

Appendix D

Rural LMA Work Group Topic Papers

Appendix D

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1. Overview to Appendix D

In late 2012, the California Central Valley Flood Control Association established the Rural LMA Work Group to support the regional flood management planning efforts. The purpose of the work group was to identify and describe problems that are unique to rural areas and propose solutions/actions for inclusion in the RFMPs. This effort was based on the belief that sustainable, systemwide flood management must consider the role of rural communities and agricultural areas which provide the opportunity to realize multiple objectives identified in the CVFPP.

The following pages contain the topic papers prepared by the Rural LMA Work Group.

Appendix D

Rural LMA Work Group

Background

The California Central Valley Flood Control Association (Association) was established in 1926 to promote the common interests of its members in maintaining effective flood control and protection in the California Central Valley. The Association has been and continues to be actively involved in advancing and advocating for effective flood management in both rural and urban areas. In 2008, the Association established a committee called the Sacramento Valley Flood Control Action Work Group which was comprised of urban and agricultural interests with the intention of engaging local expertise and resources to assist in the formulation of regional flood management solutions for the Sacramento Valley in support of development of the State of California's Central Valley Flood Protection Plan (CVFPP). The Action Work Group's effort culminated with a report titled *"Rural Flood Protection in the Sacramento Valley"* (Report) in October 2011, which expressed important elements and considerations from a rural and agricultural perspective.

Subsequently, in July 2012, the State of California adopted the CVFPP and initiated a regional flood management planning program. To support this effort, the Association established the Rural LMA Work Group (Workgroup) in late 2012 with the purpose of identifying and describing problems that are unique to rural areas and proposing solutions/actions for inclusion in the Regional Flood Management Plans (RFMP). This effort was based on the Workgroup's belief that sustainable, systemwide flood management must consider the role of rural communities and agricultural areas which provide the opportunity to realize multiple objectives identified in the CVFPP.

ROLE OF RURAL LEVEES

Rural areas in the Central Valley have played a critical role in flood management for decades. This role varies in scope and scale from the operation and maintenance of levees protecting small communities and rural lands to the operation and maintenance of bypass levees, which are a crucial components of the entire flood control system offering flood protection to both urban and rural areas. As flood risk management in the Central Valley moves forward under a new paradigm as outlined in the CVFPP, the prioritization of the State's investments should consider this critical role and the importance of rural areas to the agricultural economy and character of the Central Valley.

With thoughtful, proper planning and implementation, rural lands, particularly farmlands, can provide both environmental benefits and flood risk reduction benefits during extreme events for urban areas, while simultaneously meeting the intrinsic purposes and goals of agricultural interests.

The existing flood management paradigm in the Central Valley depends heavily on the sustainability of these rural leveed systems. Recognizing the importance of these rural areas, the Workgroup identified key topics of importance whose impacts on rural levees are unique.

Workgroup Efforts

The Workgroup identified eleven topics and has prepared an overview of each topic in the form of a topic paper. The eleven topics and the topic statement for each are:

Agricultural Floodplain Mapping and Rate Issues – A significant portion of agricultural lands in the Central Valley are mapped as Federal Emergency Management Agency's (FEMA) regulated floodplains, or Special Flood Hazard Areas (SFHA). The restrictions for a SFHA do not provide the flexibility needed to sustain agriculture including the ability for reinvestment in infrastructure without unreasonable or cost-prohibitive measures. The RFMP effort should motivate changes in Federal law or policy to remove the financial disincentives and barriers to agriculture thriving in leveed basins mapped as FEMA 100-year floodplains.

Channel, Bank, and Bypass Maintenance – Insufficient maintenance of channels and banks of the Sacramento flood control system is adversely impacting its carrying capacity and performance and is compromising the ability of LMAs to maintain PL84-99 eligibility for their levee systems. Barriers to performing adequate maintenance include environmental and regulatory restrictions, insufficient funding and resources, and competing maintenance priorities, and competing interests of federal and state regulatory and resource agencies, and flood system maintenance agencies.

Flood Structure Protection Area – Create a mechanism to provide LMAs the ability to review land-use activities in the vicinity of flood protection structures so that the activities do not conflict with the design, construction, maintenance, operation of the LMA's facilities, and do not compromise structure integrity.

Rodent and Burrowing Animal Control – The presence of rodents on levees is a historic and ongoing problem that poses a threat to levee integrity due to increased seepage penetration into the levee and interior and exterior erosion causing voids and levee stability issues via the burrows the rodents create.

Continuance in the Federal Program – Continued participation in the Federal Program provides benefits for planning and implementation of major repair and/or improvement projects as well as benefits during and following emergency events. However, deauthorization, or removal from the Federal program through other means, may provide its own benefits. A weighing of advantages and disadvantages should take place to determine if deauthorization should be pursued and if so how and where (i.e., large or small systems, rural or urban systems, etc).

Eligibility in the PL84-99 RIP – Inactive status in the Rehabilitation and Inspection Program (RIP) results in a loss of eligibility for Federal PL 84-99 rehabilitation assistance (i.e., funding) following an emergency event and Sponsors and LMAs would therefore be faced with rehabilitating damaged levees using all non-Federal funds. It is difficult for Rural LMAs to design, implement, and fund rehabilitation of levees following an emergency event without Federal assistance. If LMAs are unable to fund or otherwise implement repairs, it is unclear who would make the repairs and if this responsibility would fall on the State as the non-Federal sponsor.

Pipe Maintenance and Inspection – LMAs lack the enforcement authorities for inspection and maintenance of private and certain public pipe penetrations in their levees. The Central Valley Flood Protection Board (CVFPB), as the authorizing agency, has issued the encroachment permits for these facilities and holds the enforcement authority through the encroachment permits. In light of reluctance for pipe owners to properly inspect and maintain their pipes, there is a need to develop clear enforcement action and also develop other cost effective methodologies for performing the inspections that do not solely rely on video and sonar.

Encroachments – Undocumented encroachments and non-compliant encroachments present safety and legal challenges for LMAs.

Permitting and Maintenance Activities – Most maintenance activities are exempt from NEPA and CEQA but require compliance with other laws such as State and Federal endangered species laws and California’s streambed alteration law. Compliance with such laws is usually achieved through a permitting process that is burdensome, lengthy, and expensive. As such, LMAs typically avoid the permitting process altogether to meet obligations for levee safety, or choose to not conduct proper maintenance to avoid consequences from the resource agencies.

Flood Emergency Response – The full benefits of the current LMA structure for levee emergency response and management cannot be realized without cooperatively addressing the staff and financial limitations of LMAs and related jurisdictional issues that prevent more effective, decentralized response to levee problems in a major valley-wide event placing additional response burdens on State and Federal agencies for the flood fight.

Maintenance of Mitigation and Habitat Enhancement Projects – The increasing number of mitigation planting and habitat enhancement projects within the channels, bypasses, and other floodways of the Sacramento and San Joaquin River flood systems together with existing ‘legacy’ mitigation projects is compounding the already challenging regulatory environment faced by levee maintainers. Failure to properly plan, maintain and manage mitigation and habitat enhancement projects is resulting in adverse impacts to hydraulic capacity, conveyance, and ability to inspect, monitor, and flood fight. Further, plantings are migrating beyond their original project limits and the lack of “safe harbor” agreements is creating financial and operational constraints for the LMAs.

These topic papers have been shared with the Department of Water Resources and with several non-governmental organizations. The topic papers are also being shared with the individual Regions (and other interested parties) to support development of their respective RFMP efforts. As the Regions review and consider these topic papers, it is the intent of the Workgroup to develop solutions/actions for topics that are prioritized by the Regions. For those topics not prioritized for this edition of the RFMP, it is the Workgroup’s goal to at least include all of the topic papers as an appendix and work towards solutions/actions for future editions of the RFMPs.

Agricultural Floodplain Mapping and Rate Issues

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

A significant portion of agricultural lands in the Central Valley are mapped as Federal Emergency Management Agency's (FEMA) regulated floodplains, or Special Flood Hazard Areas (SFHA). The restrictions for a SFHA do not provide the flexibility needed to sustain agriculture including the ability for reinvestment in infrastructure without unreasonable or cost-prohibitive measures. The RFMP effort should motivate changes in Federal law or policy to remove the financial disincentives and barriers to agriculture thriving in leveed basins mapped as FEMA 100-year floodplains.

Description of Topic

Agricultural economies have a dramatic impact on the economy of the United States, and the local and state economies in the areas of the country with the most agriculture production rely on the viability and success of this robust industry. In these states, a significant portion of agricultural lands are mapped as Federal Emergency Management Agency's (FEMA) regulated floodplains. In order for these states to continue to sustain a strong agricultural economy, changes are needed to the National Flood Insurance Program (NFIP) that will promote the sustainability of agriculture in the floodplain. The proposed changes will promote prudent floodplain management principles and minimize the risk of increased urbanization of the floodplain.

Through the NFIP, FEMA regulates activities in areas subject to flooding from a base flood, or a flood that has a 1-percent chance of occurring in any given year. These areas are called Special Flood Hazard Areas (SFHAs). Whether originally mapped into an SFHA, or newly remapped as a result of FEMA's Map Modernization Program and RiskMAP, significant agriculture areas around the country are found in these SFHAs with huge portions of the Central Valley also being in these SFHAs. Without substantial State and federal funding, and due to the limited financial ability of most rural communities to improve their levee systems to meet FEMA's 100-year certification criteria, these rural agricultural communities are expected to remain in SFHAs.

The restrictions of an SFHA, while effectively and appropriately curbing development in the floodplain, do not provide the flexibility needed to sustain an agricultural community. The strict regulations have made reinvestment in agricultural operation facilities, commercial facilities in support of agriculture, equipment repair facilities, livestock and crop processing facilities, housing for agricultural operators, or temporary farm worker housing financially infeasible and/or unattainable in these areas. This is because in order to meet the regulatory requirements of investment in agriculture in SFHAs, structures must be wet floodproofed, dry floodproofed, or elevated. These requirements are often infeasible or cost prohibitive. In addition, all federally backed mortgages for properties in SFHAs require Federal mandated flood insurance.

Legislative or administrative changes are required to allow the NFIP and its implementation to not devastate agricultural communities as an unintended consequence. These changes might include the follow examples:

- Congress could establish a FEMA flood zone for agriculturally-based communities to allow replacement or reinvestment development in historically agricultural floodplains even where new or improved construction would be below the BFE.
- Congress could require that for these special agricultural zones FEMA should adjust the NFIP rate to be more actuarially structured by evaluating the actual flood risk based on historical performance of levees, as opposed to assuming that no protection actually exists where a levee does not meet FEMA 100-year standards. This would lower the base rates for people in lower risk areas while not affecting rates for frequent claims and higher risk areas.

On February 17th, 2012, the Agricultural Flood Management Alliance (AFMA) was formed as a coalition of local agencies, organizations, and individuals interested in protecting the long-term viability of agricultural communities, industries, and operations located in the regulatory floodplain. These communities have a significant historic cultural presence and play an integral role in the viability of agriculture locally, regionally, and nationally. The Alliance adopted the following guiding principles to describe its members' common concerns and interests. The Alliance believes that the framework of flood risk management as applied in agricultural areas and agricultural communities must:

1. Support and protect the economic viability and vitality of agriculture industries and dependant small communities.
2. Recognize the benefits locally and nationally of the agricultural uses of the floodplain as a practical means to limit long-term flood risk while supporting a critical element of our economy and the security of our food supply.
3. Include provisions for agricultural and small dependant communities that allow for practical and feasible replacement of and reinvestment in industrial and commercial structures, to ensure long term socio-economic sustainability.
4. Establish flood insurance rates for agricultural and small dependant communities that are economically manageable by property owners while contributing to the overall fiscal viability of the NFIP.
5. Provide a role for representatives of the agricultural and small dependant communities to participate in the process of developing recommended modifications to the NFIP that are specific to address these and related issues.

Relevance to the RFMP

Because the RFMP process is unlikely to take these agricultural basins out of SFHAs, the RFMP should be used to promote the ideas contained in this paper and seek relief from the NFIP for these communities, thus allowing continued investment and reinvestment in our agricultural communities. In particular, the RFMPs should specifically endorse AFMA's efforts and should cooperatively explore the viability of the State of California creating a rural flood insurance program which would allow communities to opt-out of the high-rate FEMA flood insurance.

Channel, Bank, and Bypass Maintenance

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

Insufficient maintenance of channels, banks, and bypasses of the flood control system is adversely impacting its carrying capacity and performance and is compromising the ability of LMAs to maintain PL84-99 eligibility for their levee systems. Barriers to performing adequate maintenance include environmental and regulatory restrictions, insufficient funding and resources, competing maintenance priorities, and the competing interests of federal and state regulatory and resource agencies and flood system maintenance agencies.

Description of Topic

Water Code section 8361 indicates that the State Department of Water Resources must maintain specific enumerated project features, including the “channels and overflow channels” of the Sacramento River and tributaries, while the local maintaining agencies are responsible for other features, including levees. However, the DWR’s Channel Evaluation and Rehabilitation program for the Sacramento system has been hindered at times by budget and environmental constraints. This has resulted in banks that have eroded into levees, channels that have become overgrown with vegetation, and overflow channels that have aggradated resulting in decreased carrying capacities of the system and as a result are negatively affecting levee inspection ratings.

As part of assuming maintenance responsibility for the Sacramento River Flood Control System and San Joaquin River & Tributaries, the State agreed to comply with the regulations of the Corps as defined in the Standard Operation and Maintenance Manuals for the Projects¹. In the manual, Section VI, Channels, describes “The channels of the project constitute that part of the waterway which lies between the levees of the Sacramento River ... and all tributary and distributary streams.” The manuals go on to describe the maintenance requirements of the channels and floodways in Section 6-02, paragraph a.1, which includes “(i) The channel or floodway is clear of debris, weeds, and wild growth;” as well as “(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred.” Finally, paragraph b of the same section requires that “(1) Weeds and other vegetal growth in the channel shall be cut in advance of the flood season and, together with all debris, removed from the channel; and... (4) Dumped rock or other suitable types of protection should be placed at locations found by experience to be critical trouble points, with a view to stabilizing the channel alignment and preserving the general uniformity of the bank lines.”

The above requirements of the O&M manuals for the Sacramento River system have not consistently been met. This may be the result of State funding constraints, difficulty in meeting regulatory requirements for sensitive resources, or simply a lack of prioritization. As a result, LMAs are encountering issues with overgrown channel vegetation encroaching onto levees resulting in decreased channel capacity and non-compliance with levee

¹ Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project, prepared by the Sacramento District, Corps of Engineers, US Army, Sacramento, California dated May 1955

vegetation standards; bank erosion that has encroached into the levee section and resulting in compromised levee stability; and an increase in unacceptable levee inspections resulting from these State responsibilities which may impact the ability of the State to receive Federal assistance following a flood event.

Relevance to the RFMP

The RFMP process provides an opportunity to examine why there is a lack of adequate channel maintenance such as funding constraints, regulatory constraints, and/or lack of prioritization, and develop planning, financing, and implementation strategies and solutions to address the issue going forward. Additionally, the process allows a continuing, formal venue for serious dialog and action with the State to address and resolve the issues as described.

Potential Solutions

The RFMP should recommend some or all of the following specific actions relevant to each region:

- That the State recognize and accept the definition of channels as clearly described in Section VI of the Standard Operation and Maintenance manual as “The channels of the project constitute that part of the waterway which lies between the levees of the Sacramento River ... and all tributary and distributary streams.”
- That the State should work with the USACE to update the standard Operation and Maintenance manuals for both the Sacramento and San Joaquin River Systems to establish appropriate channel maintenance measures that preserve the design capacity with consideration for the ecosystem function of the river channels and floodways. Current O&M standards are outdated and no longer feasible.
- That the State and LMAs should work with Regulatory Agencies on long-term maintenance plans to avoid the need for mitigation. These plans could limit the areas for sediment removal, vegetation thinning or removal, or slope protection in areas where the channel is encroaching within 35 feet of the levee. Maintenance measures and standards would include best management practices and be covered in maintenance agreements to avoid lengthy and costly environmental consultation.
- That the State develop a dedicated and reliable Statewide funding mechanism to provide a minimum annual revenue stream to support channel and bank maintenance. This program could include end user fees for the State Water Project and other water delivery systems.

Continuance in the Federal Program

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

Continued participation in the Federal Program provides benefits for planning and implementation of major repair and/or improvement projects as well as benefits during and following emergency events. However, deauthorization, or removal from the Federal program through other means, may provide its own benefits. A weighing of advantages and disadvantages should take place to determine if deauthorization should be pursued and if so how and where (i.e., large or small systems, rural or urban systems, etc)

Description of Topic

The levees comprising the Sacramento River Flood Control Project (SRFCP) and the Lower San Joaquin River and Tributaries Project (LSJR&T Project) are referred to as “Federal Project” levees as they are part of a congressionally authorized project. While the State of California is the non-Federal sponsor of the SRFCP, the project remains subject to Federal regulations as agreed to in cost-share agreements; Operation, Maintenance, Repair, Replacement, or Rehabilitation (OMRR&R) agreements; or other binding documents.

The primary benefits of being part of the Federal program (i.e., a congressionally authorized project) are the cost-sharing of planning studies and construction of projects, and non-cost-shared rehabilitation assistance during and after declared emergency events. Participation in a planning and potential construction of a Federal project can be difficult for rural LMAs as the cost of levee upgrades are expensive and the benefits (i.e., damages) often do not outweigh the high costs. As a result, obtaining a “Federal Interest” is difficult and subsequent funding recommendation from the Office of Management and Budget is even more difficult as it typically requires a benefit to cost ratio of greater than 3.0. Cost-shared assistance during and after declared emergencies is available to both project and non-project levees if the LMA has requested and received eligibility in the PL 84-99 Rehabilitation and Inspection Program (RIP). The RIP also requires a minimum 1.0 benefit to cost ratio, but because repairs are generally smaller as compared to major levee system upgrade projects, history indicates that this requirement can be met. Secondary benefits have in the past included the Corps’ certification of projects to support local communities in obtaining FEMA accreditation for the 100 year event. However, based on review of new guidelines (EC 1110-2-6067) published by the Corps it is unlikely that this benefit will be realized as was in the past.

In accordance with commitments made in applicable cost-sharing agreements, the non-Federal sponsor’s primary responsibility following construction of the project is Operation and Maintenance (O&M) of the project under 33 CFR 208.10 through compliance with the O&M Manual provided by the USACE at the time of project completion. The USACE can adapt and/or revise existing regulations, create new regulations, or modify O&M

Manuals as tools, technology, and science improve over time. Generally, the guiding document remains the O&M Manual, although recent updates of regulations by the USACE will likely require a modification to O&M manuals and thus O&M practices.

The USACE enforcement position and regulation concerning vegetation on levees has changed and the USACE has issued new guidelines reiterating the removal of most vegetation on levees except in cases where it can be demonstrated that the vegetation is not a threat to levee integrity. The USACE's guidelines, which are in conflict with the O&M manual for the SRFCP and LSJR&T Project, have acted as a catalyst for discussions on eligibility in the PL 84-99 RIP and the viability of remaining a Federal project as it would be extremely difficult to obtain the necessary environmental permits and the necessary funding to comply with the removal requirements.

Removal of projects from the Federal program would almost certainly require a congressional act. USACE has authority to conduct deauthorization studies, which are submitted to Congress, but funding and processing of these studies would be uncertain. USACE deauthorizations are uncommon. Independent from the USACE deauthorization project, non-Federal sponsors, or others, could pursue their own congressional legislation to remove the project from the Federal program.

If the project was deauthorized and removed from the RIP, it could be eligible for assistance for both flood fighting and rehabilitation through the Federal Emergency Management Agency (FEMA) or National Resources Conservation Service (NRCS) programs if Congress indicated so. Flood control works that are eligible for USACE's RIP program, either Active or Inactive, are ineligible for assistance from FEMA for emergency repairs and permanent repairs.

If the project were no longer in the Federal program, permitting requirements under 33 USC 408 would be eliminated except in cases where an alteration could have an effect on an adjacent, or neighboring, Federal project. Permitting under other Federal and State authorities would likely be required.

Relevance to the RFMP

As part of the RFMP, the regions should consider if the State and local communities should pursue congressional deauthorization of portions of the SRFCP and LSJR&T Project. Consideration should be given to the ability of LMAs and the State to meet standards which would provide emergency and rehabilitation assistance, the ability to fund levee improvement projects without Federal cost-share dollars, and liability for damages in the event of failures. Further consideration should be given for evaluating where levees may not be necessary (e.g., levees near the San Joaquin River National Wildlife Refuge) and could altogether be removed from the Federal program.

Rural LMA TOPIC SHEET

Flood Emergency Response

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

The full benefits of the current LMA structure for levee emergency response and management cannot be realized without cooperatively addressing the staff and financial limitations of LMAs and related jurisdictional issues that prevent more effective, decentralized response to levee problems in a major valley-wide event placing additional response burdens on State and Federal agencies for the flood fight.

Description of Topic

Rural LMAs are separate, local political entities with primary jurisdiction and responsibility for a key aspect of flood emergency response: preventing levee failure and minimizing the extent, depth, and duration of flood waters if a levee does fail. Relying on multiple, separate, local jurisdictions for this important function promotes decentralization of authority which, in turn, leads to potentially more rapid response to levee problems by knowledgeable, highly motivated, on-scene officials. But the historically limited administrative structure, staffing, and financial resources of these levee maintaining agencies undermines this potential benefit to flood emergency response. In particular, the constrained finances of rural LMAs, whose levees often protect a wide variety of critical infrastructure in addition to their landowners, can lead to response delays as these otherwise capable jurisdictions are forced to seek necessary funds or resources from other levels of government for emergency actions.

This situation is aggravated by the jurisdictional ambiguity created among cities, counties, and many State agencies in regard to helping in an emergency with often costly levee flood fight activities by the rural LMAs' separate political status. In theory, mutual aid and coordination systems established under the California Standardized Emergency Management System (SEMS) address these issues. But mutual aid has been historically based on sharing existing resources (e.g. fire engines) and a key aspect of a levee "flood fight" is the common need to directly expend large amounts of funds for private contractors and vendors and expensive bulk materials. Current mutual aid systems do not explicitly address the provision of such direct large expenditures on behalf of another jurisdiction and FEMA disaster reimbursement regulations actually discourage it. The resulting inconsistent and variable attitudes among local counties and cities and many state agencies toward helping to control a levee problem causes rural LMAs to become overly dependent on just two agencies, the Department of Water Resources and the Corps of Engineers, for assistance with serious levee problems that could have been potentially handled locally.

In a large flood the geographic scale at which different agencies dealing with different components of the flood response establish command and control often varies due to differences in agency jurisdictional boundaries, resources, and internal protocols. This, along with the multiplicity of LMAs, often leads to failures to communicate in a major flood event. Institutionalization of the National Incident Management System (NIMS) and participation in state-of-the-art planning and training activities as advocated by State and Federal agencies to correct these problems is difficult for rural LMAs due to their limited staffs. Compliance with training

standards is also difficult for the same reason as well as from the heavy reliance of rural LMAs on volunteers and ad hoc help recruited at the time of an emergency.

Relevance to the RFMP

RFMPs should promote the following to address the issues discussed above.

1. Development of a mechanism to provide emergency cash flow and mutual aid at the beginning of a flood so that the local agency best placed to act quickly on a levee problem can do so immediately and directly. Potential mechanisms were identified in the Sacramento-San Joaquin Delta Multi-Hazard Coordination Task Force Report (SB27) report submitted but not issued by the Governor. The draft California Water Action Plan issued by Secretary Laird identifies one of those mechanisms, modification of the California Disaster Assistance Act (CDAA), and indicates that the State will pursue legislation to address this issue through that mechanism.
2. More ongoing administrative support from counties, cities, and State agencies to help rural LMAs develop and maintain more thorough and easily maintained levee response plans that would include recovery planning. Funding opportunities from DWR and other agencies should be accessed to support such multi-jurisdictional planning.
3. More pragmatic guidance for rural LMA compliance with NIMS standards, pre-established unified commands, and abbreviated safety/NIMS/SEMS response courses that can be presented upon flood warning should be created. This should not be interpreted as any desire to change SEMS but to develop more effective implementation mechanisms.
4. Establishment of unified flood fight commands made up of multiple interdependent LMAs and their key levee flood fight support agencies throughout the flood control system along with protocols for better integrating those commands with public safety commands operating in the same area. Pre-event development of regional “associations” of LMAs to better finance and support development of their emergency plans should also be explored.

Rural LMA Topic Sheet

Encroachments

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

Undocumented encroachments and non-compliant encroachments present safety and legal challenges for LMAs.

Description of Topic

Undocumented encroachments, permitted or not, and documented, non-compliant encroachments present safety and legal challenges for LMAs. If an LMA or the State cannot produce documentation of an encroachment, that encroachment is flagged during inspections as an unpermitted encroachment and therefore unacceptable. If an encroachment is not in compliance with its permit, it is also flagged as unacceptable. Depending on the type of encroachment, either can cause an entire levee system to lose eligibility under PL 84-99. Of particular concern are encroachments representing a risk to levee integrity. Further, should a failure occur due to a known encroachment listed as unacceptable or one that simply lacks documentation of compliance, could the LMA be liable?

Here are encroachment scenarios presenting a challenge:

- Not permitted,
- Legacy encroachments lacking documentation (i.e., not specifically or thoroughly documented in as-builts)
- Permitted by CVFPB, no concurrence from USACE;
- Permitted by CVFPB with concurrence from USACE, not in compliance with permit terms;
- Permitted by CVFPB with concurrence from USACE, in compliance with permit terms but not documented; or
- Not permitted, but constructed by the USACE as documented in the as-builts or O&M manual.

Resolution of these scenarios can range from straightforward to complex. For example, for encroachments which are not complex and can be shown to not impair the project, a framework or process, agreed to by the CVFPB and USACE, could be established for retroactive permitting of the facilities. This could be used for several of the scenarios. For encroachments not meeting the permit terms or for encroachments that lack permits and should not be present, a more complex process, such as the current enforcement process, would be used.

Regardless of the resolution, documentation is the first phase of determining if an encroachment is permitted and what conditions those permits included. USACE and CVFPB have undertaken an effort to research historical

and current files to build a database of encroachments. However, this database is not yet widely available to LMAs nor is it complete. The database is a good start, but more attention should be given to locating documents and files. LMAs should also participate by researching their own files and providing permits to the CVFPB or USACE for inclusion in the database, and by maintaining their own repository of encroachment permits, compliance documentation, and maintenance activities related to encroachments.

In addition to typical encroachments owned by an individual or company, there are some encroachments that exist as a result of the levee system itself. These encroachments, primarily interior drainage ditches adjacent to the landside levee toe, retaining walls, rip-rap, and pipes, present a unique set of problems as they often pre-date permits, and documentation can be inconclusive. Some of these encroachments may be found in as-builts, but others are not seen in as-builts or the as-builts cannot be found. These encroachments are typically maintained by the LMA, but many have either exceeded their lifespan and/or need improvements to meet current standards.

Relevance to the RFMP

The RFMP should encourage and emphasize the need for continued research of existing encroachment permit documentation including as-builts and levee logs. The goal of the process should be to 1) remove unnecessary facilities; 2) bring necessary facilities into compliance; and 3) permit all encroachments with clearly identified responsible parties and specific conditions of compliance. Further the RFMP should present the below ideas to help prevent similar issues from occurring in the future:

- Recommend that the State adopt a standard noticing procedure to remind encroachment owners that they must maintain their encroachments in accordance with the permit terms and current standards.
- Require encroachment owners provide annual records of maintenance, inspection, repair, and replacement demonstrating compliance with permit terms and current standards to the LMA.
- Establish a process where LMAs report annually to the CVFPB on any violations as well as any efforts the LMA has taken to resolve issues prior to being reported for action by the CVFPB. This would not prevent the LMA from doing the same outside an annual cycle for critical concerns.

In the case of those encroachments believed to be necessary for the functioning of the system (i.e., landside drainage ditches, erosion protection, or other facilities), the CVFPB should analyze the necessity of the facility and, where the facility is deemed necessary to accommodate the levee system, the State provide a funding program to address required upgrades, improvements, and/or documentation of the facility in the project as-builts.

Rural LMA TOPIC SHEET

Flood Structure Protection Area

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

Create a mechanism to provide LMAs the ability to review land-use activities in the vicinity of flood protection structures so that the activities do not conflict with the design, construction, maintenance, operation of the LMA's facilities, and do not compromise structure integrity.

Description of Topic

Flood protection structures can be adversely impacted by land use decisions ("land-use activities") which do not fully consider how the activity is integrated into a region's flood protection requirements and systems. These adverse impacts can be minor, requiring recurring, unbudgeted maintenance effort; significant, creating a need for major levee repair projects; or even catastrophic, causing failure of the levee during a high-water event, leading to a major flood event. In addition, un-integrated land-use activities can be cited by flood protection authorities as reason for decertification of a flood protection structure and/or removal of flood protection systems from aid programs such as PL84-99.

"Land-use activity" could mean any ministerial, discretionary, or other regulatory permit approvals that are likely to lead to a change to improved or unimproved land, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials. These approvals include, but are not necessarily limited to:

- General Plan amendments;
- Zoning Map changes;
- Conditional Use Permits;
- Design Review Permits;
- Parcel Mergers and Lot Line Adjustments;
- Sign Permits;
- Encroachment Permits;
- Public & Private Utilities;
- Specific Plans & amendments;
- Zoning Text amendments;
- Planned Development Permits;
- Subdivision Maps and Parcel Maps;
- Building Permits;
- Grading Permits;
- On-site Development Permits;
- Underground Pipelines.

To ensure LMAs have an opportunity to review and comment on land-use activities which could impact their systems, improved communication and interaction between LMAs and land-use authorities is needed. Creation of "Flood Structure Protection Areas" directly adjacent to levees and other flood control structures would provide LMAs an opportunity for input on land-use decisions occurring in the vicinity of their facilities. These areas would be identified in county and city floodplain management ordinances and/or general plans as zones in which input is required from LMAs before land-use decisions are finalized.

The Flood Structure Protection Areas would extend a distance, to be determined, from the land-side edge of any flood protection structure and would extend to the center-line of the adjacent watercourse.

LMA review of land-use activities would be focused on evaluating proposed land-use activities to determine if the proposed activities are likely to conflict with the design, construction, maintenance, and/or operation of the LMA facilities, or would adversely impact the integrity, of any flood protection structure.

Relevance to the RFMP

The RFMP process could be used to identify areas within the region of applicability of Flood Structure Protection Areas. The RFMP process could also help develop model floodplain ordinances and general plan amendments for adoption by local land-use authorities detailing how Flood Structure Protection Areas should be developed, implemented, and administered.

Maintenance of Mitigation and Habitat Enhancement Projects

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

The increasing number of mitigation planting and habitat enhancement projects within the channels, bypasses, and other floodways of the Sacramento and San Joaquin River flood systems together with existing 'legacy' mitigation projects is compounding the already challenging regulatory environment faced by levee maintainers. Failure to properly plan, maintain and manage mitigation and habitat enhancement projects is resulting in adverse impacts to hydraulic capacity, conveyance, and ability to inspect, monitor, and flood fight. Further, plantings are migrating beyond their original project limits and the lack of "safe harbor" agreements is creating financial and operational constraints for the LMAs.

Description of Topic

Rural LMAs recognize that when trying to accomplish specific goals, such as species recovery for example, there is value in implementing mitigation and enhancement projects within the flood control system. However, such projects are often implemented without:

- establishing that public safety has primacy over other benefits provided by the flood control system;
- identifying and securing sustainable funding for long term maintenance;
- defining maintenance roles and responsibilities;
- obtaining long-term (programmatic) regulatory permissions to perform levee maintenance without the need for additional mitigation;
- providing safeguards to neighboring landowners and levee maintaining agencies when the projects migrate beyond their original project limits.

Failure to account for these considerations has resulted in adverse impacts to the carrying capacity and performance of the Sacramento and San Joaquin River flood systems. Further, LMAs are adversely affected both financially and operationally as they cannot perform proper levee maintenance due to increased costs, permitting, or inability to access, inspect and perform repairs within those sites. This in turn can impact the status of the levee system in the PL 84-99 Rehabilitation and Inspection Program.

Relevance to the RFMP

The RFMP process provides an avenue to evaluate how mitigation planting and habitat enhancement projects are planned, implemented, and maintained currently, and identify improvements to the process. The RFMP process also allows the opportunity to examine in a comprehensive regional manner, the goals, objectives and

necessity for mitigation planting and habitat enhancement within the flood control system. The RFMPs should recommend that all in channel mitigation areas be required to address the five bullets listed above.

SUBJECT TO CHANGE

Permitting and Maintenance Activities

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

Most maintenance activities are exempt from NEPA and CEQA but require compliance with other laws such as State and Federal endangered species laws and California's streambed alteration law. Compliance with such laws is usually achieved through a permitting process that is burdensome, lengthy, and expensive. As such, LMAs typically avoid the permitting process altogether to meet obligations for levee safety, or choose to not conduct proper maintenance to avoid consequences from the resource agencies.

Description of Topic

Compliance with the State and Federal endangered species acts (ESA) presents a difficult challenge primarily because "rules of thumb" for activities impacting listed species are changing and the process to obtain permits is burdensome and lengthy often times delaying maintenance or forcing LMAs to conduct their maintenance without consultation or risk eligibility in Federal rehabilitation programs. This dilemma is particularly difficult for rural LMAs because they lack the financial resources to rehabilitate the levees following any event without Federal assistance. Further, LMAs lack the resources to implement costly mitigation measures.

Levee maintenance requirements were prescribed by USACE decades prior to ESA laws upon turnover of the SRFCP and SJR&TP. LMAs have adjusted their maintenance methodologies to accommodate these laws and the listings of species but common maintenance practices that in the past were not considered to affect listed species now are making it difficult to meet obligations for levee maintenance.

Improvements to the permitting process could be achieved through programmatic agreements or other prearranged agreements that provide for efficient processing. Additionally, incentives for using certain maintenance methodologies (e.g., timing and/or phasing of activity, type of management activity such as cutting versus burning versus spraying or grouting versus , etc), which if used, would alleviate mitigation requirements. Other options could include setting aside designated mitigation areas or providing pre-mitigation (advance mitigation).

For any activity that will substantially divert or obstruct the natural flow of the river; substantially change or use any material from the bed, channel, or bank of a river; or deposit or dispose of debris, waste or other material where it may pass into a river requires notification to California Department of Fish and Wildlife (DFW) for a streambed alteration permit. DFW contends that Section 1600 applies to areas from the waterside levee crown to and the water and wetted channel. While there is disagreement between the LMAs and DFW on what actions

constitute substantial, both parties have been relatively successful in moving forward with streambed alteration agreements enabling maintenance activities to proceed.

Relevance to the RFMP

LMAs want to perform maintenance in compliance with all rules and regulations but processes and uncertainty make this difficult. The RFMP presents an opportunity to propose a solution that provides the LMAs with the permissions they need to conduct maintenance and the assurances the resource agencies to protect listed species and resources. Specifically, a programmatic agreement or framework for permits with the resource agencies could provide an effective avenue for permitting that enables the LMAs to conduct their maintenance activities while considering the interests of listed species and resources. Agreements could be tailored for the LMA, species, timelines, etc.

Pipe Maintenance and Inspection

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

LMAs lack the enforcement authorities for inspection and maintenance of private and certain public pipe penetrations in their levees. The Central Valley Flood Protection Board (CVFPB), as the authorizing agency, has issued the encroachment permits for these facilities and holds the enforcement authority through the encroachment permits. In light of reluctance for pipe owners to properly inspect and maintain their pipes, there is a need to develop clear enforcement action and also develop other cost effective methodologies for performing the inspections that do not solely rely on video and sonar.

Description of Topic

Gravity or pressurized pipes that penetrate the levee are required to be inspected and maintained pursuant to the Code of Federal Regulations (CFR) Section 208.10 and the Standard Operations and Maintenance Manual. Those documents only provide general requirements. Current USACE guidance documents require inspection utilizing video or sonar inspection every five (5) years. Maintenance is performed as appropriate to repair or replace pipe penetrations in order to bring them into compliance with the USACE and CVFPB standards. Permitted repairs and installations must also be compliant with current California Code of Regulations, Title 23. Waters, Division 1. Central Valley Flood Protection Board.

The intent of the USACE's video inspection program is to monitor the interior of pipes through the levee every five (5) years so that pipes can be rehabilitated or replaced before damage occurs that could threaten the integrity of the levee. The inspection also provides a record of the previous condition of each pipe for comparison over time, allows an inspector to examine parts of the pipe that cannot be inspected visually from the pipe exterior or levee surface, and allows the pipe owner, DWR and /or the LMA to determine whether the condition of a pipe requires action to protect the levee. Additionally, by identifying pipes that need attention prior to failure, the repairs can be scheduled to occur outside of the typical flood season, and at a time when the pipe owner could find them more cost-effective than an emergency repair.

Video inspections are costly, and pipe owners may resist or refuse to perform them. This is problematic for LMAs as failure to perform and report the inspection results could result in unacceptable ratings by USACE and/or CVFPB. Other effective methods of inspection, such as pressure testing, may provide an acceptable level of analysis and be more cost effective and practical, and might allow for a higher level of compliance. Also, most pipes are steel, and video inspection may be limited in identifying problems as most of the corrosion occurs from the exterior of the pipe. Access to the video equipment is limited and use generally requires cutting access entrances for insertion of the devices. These access entrances can cause additional sites for corrosion to start

and can be difficult and expensive to install properly. These pipes present a very minor threat for flooding, when they cross above the floodplain or have positive closure structures on the waterside of the levee since these measures generally prevent or limit conveyance of flood waters.

While there is little or no disagreement for the inspection requirements on pipes that are located below the design water surface elevation, there are instances, particularly in the Delta, where pipes are installed on the levee slope surfaces and only penetrate the levee just below the crown above the design water surface elevation. Additionally, once the pipe inspections have been performed, and maintenance/rehabilitation actions are identified, there exist various issues regarding the necessity and expense associated with obtaining permits and the permit requirements for maintenance/rehabilitation. Many routine maintenance actions should not require costly permit application processes or expensive upgrades to the existing facility. There are also instances where a “one size fits all” regulation may not provide the most cost effective or best practice for a given situation. An example of this is positive closure devices on pipes that are located above the design water surface elevation.

In addition to the issues listed above, a majority of pipes are permitted encroachments in the flood control systems. The encroachment permits are issued through the CVFPB and only require an endorsement by the LMA. Although the existing permits themselves do not typically include requirements for video inspections, they do include a standard condition that would require the encroachment owner to remove, alter, or relocate the encroachment at their sole expense for any reasons upon written notice from the CVFPB. Because the CVFPB is the permitting agency, they hold the enforcement authority. However, they have rarely used their authority and have only recently been given legal authority to develop an enforcement process to bring encroachments into compliance with current standards.

Relevance to the RFMP

The primary issue for LMA's is that they do not own or operate many of the pipes that penetrate their levees, and therefore lack the ability to access those pipes for inspection and maintenance. Furthermore, the LMAs cannot afford to be held financially responsible for those inspections or the maintenance of the pipelines. Enforcement of the inspection and maintenance requirements is difficult and costly for the LMAs and is the responsibility of the CVFPB.

Opportunities may exist for streamlined permitting for simple repairs and rehabilitation of pipelines. In many cases a notification of the repair and a simple report may suffice provided they meet specific criteria, i.e. repairing a siphon breaker, or fixing a small leak or valve. Additionally, there needs to be some flexibility in the regulations to avoid “one size fits all” policies for construction, repair and inspection so that more cost effective solutions can be implemented that retain the overall protection desired. Finally, there needs to be outreach and education of utility owners to help them understand why compliance with the standards is important so they become willing and proactive participants.

The RFMPs should propose that the CVFPB develop a process that includes the following, very similar to the process for other encroachments

- The State adopt a standard noticing procedure to remind encroachment owners that they must maintain their encroachments in accordance with the permit terms and current standards, including video inspections of pipes crossing under or through levees.
- Require encroachment owners provide annual records of maintenance, inspection, repair, and replacement demonstrating compliance with permit terms and current standards to the LMA.
- Establish a process where LMAs report annually to the CVFPB on any violations as well as any efforts the LMA has taken to resolve issues prior to being reported for action by the CVFPB. This would not prevent the LMA from doing the same outside an annual cycle for critical concerns.
- Where pipes were installed as part of the system and the LMA is responsible for maintenance of that facility, the State should consider a funding program to assist LMAs with bringing the system facilities into compliance.

Eligibility in the PL84-99 RIP

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

Inactive status in the Rehabilitation and Inspection Program (RIP) results in a loss of eligibility for Federal PL 84-99 rehabilitation assistance (i.e., funding) following an emergency event and Sponsors and LMAs would therefore be faced with rehabilitating damaged levees using all non-Federal funds. It is difficult for Rural LMAs to design, implement, and fund rehabilitation of levees following an emergency event without Federal assistance. If LMAs are unable to fund or otherwise implement repairs, it is unclear who would make the repairs and if this responsibility would fall on the State as the non-Federal sponsor.

Description of Topic

Levee systems are inspected through the USACE RIP. Systems that receive unacceptable ratings through either routine or periodic continuing eligibility inspections are placed on inactive status in the RIP which affects the amount and type of Federal funding assistance for which a non-Federal sponsor may be eligible following a flood event.

A system status of inactive in the RIP results in a loss of PL 84-99 rehabilitation assistance following a flood event. It does not necessarily result in a loss of FEMA NFIP certification or accreditation nor does it result in a loss of Federal assistance for emergency flood fighting. A system status of active in the RIP does not guarantee rehabilitation assistance will be provided, only that it is eligible. Rural LMAs may have difficulty meeting the benefit cost ratio requirements in order to receive the rehabilitation assistance.

Flood control works that are eligible for USACE's RIP program, either Active or Inactive, are ineligible for assistance from FEMA for emergency repairs and permanent restoration. Although, FEMA may provide assistance for the placement and removal of flood fighting measures (e.g., sandbags, buttresses) on flood control works that are eligible for USACE's RIP program if such activity is necessary to eliminate an immediate threat to life, public health and safety, or improved property.

Loss of eligibility in the PL 84-99 RIP would mean that the LMAs and the State of California would have to fully fund rehabilitation following a high water event. Neither the State nor the Rural LMAs do not have sufficient budgets to fund the increased rehabilitation costs and it is unlikely that the State.

The State now requires a local partnership agreement for many new projects including those funded under Propositions 1E and 84. Clauses in this agreement, also referred to as a "local O&M agreement", include a requirement for the LMA "to continue to participate in and comply with the policies and procedures of the

USACE Rehabilitation and Inspection Program” as well as Section 208.10. It is unclear how this requirement and the inability to meet this requirement affect rural LMAs.

Relevance to the RFMP

System-Wide Improvement Frameworks (SWIFs) provide one avenue to maintain eligibility in the RIP and thus receive rehabilitation assistance while addressing long-term maintenance or repair deficiencies. It is anticipated that several LMAs in the region will pursue SWIFs and thus it will be important to consider how implementation of these SWIFs will be funded and implemented to optimize system performance and resiliency.

Although development of SWIFs as part of the regional planning process is ineligible under the current guidelines, there may be regional or system-wide opportunities to address commonly identified deficiencies. For example, regions may consider appropriate vegetation standards in their region and develop a regional variance per those standards; the State may consider a cost-share funding program to assist rural LMAs in evaluating, repairing, and/or removing encroachments; there will be opportunities for regional projects to develop regional mitigation and or restoration areas to offset impacts of local repairs; or there may be opportunities for funding programs to obtain additional O&M easements in areas that have historically had less so that rural LMAs are able to adequately maintain the inspected areas in the future and thus maintain eligibility in the RIP.

Rodent and Burrowing Animal Control

The Rural LMA Work Group (WG) was established in late 2012 with the purpose of serving as a forum for the California Central Valley Flood Control Association to identify problems that are unique to rural areas and seek solutions for inclusion in the Regional Flood Management Plans. The Rural LMA WG identified eleven topics of interest and has prepared a paper describing each topic from the perspective of the Rural LMA WG. These papers continue to be developed by the Rural LMA WG and are therefore subject to revision.

Topic Statement

The presence of rodents on levees is a historic and ongoing problem that poses a threat to levee integrity due to increased seepage penetration into the levee and interior and exterior erosion causing voids and levee stability issues via the burrows the rodents create.

Description of Topic

It is imperative that every LMA has an aggressive rodent abatement and damage repair program. Diligent efforts to eradicate burrowing animals are a necessity, and eliminating them from an infested levee is extremely difficult. Control of these animals must be pursued frequently and persistently to ensure safety of the levee during both normal conditions and high water events.

Adequate rodent control is a two-part maintenance process of eradicating the rodents and properly filling their burrows. The more rodents in an area and the longer they have been there, the greater the threat due to greater loss of levee material and further increase in populations. Voids within the levees cannot be easily detected, and therefore, pose a significant risk to levee integrity and stability. Interpretation of environmental laws and regulations by various resource agencies can limit the periods during which poison bait can be utilized and other methods can be employed to control rodents. The implementation of these regulations may be in conflict with the approved and allowed proper use of the compounds being applied and often conflict with the optimal timing for successful control. Complete eradication of rodents is difficult. However, a well-managed eradication program vigorously applied throughout the year can keep populations and concentrations of rodents under reasonable control.

Coupled with aggressive rodent abatement, thorough repair of levees damaged by burrowing rodents is essential to minimize risks posed to levee integrity. Damage repair can be achieved by excavation and re-compaction of burrows, filling holes with grout slurry, and other comparable methods. Regardless of the method of rodent burrow damage repair, voids must be filled to minimize risk to levees. Past practices of simply dragging over the rodent holes to cover them is inadequate, and does not fill the voids left by rodent infestation. Potential endangered species act (both CESA and ESA) impacts during rodent burrow repair activities have been expressed as a concern by resource agencies.

Relevance to the RFMP

Due to the importance of rodent abatement and damage repair on flood control facilities, the RFMP needs to reinforce the need for each LMA to properly address the problem. Additionally, there may be regulatory, regional or system wide actions that could provide assistance in implementation of more effective control. Examples of assistance include:

- Facilitation through environmental regulatory processes and relief from some limitations of how and when eradication actions can be performed.

- Funding to assist in the purchase and use of specialized equipment and services such as grouting machines, hiring licensed trappers and performing biological assessments to determine potential impacts to other desirable species as well as provide options for more effective control programs.
- Establish guidelines for habitat projects that could become a source of rodents. An example of this might be the development of habitat that could create a breeding area for beaver and muskrats that will migrate and take up residence in a levee.
- Establish procedures and guidelines for removal of rodent habitat and food sources.
- Establish funding and programs to work with local property owners, the farming community, and agricultural commissioners to coordinate rodent abatement activities on properties near the flood protection system, to minimize threats to levee integrity.