

FACT SHEET

Knaggs Ranch Experimental Agricultural Floodplain Study (13-31)

Deliverables: Published manuscript on Chinook salmon growth and survival results over agricultural substrates on replicated floodplains; published manuscript on zooplankton and macroinvertebrate dynamics on managed agricultural floodplains; and possibly a published manuscript on use of telemetric techniques to investigate fish behavior and habitat preference on managed agricultural floodplains.

Status: First year of investigation completed. Manuscript in prep.

Primary Investigator: Jacob Katz, Carson Jeffres, Ted Sommer, Louise Conrad

Recipient Organization: Cal Marsh and Farm Ventures LLC

Project Cost: \$497,900

SFCWA Funding: \$125,000

Partners: California Department of Water Resources (\$159,000), Resources Legacy Fund (\$38,000), National Marine Fisheries Service (\$25,000), US Bureau of Reclamation (\$150,000), UC Davis, California Trout, California Waterfowl Association, Cal Marsh and Farm Ventures LLC.



Five times the weight in six weeks on the Knaggs Ranch agricultural floodplain site.

Introduction

The Yolo Bypass has been identified as the primary mitigation site for mandated restoration of floodplain habitats. Substantial data gaps need to be filled in order to design and implement restoration plans and develop performance criteria for evaluation of restoration actions. The Knaggs Ranch Experimental Agricultural Floodplain Project will investigate the relationship between fish habitat use, growth, and survival at appropriate temporal and spatial scales on a property also used for rice farming and waterfowl habitat. These data and results will provide key information needed to identify floodplain salmonid habitat criteria, best floodplain land management practices, and guide habitat restoration projects in support of the larger ecosystem restoration program that will occur on the Yolo Bypass existing long-term restoration plans.

Objective

To answer the question: What is the effect of land use alternatives on the behavior, growth, and survival of juvenile Chinook salmon reared on a managed agricultural floodplain?

Results

A pilot study on five acres was performed in 2012. Rapid growth for juvenile Chinook salmon – on average these tripled in weight during the six-week experiment – was realized compared to salmon rearing in the nearby Sacramento River. Another pilot study was performed in 2013 on 25 acres, the results of which corroborate the initial pilot study.

Conclusions

Preliminary conclusions from pilot study:

1. Rearing in off-channel managed habitat results in rapid growth of juvenile Chinook salmon.
2. Inundation of agricultural lands can provide food-rich rearing habitat for Chinook salmon.

Relevance

Winter floodplain habitat is a vital link between upstream gravel beds where salmon spawn and the ocean where they spend the majority of their lives. Accordingly, a high priority for the Bay Delta Conservation Plan and the National Marine Fisheries Service's Biological Opinion on the Coordinated Long Term Operation of the Central Valley Project and State Water Project is the restoration of off-channel habitats. Substantial data gaps need to be filled in order to design and operate restoration plans and to develop performance criteria for evaluation of floodplain restoration actions. The Knaggs Ranch study will investigate the biological and physical parameters of fish habitat, as well as the relationships between habitat, growth, and survival. Such information is essential to the development of additional Yolo Bypass rearing habitat for Chinook at appropriate temporal and spatial scales .

Next Steps

Expand the program incrementally and demonstrate that success can ultimately be achieved on a larger landscape level scale, approximately 2,500 acres. In addition, the project hopes to incrementally examine the benefits of managed floodplain habitat to wild fish that naturally enter the floodplain. Manuscript on study (in prep) and expected to be submitted for publication in 2014.