

## Central Valley Flood Protection Plan

# Round 1 Management Action Workshops Draft Initial Management Actions

A management action is a specific structural or nonstructural strategy, action, or tactic that contributes to the Central Valley Flood Protection Plan (CVFPP) goals and addresses identified flood management problems in the Systemwide Planning Area, including any identified deficiencies in the State Plan of Flood Control (refer to *CVFPP Interim Progress Summary No. 1*). Management actions may range from potential policy or institutional changes, to recommendations for operational and physical changes to the flood management system. Management actions may address one or more CVFPP goals and are the “building blocks” for regional solutions and eventually systemwide solutions.

An initial set of management actions was developed by consolidating a large number of compiled actions and recommendations from published studies and reports, and input from Regional Conditions and Topic Work Groups during CVFPP Phase 1 activities. DWR subject-matter experts provided a preliminary evaluation of the environmental, economic, technical, and social consideration of the identified management actions. Each management action was evaluated against a uniform set of criteria to allow for a consistent comparative analysis.

Management Actions Workshops will refine the initial management actions and develop additional actions to augment this initial set of management actions. For information on Phase 2 Workshops, refer to *Attendee’s Guide to Phase 2 Workshops* available at [www.water.ca.gov/cvfmp/](http://www.water.ca.gov/cvfmp/).

Each management action is evaluated using the *Management Actions Evaluation Form*. For description of the form sections refer to the *Reader’s Guide to the Management Actions Evaluation Form* available at [www.water.ca.gov/cvfmp/](http://www.water.ca.gov/cvfmp/).

To provide detailed written comments on the management action description and evaluation, use the fillable PDF *Comments Form* available at [www.water.ca.gov/cvfmp/](http://www.water.ca.gov/cvfmp/).

## Draft Policy & Regulations Management Actions

ID	Management Actions Title
MA-049	Encourage compatible land uses with flood management system and floodplain function.
MA-050	Establish clear triggers or policy for updating flood management-related General Plan elements and other local flood management plan(s).
MA-051	Update State’s designated floodway program.
MA-052	Use Building Code amendments to reduce consequence of flooding
MA-053	Update state and local floodplain management policy to be consistent with FEMA requirements for maintaining eligibility for NFIP participation and federal financial assistance.
MA-057	Encourage multi-jurisdictional and regional partnerships on flood planning and improve agency coordination on flood management activities, including operation and maintenance, repair, and restoration
MA-058	Develop State criteria and processes for urban flood protection

## DRAFT Management Action Evaluation

**Management Action Title:**

MA-049

Encourage compatible land uses with flood management system and floodplain function.

**Description:**

*Problem:*

Much of the new development in the Central Valley is occurring in areas that are susceptible to flooding. Urbanization in floodplains increases the potential for flood damage to homes, businesses, and communities. Land use decisions made at the local level often allow development in floodplains and create situations that are incompatible with the flood management system and existing flood protection for the area. With a limited understanding of the beneficial functions of floodplains, some assert that floodplain management decisions have often been made outside of the context of watershed-level planning and without adequate consideration for natural and beneficial floodplain functions.

**Desired Outcome:**

By coordinating local land-use decisions with State flood protection, there is an opportunity to better plan development that is more compatible with the flood management system. Decisions made at the local level that provide flood protection can also benefit the community with areas of open space, parkways, trails, or habitat lands.

*Methodology:*

The State should encourage counties to identify and delineate appropriate and allowed urban and rural land uses within floodplains and identify ways, where feasible, that flood prone lands can serve multiple uses, such as groundwater recharge, recreation, or habitat. The State could define criteria for how developers know if they are meeting standards for development in areas that are at risk of flooding. In addition, the State could work with counties to promote urban development that attempts to retain existing or natural hydrologic conditions through the employment of Low Impact Development (LID) techniques. LID techniques seek to maximize the area available for infiltration so that peak flow rates, runoff volume and pollutant concentrations are reduced. Research should also be conducted and recommendations made regarding appropriate cropping or agricultural practices for certain areas, i.e. floodways vs. channel in order to reduce damages sustained by agricultural areas after floods.

**CVFPP Goals**

*Contributes Significantly to:*

Improve Institutional Support

**Potentially Contributes to (Check all that apply):**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Improve Flood Risk Management<br><input checked="" type="checkbox"/> Improve Operation and Maintenance<br><input checked="" type="checkbox"/> Promote Ecosystem Functions | <input checked="" type="checkbox"/> Improve Institutional Support<br><input checked="" type="checkbox"/> Promote Multi-Benefit Projects |
|---|---|

**Recommendations (Retained/Not Retained/Requires Further Evaluation):**

Not retained; inconsistent with DWR policy in maintaining local jurisdiction's land use authority.

**Advantages:**

• The consistency of land use compatibility considerations between the State and local jurisdictions would further align the strategy for long-term sustainability.

**Disadvantages:**

• The State does not have land use authority, which is resided in local jurisdictions.

**Economic Considerations:**

*Capital Cost? (High, Medium, Low)*

Low capital costs. Measures put in place consist of policies, best management plans, financial incentive programs, educational programs, and does not involve physical construction.

*Annual Cost to Operate/Maintain/Repair? (Increase, Decrease, or No Change)*

Decrease in O&M costs. Increased integration of land use planning with flood management will result in land use practices that are more compatible with the flood management system and the natural system, which may reduce stress on the flood management system and hence provide a net reduction in O&M and repair. LID will reduce runoff and lower peaks, which could also reduce stress on system.

*Potential for Cost-Sharing?*

Federal, State and local agencies would be involved. Potential cost sharing through federal and State grant/loan programs, cost sharing agreements, and developer-based incentives.

*Emergency Response and Recovery Costs? (Increase, Decrease, or No Significant Change)*

Potential to reduce long-term costs for emergency response and recovery. The frequency and consequences of flooding would be reduced.

*Flood fighting? (Increase, Decrease, or No Significant Change)*

Reduction in frequency and consequence of flooding would reduced long-term costs of floodfighting.

*Effect on Damage to Critical Public Infrastructure?*

Long-term reduction in damage to critical infrastructure. Best management practices would direct placement of critical infrastructure out of harm's way.

*Effect on Floodplain and Economic Development?*

Directly effects floodplain development. Land use decisions would be made from a watershed level perspective and land use decisions would be compatible with flood management system uses.

*Effect on State Flood Responsibility? (Increase, Decrease, or No Significant Change)*

Potential to reduce State Flood responsibility by reducing frequency and consequences of flooding.

**Environmental Considerations:**

*Rehabilitate key physical processes and ecological functions?*

Comprehensive land use planning in floodplains could result in rehabilitation of key physical processes and ecosystem functions by identifying and setting aside areas where rehabilitation would be most beneficial for habitats and flood management and restricting development there.

*Adverse Environmental Impact?*

None

*Permitting Considerations?*

Land use decision have potential to change existing permitting process

*Opportunity to Reduce the Adverse Environmental Impacts Associated With Operation, Ongoing Maintenance, and Repairs of FM System?*

None

**Social Considerations:**

*Public Safety?*

Potential to improve public safety by reducing frequency and consequences of flooding.

*Potential to Provide Other Benefits (Water Supply, Recreation, or Open Space)?*

Increased potential to provide other benefits, such as recreation, water supply thru enhanced recharge, agriculture, and habitat enhancement.

*Likelihood of Implementation (Politically, Institutionally, and Culturally Acceptable)?*

Not implementable without significant changes in legislation regarding land use authority.

**Technical Considerations:**

*Redirected Hydraulic Impacts?*

No redirected hydraulic impacts.

*Residual Risk?*

Potential reduction in consequences could reduce residual risk.

*Climate Change Adaptability:*

This action would enhance hydrologic adaptability by providing additional capacity to convey flood flows and reducing the consequences of the increased flood frequencies and greater flows anticipated to result from climate change; also, the use of LID techniques could decrease peak flows, and thus, reduce the impacts of extreme precipitation events. This action also could enhance biological adaptability by increasing habitat quantity, connectivity, and continuity along environmental gradients; and thus, increasing the ability of species to handle and adjust to the consequences of climate change.

**Urban, Small Community, and Non-Urban Considerations:**

MA could be practiced in all types of communities settings, however land use management needs are different for non-urban settings compared to urban. More opportunity in small communities and non-urban settings where land use not yet developed.

**Regional Applicability:**

Applies to all regions

**Integration with Other Programs:**

State mapping and outreach programs (i.e. building codes, risk notification, general plan updates, CRS)

**References:**

Delta Risk Management Strategy; California Floodplain Management Task Force, 2002, Final Recommendations Report; RCR;

**DRAFT Management Action Evaluation****Management Action Title:**

MA-050

Establish clear triggers or policy for updating flood management-related General Plan elements and other local flood management plan(s).

**Description:***Problem:*

The most recent and applicable data is not always available or used for updates to local flood management and land use planning documents, resulting in outdated planning strategy and reduced benefits. Many flood related regulations and planning are associated with a defined level of protection, in other words, an event of certain return frequency. The frequency based management strategy would often be impacted by significant events that change the statistics and/or consideration of the climate change effects and uncertainties in hydrologic condition forecast.

**Desired Outcome:**

State and local agencies could manage floodplains more proactively and adaptively and need to have access to the most recent hydrologic, climate, physical and biological conditions, policies and land use data in order to adequately update planning documents for land use and flood management. In particular, updates could be triggered by the 5-year updates of the Central Valley Flood Protection Plan and major flood events.

*Methodology:*

The State should update the General Plan Guidelines to reflect the California Floodplain Management Task Force recommendations, as applicable, and to reflect other programs, policies, and standards, including the NFIP, for floodplain management. Similarly, local jurisdictions should update their General Plan and other flood management plan(s) to reflect the updates, at a minimum level, the update should be triggered by the 5-year update of the CVFPP and occurrence of major flood events that change the frequency of events used as reference in the local plans. New data developed by local agencies for flood management planning purposes (i.e. new hydraulic models) should also be integrated into planning documents when updated.

**CVFPP Goals***Contributes Significantly to:*

Improve Institutional Support

**Potentially Contributes to (Check all that apply):**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Improve Flood Risk Management     | <input checked="" type="checkbox"/> Improve Institutional Support  |
| <input checked="" type="checkbox"/> Improve Operation and Maintenance | <input checked="" type="checkbox"/> Promote Multi-Benefit Projects |
| <input checked="" type="checkbox"/> Promote Ecosystem Functions       |  |

**Recommendations (Retained/Not Retained/Requires Further Evaluation):**

Retain for further evaluation

**Advantages:**

- Having clear triggers for Policy and General Plan updates will remove confusion as to what the local entities are to do in response to the adoption of the CVFPP.
- Improves overall public safety, property protections and provides economic benefits statewide.

**Disadvantages:**

- Not all local agencies will react the same to a "clear" trigger, some will try to use their own interpretation as long as it suits their needs.
- Some requirements could be politically sensitive.

**Economic Considerations:***Capital Cost? (High, Medium, Low)*

Low capital costs. Measures put in place consist of policies, plans, improved tools, and does not involve physical construction.

*Annual Cost to Operate/Maintain/Repair? (Increase, Decrease, or No Change)*

Decrease in O&M costs. Improvements in flood planning could result in management practices that are more compatible with the flood management system and the natural system, which may reduce stress on the flood management system and hence provide a net reduction in O&M and repair.

*Potential for Cost-Sharing?*

Indirectly. The federal and state agencies could identify the level of acceptable information used in local plans as part of the criteria for determining cost share, federal and state grant/loan programs and other incentive programs.

*Emergency Response and Recovery Costs? (Increase, Decrease, or No Significant Change)*

Improved and updated land use and other management plans would potentially reduce long-term costs for emergency response and recovery. Improved land use and flood management planning should improve ability to manage floods and reduce the frequency and consequences.

*Flood fighting? (Increase, Decrease, or No Significant Change)*

Reduction in frequency and consequence of flooding would reduced long-term costs of floodfighting.

*Effect on Damage to Critical Public Infrastructure?*

Long-term reduction in damage to critical infrastructure. More frequent and comprehensive updates of land use plans would provide better guidance for planning and placement of future critical infrastructure, reducing chances for damages.

*Effect on Floodplain and Economic Development?*

Directly effects floodplain development. Land use planning would be more robust given the better data, tools, and frequency of updates.

*Effect on State Flood Responsibility? (Increase, Decrease, or No Significant Change)*

Potential to reduce State Flood responsibility by reducing consequences of flooding through land use planning

**Environmental Considerations:**

*Rehabilitate key physical processes and ecological functions?*

Likely, but depending on whether the concept was incorporated in the original plan. The updates would continue to improve the intent, if incorporated in the original design, to be more current and durable. The positive effect under this consideration is likely to come from other management actions compatible to this one.

*Adverse Environmental Impact?*

None

*Permitting Considerations?*

None

*Opportunity to Reduce the Adverse Environmental Impacts Associated With Operation, Ongoing Maintenance, and Repairs of FM System?*

None

**Social Considerations:**

*Public Safety?*

Potential to improve public safety by avoiding putting residents in harm's way through land use planning in comparing scenario without proper/timely updates.

*Potential to Provide Other Benefits (Water Supply, Recreation, or Open Space)?*

Increased potential to provide other benefits through improved land use planning, which could provide recreation, water supply, agricultural, and habitat benefits.

*Likelihood of Implementation (Politically, Institutionally, and Culturally Acceptable)?*

Overall, improved land use management would be favorable to overall general public, government agencies, but some resistance by cities/counties that depend on tax base, and development industry.

**Technical Considerations:**

*Redirected Hydraulic Impacts?*

No redirected hydraulic impacts.

*Residual Risk?*

Potential reduction in consequences could reduce residual risk in comparing scenario without proper/timely updates.

*Climate Change Adaptability:*

Updated land-use plans that incorporate climate change scenarios could support enhancement of hydrologic adaptability by incorporating flexibility and additional capacity into the system, and thus, reduce the consequences of the increased flood frequencies and flows anticipated to result from climate change. If these land-use plans provide opportunities for restoration of habitat, this action could enhance biological adaptability by increasing habitat quantity, complexity, connectivity, and continuity along environmental gradients.

**Urban, Small Community, and Non-Urban Considerations:**

MA could be practices in all types of communities settings, however benefits and improved land use planning would probably have greater short-term benefits in the more complex urban settings, and longer-term benefits in small community areas that are expected to grow in coming decades.

**Regional Applicability:**

Applies to all regions.

**Integration with Other Programs:**

Implementing California Flood Legislation into Local Land Use Planning Handbook for Local Communities (and associated public workshops) (LRFMO), Building codes, and CRS.

**References:**

Environmental Sustainability Summary; California Floodplain Management Task Force, 2002, Final Recommendations Report; RCR; Flood Warning: Responding to California's Flood Crisis.;

## DRAFT Management Action Evaluation

**Management Action Title:**

MA-051

Update State's designated floodway program.

**Description:**

*Problem:*

The existing designated floodways are based on the passage of then-defined design flood. The designation requires re-evaluation because of the 2007 Flood Legislation that specifies increase in the desired level of protection for the urban and urbanizing areas, the past several severe floods, and the potential changes in hydrologic conditions from climate change.

*Desired Outcome:*

Additional floodways could be designated as part of the SPFC to ensure consistency with the current requirements and understanding of hydrologic conditions.

*Methodology:*

In order to provide 200-year (or greater) level of flood protection to all urban and urbanizing areas in the Sacramento - San Joaquin Valley by December 31, 2025, the State will need to define the 200-year flood and the corresponding share of the compliance responsibility to be accomplished by flood control system facilities. Additional designated floodway and improved levee design and construction standards could contribute to the desired protection under the greatest range of conditions (e.g., overtopping, earthquake, wind/wave erosion, etc.) and reduce O&M frequency and costs and extend life cycle, by 2025.

**CVFPP Goals**

*Contributes Significantly to:*

Improve Institutional Support

**Potentially Contributes to (Check all that apply):**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Improve Flood Risk Management     | <input checked="" type="checkbox"/> Improve Institutional Support  |
| <input checked="" type="checkbox"/> Improve Operation and Maintenance | <input checked="" type="checkbox"/> Promote Multi-Benefit Projects |
| <input type="checkbox"/> Promote Ecosystem Functions                  |  |

**Recommendations (Retained/Not Retained/Requires Further Evaluation):**

Retain for further evaluation

**Advantages:**

- Designated floodway is part of the system infrastructure to accomplish the desired level of protection.
- The update and reevaluation of needs would help to establish the active management of those sections to reduce the chance of flooding.

**Disadvantages:**

- Designation of floodway would require additional considerations of land acquisitions (though not required) or easements.
- The designated floodways would be integral parts of the system and thus, would involve physical changes, construction, design, and other capital expenditure.

**Economic Considerations:**

*Capital Cost? (High, Medium, Low)*

High capital costs. Adding floodways and changing levee design standards would result in physical changes to flood management at a significant capital expense.

*Annual Cost to Operate/Maintain/Repair? (Increase, Decrease, or No Change)*

Increase in O&M costs and repair costs. Additional floodways means more things to operate, maintain, and repair.

*Potential for Cost-Sharing?*

Federal-state cost sharing for improvements to SPFC.

*Emergency Response and Recovery Costs? (Increase, Decrease, or No Significant Change)*

Potential to reduce emergency response and recovery costs due to reduction in frequency and consequences of flooding.

*Flood fighting? (Increase, Decrease, or No Significant Change)*

Potential to reduce flood fighting due to reduction in frequency and consequences of flooding.

*Effect on Damage to Critical Public Infrastructure?*

Long-term reduction in potential damage to critical public infrastructure as a result of reduced frequency of flooding due to addition of floodways.

*Effect on Floodplain and Economic Development?*

Could eliminate opportunity for urban develop due to designation of new floodways but could provide opportunities for other development, both within the new designated floodway (agricultural, recreational, and habitat uses) and also in neighboring communities that might have the benefit of improved flood protection that would allow for expansion of development in existing floodplains.

*Effect on State Flood Responsibility? (Increase, Decrease, or No Significant Change)*

Potential to reduce State Flood responsibility by reducing frequency and consequences of flooding.

**Environmental Considerations:**

*Rehabilitate key physical processes and ecological functions?*

None

*Adverse Environmental Impact?*

None

*Permitting Considerations?*

None

*Opportunity to Reduce the Adverse Environmental Impacts Associated With Operation, Ongoing Maintenance, and Repairs of FM System?*

None

**Social Considerations:**

*Public Safety?*

Potential to improve public safety by reducing frequency and consequences of flooding.

*Potential to Provide Other Benefits (Water Supply, Recreation, or Open Space)?*

Increased potential other benefits, such as agriculture/recreation/habitat in new designated floodways

*Likelihood of Implementation (Politically, Institutionally, and Culturally Acceptable)?*

Would have strong support from urban communities in need of greater protection; and less support from environmental and rural communities that would receive less benefit, or no benefit, of new floodways.

**Technical Considerations:**

*Redirected Hydraulic Impacts?*

Could potentially redirect hydraulic impacts to rural and open space areas.

*Residual Risk?*

Potential reduction in consequences could reduce residual risk.

*Climate Change Adaptability:*

This action is not directly related to adaptability, but would enhance the adaptability of public health, and could increase the feasibility and cost efficiency of ecosystem restoration projects that enhance hydrologic and biological adaptability.

**Urban, Small Community, and Non-Urban Considerations:**

MA would likely be more applicable to rural settings where space exists for designating floodways

**Regional Applicability:**

Applies to all regions under the CVFPB's jurisdiction and where the designated floodway could be effective. These areas are likely in riverine corridors, but not in the tidal influenced Delta area.

**Integration with Other Programs:**

Federal and State mapping programs

**References:**

Flood Warning: Responding to California's Flood Crisis.;

## DRAFT Management Action Evaluation

**Management Action Title:**

MA-052

Use Building Code amendments to reduce consequence of flooding

**Description:**
*Problem:*

The existing mandatory Building Code provisions related to flood protection are required for the Special Flood Hazard Area that could be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year (a.k.a, the base flood or 100-year flood). The Building Code address flood protection mainly is through elevation of structures. This approach has limited effectiveness in the Central Valley where flood depths could be more than 20 feet. The urban level of protection required by 2007 Flood Legislation is for 200-year flood, exceeding the FEMA base flood.

**Desired Outcome:**

Additional mandatory Building Code provisions to protect residents in the Central Valley from death and severe injury during floods, and increase the resilience of the building to reduce damage and required time for recovery.

*Methodology:*

The 2007 Flood legislation provides guidance in developing building code amendment to protect lives and reduce flood damage in the State Plan Flood Control Planning Area, where the flood depth is expected to be above 3 feet in a 200-year event. The focus is on the deep floodplains in the Central Valley with high possibilities of floodwater ponding. This can be the starting and minimum threshold of this management action. Building code amendments can include various structural improvements for public safety reasons and for dry and wet proofing tactics to reduce overall consequence of flooding. The proposed building code amendments need to be adopted by the California Building Standard Commission, as either mandatory or voluntary requirements. The development of proposed code amendments would be consistent with the national standards and other California code development trends. Due to the various types of buildings and business sectors associated with each building occupancy categories, the requirements may have to be customized for individual occupancy, in coordination with relevant state regulatory agencies and major industrial and professional groups. DWR is embarking on a review of various occupancy types with an initial focus on educational, institutional, and recreational occupancies. As with most building code amendments, the proposed code amendment would apply to new construction and existing buildings that require significant improvement and upgrade. Cost estimates for required improvements and upgrades for single residential houses were completed on a voluntary basis and adopted by the Commission in 2001, with the support by the Building Industry Association. This will serve as a starting point for assessing across all building occupancy categories the required improvements and upgrades for existing buildings affected by the proposed code amendment.

**CVFPP Goals**
*Contributes Significantly to:*

Improve Institutional Support

**Potentially Contributes to (Check all that apply):**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Improve Flood Risk Management<br><input type="checkbox"/> Improve Operation and Maintenance<br><input type="checkbox"/> Promote Ecosystem Functions | <input checked="" type="checkbox"/> Improve Institutional Support<br><input type="checkbox"/> Promote Multi-Benefit Projects |
|---|--|

**Recommendations (Retained/Not Retained/Requires Further Evaluation):**

Retained; maintaining the scope consistent with the Health and Safety Code Section 50465, as authorized in the 2007 Flood Legislation as the CVFPP development.

**Advantages:**

- Reduce the potential flood damage and life loss in deep flooding conditions.
  - Increase the level of accessibility for rescue, the building

**Disadvantages:**

- Significant agency and interest group coordination is required because of the various occupancy groups that may be affected by the proposed code amendment, and

resilience for faster recovery.

- Decrease the burdens of state's and federal's programs for emergency response, recovery and assistance in the long run.
- Reduces residual risk regardless of the accomplishment from the reduction of chance of flooding.
- Promote reasonable land use planning and building integrity in deep floodplains.

customization is required.

- The intended evacuation direction for a building in a deep flooding condition is opposite to the current evacuation routes established for most disasters or emergency; therefore, public education is likely to be a significant challenge.
- The associated ADA requirements, where applies, could also be a significant compliance and cost challenges for some sectors such as commercial buildings and schools.
- The application of building code amendments is limited to new constructions and existing buildings with significant improvement and upgrade; therefore, it would not provide an uniform improvement on building safety and resilience during floods.
- Should the code amendment be adopted as voluntary items, the reinforcement and the anticipated outcomes may vary significantly from jurisdiction to jurisdiction .

**Economic Considerations:**

*Capital Cost? (High, Medium, Low)*

Relative low capital costs for implementing code changes. Cost to change codes relatively low. The additional cost to implement the new codes, such as the added costs of building officials reviewing plans and permitting applications, could be recovered through additional fee requirements or development agreements. The additional cost to developers for meeting the new code requirements would be recovered through additional fees added to the lease or purchase price of the property.

*Annual Cost to Operate/Maintain/Repair? (Increase, Decrease, or No Change)*

There may be an increase in costs associated with increased enforcement, inspection, and potential flood drills, subject to the actual code proposal.

*Potential for Cost-Sharing?*

Not applicable.

*Emergency Response and Recovery Costs? (Increase, Decrease, or No Significant Change)*

Potential to facilitate rescue activities during deep flood conditions, reduce long-term costs for emergency response and recovery through the reduction of flood damage to property.

*Flood fighting? (Increase, Decrease, or No Significant Change)*

Not applicable.

*Effect on Damage to Critical Public Infrastructure?*

Potential to improve building construction of critical infrastructure, preserve the function and/or reduce damage to critical infrastructure, and enable faster recovery if improvements on floodproofing tactics and material are use.

*Effect on Floodplain and Economic Development?*

There may be economic effects on some business sectors; however, this would be evaluated by the Commission as part of the adoption process. The building code amendment may encourage different types of buildings to be developed in the floodplain, but not likely to have significant impacts on local economic development.

*Effect on State Flood Responsibility? (Increase, Decrease, or No Significant Change)*

Potential to reduce the state's responsibility in emergency response and local assistance programs.

**Environmental Considerations:**

*Rehabilitate key physical processes and ecological functions?*

Not applicable.

*Adverse Environmental Impact?*

Not applicable.

*Permitting Considerations?*

*Opportunity to Reduce the Adverse Environmental Impacts Associated With Operation, Ongoing Maintenance, and Repairs of FM System?*

Not applicable.

**Social Considerations:**

*Public Safety?*

Potential to increase public safety through implementation of floodproofing, elevating, and other building improvements that allows egress during a flood event.

*Potential to Provide Other Benefits (Water Supply, Recreation, or Open Space)?*

None identified.

*Likelihood of Implementation (Politically, Institutionally, and Culturally Acceptable)?*

If properly scoped and coordinated, the building code amendment would be implemented -- as evident by the 2010 adoption of the code amendment for single residential buildings.

**Technical Considerations:**

*Redirected Hydraulic Impacts?*

Not applicable.

*Residual Risk?*

The building code amendment will reduce the residual risk.

*Climate Change Adaptability:*

The building code amendment should be considered in coordination with other regulatory developments for climate change, including the land use planning and specific building code amendment (such as the Green code adopted in 2009). The accumulative effects of various regulations and law requirements should be considered for their consistency to improve climate change adaptability.

**Urban, Small Community, and Non-Urban Considerations:**

Building code only establishes the minimum for buildings that are subject to the code regulation and permits issued by the local building officials and other relevant jurisdictions (such as the Department of State Architect, and California State Fire Marshal, or Office of Statewide Health Planning and Development). These requirements, where applicable, are not bounded by urban, small community, or non-urban designation.

**Regional Applicability:**

DWR intends to follow the legislation requirements to limit the building code amendment applied to only the State Plan of Flood Control Planning Area, where the flood depth may exceed 3 feet in a 200-year event. It would be up to the local jurisdictions to consider applicability and adoptions for use in other areas.

**Integration with Other Programs:**

Building Standards Code Update Project (LRFMO), CRS, and local general plans

**References:**

## DRAFT Management Action Evaluation

**Management Action Title:**

MA-053

Update state and local floodplain management policy to be consistent with FEMA requirements for maintaining eligibility for NFIP participation and federal financial assistance.

**Description:**
*Problem:*

Inconsistencies exist between Federal, State and local regulations regarding building codes, development within floodplains and the subsequent effect on NFIP eligibility. FEMA has notified the State that the existing Governor's Executive Order B-39-77 does not effectively bring the State and its political subdivisions into compliance with the NFIP. The order has not been updated for more than 30 years and does not reflect current knowledge of the risks associated with development in floodplains. The Governor's Executive Order requires updating pending update of Federal Executive Order, which is in progress. According to FEMA, continued noncompliance with the NFIP could endanger the State's ability to obtain federal financial assistance, including federal disaster assistance and USDA and U.S. Department of Housing and Urban Development (HUD) funding, for buildings located in FEMA's regulatory floodplains.

**Desired Outcome:**

The State could ensure that the California Building Standards Code meets, at minimum, NFIP requirements, and that other State codes applicable to public buildings meet, at a minimum, NFIP requirements. Any local code adoptions or amendments and any development approvals could also meet, at a minimum, NFIP requirements. The Governor's Executive Order should be updated to be consistent with Federal Executive Order.

*Methodology:*

Governor's Executive Order B-39-77, which includes California's policies for building State facilities within floodplains, should be updated. The update could be based on the recommendations from the California Floodplain Management Task Force in 2002, or developed through a method of equivalent effectiveness, and the update should be consistent with the Federal Executive Order. Local communities should require new and substantially improved buildings to have their lowest floor elevations to be at least one foot above the NFIP's base flood elevation, factoring in the effect of full build out of the watershed. The effects of new or additional flood management measures should be reflected in an updated base flood elevation. In raising a structure, the entire floor space or portion occupied is elevated above the expected flood elevation. The benefits of elevating a structure can include: reduced future flood damages, increased square footage suitable for storage or parking, increased property value, improved appearance, and lowered flood insurance premiums.

**CVFPP Goals**
*Contributes Significantly to:*

Improve Institutional Support

**Potentially Contributes to (Check all that apply):**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Improve Flood Risk Management<br><input type="checkbox"/> Improve Operation and Maintenance<br><input type="checkbox"/> Promote Ecosystem Functions | <input checked="" type="checkbox"/> Improve Institutional Support<br><input type="checkbox"/> Promote Multi-Benefit Projects |
|---|--|

**Recommendations (Retained/Not Retained/Requires Further Evaluation):**

Retain for further evaluation

**Advantages:**

- Updating the policies and regulations so they are consistent will continue to allow California to be eligible for participating in NFIP, and allow local agencies to receive future federal financial assistance.
- There is minimum costs for updating the policies and

**Disadvantages:**

- Adoption and enforcement by local jurisdictions can be affected by resources limitations; however, this challenge may have relationship to the lack of understanding for their actions related to their eligibility of NFIP coverage and financial assistance.

regulations is, however, there is a higher cost for actual implementation of them.

• Also there are some potential political challenges with adoption and enforcement.

**Economic Considerations:**

*Capital Cost? (High, Medium, Low)*

Low for MA development. Policy MAs will tend to have a substantially lower capital cost than other MAs which involve physical construction. Upon implementation, which could require retrofitting existing buildings to be compliant, could result in higher costs.

*Annual Cost to Operate/Maintain/Repair? (Increase, Decrease, or No Change)*

not applicable

*Potential for Cost-Sharing?*

Potential for federal grants and local cost sharing associated with actions needed to meet requirements.

*Emergency Response and Recovery Costs? (Increase, Decrease, or No Significant Change)*

Potential to reduce the consequences of flooding; thereby reducing long-term costs of emergency response and recovery. On the other hand, the compliance will allow them to receive the federal financial assistance after flooding

*Flood fighting? (Increase, Decrease, or No Significant Change)*

not applicable

*Effect on Damage to Critical Public Infrastructure?*

Potential reductions in damage to critical public infrastructure if compliance with the elevation requirements. Additional federal assistance may help the recovery of critical public infrastructure.

*Effect on Floodplain and Economic Development?*

The continued eligibility for NFIP and federal financial assistance is critical for existing and future floodplain and economic development.

*Effect on State Flood Responsibility? (Increase, Decrease, or No Significant Change)*

The ineligibility for NFIP and federal financial assistance will potentially increase the State's responsibility in flood disaster assistance, which traditionally relies on federal support significantly.

**Environmental Considerations:**

*Rehabilitate key physical processes and ecological functions?*

None

*Adverse Environmental Impact?*

None

*Permitting Considerations?*

Could impact permitting process and decisions

*Opportunity to Reduce the Adverse Environmental Impacts Associated With Operation, Ongoing Maintenance, and Repairs of FM System?*

None

**Social Considerations:**

*Public Safety?*

May improve public safety by reducing consequences of flooding, and provide greater opportunities for financial assistance to reduce secondary consequence of flooding on public safety.

*Potential to Provide Other Benefits (Water Supply, Recreation, or Open Space)?*

Could impact decisions regarding open space, water supply, parks and recreation

*Likelihood of Implementation (Politically, Institutionally, and Culturally Acceptable)?*

Significant support for this MA at federal and local level. Funding for local agencies has been challenging. Implications to construction industry may create hurdles. Could be politically sensitive, and create economic burden without significant federal and State funding options.

**Technical Considerations:**

*Redirected Hydraulic Impacts?*

Not applicable.

*Residual Risk?*

NFIP and financial assistance are major strategies in addressing residual risks.

*Climate Change Adaptability:*

Under consideration by NFIP

**Urban, Small Community, and Non-Urban Considerations:**

Building standards adoption and enforcement can be challenging in small communities and rural areas due to resources limitations

**Regional Applicability:**

All regions

**Integration with Other Programs:**

Building Standards Code Update Project (LRFMO), CRS, federal and state mapping programs, general plans

**References:**

RCR; California Floodplain Management Task Force, 2002, Final Recommendations Report; USACE 2001 Sacramento and San Joaquin River Basins Comprehensive Study;

## DRAFT Management Action Evaluation

**Management Action Title:**

MA-057

Encourage multi-jurisdictional and regional partnerships on flood planning and improve agency coordination on flood management activities, including operation and maintenance, repair, and restoration

**Description:**
*Problem:*

Flood management is often complicated by the large number of agencies and entities involved, and their complex jurisdictional roles and responsibilities. Overlapping jurisdictions across various federal and State agencies involved in flood management can lead to inconsistent policies and regulations, conflicting guidance, or inefficiencies in planning and implementing projects. Coordinating activities within this fragmented jurisdictional landscape can be challenging, particularly for local entities with limited resources.

**Desired Outcome:**

Promote streamlined, efficient, and cost-effectiveness flood management through greater coordination.

*Methodology:*

Coordination between agencies and responsible parties could take many forms, including roundtable discussions, oversight committees, interagency liaisons, repurposed agencies, or new entities. Improving coordination and cooperation might involve establishment of a new institutional framework, such as a system-wide, continuous, integrated group of responsible entities/agencies to oversee and coordinate flood protection, operations and maintenance. Another method would be to establish a single entity or resource with oversight responsibilities to streamline and provide guidelines for all planning, construction, maintenance, repair and restoration activities associated with flood management. With respect to emergency planning and response, a multi-agency coordination system could be developed for jurisdictions in the Central Valley and Delta to improve regional coordination, incident prioritization, and resource management in a major flood. Recommendations for institutional changes or practices could be developed as part of a floodplain management advisory committee composed of local and State government representatives, floodplain managers, and other stakeholders. The benefits of improved coordination could include streamlined permitting and approval processes; more efficient and cost-effective routine maintenance and repairs; more successful and sustainable environmental mitigation through regional coordination with conservation efforts; better leveraging of available funding sources; and flood management projects that provide multiple, mutual benefits.

**CVFPP Goals**
*Contributes Significantly to:*

Improve Institutional Support

**Potentially Contributes to (Check all that apply):**

- |  |   |
|--|---|
| <input type="checkbox"/> Improve Flood Risk Management<br><input checked="" type="checkbox"/> Improve Operation and Maintenance<br><input checked="" type="checkbox"/> Promote Ecosystem Functions | <input checked="" type="checkbox"/> Improve Institutional Support<br><input checked="" type="checkbox"/> Promote Multi-Benefit Projects |
|--|---|

**Recommendations (Retained/Not Retained/Requires Further Evaluation):**

Retained for further evaluation

**Advantages:**

- Potential to improve efficiency and effectiveness of a broad range of flood management activities (maintenance, repairs, restoration and conservation).
- Low initial investment cost

**Disadvantages:**

- May require changes to the purpose or responsibilities of existing institutions.

**Economic Considerations:**

*Capital Cost? (High, Medium, Low)*

Low initial investment cost compared with structural measures

*Annual Cost to Operate/Maintain/Repair? (Increase, Decrease, or No Change)*

Potential to decrease O&M costs through streamlining and improving regional coordination

*Potential for Cost-Sharing?*

Potential for costs to be spread across multiple agencies and jurisdictions to meet mutual goals and objectives

*Emergency Response and Recovery Costs? (Increase, Decrease, or No Significant Change)*

Potential to increase the efficiency and effectiveness of emergency planning, response, and recovery efforts

*Flood fighting? (Increase, Decrease, or No Significant Change)*

Potential to improve the cost-effectiveness of flood fighting by increasing efficiency and reducing overlapping .

*Effect on Damage to Critical Public Infrastructure?*

No direct effects

*Effect on Floodplain and Economic Development?*

No direct effects

*Effect on State Flood Responsibility? (Increase, Decrease, or No Significant Change)*

No direct effects, but improving coordination could indirectly facilitate more effective O&M and timely implementation projects to reduce flood liabilities.

**Environmental Considerations:**

*Rehabilitate key physical processes and ecological functions?*

No direct effects; however, improved coordination could foster integration of mitigation, restoration, and conservation activities across multiple agencies and jurisdictions, resulting in more successful rehabilitation of ecosystem functions (consolidating mitigation efforts within regions, implementing mitigation in advance of impacts, and selecting more suitable lands for mitigation)

*Adverse Environmental Impact?*

None

*Permitting Considerations?*

None

*Opportunity to Reduce the Adverse Environmental Impacts Associated With Operation, Ongoing Maintenance, and Repairs of FM System?*

Potential to improve the efficiency and effectiveness of mitigation associated with flood system maintenance and repairs

**Social Considerations:**

*Public Safety?*

No direct effects; however, improved coordination would indirectly improve public safety by facilitating more efficient, cost effective, and timely operation, maintenance, and repair activities and new project implementation

*Potential to Provide Other Benefits (Water Supply, Recreation, or Open Space)?*

Coordination across agencies and jurisdictions could promote multi-benefit projects that meet mutual goals and objectives

*Likelihood of Implementation (Politically, Institutionally, and Culturally Acceptable)?*

May be difficult to sustain coordination over the long-term; individual agencies may be unwilling or unable to participate due to cost or governance structure

**Technical Considerations:**

*Redirected Hydraulic Impacts?*

No direct effects

*Residual Risk?*

No direct effects. However, greater coordination of floodplain management activities would reduce residual risk

*Climate Change Adaptability:*

Potential to enhance biological adaptability by increasing the connectivity and complexity of mitigation habitats, and their continuity along environmental gradients, thus, increasing the ability of species to adjust to the consequences of climate change

**Urban, Small Community, and Non-Urban Considerations:**

No specific considerations identified

**Regional Applicability:**

Applicable to all regions

**Integration with Other Programs:**

Corridor Management Strategy (FMO); Flood Projects Office; Federal, State and local programs, policies and regulations including mapping, building codes, emergency response, general plans

**References:**

RCR; Environmental Sustainability Summary; CCVFCA White Paper: Flood Protection and Risk Management in the Sacramento Valley, 2008, First Step White Paper; California Floodplain Management Task Force, 2002, Final Recommendations Report;<http://biodiversity.ca.gov/>; <http://www.carangeland.org/><http://www.centralvalleyjointventure.org/>

## DRAFT Management Action Evaluation

**Management Action Title:**

MA-058

Develop State criteria and processes for urban flood protection.

**Description:**

*Problem:*

State law enacted in 2007 (Senate Bill (SB) 5) calls for urban and urbanizing areas in the Sacramento-San Joaquin Valley to achieve a minimum of 200-year (0.5% annual chance) flood protection by 2025. However, the necessary set of criteria does not exist for evaluating whether existing or new levees are consistent with this urban level of protection (Government Code § 65865.5, 65962, 66474.5). SB 5 requires that the urban level of flood protection be consistent with criteria used or developed by DWR (Government Code § 65007(k)). To avoid delaying urgently needed flood protection, California needs interim levee design criteria that fulfill this requirement until the criteria are revised by DWR and/or adopted as regulations. DWR reviewed current guidance and levee criteria by the Corps and FEMA. With the exception of hydrologic, hydraulic, and levee freeboard requirements FEMA's levee design guidance contains no specific criteria and suggests use of various Corps documents. The Corps has developed most of the guidance needed for engineers to design levee systems, and most engineers involved in levee design and construction utilize that guidance. However, some important aspects of the Corps' guidance lack specificity, need to be modified, or are still under development including criteria for frequently loaded levees and seismic vulnerability. New advances in geotechnical evaluation and exploration are not captured by the existing guidance. A robust set of criteria for evaluating existing and new levees is needed for California. Furthermore, there are no procedural criteria that would be applicable for engineers, cities, or counties in making a finding that the urban level of flood protection exists for an area.

Due to the changing state of practice and the absence of specific guidance from the Federal government on some levee design considerations, the State needs to provide interim guidance and criteria for design water surface elevations and levee design that will be used for: (1) Evaluations of Project levees in urban and urbanizing areas; (2) Evaluations of urban and urbanizing area levees that are not part of the State-Federal flood protection system (i.e., non-project levees); (3) Guidance for urban and urbanizing area levee designs to be initiated/completed in the near future; (4) Eligibility criteria for urban Early Implementation Program grant funding; (5) Assisting local agencies in achieving FEMA 100-year flood protection; (6) Assisting local agencies in achieving the urban level of flood protection; (7) Planning studies, such as the Central Valley Flood Protection Plan.

**Desired Outcome:**

A robust and well-accepted evaluation and design criteria for urban levees, floodwalls and other flood control structures that comprise the SPFC, including appurtenant, non-project flood control structures.

*Methodology:*

DWR must develop both 1) evaluation and design criteria and 2) procedures and guidance to that will allow urban and urbanizing areas to meet the requirements of SB5.

**CVFPP Goals**

*Contributes Significantly to:*

Improve Institutional Support

**Potentially Contributes to (Check all that apply):**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Improve Flood Risk Management<br><input checked="" type="checkbox"/> Improve Operation and Maintenance<br><input checked="" type="checkbox"/> Promote Ecosystem Functions | <input checked="" type="checkbox"/> Improve Institutional Support<br><input checked="" type="checkbox"/> Promote Multi-Benefit Projects |
|---|---|

**Recommendations (Retained/Not Retained/Requires Further Evaluation):**

Retain for further consideration

**Advantages:**

• Ensures that consistent levels of protection.

**Disadvantages:**

• High implementation cost.

- Reduces State liability for flood damages.

**Economic Considerations:**

*Capital Cost? (High, Medium, Low)*

Development requires low capital costs. However, implementation costs will be high.

*Annual Cost to Operate/Maintain/Repair? (Increase, Decrease, or No Change)*

Development has no direct impact on O&M costs, although implementation would potentially increase O&M costs.

*Potential for Cost-Sharing?*

Potential to develop standards in cooperation with USACE and FEMA. FEMA’s involvement in developing the standards is also being sought by DWR, although the USACE has been more involved to date.

*Emergency Response and Recovery Costs? (Increase, Decrease, or No Significant Change)*

Implementation may reduce the frequency of flooding, thereby reducing the long-term costs of emergency response and recovery. However, it would not necessarily decrease the consequences.

*Flood fighting? (Increase, Decrease, or No Significant Change)*

Implementation reduces the long-term costs of flood fighting.

*Effect on Damage to Critical Public Infrastructure?*

May reduce damage to critical infrastructure due to decrease in frequency of flooding.

*Effect on Floodplain and Economic Development?*

May support or encourage floodplain development.

*Effect on State Flood Responsibility? (Increase, Decrease, or No Significant Change)*

Implementation reduces the frequency of flooding; thereby reducing State financial responsibility.

**Environmental Considerations:**

*Rehabilitate key physical processes and ecological functions?*

None

*Adverse Environmental Impact?*

Implementation results in further system improvements, which may have positive and/or adverse environmental impact.

*Permitting Considerations?*

Implementation will result in further system improvements, which may require additional permits.

*Opportunity to Reduce the Adverse Environmental Impacts Associated With Operation, Ongoing Maintenance, and Repairs of FM System?*

None

**Social Considerations:**

*Public Safety?*

Implementation will improve public safety by reducing the frequency of flooding.

*Potential to Provide Other Benefits (Water Supply, Recreation, or Open Space)?*

Potential to provide greater water supply reliability, recreation and open space.

*Likelihood of Implementation (Politically, Institutionally, and Culturally Acceptable)?*

High likelihood due to SB5; will require broad agreement from technical stakeholders.

**Technical Considerations:**

*Redirected Hydraulic Impacts?*

Standards will address any potential redirected hydraulic impacts.

*Residual Risk?*

May reduce residual risk to existing urban areas; may increase risk if floodplain development is encouraged (i.e., urbanizing areas).

*Climate Change Adaptability:*

This action is unrelated to hydrologic and biological adaptability.

**Urban, Small Community, and Non-Urban Considerations:**

Applicable to urban (and urbanizing) land uses only.

**Regional Applicability:**

Applicable to all regions

**Integration with Other Programs:**

Interim Levee Design Criteria for Urban and Urbanizing State-Federal Project Levees; Levee Evaluations Program; Levee Repairs Program

**References:**

Framework for SAFCA's Participation in Formulating the CVFPP: Information Item, 2009;