Content

About this draft: This is a working draft. It is incomplete. The chapter contains placeholders for some figures and tables. Much of the data is missing. Full discussion of some topics may be incomplete. This is the second of several drafts to be circulated in 2008 before the public review draft is distributed in December.

Subgroup: Improve Flood Management

Chapter # Floodplain Restoration

Floodplain restoration is one of four strategies specifically intended to improve flood management. It is a strategy to renew the vitality and functions of floodplains by reestablishing and/or maintaining floodplains in their natural state. Other flood management strategies are flood impact modification, flood susceptibility modification, and floodflow modification (see discussion of these in their volume 2 chapters). Additionally, other resource management strategies discussed in California Water Plan Update 2009 may provide flood management benefits.

The selective application of this suite of strategies creates an opportunity to engage in Integrated Flood Management, a process that promotes a comprehensive approach to flood management that considers land and water resources at a watershed scale within the context of integrated regional water management, which aims to maximize the benefits of floodplains and minimize the loss of life and damage to property from flooding.

Floodplain Restoration in California

Background

Traditionally, flood management has relied on physical improvements which divert or reduce flood waters and avoid damage to lives and property. Often referred to as "flood control," this concept favored physical modification of stream channels, dams and surface impoundments, levees, and other structures that altered or confined natural watercourses. More recently, the emphasis has shifted to a more integrated approach that includes both structural and non-structural methods and seeks to enhance the ability of undeveloped floodplains and open spaces to reduce the incidence of flood events and the implementation of land use practices that minimize the risk to lives and property. This multi-faceted approach to flood management relies on the integration of multiple strategies to achieve the broad goal of improving flood management.

To identify statewide flood risks and inform the State's flood management policies and investment decisions, DWR has initiated the FloodSAFE California program. The goals of the FloodSAFE program are: 1) Reduce the Chance of Flooding – Reduce the frequency and size of floods that could damage California communities, homes and property, and critical public infrastructure; 2) Reduce the consequences of Flooding – Take actions prior to flooding that will help reduce the adverse consequences of floods when they do occur and allow for quicker recovery after flooding; 3) Sustain Economic Growth – Provide continuing opportunities for prudent economic development that supports robust regional and statewide economies without additional flood risk; 4) Protect and Enhance Ecosystems – Improve flood management systems in ways that protect, restore and where possible enhance ecosystems and other public trust resources; and 5) Promote Sustainability – Take actions that improve compatibility with the

natural environment and reduce the expected costs to operate and maintain flood management systems into the future.

Description

Floodplain restoration includes the following types of projects, programs, and policies: (1) ecosystem restoration; (2) watershed management; and (3) floodplain management.

Ecosystem restoration improves the condition of our modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment for current and future generations. Many of California's ecosystems can never be fully restored to their natural state. Instead, efforts focus on rehabilitation of important elements of ecosystem structure and function to achieve long-term sustainability. This can include increasing the flows in streams and rivers, restoring fish and wildlife habitat, curtailing the discharge of waste and toxic contaminants into water bodies, controlling non-native invasive plant and animal species, and removing barriers in rivers and streams so that salmon and steelhead can reach their historic spawning areas. This includes the restoration of habitat on floodplains.

Watershed management refers to a collective group of actions and programs which seek to restore and protect watersheds through: proper planning and management of water resources and their uses; measures to reduce the impacts of nonpoint sources of pollution on water resources; promotion of soil conservation and the protection of waterways and wetlands; the creation of partnerships to restore and protect water resources, increasing the capacity of local groups to engage in watershed management and stewardship; and education of residents about the value of managing water resources at a watershed scale. The preservation or restoration of floodplains can be an integral part of watershed management.

Floodplain management recognizes that periodic flooding of lands adjacent to rivers and streams is a natural function and may be a preferred alternative to keeping rivers in their channels. To permit seasonal inundation of floodplains, structural improvements may be needed to constrain flooding within a defined area along with nonstructural measures to limit development and permitted uses within those areas subject to inundation. The intent of floodplain management is to preserve and/or restore the natural ability of floodplains to absorb, hold, and slowly release floodwaters.

Connections to Other Resource Management Strategies

As discussed above, this strategy is one of four specifically intended to improve flood management. The other three strategies (floodflow modification, flood impact modification, and flood susceptibility modification) are addressed in individual strategy discussions in this chapter. The concept of Integrated Flood Management relies on the application of multiple strategies to achieve a comprehensive effect. In addition to these key strategies, other strategies included in the water plan also have the potential to provide flood management benefits and may be included as an element of integrated flood management. Potential flood management benefits from other resource management strategies include:

- Conjunctive management and groundwater storage: Diversions of surface water for groundwater infiltration could enhance flood management by reducing flows.
- Conveyance: Improvements to regional water supply distribution systems could enhance the potential for flood flow conveyance.

- Surface storage: Reservoirs can be designed to provide storage for flood flows, thereby reducing downstream flood peaks or volumes.
- System reoperation: Reoperation of reservoirs constructed for water supply purposes could provide opportunities to preserve and/or enhance flood management capabilities, by providing for the storage of flood flows.
- Urban runoff management: Management of urban runoff for purposes of improving water quality can preserve and/or enhance flood management by designing management practices to reduce or delay flood peaks.

Potential Benefits of Floodplain Restoration

Seasonal inundation of floodplains can provide essential habitat for plants and animals, including those dependent on periodic floods. There may also be benefits to the economy, agriculture and society to keeping rivers and their floodplains connected, including water quality improvements and groundwater recharge. The benefits of floodplain restoration for each hydrologic region depend on the potential to preserve or restore floodplains within each region. The regional reports for each of the 10 hydrologic regions and 2 special interest areas describe some of the potential benefits of integrated flood management, including floodplain restoration.

Interregional benefits associated with floodplain restoration are limited, as the conveyance of flood flows does not occur between hydrologic regions. However, implementation of floodplain restoration within the Mountain Counties special interest area has the potential to provide benefit to downstream areas in the Sacramento and San Joaquin regions, and improvements in those regions would provide benefit to the Delta Region. Statewide benefits from floodplain restoration would result from increases in water supply which may result and a reduction in damages from future flood events and the level of State assistance associated with such events.

Potential Costs of Floodplain Restoration

The Department of Water Resources is working to identify the costs of improving flood management on a statewide basis. Included in this effort are the Central Valley Flood Protection Plan, a Statewide Flood Management Planning Project, and support for enhanced regional flood management through Integrated Regional Water Management (IRWM) plans. Collectively, these efforts will identify flood risks, propose feasible flood management improvements and quantify the cost of implementing the identified improvements. Some preliminary information may be available to inform Update 2009 of the Water Plan, but the bulk of this information may not be available until the subsequent Update of the Water Plan.

Major Issues Facing Floodplain Restoration

Implementation of floodplain restoration will not adversely affect drought preparedness, water quality; or energy consumption. As an element of Integrated Flood Management, this strategy will enhance flood management. Promotion of this strategy as an element of integrated regional water management is unlikely to create challenges, as the implementation floodplain restoration measures are not likely to impede other forms of water resource management.

As climate change could increase the magnitude of future flood events, climate change will create new challenges to flood management measures, including floodplain restoration. As current models of global climate change have not been localized to individual watersheds, specific flood impact predictions have not been developed for most locations, making planning for nonstructural

improvements problematic. Expanded implementation of integrated flood management may be the best approach to address these uncertainties. Implementation of this strategy (changed regulation and building codes) is not anticipated to be directly affected by climate change.

Currently, the extent of flood management across the state needs are not well documented, although some local flood management plans (and multi-hazard mitigation plans) may describe local needs, but coverage of such plans is not statewide. Effective floodplain restoration relies upon reliable information about potential flood risks. As many regions lack current hydrologic information or hydraulic models to estimate flood risks, the state may need to consider investments in data collection and analysis to address data gaps and improve understanding of potential flood risks.

Recommendations to Facilitate Floodplain Restoration

Consistent with the recommendations of the FloodSAFE Strategic Plan:

- The Department of Water Resources should develop a comprehensive Central Valley Flood Protection Plan (as described in SB5) with extensive stakeholder input by January 1, 2012.
- The Department of Water Resources should identify opportunities and needs to improve integrated flood management statewide and develop a financing strategy by January 1, 2012.
- The Department of Water Resources should develop a strategy to provide incentives and support for the creation and maintenance of IRWM plans that address regional flood management issues by January 1, 2012.

Selected References

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(OES 2007) Governor's Office of Emergency Management, State of California Multi-Hazard Mitigation Plan

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