

# Freshwater Ecosystem Budgets in the Sacramento River Basin

Sacramento River Basin water resources managers believe California should account for water budgeted specifically for our important ecosystems through Freshwater Ecosystem Budgets. To effectively serve multiple benefits in a highly managed water system, advancing specific, targeted environmental benefits are essential for ecosystem restoration, as well as ensuring water supply reliability for communities, farms and recreation.

*Freshwater Ecosystem Budgets* can catalyze more collaborative and innovative approaches to improve conditions for fish and wildlife by better integrating natural resource values into California water management.

A *Freshwater Ecosystem Budget* is a modern water management tool that specifies a volume of water to be made available to support a range of ecosystem functions to which native species are adapted. Recent experience and emerging science inform us that advance planning is necessary to develop and effectively implement *Freshwater Ecosystem Budgets* in a manner that balances and protects all beneficial uses of water, rather than focusing on ineffective single species management approaches.



**The descriptions here illustrate how various Freshwater Ecosystem Budgets have and can be better used for critical ecosystem functions in the Sacramento River Basin.**

These components are all consistent with our growing scientific understanding of how modern functional flows—both instream flows and flows that are spread out and slowed down across the landscape to reactivate our floodplains—can efficiently serve multiple benefits within a highly managed water system and ensure the availability of freshwater to support a range of ecosystem functions, including in drier years.



## Birds and the Pacific Flyway Species

The Pacific Flyway is an internationally significant resource for wildlife and is equally important for wildlife enthusiasts, naturalists and birdwatchers. The Sacramento River Basin has seven National Wildlife Refuges, more than 50 state wildlife areas and 500,000 acres of ricelands that provide habitat and a food source for birds, endangered giant garter snakes and nearly 250 water-dependent species along the Pacific Flyway. Today, the water budget for the Pacific Flyway is diverted from rivers and sloughs throughout the region during much of the year and spread out over ricelands, managed wetlands and refuges under existing contracts and water rights. This water budget is subject to dry year reductions and various state and federal regulatory processes.

## Salmon

Four runs of Chinook salmon migrate and spawn in the Sacramento Valley, with the winter-run and spring-run listed as endangered. As part of the Sacramento Valley Salmon Recovery Program, water resources managers are working with scientists and conservation organizations to seek the best mix of instream flows and out-of-stream floodplain reactivation to support all freshwater salmon life stages.

**Instream flows.** Water resources managers have re-managed flows on nearly every river and stream in the Sacramento River Basin to implement water budgets designed by fishery agencies and then tailored and dedicated to benefit each specific salmon freshwater life stage. Much of this water is stored in reservoirs and then released at the right time for instream flows dedicated for specific purposes, including

improved temperature management for egg incubation during spawning or pulse flows to assist salmon in their migration. Details on these water budgets can be seen at [Re-managing the Flow](#).

*The Salmon Recovery program seeks the best mix of instream flows and out-of-stream floodplain reactivation to support all freshwater salmon life stages.*

**Out-of-stream floodplain reactivation.** As scientists have recognized that food is a primary limiting factor for the recovery of salmon and other species, water resources managers, farmers and land owners have increasingly recognized and dedicated water for out-of-stream floodplain reactivation, a water budget consisting of actions that

divert water to spread it out and slow it down across the landscape for ecosystem benefits. These actions include: 1) growing fish on ricelands and then releasing them into the rivers; and 2) producing fish food on farmland by strategically inundating lands within the traditional floodplain then returning the food-rich waters to rivers when it benefits migrating juvenile salmon. The water budget is a combination of flows strategically routed into flood protection bypasses to maximize these ecosystem benefits and water that is diverted from rivers to ricelands and other managed wetlands during the fall and winter.

## Delta Smelt

The Delta Smelt is a pelagic fish with a one-year life span that lives in the Delta downstream of the Sacramento River Basin. Among other stressors, Delta Smelt appear to be starving from a lack of food in their habitat. To assist this species, water resources managers on the west-side of the Sacramento River Basin have worked with state and federal agencies to strategically re-route flows from the Sacramento River into the Colusa Drain and Yolo Bypass to provide optimal conditions to create and boost plankton, a critical food source for Delta Smelt, and transport them downstream. The managed bypass flows that support this program are a water budget that boost food production in the bypasses that can then be transported downstream to Smelt habitat in the Delta.

## Free-Flowing Wild and Scenic Rivers

Many rivers in the upper part of the Sacramento River Basin have been recognized with Wild and Scenic Designations under federal and state law. These designations serve as a water budget to ensure that water will be maintained in a free-flowing condition in these recognized reaches of the rivers.

## Sites Reservoir

The proposed Sites Reservoir is a 21st century water storage enhancement to the California water system on the west-side of the Sacramento River Basin that would provide multiple environmental benefits to improve aquatic and terrestrial habitat for fish and wildlife and withstand dry year conditions. As an off-stream reservoir upstream of the Delta, Sites Reservoir would save water during storm events and flood flows for later use during drier periods when water is less available. Up to 40 percent of the project water would be dedicated as public benefit water, a water budget that state and federal agencies would manage for ecosystem benefits, water quality benefits, and other public benefits. Examples of how this public benefit water would be put to use include dedicating 40,000 acre-feet of water for managed wetlands and enhancing system-wide flexibility by allowing more cold water to be retained longer into the summer in Lakes Shasta, Oroville and Folsom for the benefit of salmon. The recent drought underscored the critical importance of a dedicated water supply in storage upstream of the Delta for all beneficial uses of water, including ecosystem needs.

*Up to 40% of water in Sites would be dedicated as public benefit water*

## Water Acquisitions

Water purchases for the environment can serve as a flexible and practical water budget that can provide water when and where it is needed for the benefit of fish and wildlife. Water acquisitions would benefit from expedited permitting and a reliable funding source that is available to purchase environmental water during critical times.

## Delta Flows and the Water Quality Control Plan

As part of Voluntary Agreements, water suppliers on the American, Feather, Sacramento and Yuba Rivers will deliver 250,000 to 300,000 acre-feet of water for Delta flows over the next fifteen years to supplement current regulatory requirements in D-1641 to help fisheries in dry, below normal and above normal years. This water budget will be fully integrated with enhanced habitat to first provide both instream and out-of-stream benefits in the Sacramento River Basin for salmon before flowing to the Delta to improve fisheries through actions informed by a science program designed to continually determine and re-evaluate the most effective means of enhancing ecosystem conditions.



## The Public Policy Institute of California

(PPIC) and others have inspired thoughtful ideas on water budgets for the environment as an effective way to improve fish and wildlife in a collaborative manner. We recommend the PPIC's report *Managing California's Freshwater Ecosystems, Lessons from the 2012-2016 Drought* (page 31).



Water resources managers in the Sacramento River Basin are committed to working collaboratively to advance the economic, social, and environmental sustainability of the region by enhancing and preserving its water supplies and water quality for the rich mosaic of farmlands, cities and rural communities, refuges and managed wetlands, and meandering rivers that all support fisheries and wildlife.

**If you have further ideas for a Freshwater Ecosystem Budget in the Sacramento River Basin, please contact us at: [info@norcalwater.org](mailto:info@norcalwater.org).**

