



## Lead Scientist's Report

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**Summary:** Delta Lead Scientist Dr. John Callaway will discuss an article from *Marine Ecology Progress Series*, which investigates how estuarine habitat provides nursery support for fish in the Suisun Marsh, give an update on the Science Needs Assessment discussion series, review upcoming events, and provide the By the Numbers Report.

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**Colombano, D.D., A.D. Manfree, T.A. O'Rear, J.R. Durand, and P.B. Moyle.  
Estuarine–Terrestrial Habitat Gradients Enhance Nursery Function for Resident  
and Transient Fishes in the San Francisco Estuary. *Marine Ecology Progress  
Series*. March 2020.**

Estuaries have long been identified as important “nursery” grounds for fish species (i.e., providing improved survival for juvenile fish). However, details of how habitat conditions vary and affect different fish species throughout their lifetime have been lacking in the region. Nursery habitat can be important for a variety of reasons, including providing better conditions for growth, such as improved food availability or increasing survival by providing refuge from predators. To improve overall population numbers, nursery grounds also need to be physically and ecologically linked to adult habitats. Understanding how habitat conditions affect fish species across their full life cycle is essential to effectively restoring and managing estuarine ecosystems and native fish populations.

In this study, Dr. Denise Colombano, a Delta Science Fellow, and her colleagues evaluated the importance of various habitat characteristics to provide nursery support for four common fish species in the Suisun Marsh: Sacramento splittail, tule perch, starry flounder, and non-native striped bass. Using data from 22 years of monitoring across nine sloughs (tidal creeks) in the Suisun Marsh, they examined how trends in fish abundance and growth related to habitat features (i.e. slough size, sinuosity, and adjacent habitats), flows, and water quality. They found that a mosaic of habitat conditions and land-water connectivity supported these fish species. Habitat preferences differed across the four species, especially for young fish, with some species using larger, deeper channels and others using small channels within the marsh. Habitat preferences for individual species also changed as fish matured from juveniles to adults, highlighting the importance of both a mix of habitats and connectivity between habitats to provide nursery support for fish populations. The authors concluded that effective restoration and management of estuarine fish populations need to incorporate a mosaic of connected habitats that reflect the dynamic conditions found in natural sloughs.

This research directly relates to Chapter 4 of the Delta Plan, which highlights the importance of restoring ecosystem connectivity and the land-water interface. This paper also exemplifies the value of long-term data sets and synthesis in improving

understanding and management of Delta ecosystems, goals that are outlined in the Delta Science Plan and the Science Action Agenda.

### **Science Needs Assessment Pre-Workshop Discussion Series Update**

The Science Needs Assessment Workshop has been rescheduled for October 5 to 6, 2020. The workshop is being hosted by the Delta Plan Interagency Implementation Committee (DPIIC) and the Delta Independent Science Board (Delta ISB) and has been summarized at previous Council meetings.

Two pre-workshop virtual discussions have been held to date, providing an overview of projected climate change impacts for the Delta and discussing management questions related to these impacts. The third pre-workshop discussion will take place on July 28, focusing on the science that needs to be done to provide answers to potential management questions. This discussion will feature science managers from the Delta Stewardship Council, the U.S. Geological Survey, and the Interagency Ecological Program. A final discussion will take place on September 9 to discuss the science governance, funding, and integration that are needed to address these issues. All four pre-workshop discussions will provide valuable input that will feed into the October workshop.

### **On your radar**

#### ***Spring-Run Chinook Salmon Science Workshop***

The Delta Science Program, in coordination with the Department of Water Resources and the California Department of Fish and Wildlife, is organizing a virtual workshop to inform the development of population estimates for Central Valley spring-run Chinook salmon in the Sacramento River Basin. Specifically, the workshop will focus on understanding the state of the science, assessing current knowledge and data gaps, and identifying additional science and monitoring needs. The workshop will span three consecutive half-days, September 8-10, 2020. Registration for the workshop is available at <https://docs.google.com/forms/d/e/1FAIpQLSdKMZvtff92NLGxrq91-65426BNJ09v4iswxV4yo0Lf4tzJSA/viewform>.

### **By the Numbers**

Delta Science Program staff will provide a summary of current numbers related to Delta water and environmental management. The summary (Attachment 1) will inform the Council of recent counts, measurements, and monitoring figures driving water and environmental management decisions.

**List of Attachments**

Attachment 1: By the Numbers Summary

Attachment 2: Visual abstract - Estuarine–Terrestrial Habitat Gradients Enhance Nursery Function for Resident and Transient Fishes in the San Francisco Estuary

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