

Program Overview

April 1999



Sacramento
and
San Joaquin
River Basins

Comprehensive Study





**Sacramento
and
San Joaquin
River Basins**



Comprehensive Study

Table of Contents

Study Overview	1
Study Area	4
Timeline	5
Planning Parameters	6
Problem Identification	7
Identified Alternatives and Measures	8
Policy Issues and Institutional Challenges	9
Tools to Develop Alternatives	10
Program Coordination	12
Implementation Strategy	13
Public Outreach & Comment	15
Next Steps	16

Our mission is to develop a system-wide, comprehensive flood management plan for the Central Valley to reduce flood damage and integrate ecosystem restoration.

Background

Since the mid-1800s, California has enjoyed great economic prosperity. Much of this prosperity has derived from the productive lands and urban centers of the great Central Valley. Today, these areas are at risk from major flooding and protected by a flood management system that may no longer meet the needs of this important region. Recent floods have highlighted the extent and magnitude of this problem throughout both the Sacramento and San Joaquin River basins.

The January 1997 flood was one of several large floods to impact the Central Valley of California over the last two decades. The fiscal and emotional impacts of recent floods, together with changes in public attitudes and advances in scientific knowledge, have led to the need for a comprehensive evaluation of the existing flood management systems. The adequacy of the systems has been brought into question, as have land use practices in the floodplains. At the same time, a greater appreciation for environmental conditions and natural features of the river systems requires consideration of protecting and enhancing environmental values in a re-evaluation of the flood management systems.

Recognizing a Need

Four recent major floods (1983, 1986, 1995, and 1997) caused widespread and extensive damage in the Sacramento and San Joaquin Valley and resulted in substantial repair, replacement and rehabilitation efforts to the flood management systems and flooded areas.

The January 1997 flood was one of the most costly and geographically extensive flood disasters in the State's history. Major storms throughout California caused record flows on many rivers. In the Central Valley, the flood management systems for the Sacramento and San Joaquin Rivers were stressed to capacity and beyond. Reservoir flood storage reduced floodflows by 50 percent or more, saving lives and significantly reducing property damage; however, in some areas, levees failed. Levees on the Sacramento River and its tributaries sustained two major breaks.



Our mission is to develop a system-wide, comprehensive flood management plan for the Central Valley to reduce flood damage and integrate ecosystem restoration.

Many levees that did not fail were severely damaged and required extensive repairs. On the San Joaquin River, levees failed in more than two dozen places.

In both the 1986 and 1997 floods, near catastrophic damages were narrowly avoided. Both of these floods pushed the existing flood management system beyond its limits, resulting in numerous system failures. In summary:

- Existing flood management systems functioned, but were clearly overtaxed.
- Combined damages from four recent floods exceeded \$1.6 billion.
- Another flood like those of 1986 and 1997 would likely result in similar or greater devastation.
- Storms greater than those of January 1997 are possible, and the resulting flooding could be catastrophic.
- The flood management system is in desperate need of upgrade and modification.



Our mission is to develop a system-wide, comprehensive flood management plan for the Central Valley to reduce flood damage and integrate ecosystem restoration.

An Innovative Solution

In response to extensive flooding and damages experienced in 1997, the United States Congress authorized the U.S. Army Corps of Engineers to provide a comprehensive analysis of the Sacramento and San Joaquin River basin flood management systems and to partner with the State of California to develop a plan for flood management into the next century. The Corps and The Reclamation Board of the State of California are leading a Comprehensive Study to improve flood management and integrate ecosystem restoration in the Sacramento and San Joaquin River basins.

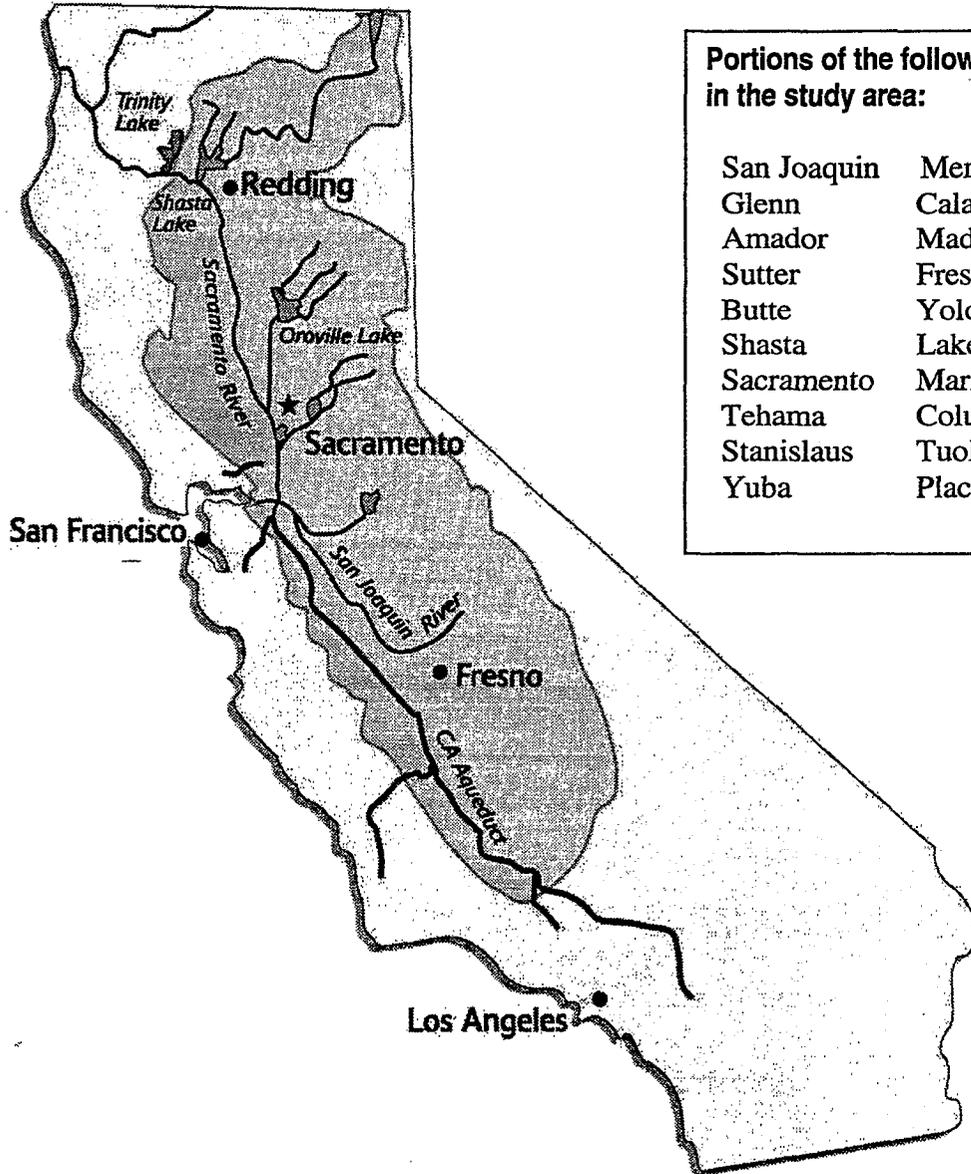
The Comprehensive Study will develop master plans that will increase flood protection and improve the ecosystem on major rivers and tributaries in the Central Valley. These plans will include an implementation strategy that will allow immediate execution of improvements to the system. Because this study is the first system-wide evaluation of the flood management systems in the Central Valley, it represents a change in how projects are identified, selected and implemented. It will look at the program from a system-wide perspective as opposed to site-specific projects.

While several local studies and programs address water supply, water quality and ecosystem restoration in the Central Valley, the Comprehensive Study is unique. It is the only program to address regional flood management issues and development of master plans to incorporate both flood damage reduction and river corridor ecosystem restoration in the Sacramento and San Joaquin River basins. Past and current efforts to address these issues form the starting point for the Comprehensive Study.



Geographic Study Area

The great Central Valley of California contains two major river systems: the Sacramento River in the north and the San Joaquin River in the south. The Sacramento and San Joaquin River Basins Comprehensive Study will address the combined watershed of these two major river systems, a drainage area of more than 40,000 square miles. Some of the cities in this area include Redding, Red Bluff, Colusa, Yuba City, Marysville, Sacramento, Stockton, Manteca, Modesto, Merced and Fresno.



Portions of the following counties are included in the study area:

San Joaquin	Merced	Siskiyou
Glenn	Calaveras	Lassen
Amador	Madera	Modoc
Sutter	Fresno	Plumas
Butte	Yolo	Sierra
Shasta	Lake	Nevada
Sacramento	Mariposa	Solano
Tehama	Colusa	El Dorado
Stanislaus	Tuolumne	
Yuba	Placer	



Project Timeline

The Comprehensive Study was launched in October 1997 and will conclude with a final report to Congress in 2002. The study is being conducted in two phases.

- Phase I of the Comprehensive Study, *which concluded in March 1999*, focused on evaluating current conditions through a Post-Flood Assessment, developing hydrologic and hydraulic models, establishing a mission statement, identifying flooding and related environmental problems, formulating preliminary planning objectives, initiating a public involvement program, collecting potential solution measures and developing a plan of action for Phase II.
- Phase II, *which continues through 2002*, will concentrate on fully implementing the public involvement program, conducting feasibility-level assessments, developing basin master plans and developing an environmental impact statement/environmental impact report (PEIS/EIR) to support implementation.

A staged approach to implementation of the master plans will allow the integrity of the flood management system to be maintained and facilitate the participation of local sponsors. Some projects will be recommended for immediate authorization and other priority elements will be recommended for immediate follow-on development. Remaining elements will be implemented as sponsors are identified and funds become available.

Feb/Mar 1998	Nov/Dec 1998	April 1999	2001	2002
Initial Focus Group Research on Planning Parameters	Regional Meetings on Planning Parameters	Interim Report to Congress	Release of Draft Strategy for Flood Management and Related Ecosystem Restoration (PEIS/EIR)	Final Strategy and PEIS/EIR (including an implementation plan)
Identification of "Spin-Off Projects" and Early Implementation Projects ▶				



Planning Parameters

During Phase I, planning objectives, principles and considerations were developed to guide the Comprehensive Study. Planning objectives recognize the dual goals of the Comprehensive Study as well as potential policy issues and institutional barriers. The Comprehensive Study will be guided by two main principles: that significant progress is needed toward both flood damage protection and ecosystem restoration and that measures must be commonly acceptable, legally feasible and implementable. Through public outreach and stakeholder involvement, it was determined that stakeholder opinion supports addressing political, economic, environmental and public factors that historically have restricted the planning, operation and maintenance of flood management systems. The basic objectives identified are:

Improve flood risk management throughout the systems

- Identify existing flood protection levels for the systems
- Avoid or reduce potential flood damages in the future through flood risk education
- Improve reliability, conveyance capacity and use of reservoir storage to reduce risk
- Minimize operation and maintenance costs of the flood management systems
- Improve system-wide floodplain management among local, State and Federal entities

Integrate ecosystem protection and restoration with flood damage reduction measures

- Promote natural processes
- Increase and improve riparian, floodplain, and riverine habitat
- Promote recovery of threatened and endangered species and the stability of native species
- Preserve agricultural productivity while promoting the ecological value of agricultural land

Resolve policy issues and address institutional procedures

- Develop tools to analyze the hydrologic, hydraulic, geomorphic and biologic processes of the flood management systems
- Improve flood management and streamline procedures to obtain permits to minimize and resolve conflicts
- Develop a process to identify solutions that are multi-objective, are likely to be accepted by all concerned and can be implemented in a timely manner



Problem Identification

Problems with the existing flood management systems, both flood problems and related environmental problems, were identified by the Comprehensive Study Team and through technical support group meetings. Representatives of participating agencies, local governments, organizations and individuals throughout the Central Valley collectively identified a broad range of problems. These are summarized as:

Flood Problems

- The flood management systems, designed early in this century, do not now have the capacity to convey peak floodflows experienced in the past decade.
- For many parts of the system, the level of flood protection is not known and may not correlate to the value of property at risk of flooding.
- Levee structural integrity is not reliable in some parts of the systems.
- The cost to maintain the systems is extremely high because of erosive floodflows or sedimentation.
- No public or private entity has responsibility for maintaining flow-carrying capacity of the San Joaquin River channel from the Merced River downstream to the Delta.
- The current operation plans for existing reservoirs, lack of a system operation model and the need for additional storage, preclude optimal use of storage in the flood management systems.

Environmental Problems Related to Flooding and Flood Management

- Confining floodflows in reservoirs and between levees has caused the loss of natural hydrologic and geomorphic processes. Habitat for fish and wildlife has been lost or severely degraded as a result of the loss of natural processes.
- Mitigating for loss of habitat related to bank protection has in the past been inadequate and/or unsuccessful due to constraints related to funding, compensation to neighboring landowners, potential impacts to infrastructure and lack of suitable sites.
- Species numbers and community diversity are being lost because the quantity and diversity of remaining riparian, wetland and shaded riverine habitats are insufficient.
- Restoration of habitats and critical ecosystems has been limited by the lack of natural stream processes, adequate space for habitat and some levee maintenance policies.
- Non-native plants and animals threaten the survival of native species and can decrease floodway capacity.
- Reservoir releases to provide flood storage could possibly be modified to benefit downstream fisheries without impacting flood storage.



Identified Alternatives and Measures

Measures for flood damage reduction and ecosystem restoration were identified from many sources. Measure types were further defined in meetings with Focus Groups, the Local Support Groups and the Executive Committee. Two types of measures were defined; those that primarily address flood damage reduction and those for ecosystem restoration. These measures are not always mutually exclusive, as many have the potential to help meet both goals, which is the ultimate objective of the master plans to be developed in Phase II.

Flood Damage Reduction Measures	
Measures Affecting Flood Flow Regime	
<ul style="list-style-type: none"> · Create or modify existing reservoir storage and/or releases · Create or modify transient storage in flood basins · Modify existing water control plans 	
Measures Affecting System Capacity	
<ul style="list-style-type: none"> · Backup levee · Setback levee · Reconstruct channel · Raise levee 	<ul style="list-style-type: none"> · Improve or create bypass system · Create meanderbelt · Manage vegetation/substrate within existing floodway
Measures Affecting System Reliability	
<ul style="list-style-type: none"> · Protect streambank · Strengthen, raise and/or repair levee 	
Measures Affecting Management of the Floodplain	
<ul style="list-style-type: none"> · Modify existing buildings to reduce future damage · Discourage future development in floodplains · Redirect incompatible development out of floodway/floodplain · Require flood insurance 	
Ecosystem Restoration Measures	
<ul style="list-style-type: none"> · Reforest floodplain corridors · Protect existing natural physical processes · Re-establish suitable hydrologic regime to restore natural physical processes · Remove bank protection to restore natural processes · Allow riparian forest to reach maturity · Restore oxbows -- grade and plant abandoned oxbows · Hardpoint bank protection -- protect pumps, diversions, etc. locally (e.g., with mini spur-dikes) rather than continuous revetment · Restore and reforest high terraces and berms · Raise bypass levees to allow habitat development · Raise mainstem levees to allow habitat development · Allow habitat development within off-stream storage areas · Create habitat node(s) 	



Policy Issues and Institutional Challenges

Existing institutional policies and funding structures were not created to deal comprehensively with system-wide flooding and ecosystem issues. Too often, these policies and structures have led to a piece-meal and localized approach to regional problems. Some policy issues to be dealt with include:

Environmental Restoration, Flood Damage Reduction and the Regulatory Process

- Agency exemptions from compliance reduces authority of other agencies.
- Permit compliance requirements are time consuming and costly.
- Conflicts arise between environmental restoration and flood management objectives.
- It is difficult to acquire land to increase capacity of floodplains and floodways.
- Setback levees could be incompatible with agricultural land uses or sever riparian rights.
- Environmental restoration opportunities may conflict with raising, strengthening and protecting levees.
- Bank protection projects lack funding.
- Focus on traditional alternatives has caused environmental impacts.
- Focus on nontraditional alternatives may overlook environmental benefits of dams and reservoirs.
- Reoperation of existing facilities is limited by other beneficial uses, such as downstream water supply, hydroelectric energy production, fisheries and habitat values.

Flood Risk and Hydraulic Effects

- Floodplains are not consistently delineated, making land use and flood planning difficult.
- Some floodplain designations are unreliable.
- Flood planning needs to be integrated with land use planning and local decision-making.
- Reimbursement policies provide disincentive for alternative flood damage reduction approaches.
- No consistent policies exist to assess hydraulic impacts and mitigation.

Limitations with Federal and State planning and project development

- Multiple partnering of multi-objective projects is difficult.
- Projects do not always address regional problems - approach is local, or piece-meal.
- Emphasis on National Economic Development can overlook the benefits of integrating ecosystem restoration.
- No clear methodology exists to formulate plans that provide different types of outputs.
- Lack of policy on reimbursements to local interests for locally constructed projects.
- The Reclamation Board has no authority or mission to participate in environmental restoration projects that are unrelated to Federal flood damage reduction facilities.



Tools to Develop Alternatives

The Study Team will utilize state-of-the-art tools in the development of a system-wide flood management plan. In the past, planning and repairs have been addressed on an as-needed basis. The following tools will allow the Study Team to develop master plans incorporating a new systems-wide approach to analysis for the Central Valley. The U.S. Army Corps of Engineers has conducted a post-flood assessment of four recent floods and is developing hydrologic and hydraulic models of the two river systems. Other tools being developed include:

Geographic Information System (GIS)

A Geographic Information System is being developed for both the Sacramento and San Joaquin River basins for the purpose of:

- Preparing base maps and figures
- Assisting in the evaluation of potential measures and alternatives
- Conducting mapping analyses associated with the Ecosystems Functions Model

In order to use as much existing data as possible, the team has convened GIS workshops, contacted local stakeholders and has retained engineering experts to identify needed information. As a result, the Study Team has determined what data the GIS would need in order to accomplish its objectives.

Coordination to Maximize Efforts

Coordinating with other groups will maximize GIS consistency and avoid duplication:

- DWR District Offices
- DWR's Information Systems and Services Office
- California State University, Chico
- Sacramento River Advisory Council
- University of California at Davis and Berkeley
- Bureau of Land Management
- Resources Agency (California Environmental Resource Evaluation System or "CERES")
- CALFED
- Others



Ecosystems Functions Model Conceptual Plan (EFM)

The Ecosystems Functions Model is an important tool to support planning, implementation and monitoring objectives of the Comprehensive Study. It would combine streamflow information from hydrologic and hydraulic models with information from other sources to describe the likely effects of measures on important ecosystem attributes.

The EFM would:

- Assist the conceptual design of potential measures for flood damage reduction and environmental restoration
- Indicate expected impacts of potential measures and enable a retrospective evaluation of their effectiveness

The EFM would be structured for simulation of individual river reaches, entire rivers or the entire Sacramento and San Joaquin River basins. It would provide flexibility in addressing key issues, schedules and cost constraints of the Comprehensive Study.

It would be designed to accommodate the future development of new predictive techniques or additional data and would serve as a valuable tool for ongoing adaptive management of the flood control systems.

Modeling and Coordination

Ecosystem modeling concepts developed by scientists associated with the CALFED process serve as a starting point for the Comprehensive Study EFM. The Study Team will continue to coordinate the development and implementation of the EFM with CALFED.



Program Coordination

Agency Coordination

The Comprehensive Study is being developed at a time when several other major programs are considering a multitude of issues in the Central Valley. Interagency cooperation and public involvement will assure that solutions are well coordinated and opportunities for complementary benefits are achieved.

An Executive Committee, comprised of numerous State and Federal agencies, provides project direction, lends resources for the study, assists in resolving emerging policy issues and ensures that study results and policies are consistent and coordinated with other related programs.

THE EXECUTIVE COMMITTEE	
Partners	
U.S. Army Corps of Engineers	The Reclamation Board State of California
Participating Agencies	
<u>Federal</u>	<u>State</u>
<i>Fish and Wildlife Service Forest Service Environmental Protection Agency Federal Emergency Management Agency Bureau of Land Management U.S. Geological Survey National Marine Fisheries Service Natural Resources Conservation Service Bureau of Reclamation</i>	<i>Department of Fish and Game Water Resources Control Board Department of Water Resources Department of Parks and Recreation Department of Boating and Waterways State Lands Commission Office of Emergency Services Department of Food and Agriculture CALFED Bay-Delta Program (Federal/State)</i>

Coordination With Other Programs

The Federal and State governments are jointly involved in several major programs that address environmental restoration in the Central Valley. The Comprehensive Study's joint objectives of flood damage reduction and ecosystem restoration necessitate close coordination with other programs. Often, measures for flood damage reduction, improved water management and ecosystem restoration can be combined to enhance their effectiveness and produce complementary benefits.

Through the Executive Committee and other outreach efforts, the Comprehensive Study will identify opportunities where flood damage reduction and ecosystem restoration measures could be combined or expanded with other programs to help accomplish mutual objectives.



Implementation Strategy

The Final Comprehensive Study Report will include a recommendation for authorization of the master plans similar to the Critical Projects Program, authorized in Section 528(b) of the Water Resources Development Act of 1996 (WRDA '96), and will be consistent with fiscal resources and other constraints. Implementation of the master plans will be staged. Important considerations in project staging are to maintain the integrity of the flood management system and to maintain participation of local sponsors throughout the staged implementation. The need to reduce flood damages and restore ecosystems is immediate. Early in the process, projects will be recommended for immediate authorization and/or implementation.

Spin-Off Projects

Because of the large geographic scope of the Comprehensive Study, potentially feasible projects have been, and will continue to be, identified throughout the planning process. These potential projects will match the goals and objectives of the study, will meet the programmatic definition of water resource problems and will have support for immediate implementation by Federal and non-Federal sponsors. Some of these potential projects may also match the goals and objectives of other State or Federal programs as well as meet the objectives set by this study. Procedures have been developed during this study to identify projects that may "spin-off" to existing programs for immediate implementation by the Corps, State, or other entity.

Projects may also qualify as spin-offs if they could be more efficiently and effectively implemented through a different program. Spin-off projects could include projects for which expertise is housed in an agency or organization other than the Corps, Reclamation Board or Department of Water Resources, such as the U.S. Fish and Wildlife Service or the California Department of Fish and Game.

Three spin-off projects were identified in Phase I and have been advanced to project-specific evaluation and planning processes. The Comprehensive Study will continue to monitor the progress of these projects and will incorporate their components into the ultimate plan. Throughout the Comprehensive Study process, the study team will continue to identify other potential spin-off projects and provide support for their implementation.

Early Implementation Projects

Early implementation projects comprise the second implementation stage of the Comprehensive Plan. Early implementation projects will be identified and developed to feasibility level detail during Phase II of the Comprehensive Study.



The study team will encourage the public, stakeholders, flood management agencies, participants in other projects and other government entities to propose early implementation projects. These projects will be clearly identified in the Comprehensive Study's Final Report. The study team anticipates that identification of these early implementation projects will form the foundation for the program.

Early implementation projects will be identified, developed and recommended for Congressional authorization and implementation in the Final Report. Developing and implementing projects that meet multiple objectives of the related, ongoing programs in the study area may require Federal authorization of innovative funding arrangements that involve multiple agencies and partners.

EARLY IMPLEMENTATION PROJECTS

- Provide significant flood damage reduction and ecosystem restoration benefits
- Do not preclude other options in the flood management system
- Have broad support among agencies and stakeholders
- Have a sponsor willing and financially able to participate

Full Plan Implementation

The final report and supporting environmental documentation will include a recommendation for staged implementation of the master plans. The master plans will be a guide for future project development and for decisions about emergency response activities. The master plans will ensure that site-specific projects and actions are fully coordinated and integrated in the concept of an overall system-wide development program.



Public Outreach & Comment

During Phase I of the Comprehensive Study, a public outreach program was developed and initiated to provide a forum for stakeholder and participating agency involvement in the development of study planning parameters. The public outreach program takes an approach that concentrates on geographic regions and encourages the participation of the stakeholders most likely to be interested in and affected by the study. A wide array of communication media were developed to assure that timely information reaches potentially interested parties. Newsletters are used to report progress on the Comprehensive Study and notify interested parties of public involvement opportunities. Where appropriate, stakeholders were interviewed to obtain information for potential use in the study.

Public involvement during Phase I included several working groups, which were formed to encourage public participation in the identification of problems. The groups provided a forum for diverse interests to share their perceptions of the problems and for agency representatives to achieve a better understanding of public and other agencies' concerns.

- **Technical support groups** identified known problems and potential solutions
- **Policy focus groups** identified policy issues and needs for policy changes
- **Local support groups** identified local concerns regarding potential solutions and validated the products of the technical support and policy focus groups

Early in Phase I of the Comprehensive Study, technical support groups met to identify known problems with the existing system. The technical support groups consisted of participating agencies, local governments, organizations and individuals throughout the Central Valley.

Between June and September 1998, The Reclamation Board and the Corps held four policy focus group meetings to address issues that affect flood management and ecosystem restoration planning. The groups were asked to identify policies and institutional barriers that affect flood damage reduction, associated land use planning and environmental restoration and identify potential changes to existing policies based on the issue statements.

In November/December 1998, eleven local support group meetings were held at locations throughout the Sacramento and San Joaquin River basins, as well as San Francisco, to further define problems and identify potential opportunities for solutions. These meetings were closely coordinated with local California Department of Water Resources offices, who have historically worked with local stakeholders on water management and flood protection issues.

LOCAL SUPPORT GROUP MEETINGS

Red Bluff
Chico
Colusa
Willows
Marysville
Knights Landing
Sacramento
San Francisco
Modesto
Merced
Fresno



Our mission is to develop a system-wide, comprehensive flood management plan for the Central Valley to reduce flood damage and integrate ecosystem restoration.

During Phase II, the Comprehensive Study will continue to expand the public outreach program, complete model development, formulate and evaluate alternative flood management and ecosystem restoration alternatives, develop programmatic environmental documentation, identify additional policy and legislative requirements to support implementation, identify spin-off projects and develop early implementation projects and move them to implementation

Expand Public and Stakeholder Involvement

During Phase II, the public outreach program will be used to obtain feedback on the direction of the Comprehensive Study and to integrate the public and stakeholders into the formulation and analysis of alternatives. The goals of the public outreach program are to:

- Identify linkages with other resource management programs
- Develop support for potential flood damage reduction measures
- Establish refined planning objectives
- Develop support for specific management measures to be applied at specific failure points
- Integrate environmental restoration benefits system-wide
- Develop flood protection levels for reaches of the rivers which enjoy broad support

This public outreach program will also support public involvement requirements to develop NEPA and CEQA environmental documentation on the Comprehensive Study.

Plan Formulation and Evaluation

During Phase II, the hydrologic/hydraulic, ecosystem functions and flood damage assessment models, as well as environmental, economic and engineering design technical studies will be used to evaluate and combine measures to prepare the master plans for the two basins.



Our mission is to develop a system-wide, comprehensive flood management plan for the Central Valley to reduce flood damage and integrate ecosystem restoration.

The hydrologic and hydraulic models will be completed and calibrated. With these models, overbank floodflows will be simulated to determine the effectiveness of the flood management system to convey large flows; also, areas where the system is inefficient can be precisely identified. Flood frequency curves for the main stems of the Sacramento and San Joaquin Rivers will be updated and revised and sedimentation models will be used to determine reaches of aggradation and degradation.

The Ecosystem Functions Model (EFM) will be fully developed, tested on one to three pilot reaches, further refined and calibrated and used throughout the remainder of the study to evaluate potential effects of various measures and combinations of measures. The Geographic Information System (GIS) database will be the main source of input information to the EFM and will also be used to display the forecasting output. The GIS will then be used to catalog and identify impacts to existing resources.

Environmental Documentation

An environmental impact statement/environmental impact report (PEIS/EIR) will be prepared in Phase II. The PEIS/EIR will evaluate the overall potential environmental effects of the measures and plans for flood damage reduction and ecosystem restoration along the Sacramento and San Joaquin Rivers.

Environmental documents recently prepared by CALFED, the U.S. Fish and Wildlife Service and the Bureau of Reclamation may have already addressed many measures and actions and will be incorporated into the PEIS/EIR evaluations where appropriate.

Study Schedule

The Comprehensive Study was launched in October 1997 and initiated with the signing of the Feasibility Cost Sharing Agreement in February 1998. Phase I concluded with a documentation report in April 1999. The Phase II report will be submitted to Congress in 2002.





**Sacramento
and
San Joaquin
River Basins**

Comprehensive Study

**1325 J Street, Room 1560
Sacramento, CA 95814-2922
Phone: 916.557.5140
Fax: 916.557.7202
e-mail: compstudy@spk.usace.army.mil
www.spk.usace.army.mil/civ/ssj**