



2019 Longfin Smelt Symposium: A Synthesis of Management-relevant Science



Abstract

The state of Longfin Smelt science has advanced as an outcrop of the 2014 settlement agreement between the State Water Contractors (SWC), the California Department of Water Resources (DWR) and the California Department of Fish and Wildlife (DFW). This settlement agreement called for a science program to conduct a suite of studies on Longfin Smelt for several years. The state of Longfin Smelt science has advanced because this science program included a strong commitment by agencies and stakeholders to work collaboratively and to think outside the status quo.

Topics: Longfin Smelt, Science Communication, Synthesis

Background

On November 7, 2019 the SWC Science Program hosted a Longfin Smelt Symposium – documenting our current understanding of the species and highlighting key gaps in knowledge with the purpose of improving our understanding of species life history. Understanding life history helps to inform management actions and decisions intended to benefit Longfin Smelt, including habitat restoration, flow actions, survey design and species conservation status.

This poster provides a synthesis that highlights key symposium findings of management relevance, calls out areas for further study and offers a brief description of the SWC's Science Program.

About Longfin Smelt

Longfin Smelt *Spirinchus thaleichthys* are euryhaline, anadromous fish that have a short life cycle of two to three years. Longfin Smelt in the Bay and Delta occupy pelagic habitat from tidal freshwater, through the lower Estuary, and the coastal ocean. Populations of Longfin Smelt occupy coastal habitat northward to Alaska. Longfin Smelt are listed as threatened under the California Endangered Species Act and are being considered for listing under the federal Endangered Species Act.

Areas for Further Study:

While we have learned a tremendous amount about Longfin Smelt in the past ten years, several key gaps remain, including:

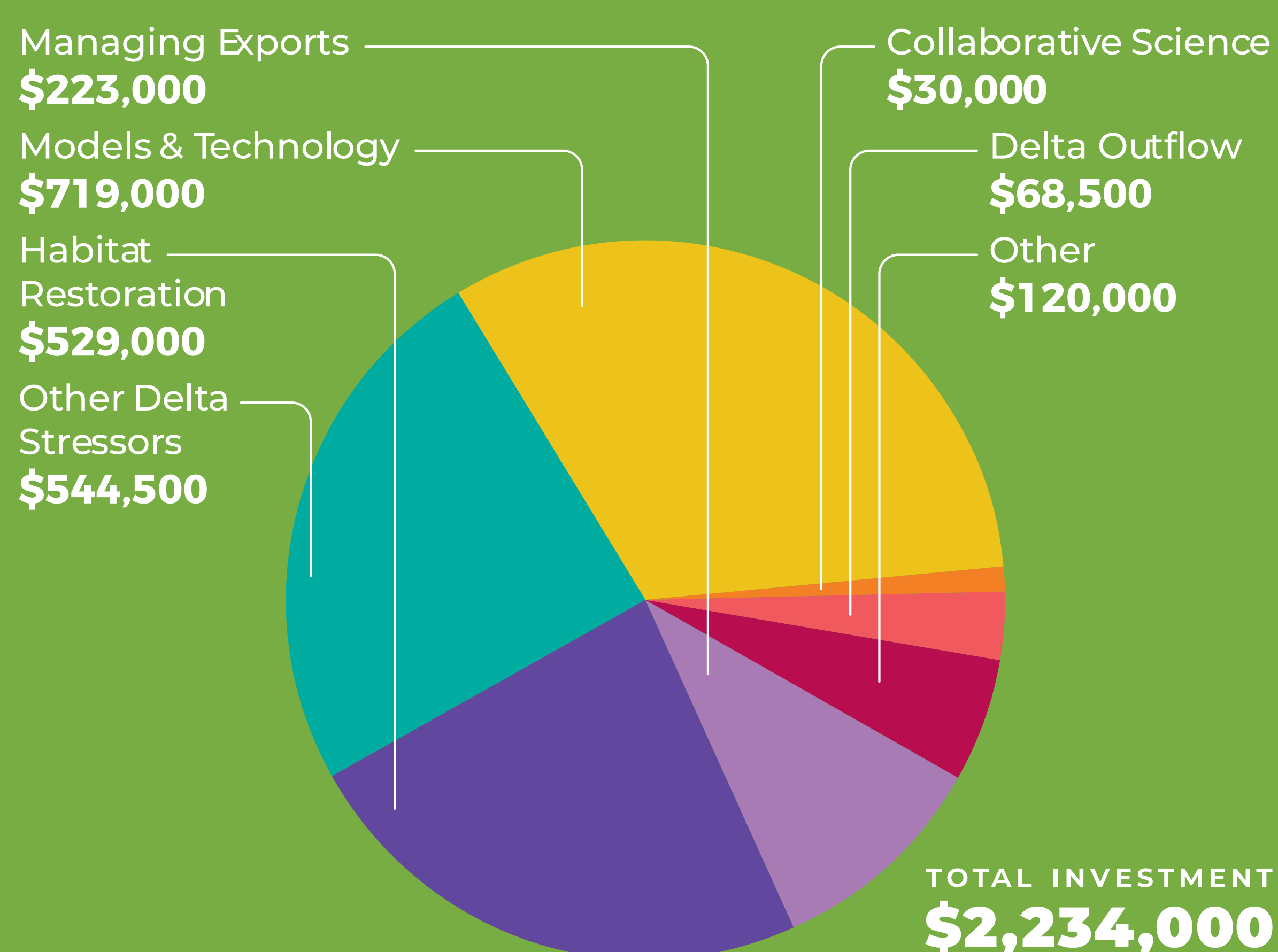
- Developing a predictive model to evaluate the effects of management actions
- Developing culture protocols for laboratory study
- Understanding survival of larvae to rearing habitat and retention of juveniles in rearing habitat
- Understanding how ocean conditions affect the species
- Evaluating ocean occupancy
- Studying the effects of contaminants

The SWC Science Program will continue to invest in studies that reduce uncertainties to advance our understanding of the species life history, habitat, and stressors.

Our Science Program

By looking at our state's water supply challenges through a scientific lens, we can help the state to achieve the coequal goals of providing a more reliable water supply for California and protecting, restoring and enhancing the Delta ecosystem.

That is why the SWC is collaborating with our partners in academia, government, non-profit and the private sectors, investing over \$2 million annually in new research and other programs that will spur future policymaking and improved water management practices throughout California.



Key Findings

- Longfin Smelt are multibatch synchronous spawners (presented by Trishelle Tempel)
- Longfin Smelt have diverse diets dominated by *Eurytemora affinis* and mysids (presented by Michelle Jungbluth)
- Longfin Smelt are found more seaward in the lower Estuary than previously thought, especially during high flow years, where they appear to be occupying marsh habitats (presented by Jim Hobbs)
- Longfin Smelt don't appear to spawn solely in freshwater (presented by Levi Lewis)
- The population in the Estuary is the southernmost range of the species, and genetic flow appears to be northward towards Canada and Alaska (presented by Mandi Finger)
- Longfin Smelt tend to stay low in the water column during the day and distribute more evenly throughout the water column at night (presented by Wim Kimmerer)
- Simple behaviors may explain their distribution (presented by Corey Phillis)
- Ocean conditions may be important to their life history (presented by Fred Feyrer)
- Proportional entrainment is low, so entrainment doesn't seem to be a significant stressor for the species currently (presented by Ed Gross)

Other Findings with Management Relevance:

Habitat is more widespread than previously thought, so restoration planning should include westward locations to accommodate a broader distribution of Longfin Smelt; increased abundance following wet years may be driven by lower Estuary tributary flows, not just Delta outflows; and changes in the food web appear to be a significant stressor. Ultimately, the data and information from the Longfin Smelt science program from the settlement agreement as well as science related to the 2020 Incidental Take Permit (ITP) should align with how we manage the species for recovery.

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