

Executive Summary for the Draft Central Valley Flood System Conservation Strategy

In the Central Valley of California, flood risks, water supplies, and the functioning of ecosystems are linked, with actions in one area affecting other areas. The Central Valley Flood Protection Act of 2008 required the California Department of Water Resources (DWR) to develop a sustainable, integrated flood management plan to improve the management of flood risks and conservation of river and floodplain ecosystems in the Sacramento and San Joaquin Valleys.

To address these needs, DWR has prepared the Central Valley Flood Protection Plan (CVFPP), which is a long-term planning document that provides a framework for prioritizing investments in the State Plan of Flood Control (SPFC) and helps resolve related regulatory, funding, and operations and maintenance (O&M) challenges. Its primary goal is to improve flood risk management, and its secondary goals are to promote ecosystem functions, improve O&M, improve institutional support, and promote multi-benefit projects.

The Central Valley Flood System Conservation Strategy (or Strategy) is an integral part of the CVFPP. The Strategy supports the attainment of all CVFPP goals but focuses on the improvement of ecosystem functions through the integration of ecological restoration with flood risk reduction projects where feasible.

Purpose

The purpose of the Conservation Strategy is to provide:

- A comprehensive, long-term approach for improving riverine and floodplain ecosystems through multi-benefit projects that provide ecological benefits while protecting public safety
- A regional programmatic framework for increasing the predictability and cost-effectiveness of permitting while resulting in more effective and less costly conservation outcomes and
- Contextual information and tools for use in planning and permitting processes

To fulfill this purpose, the Conservation Strategy identifies:

- Goals
- Measurable objectives
- Integration approaches

- A strategic permitting approach
- An implementation approach

The following sections describe these components of the Conservation Strategy.

Goals

The Conservation Strategy identifies goals to guide the promotion of ecosystem functions. These goals are based on the environmental objectives of the Central Valley Flood Protection Act (California Water Code, Section 9616[a]) and are as follows:

- **Ecosystem Processes: Improve dynamic hydrologic (flow) and geomorphic processes in the SPFC**—These ecosystem processes are critical for maintaining certain habitats and species. A diversity of flows, suitable sources of sediment, and a sufficiently broad river corridor to allow stream meandering are necessary to sustain fisheries and riverine habitats.
- **Habitats: Increase and improve the quantity, diversity, and connectivity of riverine and floodplain habitats**—These habitats include aquatic, riparian, wetland, shaded riverine aquatic cover, and other floodplain habitats, as well as agricultural lands that can provide important wildlife values.
- **Species: Contribute to the recovery and sustainability of native species populations and overall biotic community diversity**—Native species addressed by this Strategy include species that are primarily associated with riverine habitats and that are at risk of extirpation or extinction. Although the preceding goals are the foundation for species conservation, this goal emphasizes the need to avoid and minimize adverse effects on sensitive species, develop compensatory habitat (particularly on adversely affected sites), and contribute to species recovery in addition to mitigating impacts.
- **Stressors: Reduce stressors related to the development and operation of the SPFC that negatively affect at-risk species**—These stressors include invasive plant species, constraints on sediment sources and channel meander migration, isolation of floodplains from rivers by levees, and fish passage barriers, all of which contribute to loss and degradation of ecosystem functions and habitat.

Measurable Objectives

The Strategy's objectives specifically describe desired outcomes for the goals. These more specific descriptions support project formulation, support funding and management decisions, and serve as yardsticks for measuring progress in implementation. These objectives are intended to serve as a framework for evaluating progress over time and not as mandated performance criteria.

The objectives focus on the processes, habitats, and species with the greatest potential to benefit from conservation actions integrated with flood risk management actions. They also focus on stressors to these processes, habitats, and species that could be addressed by flood risk management. These targets are listed in Table ES-1.

Table ES-1. Ecological Goals and Targeted Ecosystem Processes, Habitats, Species, and Stressors

Ecological Goal	Targeted Ecosystem Process, Habitat, Species, or Stressor
Ecosystem processes. Improve dynamic hydrologic and geomorphic processes.	Floodplain inundation
	Riverine geomorphic processes
Habitats. Increase and improve quantity, diversity, and connectivity of riverine and floodplain habitats.	SRA cover
	Riparian
	Marshes and other wetlands
	Floodplain agriculture
Species. Contribute to the recovery and sustainability of native species populations and overall biotic community diversity.	Targeted species: Delta button-celery Slough thistle Valley elderberry longhorn beetle California Central Valley steelhead DPS Chinook salmon—Central Valley fall-/late fall–run ESU Chinook salmon—Central Valley spring-run ESU Chinook salmon—Sacramento River winter-run ESU Green sturgeon—southern DPS Giant garter snake Bank swallow California black rail Greater sandhill crane Least Bell’s vireo Swainson’s hawk Western yellow-billed cuckoo Riparian brush rabbit Riparian (= San Joaquin) woodrat
Stressors. Reduce stressors related to the development and operation of the SPFC that negatively affect at-risk species.	Revetment
	Levees ¹
	Fish passage barriers
	Invasive plants

Key: DPS = Distinct Population Segment; ESU = Evolutionarily Significant Unit; SPFC = State Plan of Flood Control; SRA = shaded riverine aquatic.

Note:

¹ In particular, levees are a stressor where located within river meander zones or if their design does not provide sufficient capacity for riparian habitat throughout the floodway.

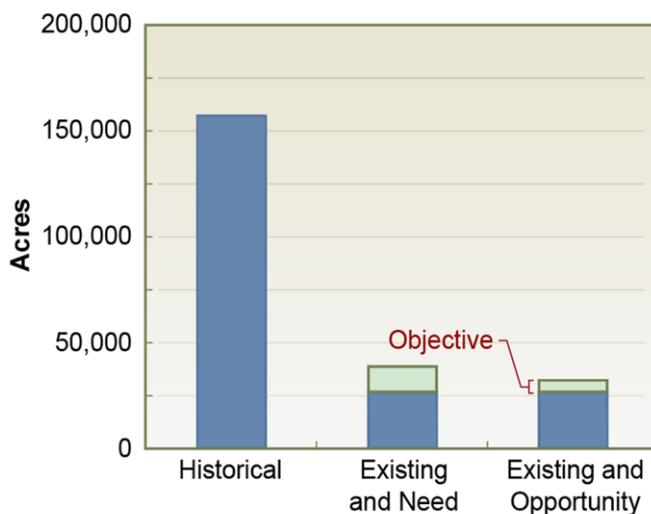
Objectives consist of one or more metrics (specific, measurable attributes, such as the acreage of riparian vegetation), and for each metric, an amount of change (a magnitude of ecosystem enhancement [i.e., of net improvement to river and floodplain ecosystems]). Metrics were selected on the basis of several attributes: relevance, responsiveness, cost-effectiveness, reliability of interpretation, and transparency/ease of communication.

Enhancement amounts are based on the size of conservation needs and the size of opportunities for multi-benefit projects to provide that needed conservation.

For ecosystem processes and habitats, the size of ecological objectives has been determined by (1) synthesizing conservation needs identified by recovery planning for species targeted by the Strategy and (2) estimating the extent of conservation opportunities indicated by flood planning. The process for determining the size of these objectives is illustrated in Box ES-1. A more detailed description of the process used to identify the measurable objectives is presented in Appendix L of the Conservation Strategy, “Measurable Objectives Development: Summary of Conservation Needs and Scale of Restoration Opportunities.”

Box ES-1

Setting Objectives Based on Opportunities to Contribute to Conservation Needs



Objectives have been set to realize opportunities to contribute needed conservation.

In the example shown here, the historical and existing amounts of riparian vegetation are displayed as blue bars. The additional amount of riparian vegetation needed and the size of restoration opportunities are displayed as green bars. The additional amount needed to meet species’ recovery needs is more than multi-benefit flood projects could likely restore. Therefore, the objective is set to the estimated size of opportunities to restore riparian vegetation. If the potential contributions of flood projects had been greater than the need, the objective would have been set to match the size of the estimated need.

For invasive plants and fish passage barriers, the size of objectives has been based on DWR's Invasive Plant Management Plan and its Synthesis of Fish Migration Improvement Opportunities in the Central Valley Flood System. DWR's approach to invasive plant management and opportunities for improving fish migration are summarized in the Strategy. These DWR documents are presented in their entirety in Appendix E, "Invasive Plant Management Plan," and Appendix K, "Synthesis of Fish Migration Improvement Opportunities in the Central Valley Flood System," of the Conservation Strategy.

Because conservation needs of target species were a basis for determining ecosystem process, habitat, and stressor objectives, separate objectives for target species were not developed. Objectives also were not developed for levee and revetment modifications needed to attain ecosystem process and habitat objectives because the amounts needed could vary substantially depending on the specific projects implemented.

The objectives are preliminary because there is a moderate to high level of uncertainty regarding the size of conservation needs and regarding the scale and feasibility of potential opportunities. Therefore, these objectives will be reevaluated and revised as necessary to support effective conservation and wise use of State funds.

Attainment of these objectives, similar to attainment of the other objectives of the CVFPP, depends on future funding and on contributing actions by the multiple organizations implementing flood projects and operating and maintaining the SPFC.

Integration Approaches

Greater integration of conservation with flood projects and O&M is the means by which the Strategy would improve river and floodplain ecosystems. The Strategy describes how ecosystem improvements can be integrated with projects and O&M activities. It also describes DWR's approach to vegetation management in the flood system and DWR's support of agricultural stewardship, both of which are essential to the successful integration of conservation activities with flood risk reduction activities.

The Strategy proposes that the integration of conservation with flood management activities should conform to several guiding principles, including:

- Plan conservation incrementally in relationship to investments in flood risk reduction.
- Design ecosystem improvements to avoid significant hydraulic and other unintended impacts.
- Prioritize restoration at existing habitat reserves and public lands.
- Secure funding to maintain restored habitat.

Integrated Projects and O&M

Several types of habitat restoration actions can be incorporated into multi-benefit projects that expand the floodway, remove facilities, modify levees and control structures, or change flood system O&M practices. These include modification of floodplain topography, and the restoration of riparian habitat (including Shaded Riverine Aquatic cover) and of marshes and other wetlands. The Strategy describes these actions and their applicability to different types of flood risk reduction projects and O&M practices. It also discusses the factors that affect resulting ecological benefits.

The Strategy also describes DWR's approach for implementing coordinated and forecast-based operations for Central Valley reservoirs. It does not identify objectives for river flows because these flows are managed for other purposes in addition to flood risk reduction—in particular, water supply and hydroelectric power production. However, DWR is evaluating opportunities to improve management of river flows through coordinated and forecast-based operations. This approach to operations may provide a variety of opportunities to improve ecosystem processes and habitats (such as enhancing channel meander migration rates and improving fish passage).

Vegetation Management

Vegetation management is a major aspect of maintaining the flood system and the existing mosaic of floodplain habitats. It consists of efforts to manage levee vegetation, channel vegetation, and invasive plants. The Strategy describes how DWR is planning to incorporate additional conservation into this management. A more detailed description of DWR's planned approach is presented in Appendix D of the Strategy, "Vegetation Management Strategy."

Levee Vegetation Management

Levee vegetation management is particularly important because levee vegetation can impede visibility and accessibility for inspections and flood fighting. Long-term management of vegetation will be accomplished through adaptive management of vegetation on levees. This approach:

- Allows existing "legacy" trees and other woody vegetation to live out their normal life cycles unless they pose an unacceptable threat
- Precludes growth of new woody vegetation on newly constructed levees
- Allows visibility for inspections and access for maintenance and flood fight to be maintained
- Allows retention of lower waterside vegetation (below the Vegetation Management Zone delineated on each levee)
- Emphasizes establishment of riparian corridors as a preferred approach for providing compensatory habitat in the short term for loss of habitat on the levee profile in the longer term

- Allows for limited managed recruitment of woody vegetation in areas of the lower waterside slope not currently occupied by riparian habitat

Channel Vegetation Management

Successful channel vegetation management balances the need of providing channel capacity to convey floodwaters, while maintaining the habitat values of vegetation within these floodways. A multi-purpose project approach is under development in order to better achieve these goals and best planning practices can inform these efforts. These practices also seek to reduce O&M costs, control invasive weeds, and establish specific native plant communities to improve conveyance, protect floodway infrastructure, and benefit wildlife. The 2017 update to the CVFPP is expected to include these practices.

Invasive Plant Management

Invasive plants are a major stressor of ecosystem processes and habitats and also negatively affect O&M. DWR's approach to reducing the impacts of invasive plants is detailed in Appendix E of the Conservation Strategy, "Invasive Plant Management Plan." The plan has a threefold approach to reducing invasive plant impacts:

- Increase institutional support for a systemwide invasive plant treatment program for DWR-maintained areas
- Develop and implement a coordinated, systemwide invasive plant treatment approach in Channel Maintenance Areas, and effectively track results
- Further develop partnerships through which the use of DWR resources can be optimized, and provide resources that facilitate consistency with DWR's approaches beyond its maintenance areas

Agricultural Stewardship

DWR considers agricultural land stewardship to be an important element in its efforts to achieve the public safety, economic stability, and ecological goals of the CVFPP and the Strategy. DWR also recognizes that conservation actions can affect agriculture. Therefore, the Conservation Strategy supports improving agricultural stewardship policies associated with flood risk management activities, monitoring the effects of conservation actions on agriculture, and supporting regulator mechanisms to avoid restrictions on agricultural activities resulting from expansion of threatened or endangered animal populations onto private lands near restored habitats (such as landowner development of Safe Harbor Agreements with the federal government).

DWR also will work with other State and federal agencies to support wildlife-friendly agriculture that is compatible with flood risk management. It will use tools such as landowner incentive programs, easements, and management of conserved areas. DWR's support of wildlife-friendly agriculture would be based on identified and available funding. In the context of the Conservation Strategy, wildlife-friendly agricultural practices are practices that either increase

the habitat value of existing agricultural land for targeted species or reduce the potential for mortality of targeted species and adverse effects on their habitats in adjacent natural areas.

Strategic Permitting Approach

Implementation of the CVFPP, including the Conservation Strategy, will involve numerous flood risk management and conservation actions over a long time frame. These substantial financial investments and commitments to improve public safety, ecosystems, and economic stability are linked to the ability to efficiently obtain permits and a number of regulatory approvals.

Therefore, the Conservation Strategy proposes a framework for increasing the efficiency of environmental compliance. This approach would incorporate existing efforts (Routine Maintenance Agreements and the Small Erosion Repair Program), expand use of advance mitigation, and implement regional permitting processes.

Regional permitting would be the primary institutional approach to improving long-term permitting efficiency. The specific approaches to doing so are based on existing laws, which are the basis of comparable programs, such as regional habitat conservation plans and natural community conservation plans. Agreements forged within these regional planning frameworks are expected to ultimately yield cost savings for more rapid project execution and more efficient O&M. Permitting on a regional basis also would result in more effective conservation outcomes. In addition, it would make the permitting process manageable in terms of participants, area of coverage, range of issues, and management complexity. It would cover capital improvements and O&M.

Implementation Approach

DWR and other State and federal agencies, LMAs, local communities, and nongovernmental organizations will need to work together to apply the approaches described in the Conservation Strategy and achieve the Strategy's objectives and thereby attain the CVFPP goal of promoting ecosystem functions. Four key components of the Strategy's implementation approach will support these partnerships:

- Adaptive management
- Funding
- Coordination and collaboration
- Outreach and engagement

These components of the implementation approach are described below.

Adaptive Management

Adaptive management uses the results of new information, gathered from monitoring and from other sources, to adjust strategies and practices. In collaboration with its partners in flood management and conservation, DWR will, to the extent that funding and personnel are available, use adaptive management to implement the Strategy and evaluate its success.

DWR proposes to inform adaptive management with several types of monitoring, including regional-scale monitoring at 5-year or 10-year intervals to document progress toward ecological objectives. Adaptive management also would be informed through focused studies and other sources of information and would be supported by an implementation tracking and data-sharing system.

For informing DWR's adaptive management of implementation, the State has proposed an organizational structure that provides for agency engagement and coordination through an Interagency Advisory Committee and provides for technical guidance through a Scientific Advisory Committee.

Funding

Ecosystem improvements in the Central Valley flood system would be funded and implemented, where feasible, as part of implementing the State Systemwide Investment Approach. Such improvements would be, in large part, a component of integrated, multi-benefit flood projects that are expected to be high priorities for State funding. DWR's guidelines for existing and future funding are likely to reflect the State's current multi-benefit investment priorities, but funding priorities are ultimately going to be established as part of the funding authorization and appropriation process.

Projects providing multiple benefits can attract funds from other sources as well. These sources include future State and federal conservation programs and authorizations, State bond funds for conservation, cost-sharing with other conservation plans, and potentially the State's Greenhouse Gas Reduction Fund.

Furthermore, integrating ecosystem improvements into flood risk management actions is likely to increase public support and funding of those actions, giving DWR access to more funds for flood risk management in the future.

Coordination and Collaboration

The Conservation Strategy relies on the integration of ecosystem improvements with flood risk management in actions taken by DWR and other State and federal agencies, LMAs, local communities, and nongovernmental organizations. Coordination and collaboration among these organizations is therefore a key component of the Strategy's implementation. Coordination and collaboration in refining the CVFPP and with existing conservation plans is particularly important and is described further below.

Coordination and Collaboration in CVFPP Refinement

The refinement of the CVFPP to achieve sustainable, integrated flood risk management is occurring primarily through three interrelated planning processes: development of basin-wide feasibility studies for the Sacramento and San Joaquin River Basins, creation of regional flood management plans, and development of the Strategy. In developing the basin-wide feasibility studies, DWR is applying guidance and supporting information from the Strategy to the development and assessment of designs, costs, and benefits associated with improving ecosystem functions. DWR also will use the Strategy to highlight the permitting, flood risk management, ecosystem, and other benefits of integrating ecosystem improvements into projects identified in regional plans.

Coordination and Collaboration with Existing Conservation Plans

The Conservation Strategy will be implemented alongside many other conservation efforts, some of which are in place and some of which are in progress. These other conservation efforts are summarized in Appendix J, “Existing Conservation Objectives from Other Plans.” The Conservation Strategy supports coordination and collaboration with related conservation plans in six ways:

1. Identifying and resolving potential conflicts with regional conservation plans during the planning and development of the 2017 CVFPP
2. Minimizing SPFC-related constraints on the success of other regional conservation plans in attaining their objectives
3. Collaborating on, and sharing the funding of, projects of common interest
4. Implementing conservation actions that complement, and do not preclude, those of other conservation plans (e.g., restoration projects that increase regional habitat connectivity)
5. Implementing conservation actions that contribute directly to the attainment of the objectives of other conservation plans
6. Participating in regional conservation plans, when such participation contributes to attainment of the Conservation Strategy’s objectives

Outreach and Engagement

DWR will continue to solicit further input on the Conservation Strategy from stakeholders and provide additional materials and venues to ensure constructive communication with the public. More specifically, DWR plans to continue to:

- Coordinate with related regional conservation planning efforts
- Develop and facilitate workshops as necessary for stakeholders and interested parties

- Create, distribute, and publish (e.g., on the DWR website) fact sheets, workshop notices, and reports of notable news
- Through the Teacher Floodplain Institute, help teachers understand the State's conservation and flood risk reduction work on river systems and floodplains
- Work on agricultural land stewardship strategies and engage agricultural organizations and landowners
- Develop and promote Safe Harbor Agreements, a Good Neighbor Policy, tools used in Regional Advance Mitigation Planning, and Corridor management Plans in collaboration with regulatory agencies and local organizations
- Engage nongovernmental groups to identify and pursue potential conservation opportunities
- Plan and facilitate working meetings within DWR and with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, National Marine Fisheries Service, State Water Resources Control Board, National Resources Conservation Service, California Department of Conservation, California Department of Food and Agriculture, and others
- Coordinate regularly with planning groups to ensure that they have current information and data pertaining to Conservation Strategy efforts, for use in their own regional or statewide planning efforts
- Provide targeted outreach to LMAs to ensure that their regional and systemwide needs are clearly understood
- Continue to look for opportunities to implement multi-benefit projects and programs that support them