate level of response. This document is used throughout the State

- Identify short-term response actions
- Prioritize response sites (in coordination with DOC) – see Section 4.6 below
- Develop Action Plans and Operational Strategies/Tactics
- Ensure logistics requests are authorized and documented prior to deployment or moving the request down to LMA/OA or up to Cal OES

#### **4.4.2 POC Deployment Activities**

- Initial actions and deployment must consider personnel safety first
- Deploy resources for SWP incidents
- Deploy ICTs as necessary
- Provide assistance to the FOC as requested by FOC
- Coordinate with FOC, DOC, and DOE for resources for SWP incidents

#### **4.4.3 DOC Deployment Activities**

- Coordinate DWR emergency response resources and resolve conflicts, as needed

### **4.5 Sustained Response**

Sustained Response is the continuation of flood fight and other threat mitigation activities until the emergency situation has stabilized. These activities may extend from several days to several weeks depending on the severity and duration of the emergency.

The Sustained Response phase will continue with the activation and deployment activities plus activities in the following subsections.

#### **4.5.1 FOC Sustained Response Activities**

- Respond to requests for local direct flood fight assistance
- Continue sustained response until emergency has passed

#### **4.5.2 POC Sustained Response Activities**

- Continue assistance to FOC
- Continue sustained response for SWP incidents

#### **4.5.3 DOC Sustained Response Activities**

- Coordinate with Cal OES on declared disasters – cost recovery
- Assist in establishing priorities for continued resources use
- Resolve conflicts on resource use

## 4.6 Delta Flood Emergency Response Priorities

When there is a need for emergency response at multiple sites and resources are limited, it will be necessary for the Department to set priorities. This section provides an overview of Department priorities, the criteria that will be used to evaluate the situation, and potential response actions.

### 4.6.1 State Interest

The degree of State interest in Delta islands varies island by island according to the Department's overall responsibility for protection of life and property (including public infrastructure.) Additional consideration is made for protection of the facilities and operation of the State Water Project. The following criteria may be considered in determining State interest:

- **Population.** Public safety and saving lives is the highest priority
- **Water Quality and Water Supply Infrastructure.** The eight western islands and tracts (Sherman Island, Twitchell Island, Bradford Island, Bethel Island, Jersey Island, Webb Tract, Hotchiss Tract, and Holland Tract) have been identified by the State as being critical to water quality in the Delta as they provide a buffer against saltwater intrusion. Levees along water conveyance corridors are also important; Victoria Canal (Victoria Island and Union Island); Barker Slough (Hastings Tract); Rock Slough (Hotchkiss, Veale and Holland); and Old River & Middle River (Victoria Island, Woodward Island, Bacon Island, Mandeville Island, McDonald Island, Jones Tract (Upper and Lower), Drexler Tract, Middle Roberts, Union Island, and Clifton Court). During high flood flows, levee failures along these corridors would have significantly less impact on water quality than failures that may occur during dry periods. Therefore, levees along these corridors that are damaged in the course of an earthquake during low-flow conditions will be important to maintain. In addition, water infrastructure such as facilities of the SWP and other water conveyance features may need emergency response assistance to protect them from failure
- **Highways.** Highways provide significant State and regional economic benefits and can provide public health and safety benefits in that they are used for evacuations and medical response. Emergency responders rely on highways for access during for flood fights and other emergency response activities such as evacuations. In addition, flooding of major highways through the Delta would cause significant disruption to the regional and State economies
- **Other Critical Infrastructure.** Levees protecting private utility corridors, railroads, and utility water conveyance facilities are important to the State economy and can impact public health. For example, the Mokelumne River Aqueduct crossing the south Delta from east to west provides water to approximately 1.3 million people in the East Bay Municipal Utility District service area. A failure of the aqueduct, especially if a levee fails at a crossing of the aqueduct, could result in longer-term health and welfare problems

- **Dollar Assets.** When population is less than about 100 people on an island or tract and they have been already evacuated, it is reasonable to consider allocating resources based upon dollar assets. In most cases, assets provide a good surrogate for the order of structures at risk. Examples: homes, improvements, gas wells, livestock, power transmission, etc.

Based on the above criteria, Table 4-2 provides guidance to assist the FOC Director in prioritizing the Department's emergency response assistance when multiple locations need its assistance.

**Table 4-2 The Department’s Flood Emergency Response Categories for Islands/Tracts**

<b>PRIMARY CRITERIA</b> See Supplement B for population, infrastructure, assets and other island/tract characteristics	<b>SECONDARY CRITERIA</b> Each response category is further sorted in order of the listed secondary criteria (if applicable)	<b>RECOMMEND MINIMUM RESPONSE ACTION</b>	<b>RESPONSE CATEGORY</b>
<b>Population &gt; 2000</b> (Protection of Life and Property)	-none-	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>1</b>
<b>2000 &gt; Population &gt; 100</b> (Protection of Life and Property)	A. Legacy Towns B. Hwys/Evac Routes C. WQ/WS Infrastructure	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>2</b>
<b>Water Quality/Water Supply Infrastructure</b>	A. Population B. Project Levees	FLOOD FIGHT UNTIL SITUATION IS NO LONGER URGENT OR OTHERWISE CHANGES	<b>3</b>
<b>Hwys/Evacuation Routes</b> Recommended response actions in the following order: J11, 160, 4, 12, Interstates, and other county roads (Life Safety)	A. WQ/WS Infrastructure B. Population (descending order)	FLOOD FIGHT UNTIL SITUATION IS NO LONGER URGENT OR OTHERWISE CHANGES	<b>4</b>
<b>100 &gt; Population</b> (Protection of Life and Property)	A. Project Levees B. Other Critical Infrastructure	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>5</b>
<b>Project Levees</b> (Protection of Property)	A. Other Critical Infrastructure B. Assets	FLOOD FIGHT UNTIL LEVEE IS STABILIZED OR FAILURE	<b>6</b>
<b>Other Critical Infrastructure</b> Mokelumne Aqueduct, Railroads, Electrical Transmission Lines (Protection of Property)	A. Assets	PROVIDE TECHNICAL ASSISTANCE OR FLOOD FIGHT WITH AGREEMENTS IN PLACE	<b>7</b>
<b>Assets (\$M)</b> (Protection of Property)	-none-	PROVIDE TECHNICAL ASSISTANCE	<b>8</b>

#### **4.6.2 Prioritizing the Department's Emergency Response Activities**

When confronted with flood emergencies in the Delta, which may involve multiple islands with extensive damage to levees and infrastructure, the Department will need to determine the extent to which it should respond, and to set priorities among potentially competing needs.

For any given incident, the guiding principle for the Department is that beyond an immediate flood fight to avert levee failure or to stabilize a flooded island, the State benefits to be derived by its participation in response activities such as stabilizing a levee breach, should be commensurate in value with the Department's anticipated emergency expenditures in those activities. Thus, at each stage of involvement in response activities after the initial flood fight, the Department will conduct a careful analysis of the likely cost involved, the State interests that would be protected, likely beneficiaries, and potential cost-sharing opportunities. The Department will actively pursue cost-sharing opportunities with potential beneficiaries of emergency response operations, such as local reclamation districts, utilities, municipalities, and businesses. It will also execute indemnity agreements with the affected beneficiaries of the emergency assistance, such as the responsible reclamation districts and affected utilities.

Table 4-2 shows the criteria and recommended actions for each response category. When multiple levees need emergency response at the same time and resources are limited, the table shows the order of allocation of resources. For example, levees falling in Response Category 1 would receive emergency response actions prior to other response category numbers. Therefore, the response categories provide for sequencing from Response Category 1 first to Response Category 8 last.

Within a given category, the secondary criteria provides additional guidance for ordering response actions. For example for Response Category 2 for populations between 1000 and 2000 people, the secondary criterion would allocate resources to protect legacy towns before protecting highways.

Since the greatest need for the Department's assistance will likely occur during high Delta inflows, water quality concerns due to potential levee failures are likely to be low, due to the large amount of fresh water entering the Delta during such events. In the less likely event of a major earthquake causing damage to multiple islands, Chapter 5 includes the potential for stabilization of those levees in its resource sequencing guidance.

If significant resources are being considered for allocation to a certain action during a flood response, it will be worthwhile to address the 'long-term' recovery strategy options at an early stage so that it is more likely to fit in or match up with long-term objectives.

#### **4.7 Request Additional Response Resources**

The FOC Director may request assistance from other agencies according to protocol outlined in the *State-Federal Flood Operations Center Flood Emergency Operations Manual* (FEOM, DWR, 2013).

Obtaining additional resources and funding for flood emergencies and the protocols for doing that are addressed in Water Resources Engineering Memorandum No. 63 (WREM 63 – DWR (2013) in revision), including how to access to the Department's Flood Response Fund (FRF) and USACOE assistance through PL84-99.

## 4.8 Adjust Response Activities as Situation Changes

The FOC Director may face a multitude of considerations at the incident sites that could influence the sequencing of flood fighting assistance, either to meet event-specific conditions or changing conditions. Considering rapidly changing conditions during Delta flood emergencies, the FOC Director will use the best available information, but may need to make adjustments in response to sequencing based only on experience in the Delta and professional judgment. Such issues may include:

- Worker safety
- Accessibility
- Protection of traffic corridors for evacuation or material transport
- Severity of levee damage and likelihood of levee failure
- Emergency response needs in areas of the State outside of the Delta
- Emergency response actions already underway in other areas of the Delta
- Other unforeseen conditions

In most cases, these modifications to sequencing must be FOC Director judgment calls based on limited information and time.

## 4.9 Response Operations

The Department's emergency response operations are intended to stabilize the emergency situation, and can include an emergency flood fight response to prevent levee failures or limit wave wash erosion following such failures, and stabilization of levee breaches following failures, as described in greater detail below:

- **Emergency Flood Fight Response:** In response to threatened or actual levee failures, the Department's emergency response can include technical assistance and flood fight assistance, including staff, flood fight materials, equipment at its disposal, or emergency funding for the local reclamation districts responsible for the levees. Such assistance is intended to help protect lives and property and to stabilize the situation to prevent further damage through controlling seepage, stabilizing weakened levees, installing wave wash erosion protection, and other actions. It may also involve assistance in mitigating accelerated seepage on islands adjacent to those that have flooded. The Department will provide such assistance when the responsible LMAs request such assistance under SEMS, indicating that local resources are inadequate to address the incident
- **Armoring Levee Breaches:** Armoring of levee breaches exposed to rushing floodwaters and subsequent tidal exchanges can limit the damage in the vicinity of such breaches, the cost of repairs, and the duration of inundation. A levee breach left unprotected will continue to erode after the island has flooded, due to daily tidal currents and wave wash, although the rate of erosion will gradually decrease as the breach widens and velocities through the breach lessen. It cannot be considered stabilized until it is armored or closed.

Breach armoring can be viewed as part of the response phase or part of the recovery phase, depending upon the scope of the work and the assets at risk. Such armoring is the responsibility of the LMA. Because it involves the mobilization of barge-mounted cranes to place mounds of large rip-rap at the exposed levee ends, it may be beyond the financial capabilities of the responsible LMA, leading to a request for Departmental assistance through SEMS. Before the Department makes a decision whether or not to contribute resources or funding for armoring a levee breach, Department staff should conduct a careful analysis of the likely costs involved, the State interests that would be protected, the likely beneficiaries, and the potential for cost-sharing with beneficiaries. The Department should actively pursue any reasonable cost-sharing opportunities with, and seek indemnity from, potential beneficiaries of emergency levee armoring before committing to participate. The Department does not have the staff and equipment in-house to do such work and if it decides to participate in breach stabilization, would need to either contract with a construction contractor or make funding available for the (LMA) to do so.



# 5 Recovery



## 5.1 Overview

Recovery is the last phase of the emergency management cycle, and by far the most expensive and time consuming. On the other hand, in this phase of the cycle, after at-risk populations have been evacuated and relocated, crops and infrastructure are flooded, and levees stabilized, there is time to carefully consider recovery options and the degree of State participation.

**Recovery**  
Recovery actions may take place after levees have failed in the Delta. Depending on State interests and available funding DWR may participate in closing levee breaches and in dewatering flooded islands/tracts. However, since the recoveries must be cost effective, some flooded islands/tracts may not be recovered.

Consistent with the guiding principle described for emergency response, the anticipated State benefits to be derived by its participation in recovery operations should be commensurate in value with its expenditures in those activities. Thus, at each stage of involvement in the recovery process, the Department will conduct a careful analysis of the likely costs involved, the State interests that would be protected, likely beneficiaries, and potential cost-sharing opportunities. Prior to participating in recovery operations, the Department will actively pursue cost-sharing opportunities with potential beneficiaries of those emergency response and recovery operations. In addition, the Department will pursue indemnity from the these beneficiaries to the extent feasible.

Where the State’s interests justify the Department’s involvement in Delta emergency recovery operations, its recovery operations are expected to be focused on restoring SWP operations, repairing and stabilizing damaged levees, closing Delta channels to help manage Delta water quality, armoring levee breaches to prevent further damage, closing levee breaches, and pumping out flooded Delta islands.

## 5.2 Magnitude of Event and Recovery Operations

The magnitude of the triggering incident and its impacts on the various Delta assets and resources will largely determine the scope and duration of the recovery phase. In the event of a major disaster, involving extensive damage to the Delta levee system, SWP infrastructure, and impacts to Delta water quality, the Department’s recovery activities will likely continue for many months, require a substantial commitment of staff resources, the expenditure and tracking of many millions of dollars, and thorough documentation for the federal reimbursement claims process. It will require the concurrent management of multiple reconstruction contracts that must be coordinated and prioritized throughout the recovery period. The need for thorough documentation to support the federal claims reimbursement process places an additional burden on the Department, because the claims process requires more thorough documentation than is typically produced in the normal course of business. In addition, this burden will be imposed on the Department at a time when its resources are already challenged by the magnitude of the reconstruction effort. This section outlines the organizational structure and processes required to successfully meet these challenges.

## 5.3 Assessment of State Interest, Priorities, and Extent of Involvement in Recovery

As described in Chapter 4, when multiple levee damage and failure sites are involved, the Department must establish the extent of the State's interest in the islands and tracts threatened or flooded due to levee damage, then set the priorities among them. Section 4.6 describes the process for the emergency response phase by which the Department will rapidly evaluate the various damage and failure sites, assess the populations and assets at risk, and systematically establish priorities among the damaged sites. This process is designed to help the FOC to appropriately prioritize the deployment of staff, equipment, and supplies in the hectic hours and days after the onset of the emergency, when field information is likely to be incomplete, yet decisions need to be quickly made and executed.

During the recovery phase, the nature of the assessment and prioritization process changes. Although urgency will continue to be a driver until the SWP and the Delta levee system is restored, there will be sufficient time to gather more detailed and up-to-date field information and for the Department staff to conduct more thorough and nuanced analyses to support and help guide recovery priorities. For each damaged site for which the Department is considering participating in the recovery process, staff will need to conduct a threshold analysis to determine the extent of the State's interest at each stage of recovery.

After the analysis, the Department should actively pursue any reasonable cost-sharing opportunities with, and seek indemnity from, potential beneficiaries of the work needed before committing to participate. The Department does not have the staff and equipment allocated or budgeted in-house to do such recovery work and if it decides to participate would need to either contract with a construction contractor or make funding available for the (LMA) to do so.

### 5.3.1 Recovery Actions

**Armoring Levee Breaches:** As noted in Chapter 4, breach armoring can be viewed as part of the response phase or part of the recovery phase, depending upon the scope of the work and the assets at risk. Such armoring is the responsibility of the LMA. Because it involves the mobilization of barge-mounted cranes to place mounds of large rip-rap at the exposed levee ends, it may be beyond the financial capabilities of the responsible LMA, leading to a request for Departmental assistance.

**Closing Levee Breaches:** Closing levee breaches eliminates the tidal exchange between the flooded island and the rest of the Delta, and is a necessary precursor to dewatering the island. This is a major construction project, typically in the range of \$5 million to \$15 million in magnitude for each island. Breach closure is the responsibility of the LMA, which, like armoring the levee breach, involves the mobilization of barge-mounted cranes to place a large volume of engineered fill (an appropriate mix of sand, gravel, and rock) in the breach. This may be beyond the financial capabilities of responsible LMA, leading to a request for Departmental assistance.

**Dewatering Islands:** Dewatering a flooded island requires the installation of one or more high-capacity pump stations and can take up to six months, with the cost and duration dependent upon the installed pumping capacity and the volume of floodwater on the island. Dewatering a flooded island is the responsibility of the LMA, but may be beyond the financial capabilities of responsible LMA, leading to a request for Departmental assistance.

**Channel Closures:** Placing barriers in some channels may be beneficial in protecting longer term water quality issues.

**Reduce/Halt Water Diversions:** Reducing or halting water diversions and exports prior to or during island/tract flooding can lessen the saltwater intrusion.

**Install/Remove Temporary Barriers:** Removal of temporary barriers placed for agriculture or fish facilitate improved South Delta channel circulation and flushing. In addition, installation of temporary barriers may be advisable under dry conditions.

### **5.3.2 Recovery Strategies**

Recovery strategies that DWR will consider incorporate the above-mentioned island recovery actions that may or may not be undertaken for a given island/levee unit.

For events involving multiple flooded islands, a resource allocation strategy must be selected and resource allocation schedule established. There are three recovery strategies that can be used depending on the type of event, position of X2 (a measure of salinity and freshwater loading into Suisun Bay)<sup>2</sup>, and the volume of flooded islands:

- Flood Basic Recovery Strategy

The Flood Basic recovery strategy will apply to most Delta levee failure events. In general, during major flood inflow to the Delta, X2 will be west of the Delta, and water quality for exports will not be a problem in the near-term. Levee breaches during this time will fill islands/tracts with fresh water. Table 5-1 shows the initial resource allocation

- Earthquake Basic Recovery Strategy

The Earthquake Basic recovery strategy will apply to most Delta levee failure events that result from an earthquake. Since it is unlikely that a major earthquake will occur coincident with a major flood event, water quality for exports may be a problem. Table 5-2 shows the initial resource allocation

- Earthquake Middle River Recovery Strategy

The Earthquake Middle River recovery strategy will apply as a result of an earthquake when the volume of flooded islands and X2 are large. This strategy establishes a fresh water pathway from the Sacramento River to the export pumps in the south Delta, generally along Middle River. Repair of levees and construction of channel barriers along this corridor can be used to restore Delta water exports during extreme events. Table 5-3 shows the initial resource allocation

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<sup>2</sup> Or the distance from the Golden Gate to the point where the daily average salinity is 2 parts per thousand at one meter off the bottom.

**Table 5-1 Flood Basic - Initial Resource Allocation Schedule**

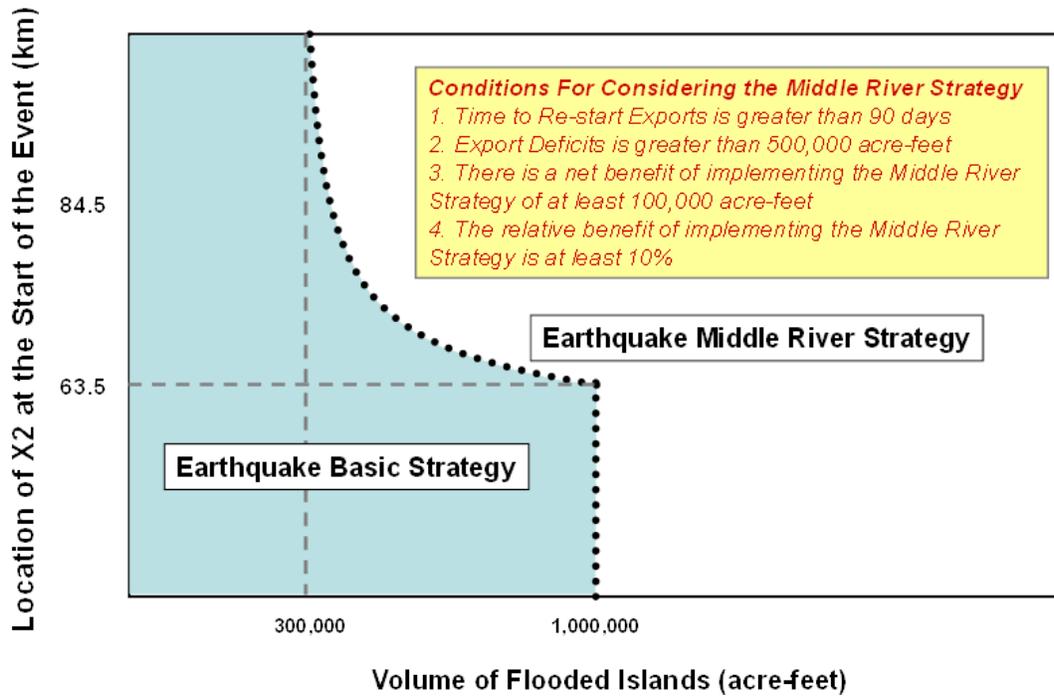
Strategy	Initial Resource Allocation
<b>Flood Basic</b>	<ol style="list-style-type: none"> <li>1. <b>Non-Flooded Islands</b> – Stabilize / repair damaged levees on un-flooded islands with population, public health, infrastructure, or property assets:               <ol style="list-style-type: none"> <li>a. Population over 5,000</li> <li>b. Levees within 500 feet of Mokelumne Aqueduct crossing</li> <li>c. Population between 500 and 5,000</li> <li>d. Public Health – agricultural chemicals and hazardous materials</li> <li>e. Asset Value over \$1 billion</li> <li>f. Infrastructure – water export facilities</li> <li>g. Public Health – sewage treatment/discharges and tank farms</li> <li>h. Asset Value \$200 million to \$1 billion</li> <li>i. Population between 20 and 500</li> <li>j. Infrastructure – railroads and highways</li> <li>k. Salinity – levees along Middle River corridor</li> <li>l. Asset Value \$100 million to \$200 million</li> <li>m. Salinity – levees along Old River corridor</li> </ol> </li> <li>2. <b>Flooded Islands</b> - Repair and dewater flooded islands to recover critical infrastructure, homes and businesses:               <ol style="list-style-type: none"> <li>a. Population over 5,000</li> <li>b. Levees within 500 feet of Mokelumne Aqueduct crossing</li> <li>c. Population between 500 and 5,000</li> <li>d. Public Health – agricultural chemicals and hazardous materials</li> </ol> </li> <li>3. <b>Non-Flooded Islands</b> - Stabilize damaged levees on remaining un-flooded islands in groups.</li> <li>4. <b>Flooded Islands</b> - Repair and dewater additional flooded islands in key groups:               <ol style="list-style-type: none"> <li>a. Asset Value greater than \$200 million</li> <li>b. Infrastructure – transportation corridors and gas storage</li> <li>c. Salinity – levees along Middle River corridor</li> <li>d. Population between 20 and 500</li> </ol> </li> <li>5. Stabilize damaged levees on remaining un-flooded islands.</li> <li>6. Repair and dewater remaining flooded islands.</li> </ol>

**Table 5-2 Earthquake Basic - Initial Resource Allocation Schedule**

Strategy	Initial Resource Allocation
<p><b>Earthquake Basic</b></p>	<ol style="list-style-type: none"> <li>1. <b>Non-Flooded Islands</b> - Stabilize / repair damaged levees on non-flooded islands with population, public health, infrastructure, or property assets in the following order (see Table 4-3 for the category definitions):               <ol style="list-style-type: none"> <li>a. Population over 5,000</li> <li>b. Levees within 500 feet of Mokelumne Aqueduct crossing</li> <li>c. Population between 500 and 5,000</li> <li>n. Public Health – agricultural chemicals and hazardous materials</li> <li>d. Property Value over \$1 billion</li> <li>e. Levees along Middle River and Old River corridors</li> <li>f. Public Health – sewage treatment/discharges and tank farms</li> <li>g. Property Value \$200 million to \$1 billion</li> <li>h. Infrastructure - State Highways</li> </ol> </li> <li>2. <b>Flooded Islands</b> – Close breaches, repair damaged levees, and dewater flooded islands to recover critical infrastructure, homes and businesses:               <ol style="list-style-type: none"> <li>a. Levees within 500 feet of Mokelumne Aqueduct crossing</li> <li>b. Public Health – agricultural chemicals and hazardous materials</li> <li>c. Population over 5,000</li> </ol> </li> <li>3. <b>Non-Flooded Islands</b> - Stabilize /repair damaged levees on remaining un-flooded islands in population, property value, infrastructure, or salinity groups not addressed in Step 1. Includes all Population, Property Value, and Salinity Groups.</li> <li>4. <b>Flooded Islands</b> – Close breaches, repair damaged levees, and dewater flooded islands or tracts with key infrastructure or property:               <ol style="list-style-type: none"> <li>a. Levees along Middle River and Old River corridors</li> <li>b. Infrastructure - State Highways</li> <li>c. Asset Value over \$500 million</li> <li>d. Levees in the Central and West Delta</li> <li>e. Population Groups through E, Asset Value above \$100 million, Salinity through Group 4 and Public Health through Group D</li> </ol> </li> <li>5. Stabilize damaged levees on remaining un-flooded islands or tracts not in groups</li> <li>6. Repair and dewater remaining flooded islands</li> </ol>

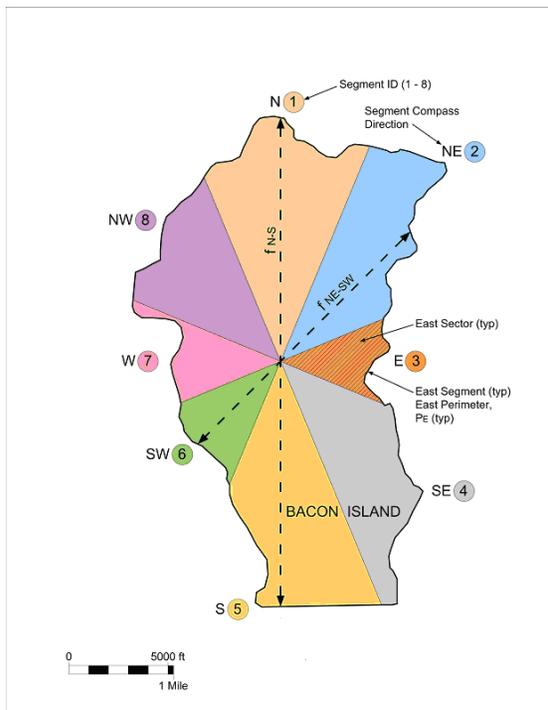
**Table 5-3 Earthquake Middle River - Initial Resource Allocation Schedule**

Strategy	Initial Resource Allocation
<p><b>Middle River Corridor</b></p>	<p><b>Levee Repairs</b></p> <ol style="list-style-type: none"> <li>1. Close breaches and stabilize damaged levees on flooded island sectors along the west side of Middle River pathway sufficient to prevent cross-island flows from Old River to the pathway. Levee repairs are carried out in the following order:               <ol style="list-style-type: none"> <li>a. Victoria Island – Sectors 2, 3, 4, 5, 6<sup>1</sup></li> <li>b. Woodward Island – Sectors 2, 3, 4</li> <li>c. Bacon Island – Sectors 2, 3, 4</li> <li>d. Mandeville Island – Sectors 1, 2, 3, 4</li> <li>e. McDonald Island – Sectors 8, 7, 6, 5</li> <li>f. Jones Tract (Upper and Lower) – Sectors 8, 7, 6, 1</li> <li>g. Drexler Tract (or Middle Roberts) – Sector 6</li> <li>h. Union Island – Sectors 1, 8, 7, 6, 5</li> <li>i. Clifton Court – All sectors</li> </ol> </li> <li>2. Stabilize damaged levees for non-flooded islands sectors along the Middle River pathway to prevent additional flooding, working in the same order as listed in Step 1.</li> <li>3. Close other breaches and stabilize other levees in the Central and West Delta to limit salinity impacts on water exports.</li> <li>4. Prevent additional flooding of un-flooded islands with damaged levees using the Earthquake Basic strategy (see Table 6-1).</li> <li>5. Repair flooded islands based on critical infrastructure and asset value using the Earthquake Basic strategy (see Table 6-1).</li> </ol> <p><b>Addition Actions:</b></p> <ol style="list-style-type: none"> <li>1. Install the Old River tidal pumping barrier north of Victoria Canal.</li> <li>2. Install channel barriers in the South Delta to prevent tidal flows from Old to Middle River. Work south to north.</li> <li>3. Install the Sacramento River barrier system, if used.</li> </ol>
<p><sup>1</sup> See Figure 5-2 for a definition of the island sectors.</p>	



**Figure 5-1 Choosing Earthquake Strategies**

Figure 5-1 provides a recommendation for choosing earthquake strategies based on Delta water quality and the volume of flooded Delta islands.



**Figure 5-2 Island sectors for the purpose of scheduling levee repairs**

The information-gathering, analysis, prioritization, and subsequent recovery operations are structured in accordance with the responsibilities and strengths of the various units within the Department. The following sections summarize the recovery activities of the DOC, the POC, and the FOC, supported by the DFM.

## **5.4 The Roles of the Department's Three Operation Centers in Flood Emergency Recovery**

As described in Chapter 4, the Department relies on three primary emergency operation centers, as needed, during emergency response operations. These centers are the DOC, POC, and FOC. Their roles change as emergencies transition from the response phase to the recovery phase.

The recovery phase begins when damaged levees and flooded areas have been stabilized, and efforts shift to repairing damaged levees, pumping out flooded islands, and ultimately, repairing or replacing infrastructure damaged by floodwaters. There is generally time to clearly define the roles of various units within the Department, as well as among local, State, and federal agencies.

In the recovery phase there is a transition to an orderly reconstruction process, managed as a series of distinct construction contracts for such activities as breach closures, levee strengthening, pumping out islands, and otherwise repairing damaged infrastructure. It is possible for recovery activities to occur simultaneously with response activities at other locations.

### **5.4.1 FOC Recovery Activities**

The FOC will return to monitoring status once all emergency sites are stabilized and no longer need active maintenance and monitoring. For major emergencies, with multiple sites involved, the deactivation process will be gradual, with FOC activation shifting from 24/7 to daytime only, gradual reductions in deployment of field crews, resolution of interagency coordination issues, and the gradual reduction in the need for equipment and supplies.

As incidents are closed, assigned Department staff returns to their regular duties.

The FOC will support the DOC and the multi-disciplinary disaster recovery team in conducting evaluations of the extent to which the Department will participate in recovery projects and to provide the expertise needed to compile the data and information the Department will need in the federal reimbursement claims process.

FOC staff will provide data, evaluate alternative recovery scenarios, help assess benefits, prepare analyses, and make recommendations in support of executive-level determinations regarding the extent of the Department's involvement in, and priorities of, recovery activities. The FOC may use its emergency response tools to help support the Department's detailed assessment of the effects of various recovery scenarios on Delta water quality recovery, thereby assisting in the formulation and selection of recovery actions.

### **5.4.2 POC Recovery Activities**

The POC continues to function on a 24 hours a day- seven days a week basis during major disaster

recovery operations. The POC continues to monitor progress, including recovery of Delta levees, restoration of water quality, and repairs to SWP facilities. It adjusts operations in accordance with field conditions and guidance provided by the DOC. It may work with the FOC and CDEC to deploy additional field sensors so that operations can be more closely monitored as conditions change in the field during the recovery process.

### **5.4.3 DOC Recovery Activities**

Although 24/7 operations are replaced by normal work shifts as soon as feasible in the recovery phase, the DOC continues to play a significant role through the recovery process. The importance of that role increases with the magnitude of the emergency recovery operations. In the event of a major Delta emergency, triggered by a large flood, an earthquake, or a combination of events, the DOC will play a critical role, providing executive level coordination for securing recovery funding from DOF and the Legislature, formulating cost-sharing and indemnity agreements with potential beneficiaries, allocating resources among competing priorities, and working with FEMA to obtain maximum federal reimbursements. It will play a lead role in executing the Department's Business Recovery Plan until the continuity of its critical business services is ensured.

It will continue to function as a critical component of the Department's SEMS structure throughout the recovery process, ensuring that Operations, Planning and Intel, Logistics, and Finance/Administration are properly managed and coordinated. It will ensure a continuity of coordination between SEMS levels, from the local level to the Governor's Office.

In the event of a major Delta levee disaster the DOC will direct a disaster recovery team, organized in accordance with SEMS principles, assembled from experts throughout the Department with the multi-disciplinary expertise needed to manage all phases of multiple disaster recovery construction projects, environmental review and permitting as needed, inter-agency coordination, funding, and documentation. Team members will in turn be supported by their respective divisions. It is neither practical, nor necessary to develop the roster for such a team ahead of time, as the size of the team and its composition will be largely dictated by the magnitude and nature of the disaster, the types of expertise needed on the recovery team, and the employees available to provide the requisite expertise at the time.

This organizational structure reflects the Department's need to direct and coordinate major disaster recovery operations at the executive level, with frequent and effective coordination with the Director and the Executive management team, with the Resources Agency, DOF, Cal OES, USACE, FEMA, USBR, and other agencies with critical disaster recovery roles. It provides for high-level policy guidance on the difficult decisions regarding disaster recovery priorities, including the extent to which the Department will participate in any given site recovery phase. Following major disasters the DOC, supported by the disaster recovery team, will continue to function for many months, until recovery projects have been completed.

In summary, the DOC will continue to function throughout the recovery phase after major disasters, because resource constraints will persist for weeks or months after the triggering event. The DOC will coordinate at the executive level with Cal OES, FEMA, and the USACE; oversee the prioritization and allocation of limited resources among multiple recovery operations, and monitor progress. The DOC will direct the activities of the multi-disciplinary disaster recovery

team, created by the Department at the beginning of the recovery phase. The DOC will be deactivated when major resource allocation, prioritization, construction, cost sharing, and reimbursement issues are resolved.

#### **5.4.4 Key Department Support Units during the Recovery Phase**

The DOC and its multi-disciplinary disaster recovery team are supported by units throughout the Department with the appropriate expertise throughout the recovery period. Of particular importance during this phase are the Division of Fiscal Services, DOE, DFM, FESSRO, and the Delta Modeling Branch within the Bay-Delta Office.

##### **5.4.4.1 Division of Fiscal Services (DFS)**

DFS plays a key role because the Department's involvement in major disaster recovery activities will be supported by special fund allocations provided by DOF. Extensive coordination and communication with DOF will be required, including documentation to support special funds allocations, creating special accounts and fund management and accountability structures, and working with units throughout the Department to appropriately disburse the funds. There will be close coordination with staff appointed as the Department's FEMA Reimbursement Coordinator and DFM, to ensure that expenditures can be federally reimbursed to the maximum extent allowed.

##### **5.4.4.2 Division of Engineering (DOE)**

DOE serves as the Department's center of expertise regarding engineering design, construction and construction management. When the Department chooses to contract for construction services such as breach armoring, breach closure, or island de-watering operations, DOE will administer those contracts until the work is done, such as occurred during the Jones Tract flooding of June-December 2004. DOE field staff will design disaster recovery projects, execute contracts, monitor work, verify quantities, ensure quality, and facilitate timely payment. Recovery contracts may be executed under the Department's emergency contracting authority (California Contracts Code, §10122), or using normal contracting procedures. This role is expected to persist for months after a major emergency event.

##### **5.4.4.3 Division of Flood Management (DFM)**

DFM provides a deep reservoir of expertise regarding levee assessments, repair options, and system-wide implications of various repair scenarios. It maintains close working relationships with Cal OES, Cal Fire, Cal Trans, CCC, USACE, OAs, LMAs, and other agencies involved in emergency response and recovery activities. DFM will continue post-disaster coordination, including assisting in the documentation of local costs and damages, assessments of recovery strategies, sharing of real-time hydrologic information, and related activities. It will support the DOC and the Department's multi-disciplinary team to ensure that recovery activities and costs are thoroughly documented such that Departmental costs can be federally reimbursed to the extent allowed.

#### 5.4.4.4 FloodSAFE Environmental Stewardship and Statewide Resources Office (FESSRO) and the Division of Environmental Services

FESSRO maintains close liaisons with Delta LMA's, detailed data regarding Delta levees, land use, infrastructure assets, will work closely with LMAs to monitor, coordinate, and assist in local recovery efforts. FESSRO provides support to Delta LMAs and the Department in completing environmental documentation, obtaining regulatory permits, and facilitating environmental restoration during the recovery process. FESSRO may provide financial and technical support to the LMAs, consistent with the Department's Delta levees subventions and special projects authorities, as mandated under CWC 12980 Et. Seq. and 12300 Et. Seq.

#### 5.4.4.5 Delta Modeling Branch

The Delta Modeling Branch operates sophisticated, well calibrated, and tested models of the Delta and the SWP and, will use these tools to provide projections of Delta water quality and hydrodynamic conditions and water supply impacts for various recovery scenarios and phases.



## 6 Glossary and References

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### 6.1 Glossary

Legal Delta	The legal Delta consists of approximately 738,239 acres at the confluence of the Sacramento and San Joaquin rivers as defined in <i>Section 12220 of the California Water Code</i> .
Non-Project Levee	For the Delta, non-project levees are levees that are maintained by reclamation districts or levee districts, but are not part of the SPFC. Non-project levees in the Delta include only those shown on page 38 of the Department's Sacramento-San Joaquin Delta Atlas dated 1993.
Preparedness	The actions to ready personnel, facilities, and material for future use to a flood emergency. To be up-to-date, preparedness is continuous.
Private levee	The Delta contains other private levees that are not maintained by a reclamation district or levee district. Generally, the State will not participate in response or recovery for these levees.
Project levee	Project levees are those levees that are part of the State-federal flood protection system in the Sacramento-San Joaquin Valley of California. These are levees of federally authorized projects for which the State has provided assurances of cooperation to the United States federal government and are considered part of the State Plan of Flood Control (SPFC); see <i>State Plan of Flood Control Descriptive Document</i> (DWR, November 2010).
Response	The actions taken during an ongoing emergency to mitigate the potential failure of levees. Response ends when the threat of levee failure has passed and levee damage is stabilized.
Recovery	Potential actions to repair levees that fail and pump out flooded areas. In some cases where economics do not support recovery to pre-flood conditions, recovery may entail modifications to change use (establish habitat or other uses).
Tract	Delta tracts are areas around the edges of the Delta that are subject to tidal influence, but do not require levees on all sides because of the presence of high ground on one side. However, some tracts have levees on the high ground portion to protect the areas from upstream runoff. Also, some islands are named as tracts – Webb Tract for example.

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PUBLIC SAFETY

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