



# Delta Smelt Resiliency Strategy

Progress Report | June 2017

**In July, 2016**, state and federal agencies released a Delta Smelt Resiliency Strategy aimed at rapidly improving conditions for endangered Delta smelt. Found only in the Sacramento-San Joaquin Delta, the species is near extinction. The Strategy included 13 near- and mid-range actions aimed at creating better habitat, more food, and higher turbidity, along with reduced levels of weeds, predators, and harmful algal blooms. Ultimately, the actions should reduce mortality of Delta smelt and boost the rate at which the fish grow, reproduce, and survive.

The California Department of Water Resources (DWR), the California Department of Fish and Wildlife (DFW), the U.S. Bureau of Reclamation, the state Division of Boating and Waterways (DBW), the U.S. Fish and Wildlife Service, and the U.S. Bureau of Reclamation have worked together the past year to implement the Strategy. The smelt food production action also involves partnering with local agricultural water agencies and farmers.

Most progress under the plan has been made with existing funding and staff, but the Governor's proposed 2017-18 budget includes \$900,000 for aquatic weed control, \$800,000 for food web adaptive management projects, \$1 million for the Roaring River distribution system food production project, and \$800,000 for coordination of managed wetland flood and drain operations in Suisun Marsh.

Here is a summary of progress made in 2016-2017 on each action:

## Aquatic Weed Control

Invasive weeds blanket many Delta waterways. The weeds encroach on open water habitat that Delta smelt depend upon, and often harbor non-native predators. The plants filter the water column, removing suspended particles that help hide smelt from predators. The Strategy calls for increased treatment of aquatic weeds in the Delta.

**Update:** DWR, DFW and DBW built on the state's existing herbicide treatment program for invasive weeds to target nearly 200 acres of Delta smelt habitat at Decker Island in the western Delta and in the Cache Slough complex in the north Delta. Field studies have begun to evaluate the effect of herbicide treatment on the habitat, including the Delta smelt's food web.

## North Delta Food Web Adaptive Management Projects

Historically, the slow-moving wetlands and waterways of the Delta generated prodigious amounts of the microscopic plants and animals—phytoplankton and zooplankton—that support Delta smelt. In today's vastly altered, channelized Delta, smelt suffer from a shortage of food, particularly during summer and fall. The Strategy calls for augmented flows through the Yolo Bypass, one of the remaining food-rich areas, to deliver plankton to downstream areas inhabited by Delta smelt.

**Update:** DWR and DFW partnered with many agencies and farmers in the summer of 2016 to direct water through a wetland and tidal slough corridor of the

Sacramento River system and into the Delta. Close monitoring showed that the nutrient-rich “pulse flow” successfully generated a phytoplankton bloom and enhanced zooplankton growth and egg production. DWR will continue to work with Sacramento Valley water districts and others to repeat such flows and enhance Delta food production. (See chart on next page.)

## Outflow Augmentation

Scientific modeling suggests that seasonal outflows could ameliorate the harmful effects on Delta smelt of predation, harmful algal blooms, and food shortages. Outflows could test the hypothesis that the location of the low-salinity zone is important for Delta smelt at times other than fall. The Strategy called for spring and summer outflows of 85,000 acre-feet to 200,000 acre-feet above current water quality standard requirements.

**Update:** Additional outflows were not necessary in water year 2016-17, one of the wettest on record. State scientists are studying how the massive outflow affects ecosystem and species.

## Reoperation of the Suisun Marsh Salinity Control Gates

The Suisun Marsh in the western Delta contains good Delta smelt habitat, but the fish are sensitive to salt levels in the estuary. By reducing salinity in the marsh during the dry summer months, scientists hope to attract smelt to high-quality habitat. The Strategy proposes summer reoperation of the Suisun Marsh Salinity Control Gates to freshen the marsh.

**Update:** State Water Contractors, which represents the water districts that take delivery of water from the State Water Project, have prepared an adaptive management plan on the reoperation of the gates, which restrict the flow of higher salinity water from Grizzly Bay into Montezuma Slough during incoming tides and retain lower salinity Sacramento River water from the previous ebb tide. DWR has also initiated a feasibility study that includes engineering, modeling, and permitting evaluations. Pilot reoperation could begin in 2018.

## Sediment Supplementation in the Low Salinity Zone

Laboratory and field studies show that Delta Smelt require turbid water. Smelt habitat has degraded because there is less sediment in the system to

generate turbidity. The Strategy calls for DWR to assess the feasibility of adding sediment to increase turbidity in the low-salinity zone.

**Update:** The State Water Contractors evaluated whether sediment supplementation was a feasible action to effectively increase turbidity in the low-salinity zone. Modeling was done to assess whether sediment supplementation is feasible, what magnitude of supplementation would be required in order to affect turbidity, and the spatial and temporal extent to which sediment supplementation would affect turbidity. Results are under review. If this action is determined to be technically feasible, next steps include assessing the feasibility of permitting and implementation.

## Spawning Habitat Augmentation

Like related fish species, Delta smelt likely prefer sandy shoal habitat for spawning. The Strategy calls on DWR to evaluate the availability of suitable spawning substrates in Suisun Marsh and Cache Slough, and if necessary, introduce sand in areas where pre-spawning adults have been found in higher densities.

**Update:** DWR and the Delta Science Program are compiling data on the current status of substrates in order to consider targeted supplementation of sediment.

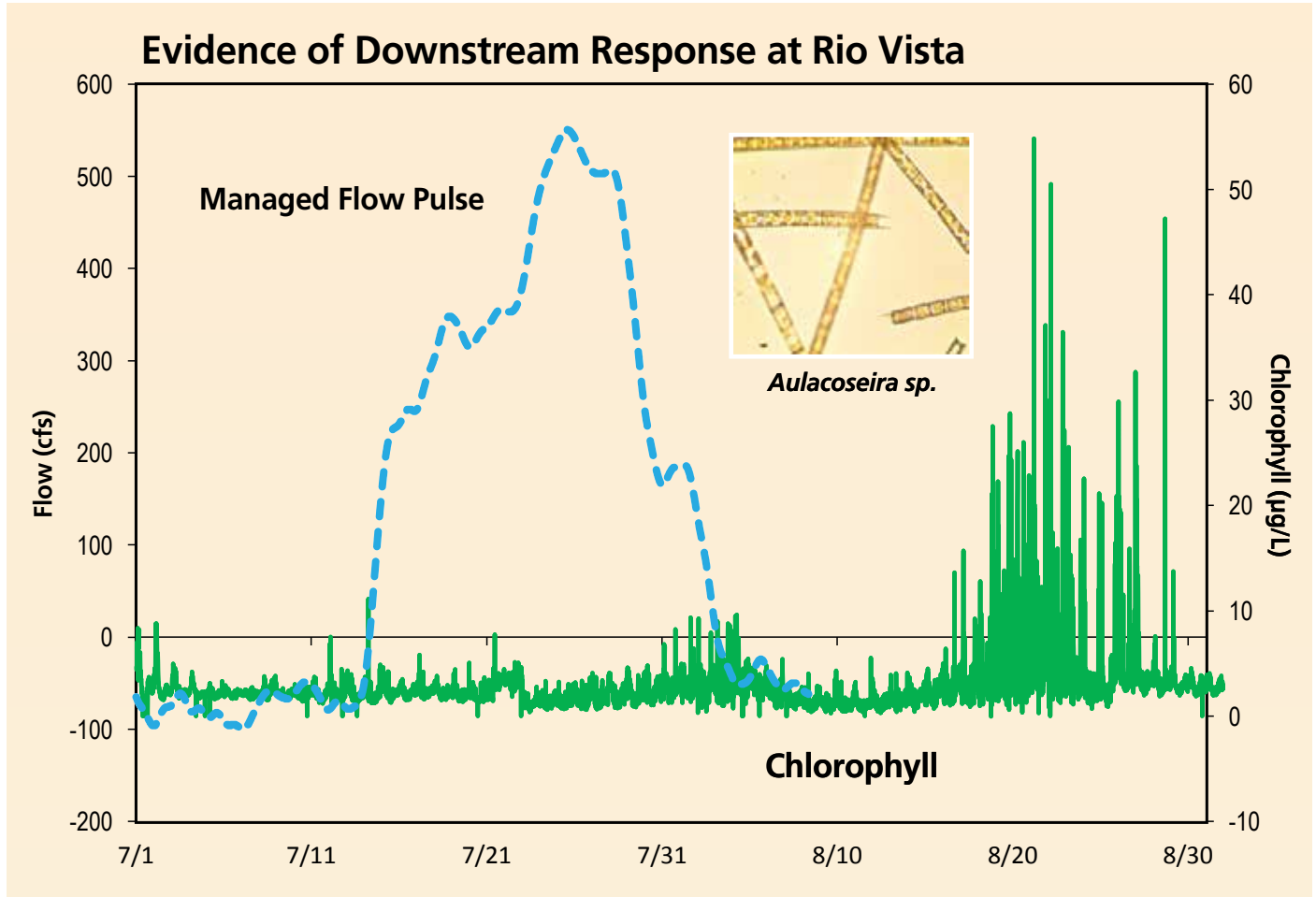
## Roaring River Distribution System Food Production

Grizzly Bay is part of the Suisun Marsh in the western Delta, and potentially offers good Delta smelt habitat. To increase smelt food production in the Grizzly Bay area, the Strategy calls on DWR to install drain gates on the western end of the Roaring River Distribution System in order to drain food-rich water from the canal into Grizzly Bay.

**Update:** The Governor’s proposed budget for 2017-18 includes \$1 million for implementation of this project.

## Coordinate Managed Wetland Flood and Drain Operations in Suisun Marsh

The managed wetlands of Suisun Marsh have the potential to generate the microscopic plants and animals at the base of the food chain, which could help Delta smelt. Under the Strategy, DWR will coordinate with the Suisun Resource Conservation District and the Department of Fish and Wildlife to develop a plan for



flooding and draining the managed wetlands into adjacent tidal sloughs and bays to boost food production.

**Update:** DWR and San Francisco State University are in the midst of a field evaluation of the food web effects of such an approach.

### Adjust Fish Salvage Operations during Summer and Fall

Fish drawn toward the federal and state water project pumps in the south Delta are captured, counted and returned to safer spots in the Delta. Some of the salvaged fish are non-native bass and other species that prey on or compete with Delta smelt. Under the Strategy, DWR and the U.S. Bureau of Reclamation will consider whether to stop returning non-native fish to Delta channels during summer.

**Update:** DWR used historical fish data to evaluate this proposal and found that the quantity of non-native fish

potentially removed would be modest compared to total predator populations in the Delta. Several logistical issues also were identified with this concept. The Bay Delta Office within DWR is currently working on predation projects and studies that could influence future actions.

### Stormwater Discharge Management

To reduce contaminants in the Delta, the Strategy calls for state agencies to consider funding entities such as the Sacramento Stormwater Quality Partnership and counties and cities that discharge stormwater to Delta channels.

**Update:** The Governor's proposed 2017-18 budget includes \$90 million for the State Water Resources Control Board's Storm Water Grant Program, which funds storm water and dry weather runoff projects that best advance the goals of improving water quality and

realizing multiple benefits from the use of storm water and dry weather runoff as a resource. Local governments must apply for the funding.

## Rio Vista Research Station and Fish Technology Center

Many state and federal agencies are involved in Delta research and monitoring to support Delta smelt management. To consolidate those efforts, improve coordination and gain efficiencies, the Strategy calls for the creation of a new Delta research field station at the former Rio Vista Army Base.

**Update:** DWR reached a significant milestone recently with the release of final environmental documents for the Rio Vista Estuarine Research Station, which will include office space, laboratories, and boat storage. The project is planned in conjunction with the U.S. Fish and Wildlife Service's Regional Fish Technology Center, a five-acre complex that will house populations of fish species including Delta smelt. An additional refuge population of smelt will help guard against extinction. Another major activity during 2017 was the organization of a workshop to discuss how fish from the refuge population might be used for management. The large workshop included regional and national technical experts, and covered topics such as legal, environmental, and logistical issues. The workshop findings will be used to guide initial laboratory and field work on the use of captive fish for smelt conservation.

## Near-term Delta Smelt Habitat Restoration

More than 90 percent of the Delta's original wetlands are gone. State agencies are advancing several projects to restore tidal wetlands to the western Delta, which could benefit smelt and many other species. The Strategy calls for progress under the state's Cal EcoRestore program, which aims to restore at least 30,000 acres in the estuary.

**Update:** State, local, and federal agencies and private interests broke ground last fall on the Tule Red project,

which will reopen 400 acres of former duck hunting club lands in Suisun Marsh to daily tidal action. DWR also launched a first-of-its-kind approach to speeding the pace of restoration by soliciting project proposals from private companies, non-profit groups, and individuals. Two projects involving approximately 700 acres have been selected, with a second solicitation expected soon. Construction is expected to begin on restoration projects in the coming year on Dutch Slough, Hill Slough, Decker Island, Lower Yolo Ranch and Bradmoor Island.

## Franks Tract Restoration Feasibility Study

Located near the confluence of the Sacramento and San Joaquin rivers, the flooded Delta island called Franks Tract may be suitable for low-salinity habitat preferred by Delta smelt. The Strategy calls on the Department of Fish and Wildlife to conduct a feasibility study on restoration in order to reduce invasive aquatic weeds and predation, while increasing turbidity and fish food production.

**Update:** A conceptual restoration design has been prepared for evaluation. The conceptual plan would convert a portion of Franks Tract to inter-tidal marsh and modify hydraulic connections between False River and Old River through Franks Tract and associated channels. Contracts are in place with the Metropolitan Water District of Southern California to produce an engineering feasibility report for restoration construction. DWR will conduct three-dimensional hydrodynamic modeling to evaluate changes in circulation patterns and effects on turbidity and water quality. Additional two-dimensional modeling will assess the effects of the restoration in the context of other habitat restorations being implemented through California EcoRestore on water circulation and quality in the Delta. Outreach to the local community and affected recreational users will be conducted as a part of the study. A final report is expected by the end of November 2017.