

5. Emergency Response

5.1. Introduction

This Chapter of the Mid and Upper Sacramento Regional Flood Management Plan (RFMP) describes the current status of flood emergency response in the Mid and Upper Sacramento River Regions. The nature of residual risk in the region and the current response structure is described in some detail. This chapter also provides an overall assessment of regional flood response readiness. Out of this assessment some key response issues have been identified and described. Information for these assessments was acquired during field trips and meetings conducted in March and November 2013 and through independent outreach and research. Finally, this chapter includes some recommended projects for improving the level of flood response readiness. These are presented to serve as a basis for discussion by stakeholders. All information in this draft Chapter is preliminary and subject to review, correction and modification, and final approval by local stakeholders.

5.2. Background

Initial emergency response to disaster events in California is the responsibility of local government entities (i.e., counties, cities, special districts) and, in some cases, locally-based State agencies (e.g. California Highway Patrol). A key locally-based State agency in the Mid and Upper Sacramento River Regions with an important local flood response function is the Department of Water Resources which uniquely in the Central Valley directly maintains significant stretches of project levees through State “maintenance areas”. Local entities and locally-based State agencies provide emergency response within their legal “jurisdiction”. This “jurisdiction” is defined by either geography or specific mandated response function(s), or by a combination of both. As a result of this legal “jurisdiction” local entities and relevant locally-based State agencies retain primary command and control (“incident command”) for subsequent emergency response and recovery activities occurring within their jurisdiction.

Local and State public agencies are required to use the National Incident Management System (NIMS) and the California Standardized Emergency Management System (SEMS) to organize and conduct their disaster response activities. These emergency management systems require agencies to use the Incident Command System (ICS) to organize response in the “field”, where the direct impacts of the disaster are being handled. Higher levels of county, city, and State response management occur within “emergency operations centers (EOC)” or “departmental operating centers (DOC)” where special, but often somewhat different, adaptations of the ICS is used to organize activities. Where a disaster event extends across multiple different jurisdictions, by geography or function, the ICS recommends that a “Unified Command” be established in the field among all involved agencies with primary jurisdictional responsibilities.

Counties and many cities also maintain a specialized “emergency management” function within their organization in addition to agencies/departments with specific emergency response functions (e.g. Sheriff, fire department). This emergency management function is responsible for coordinating the activities of the different departments of the jurisdiction during an event, assisting those internal departments with pre-disaster readiness activities, and facilitating executive management control of the overall response. The emergency management organizations performing this function generally prepare and maintain a jurisdictional emergency operations plan (EOP) which describes how this overall disaster management function will be performed as well as specific plans/procedures of departments of the jurisdiction where they exist.

Counties are also mandated by State law to create and manage an “operational area” organization. This is a special organization composed of all local public jurisdictions within the county for the purpose of facilitating joint management of response resources and information to achieve the most efficient response possible. This special purpose operational area organization serves as a key communications and coordination link between different local jurisdictions and between those local jurisdictions and the State and federal governments.

Except for those locally-based State agencies which have initial emergency response responsibilities, and therefore a local incident command role in the field, State agencies primarily provide resources and support to responsible local agencies at their request. These resources are acquired under protocols laid out in the mutual aid and other systems described in the California Standardized Emergency Management System (SEMS). The California Office of Emergency Services (Cal OES) is responsible for the coordination of this State response in support of impacted local agencies. Cal OES staff do not typically serve as part of the disaster command structure actually managing the response in the field. The Federal Emergency Management Agency (FEMA), which coordinates the response of federal agencies at requests for resources or support from the State, also does not have a role in the local command structure managing response activities.

Local agencies are responsible for maintaining a readiness to meet their responsibilities in a disaster. Such readiness may take the form of developing a pre-planned NIMS response organization, preparing written plans or protocols, conducting training and exercise programs, and acquiring specialized equipment, supplies, and facilities. Whether any such actions taken are “adequate” or otherwise of an acceptable nature is a subjective evaluation. Statutes provide readiness mandates of a general nature and federal and State guidance provide general preparedness guidance and implementation methodologies but neither provide an unambiguous methodology for determining whether any particular response activity can be performed “adequately” by a jurisdiction. Therefore, any assessment of a local agency’s “readiness” is dependent to a large degree on a subjective evaluation based on one or more “readiness indicators” (e.g. existence of a written plan or conduct of an exercise) that can be reviewed and assessed.

5.3. Flood Response Roles

5.3.1. Flood Emergency Response Structure

There are two key separate components of flood response; levee flood fight operations and general public safety operations. These components must be evaluated separately because each is conducted by a different group of jurisdictions/agencies and each component has very different response issues and challenges. Levee flood fight operations include emergency activities aimed at preventing failure of a levee during a flood or reducing the extent, depth, or duration of flood waters if a levee does fail. Such activities include levee patrol and basic remedial actions involving the placement of sandbags or rolls of plastic. Importantly, it also often includes the acquisition of private contractors and/or bulk materials for more substantive remedial actions such as the placement of rock blankets or the creation of a relief cut. General public safety operations, on the other hand, include those traditional public safety activities of public warning, evacuation, rescue, fire suppression, and recovery normally conducted by local law, fire and other agencies.

Levees are often maintained by a “special district” (or State “maintenance area”) created for that sole specific function. Where such a special district (e.g. reclamation district, levee district, flood control district) has been established, it has primary jurisdiction for performing flood fight operations on its levee as a concomitant of its day-to-day levee maintenance responsibility. Within “maintenance areas” the Department of Water Resources has these responsibilities. In regard to public safety operations, fire suppression and rescue are generally provided in the Mid and Upper Sacramento River Regions by “fire districts”, except in the case of two incorporated cities which have internal fire departments. Local law agencies generally provide traffic control and security functions. Public warning and evacuation activities seem to be a shared responsibility among multiple local agencies but specific local procedures identifying how this responsibility would be managed were not identified.

The Mid and Upper Sacramento River Regions include eleven reclamation districts, levee districts, or State maintenance areas that maintain project levees in the area. There are additional reclamation districts present in the region but they perform their functions through other means than levees. In addition, there are three important levee systems either maintained by a county or city directly or currently without a clearly identified maintaining agency. Table 4.1.1 shows the approximate size, status, land uses, and assets of each of the levee maintaining districts along with the local agencies responsible for performing the public safety operations component within the area protected by that district’s levee.

Table X. Mid and Upper Sacramento River Regions Levee Maintaining Agencies

RDs	Size of District (acres)	Distance of Levees (miles)	Primary Land Use	Critical Public Assets	Status of LMA	Public Safety Agencies*
RD70	20,315	23.6	Agriculture		Active	Sutter Co Sheriff; Sutter Basin Fire Protection District

RDs	Size of District (acres)	Distance of Levees (miles)	Primary Land Use	Critical Public Assets	Status of LMA	Public Safety Agencies*
RD108			Agriculture		Active	Colusa Co Sheriff; Sacramento River Fire Protection District; Colusa Fire Department
RD787			Agriculture		Active	Yolo County Sheriff; Knights Landing Fire Protection District
RD1500			Agriculture		Active	Sutter County Sheriff; Sutter Basin Fire Protection District
RD1660			Agriculture		Active	Sutter County Sheriff; Meridian Fire Protection District
LD1			Agriculture		Active	Glenn County Sheriff; Glenn Cordora Fire Protection District
LD2			Agriculture		Active	Glenn County Sheriff; Glenn Cordora Fire Protection District
LD3			Agriculture		Active	Glenn County Sheriff; Glenn Cordora Fire Protection District
MA1			Agriculture		Active	Colusa County Sheriff; Princeton Volunteer Fire Department; Colusa Fire Department
MA5			Agriculture		Active	Colusa County Sheriff; Sacramento River Fire Protection District
MA12			Agriculture		Active	Butte County Sheriff; Butte County Fire Department
Hamilton City J-Levee			Agriculture		Inactive special district	Glenn County Sheriff; Hamilton City Fire Protection District
Tehama County Gerber Levee			Agriculture			Tehama County Sheriff; CalFire Tehama Glenn Unit

RDs	Size of District (acres)	Distance of Levees (miles)	Primary Land Use	Critical Public Assets	Status of LMA	Public Safety Agencies*
Big Chico Creek System Levees					Active	City of Chico

5.3.2. Coordination of Multi-Agency Response

Within the Mid and Upper Sacramento Regions planning area, the six county Offices of Emergency Services (OES) are responsible for the day-to-day administration of disaster preparedness, mitigation, response, and recovery programs within their jurisdictions. These OES offices also provide administrative support to their respective Operational Area Councils and County Disaster Councils. In a disaster, these offices are responsible for coordinating the response of their county departments within the unincorporated area. They are also responsible as the lead “operational area” organization for coordinating information and resource sharing among the separate jurisdictions (e.g. cities, districts) within their political boundary. The county OES offices maintain emergency operations center (EOC) facilities to support the performance of these coordination activities.



The areas protected by project levees within the Mid and Upper Sacramento River Regions are unincorporated except for the Cities of Colusa and Chico. The City of Colusa is within the area protected by levees maintained by State Maintenance Area 1 and Reclamation District 108. The City of Chico maintains the flood control system for Big Chico Creek which runs through its jurisdiction. Aside from those two cities, flood response in this planning area is, therefore, primarily a matter of coordinating the activities of county public safety agencies (primarily the sheriff’s department and public works) and special districts (e.g. fire and reclamation/levee district/maintenance areas) having response functions in the area of concern.

This coordination of agencies and special districts conducting public safety operations in the field is usually accomplished through 1) an established Unified Incident Command with related field command post, and 2) at the operational area by the local county OES. No written pre-planned Unified Command structures, command post locations, or field multi-agency coordination processes for specific and distinct areas were identified during the research for this chapter. At this point, it would appear that these relationships would be developed on some formal basis at the time of the emergency. The presence of personnel with past flood experience would, therefore, be necessary to take advantage of past response experience in attempts to establish an effective incident command in a future event.

5.3.3. *Mutual Aid*

The California Master Mutual Aid Agreement was implemented in the 1950's to serve as a mechanism for separate California political jurisdictions to share resources in a disaster.

The Agreement establishes a process for “no cost” borrowing of resources from other jurisdictions in a disaster. The requesting jurisdiction does have a responsibility for providing for the maintenance of these outside resources during the period that they provide this assistance. The Master Mutual Aid Agreement is based on the fundamental concept that resources shared are held in common among jurisdictions (e.g. fire trucks, police officers) so that potential reciprocity applies. There are no provisions, requirements, or protocols in the Master Mutual Aid Agreement for the direct expenditure of funds by one jurisdiction on the behalf of another jurisdiction to help meet the requesting jurisdiction's responsibilities. In fact, FEMA public agency disaster assistance regulations discourage such cross-jurisdictional expenditures.

Each county within the Mid and Upper Sacramento River Regions, and their internal jurisdictions (i.e. cities and special districts), share resources in a disaster under the provisions of this Master Mutual Aid Agreement. No special or separate mutual aid agreements exist within the Mid and Upper Sacramento River Regions to supplement the provisions of that Agreement. Therefore, no county or city jurisdiction is required by law or agreement to assist a levee maintaining special district (and therefore separate jurisdiction) with direct expenditures to help prevent a levee failure, or physically contain a flood. While examples of such assistance through the provision of resources (e.g. sandbags) or funds were identified, no explicit or written policies guiding the provision of such assistance to a levee maintaining agency were identified making such help in the future ad hoc and dependent on bureaucratic dynamics operable at the that time.

5.3.4. *U.S. Army Corps of Engineers and PL84-99 Programs*

The U.S. Army Corps of Engineers plays a unique role in flood response that must be clearly recognized in any planning effort to improve local response capabilities. Most levees forming the State Plan of Flood Control were constructed through federal flood control programs. The U.S. Army Corps of Engineers supervised the construction of such levees and upon completion of each project the responsibility for its maintenance was turned over to a local maintaining agency under written agreement. These agreements included an obligation to operate and maintain the project according to operation and maintenance (O&M) manuals developed by USACE as well as provide assurances and other commitments. This federal obligation originating in the generally distant beginnings of the current levee system has played a central and critical role in subsequent flood emergency response.

5.3.5. *O&M Manual Flood Fight Components*

USACE Operation and Maintenance Manuals issued at the time of project completion contain suggested methods of combating flood conditions. The LMAs obligation to conform to their respective O&M manuals means that this information must be referenced when current flood

safety plans are developed. However, some of this information is no longer current with modern response systems so while LMAs should ensure that flood safety plans are consistent with their O&M Manuals they should develop their plans with the current operational area response system and protocols in mind. LMAs should note where flood response protocols must deviate from out-of-date suggestions in their O&M Manual. This information can then be forwarded to USACE as an addendum to the manual. This will ensure that flood fight operations are conducted in a manner consistent with current response systems as well as the O&M manuals. This action should occur concurrently with coordination with USACE for integration of federal resources into flood fight operational protocols.

USACE involvement in flood fight under PL84-99 authorities will continue despite federal action to remove LMAs from PL84-99 levee rehabilitation support and flood safety plans will need to address this involvement while maintaining O&M manuals as an active and critical part of flood response.

5.3.6. *PL84-99 Levee Rehabilitation*

A long standing role of USACE in flood emergency response was rehabilitation of damaged levees after a flood under PL84-99 authority. Historically there has been a strong dependence on the federal funding under this program to perform expensive re-construction of levee breaches and other levee rehabilitation actions. The current effort of USACE to remove LMAs from PL84-99 eligibility for such assistance has wide-ranging consequences for the future of flood control in California. If sustained, it will require a paradigm shift in how levee maintenance is funded and structured. A paradigm shift that is at yet undefined, much less implemented.

It is clear that the ability of the Mid and Upper Sacramento River Region LMAs, with a couple of possible exceptions, to repair levee breaches, or perform extensive repairs to levees damaged by impounded flood waters, is questionable. Experience has also shown that districts suffering a breach and subsequent flooding have found it nearly impossible to obtain loans from banks or other financial institutions to generate cash flow for immediate action. Therefore, absent this critical historic USACE assistance, the rehabilitation of the flood control system after a flood becomes a question mark without immediate answers.

Answers to this issue may only be forthcoming after the next flood if the issue is not addressed by policy makers at all levels of government in the meantime. If the LMAs cannot act promptly then areas will remain flooded for longer periods and remain vulnerable to flooding from minor events for longer periods. This will further degrade the ability of the LMA to finance any rehabilitation of the system to its prior condition.

In this situation, the question becomes whether the next level of government, cities and county, with assets impacted by the flood waters would act to perform levee rehabilitation. It has been noted elsewhere in this chapter how the involvement of these entities in levee flood fight has been greatly hindered by the jurisdictional barrier created by the formation of special districts for flood control in the past. This jurisdictional barrier clearly also serves as a hindrance to action by those local entities to system rehabilitation. Motivation to act by a city or county would be entirely

dependent on that organization's perception of the level of importance of regaining use of any of its infrastructure impacted by the flood waters.

If city or county government fails to act, it would fall to the State, in particular to the Department of Water Resources, to act to repair breaches and other levee damages. The lack of a standing emergency fund for such purposes at the State level means that such action would require a political decision at the time of the event. There is no clear pre-event policy addressing this issue in place at the State level as there is no clear pre-event policy at the city or county levels.

Given this situation, the question of what are the implications of losing PL84-99 levee rehabilitation assistance becomes essentially a rhetorical one. No extensive research is needed to know that no ready source of funds at the LMA, local or State level is in place to replace this historic federal assistance. No funds are in place because there is no clear policy as to how this change in federal policy will be addressed.

Clearly, there are only two options available. New joint discussions to define a new structure for rehabilitating levee systems must be carried out by local and State agencies. This will involve either strengthening LMA ability to perform this work or identifying new roles for other local and State agencies in system rehabilitation. Once a conceptual policy is in place then funding sources can be identified. The SB27 Sacramento-San Joaquin Delta Multi-Hazard Coordination Task Force report issued by the Governor in 2011 identified the need for a substantial emergency fund to be created to ensure adequate cash flow for expensive levee flood fight operations in an emergency. The role of such an emergency fund to provide cash flow for response and rehabilitation of the system for all areas of the SPFC after a flood could be added to the discussions concerning implementation of a new local/State structure for meeting this essential flood control activity.

5.4. Emergency Response Readiness

5.4.1. *Analysis of Residual Risk*

Project levees were constructed in the Mid and Upper Sacramento River Regions to prevent damage from a flood of a specified magnitude. Since one or more of the levees may not perform this function in the future due to a design, construction, or maintenance flaw, there is a "residual risk" that flood waters at, or below, design criteria will degrade and fail the levee. In addition, because levees are designed, as noted, to control floods of a specified magnitude there is also a "residual risk" to the protected area that a flood exceeding that design criteria of the levee will occur and either overtop or otherwise fail the levee.



This residual risk is addressed by developing the capacity to 1) effectively respond to the appearance of a flaw in a levee to prevent complete failure, 2) effectively respond to physically limit the extent, depth, or duration of floodwaters if a levee does fail, 3) remove people and

property from the area subject to flooding, and 4) provide additional physical protection to specific assets in place that cannot be removed. The level of organizational, resource, and procedural capacity needed to perform these actions depends, in part, on the potential response complexity of an area (for example, it is generally a more complex matter to evacuate an urban area than a rural area).

In regard to emergency response, the capacity needed to adequately address this residual risk is partially dependent on the relative difficulty of performing the appropriate protective actions. In this regard, the project levees in the Mid and Upper Sacramento River Regions and surrounding area do not present any special problems for the conduct of flood fight operations. No special circumstances or conditions exist that would prevent application of standard flood fight techniques where needed. In general, the complexity of evacuating people and property from an area subject to flooding in this area is less than for many areas of the Central Valley due to its mostly rural nature. Highly urbanized areas subject to flooding are limited in number although these areas, of course, present a more complex response issue. Rural areas do make some protective action issues of more critical interest, such as evacuation of hazardous materials and debris removal after a flood.

5.4.2. *Flood Fight Readiness*

Determining whether an existing response capacity is adequate is highly subjective. For a short-term study some simple indicators must be used to provide a general impression of the degree of attention that jurisdictions are applying to flood preparedness. From such an impression one then must make a subjective judgment based on experience on the degree to which a jurisdiction will perform adequately when the time comes.

Simple indicators in regard to flood fight capacity can be the existence of 1) written levee flood fight plans or flood-specific plans maintained by supporting agencies, 2) evidence that personnel receive training to perform levee patrol and basic remedial actions (e.g. sandbagging), 3) clear and unambiguous protocols for establishing flood fight command and control, and 4) the presence of stockpiles of materials or funds clearly identified and available for use in emergency response. Simple indicators of the capacity of the other jurisdictions in an operational area to rapidly and effectively support LMA flood fight operations would be the existence of 1) flood fight stockpiles maintained by these other jurisdictions which can be accessed by the reclamation or levee district, 2) flood specific mutual aid procedures, 3) clear and unambiguous policies for the provision of personnel and funds to assist with levee flood fight, and 4) regular joint exercises with levee maintaining agencies. While certainly not comprehensive, these indicators would provide a general impression of the ability of the two flood response components described above to perform effectively and to effectively coordinate and/or support the other.

Table X. Indicators of Flood Fight Readiness

Agency	Written Flood Fight Plan or Procedures	Clear Flood Fight Command Protocols	LMA On-Hand Resources: Materials, Trained Crews, Emergency Fund (EF)	County, City or Fire District Mutual Aid/Coordination Capability	Exercises: Internal/Multi-agency
Reclamation District 70	No	No	Stockpile - Yes Crews – Yes but no ICS/NIMS training EF - Yes	Stockpile - None Crews – None EF –None No clear LMA Mutual Aid procedures	No
Reclamation District 108	Yes; additional elements needed	No	Stockpile – Yes Crews – Yes EF - Yes	Stockpile - None Crews – None EF – None No clear LMA Mutual Aid procedures	No
Sacramento River West Side Levee District	Yes; additional elements needed	No	Stockpile – Yes Crews – Yes EF - No	Stockpile - None Crews – None EF –None No clear LMA Mutual Aid procedures	No
Reclamation District 787	Yes; additional elements needed	No	Stockpiles – Yes Crews – Yes EF – No	Stockpile - None Crews – None EF –None No clear LMA Mutual Aid procedures	No
Reclamation District 1500	Yes	Yes	Stockpile - Yes Crews – Yes EF -Yes	Stockpile - No Crews – CCC EF – No Agreement with CCC	Yes
Reclamation District 1660	No	No	Stockpile – Yes Crews – Yes but no ICS/NIMS training ER – Yes	Stockpile - None Crews – None EF –None No clear LMA Mutual Aid procedures	No
Levee District 1 (Glenn)	No	No	Stockpile – No Crews – No EF – No	Stockpile - No Crews – No EF –No No clear LMA Mutual Aid procedures	No
Levee District 2 (Glenn)	No	No	Stockpile – No Crews – No EF – No	Stockpile - No Crews – No EF –No No clear LMA Mutual Aid procedures	No
Levee District 3	No	No	Stockpile – No Crews – No EF – No	Stockpile - No Crews – No EF –No No clear Mutual Aid procedures	No
Maintenance Area 1 (DWR)	Yes	Yes	Stockpile – Yes Crews – Yes EF – Yes	Stockpile - Crews – EF – No clear Mutual Aid policy in regard to State Mas	No

Agency	Written Flood Fight Plan or Procedures	Clear Flood Fight Command Protocols	LMA On-Hand Resources: Materials, Trained Crews, Emergency Fund (EF)	County, City or Fire District Mutual Aid/Coordination Capability	Exercises: Internal/Multi-agency
Maintenance Area 5 (DWR)	Yes	Yes	Stockpile – Yes Crews – Yes EF – Yes	Stockpile – No Crews – No EF – No No clear Mutual Aid policy in regard to State Mas	No
Maintenance Area 12 (DWR)	Yes	Yes	Stockpile – Yes Crews – Yes EF – Yes	Stockpile - No Crews – No EF – No No clear Mutual Aid policy in regard to State Mas	No
Hamilton City J Levee	No	No	Stockpile – No Crews – No EF – No	Stockpile - None Crews – None EF – None No clear LMA mutual aid procedures	No
Tehama County Gerber Levee	No	No	Stockpile – No Crews – No EF – No	Stockpile - Crews – EF – Field Cmd -	No
City of Chico Big Chico Creek System	No	Yes	Stockpile – No Crews – No EF – No	Stockpile - Crews – EF – Field Cmd -	No

5.4.3. *General Assessment of the Readiness to Conduct Flood Fight Operations*

A review of the capacity indicators above indicates that the readiness of the Mid and Upper Sacramento River Regions levee maintaining agencies ranges widely.

Overall, a judgment can be made based on best practices that the readiness of the LMAs as a group to conduct effective flood fight operations is below optimal. Even among the State maintenance areas, where a high level of readiness is evident, there are indications that coordination or the potential for mutual aid with local governments is informal, lacks written policies, and could be further clarified, in particular, as to how State staff operating in their maintenance area could access assistance from other jurisdictions as opposed to other levels of the Department of Water Resources.

LMAs either have no written plans for conducting flood fight operations or have plans that do not share a common format or content with the plans of other LMAs. There appears to be clear leadership within LMAs for organizing and conducting flood fight operations but few personnel who were identified as potential managers of such operations have formal ICS/NIMS training. Levee flood fight leadership would, therefore, be competent but would lack an optimal ability to apply ICS/NIMS concepts to inter-agency coordination and mutual aid.

Local governments, other than levee maintaining entities, do not maintain stockpiles of flood fight materials to support potential flood fight operations on the levees and do not have clear policies in regard to providing such support to the LMAs. This leads to a lack of formal flood fight training

of local government staff that could quickly assist with common flood fight activities such as levee patrol if needed. In some cases, such as in Glenn County, local fire district personnel assist in LMA activities but it is unclear whether they are acting as fire district employees or in a dual capacity as members of the LMA.

In regard to the provision of funds for more complex remedial actions to prevent levee failure, there does not seem to be clear and written policies within local governments identifying their level of willingness or capability for assisting with funding for direct acquisition of contractors or expensive bulk material. Local governments also do not have clear and pre-determined field command protocols for inter-agency coordination in the field except in a few cases.

Finally, levee maintaining agencies and public safety jurisdictions that would be operating in the same area do not conduct regular exercises to identify gaps in the development of an optimal response capability. These factors, the existence of a considerable level of residual risk, and a review of best practices available in the Central Valley would justify the evaluation that the Mid and Upper Sacramento Regions planning area’s capacity to address residual risk through flood fight operations is below optimal.

5.4.4. Public Safety Operations Readiness

Turning to public safety operations for areas protected by project levees, some simple indicators of response capacity would be the existence of 1) general response plans, 2) flood specific response plans and/or training programs, 3) general Incident Command System/National Incident Management System (NIMS) training programs, and 4) written protocols for establishing multi-agency command and control in the floodplain. Indicators of the capacity of the counties, cities, and fire districts in the region to rapidly and effectively apply resources to assist with the removal of people and property from threatened areas would be existence of 1) resources/equipment for conducting warning, evacuation, and rescue operations and 2) clear law, fire, and EMS mutual aid procedures.

Table X. Level of Public Safety Operations Readiness

Agency	Written Emergency Response Plan (General and/or Flood Specific)	Training and Frequency (ICS/NIMS; Flood Fight Specific)	Command and Control Protocols specifically for Flood Operations	Resources/Equipment Available/Suitable for Floodplain Warning, Evacuation, Rescue, etc.	Clear Mutual Aid Procedures for Law, Fire, EMS
Yolo County; KLFPD	Standard EOP only No flood specific response plan	ICS/NIMS – Yes FF specific – No	No	Yes	Yes
Colusa County; City of Colusa; PVFD; SRFPD	Standard EOP only No flood specific response plans	ICS/NIMS – Yes, within Fire/Law FF specific – No	No	Yes	Yes

Glenn County; HCFPD; GCFPD; OFPD	Standard EOP only No flood specific response plan	ICS/NIMS – Fire and Law FF Specific – No	No	Yes	Yes
Tehama County; CFTGU	Standard EOP only No flood specific response plans	ICS/NIMS – Fire and Law FF Specific – No	No	Yes	Yes
Butte County; City of Chico	Standard EOP only No flood specific response plans	ICS/NIMS – Fire and Law FF Specific – No	No	Yes	Yes
Sutter County; MFPD; SBFPD	Standard EOP only; No flood specific response plans	ICS/NIMS – Yes FF Specific – No	No	Yes	Yes

*** Agency Abbreviations**

- CFTGU – CalFire Tehama Glenn Unit
- GCFPD – Glenn Cordora Fire Protection District
- HCFPD – Hamilton City Fire Protection District
- KLFPD – Knights Landing Fire Protection District
- MFPD – Meridian Fire Protection District
- OFPD – Ord Fire Protection District
- PVFD – Princeton Volunteer Fire Department
- SRFPD – Sacramento River Fire Protection District
- SBFPD – Sutter Basin Fire Protection District

5.4.5. General Assessment of Readiness to Conduct Public Safety Operations

A review of the capacity indicators above indicate that the readiness of the public safety agencies in the Mid and Upper Sacramento River Regions to conduct effective public safety operations in the floodplain are adequate but below optimal based on best practices in the Central Valley. Jurisdictions maintain normal general emergency operations plans and conduct more or less routine general ICS/NIMS training. There are the normal established fire, law, and EMS mutual aid systems and most counties have specialized equipment for supporting field command and control activities available. However, specific and comprehensive plans for response to flood events do not exist and no flood fight specific training provided to county, city, and fire district responders was identified. Several jurisdictions work closely with one or more LMAs during a flood but this operational relationship is not documented so exact roles and relationships remain vague. The participation of residents in both the local fire district and the levee maintaining agency also tends to blur inter-agency relationships since it seems to be unclear under which agency’s auspices these dual role personnel are responding.

Written plans for conducting more complex elements of public safety operations in a floodplain (e.g. evacuation of dairies and hazardous materials) were not identified where they are appropriate. Specific, written, protocols for establishing command and control in the floodplain during flood events were also not identified. Finally facility-specific written plans for removing or protecting in place critical infrastructure components were not identified.

The existence of normal emergency plans, ICS/NIMS training, and specialized equipment indicate a normal competency to conduct public safety operations in the floodplain if needed. This competency, coupled with the less complex nature of the evacuation/rescue/security problem in the floodplain, would indicate normal and adequate response capacity. However, the lack of flood specific plans and training, as well as the lack of written plans for more complex rural evacuation issues, would indicate that the Mid and Upper Sacramento Regions planning area’s flood response capacity for public safety operations is less optimal than it could be.

5.4.6. Gaps and Overlaps

Written emergency plans that do exist in the Mid and Upper Sacramento River Regions are general in nature and prepared by each jurisdiction to describe how they will conduct their own operations within their own jurisdictional boundaries. Although Operational Area Councils are in existence it appears that participation by levee maintaining agencies is limited during routine coordination meetings and activities. Department of Water Resources staff assigned to State levee maintenance areas also do not seem to participate in these local coordination processes on a routine basis. The lack of flood response specific procedures or plans precludes the existence of overlaps. The lack of specific written command or response protocols specifically for response in the area protected by project levees makes it impossible to evaluate whether any other assumptions exist within jurisdictions about command or coordination that would conflict with each other.

The readiness analysis performed above indicates that five key general gaps exist in the Mid and Upper Sacramento River Regions planning area's capacity to address all flood response issues in an optimal manner.

- Lack of region wide consistent LMA written levee flood fight plans and floodplain-specific procedures within county and city emergency operations plans.
- Ambiguity in relationships of local public agencies to LMAs in how they will coordinate field operations. In those cases where LMA command is identified, there is a lack of ICS/NIMS training among the LMAs to facilitate coordination processes
- Lack of clear and unambiguous policies by operational area jurisdictions in regard to providing mutual aid of personnel, resources/materials, and funds to LMAs to support levee flood fight operations.
- Lack of joint exercises to identify response gaps and improvement opportunities.
- Lack of effective mechanisms to ensure that routine coordination and planning activities between LMAs and other public agencies occur to promote and maintain solutions to the other identified response issues.

Specific response issues relating to these five general gap categories are discussed below.

5.5. Funding and Commitment

There are five reclamation districts that indicated they had a standing emergency fund to support flood fight efforts. Most of those indicated that the level of this funding was considered inadequate. State officials indicated that emergency funds were available to staff of DWR maintenance areas but the presence of an overarching State bureaucracy in this case makes the nature of such potential emergency funding significantly different from independent LMAs. In general, the limited financial situation of reclamation and levee districts and the resulting general difficulty in maintaining an adequate emergency fund makes their ability to respond to financial demands of flood emergencies questionable.

No other jurisdictions in the Mid and Upper Sacramento River regions were identified that maintain a designated and budgeted emergency fund for responding to emergencies. County and city jurisdictions would clearly be dependent on their internal general fund reserves or any general budgeted contingency funds to meet extraordinary costs of meeting their direct emergency response mandates. Whether a jurisdiction's general fund could deal with the extraordinary costs of responding to a disaster would be dependent on the size of the disaster and magnitude of its impact.

Use of a jurisdiction's internal general fund to assist the LMAs with levee flood fight operations is not required by existing mutual aid agreements or any statute. Such expenditure of county or city tax dollars in another jurisdiction has legal barriers as well as issues with FEMA disaster assistance regulations, both of which would best be addressed with a written flood-specific mutual aid protocol. Such a protocol does not exist in the Mid and Upper Sacramento River Regions. Examination of the general funds of local county or city jurisdictions would not be productive given the absence of a clear commitment or protocol for providing direct expenditure support on behalf of LMA special districts.

Without a clear commitment to provide financial assistance, and without a designated budgeted emergency fund, it is impossible to evaluate the capacity of the non-LMA jurisdictions to assist with flood fight operations.

5.6. Response Issues

Jurisdictions within the Mid and Upper Sacramento River regions have, without exception, worked hard over the past years to improve response capability and institutionalize SEMS and NIMS response doctrine. However, the relatively small size of jurisdictions in this region creates significant challenges to improving overall response. Levee maintaining agencies, in particular, struggle to maintain optimum plans due to small staffs and limited resources. Active cooperation among LMAs to pool resources for maintenance of plans and stockpiles has been limited and no formal mechanism for such cooperation has been formed. The existence of large stretches of levees maintained by State employees of the Department of Water Resources in defined "maintenance areas" further complicates the creation of SEMS consistent joint planning, mutual aid and coordination processes.

5.6.1. General Issues

A meeting of regional jurisdictions conducted in March 2013 identified several general areas of improvement that should be addressed in the regional flood management plan. These jurisdictions also agreed that better integration of their individual response systems was a key to significant preparedness progress.

General Issue #1: Need for higher quality, more user-friendly local, tactical, flood safety plans

Many levee maintaining agencies lack adequate written plans for flood fighting their levees. Plans that do exist are not uniform in format or content. Historical knowledge, knowledge of local topography, and awareness of potential containment actions in the event of a breach are often known by LMA officials but not documented. Many of the LMAs must comply with Water Code Section 9650 (AB156) flood safety plan requirements and all LMAs must comply with the State priority of developing local flood response plans if they are to receive DWR grant funding. This situation makes the issue of developing a standard, state-of-the-art, template for a local, tactical, flood safety plan for consistent implementation throughout the regions a critical issue.

As an added point to this issue, research for this chapter indicates that specific information on the probable behavior of flood waters flowing from foreseeable breach scenarios has not been developed. The lack of this information hinders the ability of local jurisdictions to develop detailed action plans before a breach occurs. Improving this situation as part of the development of local flood safety plans should be a high priority.

General Issue #2: Need to reduce failures of communication in the field between multiple, separate, jurisdictions operating in the same area with different functions

Field tours of the region revealed a common problem that has also been recognized in other regions of the Central Valley. This is the failure of different jurisdictions operating in the field with different response functions to effectively communicate in many instances. Stories of public safety officers who don't allow reclamation district levee patrols through, LMA staff who don't know how to contact public safety field command staff, and unilateral actions by one agency that affects the ability of others to perform their functions were common in the field interviews. While the complexity of disaster operations makes some of these failures inevitable, reducing failures to communicate in the field, particularly across political lines, is a high priority for the region.

General Issue #3: Need for a more integrated and sophisticated regional flood fight resource stockpile system

Current practice is for individual LMA's to stockpile flood fight resources for their own needs within their own jurisdiction. Stockpiles that do exist contain standard general resources (e.g. sandbags) but not necessarily specific materials or resources that would be needed to respond to specific foreseeable breach scenarios. DWR stockpiles large quantities of flood fight materials but the State interest is that these materials be available for crisis situations and to back up local stockpiles and not for initial needs.

The situation tends to be worse in regard to specialized evacuation supplies such as signs, low-power radio transmitters, and barricades. Barricades and other general supplies might be stockpiled by jurisdictions but rarely with the implementation of a specific evacuation tactical plan in mind. If a breach-scenario analysis is completed as part of the creation of higher quality local flood emergency action plans then this could promote the preparation of more detailed evacuation/rescue plans and the subsequent acquisition of specific supplies needed to carry them out.

General Issue #4: Need for better tools for creating a regional common operating picture

Regional jurisdictions feel that additional means for sharing real-time critical information should be created for the region. Essential elements of information were identified that would best help create a common sense of the regional threat if effectively shared. This common operating picture would facilitate inter-agency and inter-jurisdictional coordination and sharing of resources. These essential elements of information are; 1) levee patrol reports in order to reduce rumors and create an accurate sense of the status of all levees, 2) real-time locations of resources deemed critically limited to enhance the ability of mutual aid systems to deploy these resources as effectively as possible, 3) location, contact, and status information of activated unified flood fight and public safety field commands, and 4) contents of local flood emergency action plans for download in an easily printed and used map format.

5.6.2. Specific Response Issues

The following specific issues fall under the general issues identified above and were identified during a follow up interview process in November 2013.

- **Interaction with Levee Maintaining Agencies.** Operational areas in the regions have a mixed relationship with the levee maintaining agencies within their jurisdiction. Many interact with the LMAs extensively in a flood event but the manner of interaction in the field is not formally defined. LMA mutual aid processes are often not defined through any written protocols. Day to day interaction for purposes of joint planning, training, and exercises seems to be very limited throughout the regions.
- **LMA Responsibilities.** While it is clear that a levee maintaining agency is responsible for maintaining its levee and repairing any damage that may be caused by a flood, it is less clear whether an LMA is directly responsible for 1) removing impounded flood waters resulting from a breach, and 2) taking action to limit damage once flood waters originating within their jurisdiction leaves their jurisdiction. General experience is that LMAs do assist with removing impounded flood waters to some extent within their financial resources. However, they do not cross jurisdictional boundaries to flood fight flood waters leaving their jurisdiction. Any concurrent responsibility of impacted cities or counties or of the State of California to assist in dewatering is poorly defined making dewatering operations, in particular, ad hoc activities.
- **Evacuation Planning.** Written evacuation plans for specific areas protected by project levees were not identified and no written plans for assisting property owners with the evacuation of dairies and removal of hazardous materials were identified. These adjuncts to a comprehensive local, tactical, flood safety plan should be addressed.

The rural nature of the Mid and Upper Sacramento River Regions simplifies the problems of warning, evacuation, and rescue for people but elevates the importance of other evacuation and recovery issues unique to agricultural areas. Evacuation planning for the two regional cities and the numerous smaller but significant communities (e.g. Hamilton City) in the region also remains a key issue.

- **Flood Fight Materials and Mutual Aid.** No jurisdiction outside of reclamation districts and DWR was identified that maintains stockpiles of materials specifically for supporting levee flood fight operations. Specific processes for levee maintaining agencies to request mutual aid were lacking. This lack of specific written processes is even more critical in these regions since the existence of State maintenance areas within local operational areas could potentially lead to SEMS inconsistent mutual aid activities.
- **Flood Fight Operations Training.** No non-LMA jurisdiction was identified that conducts regular flood-specific training or DWR flood fight classes to its employees. This decreases the potential for meaningful, local, mutual aid processes for flood fight operations.
- **Debris Removal.** FEMA will allow counties to assist with removal of debris from private property that did not originate from the property owner's possessions or land. Counties would need to accept that role and develop a written debris removal plan with criteria for ensuring that debris removed by the county meets eligibility rules. No such plan was identified within the regions. Such assistance could be critical for expediting the return of agricultural and economic productivity after a flood.
- **Hazardous Materials.** No written plan for organizing the removal of hazardous waste from a flooded area was identified.
- **Mechanisms for ongoing planning and coordination.** Improved mechanisms need to be created to ensure that there is ongoing planning and coordination between neighboring LMAs and between LMAs and other public agencies responding in their areas. A more effective process would maintain essential personal relationships and ensure that solutions to other identified gaps are maintained into the future.

5.7. Opportunities

Despite the issues identified for emergency response planning in the Mid and Upper Sacramento River Regions, many opportunities are appearing to assist with efforts to improve the situation.

5.7.1. *Standard Local Flood Safety Plan Template*

The issuance of two grants by DWR for local flood emergency response projects has stimulated discussion on the need for adequate local tactical flood response plans that meet some consistent standard, format and content. DWR grant guidance indicates that completion of such local plans is a prerequisite to obtaining funds for other response items such as supplies or communications and the recent addition of Water Code Section 9650 (AB156) to State law which also requires such efforts. These mandates highlight the need for a standard and high quality template for such plans before uncoordinated and independent efforts result in a mixed bag of plans in the region with different formats and quality.

The preparation of the regional flood management plan is an opportunity to develop such a common, high quality, approach to meeting State mandates. As part of the project definition process for the regional flood management plan, a technical manual was developed defining and

elaborating a standard, high quality, flood safety plan based on best practices in the Central Valley. This technical manual is included in the RFMP appendices and takes advantage of this opportunity to provide local agencies with a consistent approach to local flood planning before extensive work begins.

5.7.2. *Funding Opportunities*

Propositions 1E and 84 passed by the voters in 2006 provided, among other things, for \$135 million in funding for enhancing flood emergency response in the State. In 2013, DWR issued the first grants to locals from these funds for local flood emergency response projects. A “statewide” grant with total funding of \$5 million was issued in March 2013, and a “Delta-specific” grant with total funding of \$5 million was issued in August 2013. Mid and Upper Sacramento Regions jurisdictions were eligible for applying for the statewide grant and submitted a joint, regional, application in April 2013. DWR awarded \$1.2 million to this application for preparation of local tactical flood safety plans and training in October 2013. A second round of statewide grants is anticipated in the next year or so.

This current funding opportunity and the potential second funding opportunity should be integrated into the final RFMP. Projects approved in the current grant will be identified as RFMP improvement projects and more detailed project descriptions created to guide grant implementation. Stakeholders can identify additional ER enhancement projects not funded in the current grant for inclusion in the second anticipated funding opportunity in 2014 or 2015.

5.7.3. *New Joint Planning and Maintenance Mechanisms*

The Mid and Upper Sacramento Regions RFMP process provides an opportunity for local jurisdictions to develop mechanisms and procedures for future joint flood emergency response planning and maintenance activities. Procedures and protocols used to jointly develop the regional plan should be adjusted for use after the completion of this project to perform joint planning or to jointly seek funding.

Regional operational areas could form flood response working groups within their operational area and disaster council organizations to provide a better focus and incentive for pre-event flood planning. These working groups should be composed of the reclamation districts and those public safety agencies with primary response jurisdiction within the flood plain. Working groups could be created through a written agreement or protocol that defines meeting frequency, objectives, and specific review items. The creation of such groups could ensure that flood response products developed in past preparedness projects are maintained and would help ensure that new officials have an efficient means of being properly briefed on current preparedness plans and their status.

5.8. Additional Findings

The Mid and Upper Sacramento Regions planning area is at a point where initial detailed planning for future flood fight operations and concurrent public safety operations is needed and justified. Opportunities for accomplishing this planning in the near future are available. However, a major problem in areas that have completed such detailed planning and training in the past is maintenance.

The long intervals between floods, and the other demands placed on the time of officials, makes maintenance of plans and training over the long intervals between major floods difficult. The consistent communication and cooperation that is a key element of joint planning tends to stop when initial resources run out and other demands on time become a constant distraction. Any major project to improve flood response in the Mid and Upper Sacramento Regions should include a mechanism for ensuring proper maintenance of resulting improved plans and training programs created as a result of project implementation.

5.9. Specific Recommended Projects

Based on the findings made above, the following four specific projects are recommended to improve flood emergency response preparedness in the Mid and Upper Sacramento River Regions.

5.9.1. *Overall Preparedness Goal and Summary of Recommended Projects*

The Mid and Upper Sacramento River Region jurisdictions have identified specific projects based on the review of the current status of preparedness of the region and in light of the State priorities of 1) improving local flood emergency plans and incorporating them into multi-hazard emergency response plans and 2) improving regional and interagency coordination. All specific projects would be implemented in accordance with the Federal Integrated Planning System (IPS) and Federal Emergency Management Agency (FEMA) Comprehensive Preparedness Guide (CPG) 101 as well as applicable standards of the California Standardized Emergency Management System (SEMS). All levels of government would be involved in project implementation, both vertically and horizontally, in accordance with National Response Framework doctrine.

Overall Regional Flood Preparedness Goal:

Create a sustainable, regional, integrated response structure and partnership, the foundation of which is high quality, thorough, and user friendly local flood emergency action plans to guide field response to an incipient flood problem or threat.

- Project #1: Develop a set of GIS-based local flood safety plans for the region with a common standard and mapping format.
- Project #2: Create a region-wide unified command structure and enhanced multi-agency communication and coordination system.
- Project #3: Develop and implement a regional flood response training and exercise program.
- Project #4: Implement a regional stockpile system using breach scenario analysis to supplement criteria for standard resource inventory.

Implementation of these projects will improve flood preparedness and reduce flood risks in the Mid and Upper Sacramento River Valley by addressing identified gaps in current response capabilities. They will create high quality first response to incipient flood threats by improving multi-agency coordination, decision making in the event of a levee breach, and agency response capabilities. Collection of critical information and pre-event identification of containment options to foreseeable breach scenarios in the flood safety plan implementation process will facilitate rapid and effective decision making to reduce flood damage. Enhanced regional multi-agency coordination systems which will also improve the region's ability to develop a common operating picture and share resources during a flood event. Finally, resources needed for initial response to threats to levee integrity, for initial public protection actions, and for prompt action to contain floodwaters would be acquired and placed in an integrated and more sophisticated regional stockpile system.

5.9.2. Local Flood Safety Plans

In regard to flood fight operations, reclamation districts and supporting agencies should develop local levee flood fight plans as part of an overall tactical flood safety plan as outlined by DWR. These flood fight plans would document 1) historic information and flood fight knowledge of current and past district responders; 2) current response procedures for levee flood fight; and 3) options for containing floods from a breach. Reclamation districts, levee districts, or State maintenance areas, as the local jurisdiction responsible for maintaining the flood control system, would prepare the plans with the assistance of other local jurisdictions. Flood fight plans should include provisions for flood fighting non-SPFC levees or embankments in the area that are not under the direct maintenance responsibility of a LMA or other agency but could serve to contain or limit flood extent.

The development of flood fight plans should also include identification of physical constraints to efficient response to levee problems. Areas where levee crowns or landside levee toe areas are inadequate to support potential needed response actions should be identified. In addition, areas whose improvement would support more efficient flood fight response should also be identified. These structural improvements related specifically to flood emergency response can then become a part of the LMA levee improvement plan.

A standard template for development of such flood safety plans mandated by AB156 (called tactical flood plans in DWR grant guidance) is emerging in the Central Valley that is supported by

DWR and FEMA. This template uses a map format to display information complemented with a concise written reclamation district emergency operations plan. A project definition manual based on this template is part of the Mid and Upper Sacramento RFMP.

The limited financial resources and staffing of reclamation districts makes development and maintenance of detailed and adequate levee flood fight plans difficult. LMAs also often lack formal training in developing emergency plans. LMAs could form an agreement with cities and counties to help develop plans.

5.9.3. *Unified Command Structure*

It is a high priority that local jurisdictions should clarify and document the command structure for areas threatened by flood waters. Command of levee flood fight operations and command of public safety operations should be clarified and defined in terms of ICS procedures. It is also important to clarify how separate flood fight commands and public safety agency commands will interact. These protocols could be included in the local flood safety plan. In addition, LMAs should adopt a formal mechanism for clearly designating a flood fight incident commander as part of their flood safety plans.

The Incident Command System (ICS) provides procedures and protocols for establishing a “unified command” among agencies and jurisdictions with responsibility for managing or responding to a flood event in the same geographical area. Pre-event discussion of a potential unified command structure for flood fight operations is particularly important. Identification of areas of the flood control system that are mutually dependent upon each other for protection will help determine which LMAs must work closely together in a common command. The role in such a unified command for State departmental Incident Command Teams that may arrive to assist should be worked out. Whether State agencies are merely providing advice, assuming a financial or jurisdictional responsibility for flood fight operations, or performing some other role will determine whether such outside resources will be part of the command or only a part of the operations or other function within the response. Review of the number of unified commands needed for maximum efficiency can also determine whether a pre-planned response by CalFIRE Incident Command Teams for helping with incident management is called for.

5.9.4. *Regional Training and Exercise Program*

State and federal governments require that public agencies institutionalize the National Incident Management System (NIMS) for management of disaster incidents. DWR has also issued standardized protocols for marking levee problems during levee patrols. A realistic training policy and program for LMAs should be developed as part of the planning process to provide familiarization with NIMS procedures and flood fight protocols. This should include abbreviated courses that could be presented upon flood warning to volunteers and LMA staff that have not had the opportunity to take formal courses.

A comprehensive training program should include periodic and sustained joint exercises among agencies involved in flood fight and public safety operations to ensure a well-coordinated

response, effective command and control, and familiarity among agencies that do not work together on a routine basis.

5.9.5. *Regional Stockpile System*

Design regional stockpile system including location of long-term storage sites and pre-identified deployment sites (staging areas) with specific site inventories. Completion of high quality flood fight-based local flood safety plans will provide the information needed for design of a more sophisticated regional stockpile system.

Resource needs for implementing identified containment options for foreseeable breach scenarios will now be identified and integrated into inventories for specific stockpile locations.

Develop agreements for use of specific long term and staging area storage sites and work with site owners to implement plan. Establish procedures for accessing regional stockpiles consistent with mutual aid and SEMS processes but ensuring rapid access to resources by field responders dealing with levee problems. Acquire materials and resources for regional stockpile system and place in long-term storage areas in accordance with the system plan. Specialized containers for rapid movement of materials to staging areas will be acquired as needed.