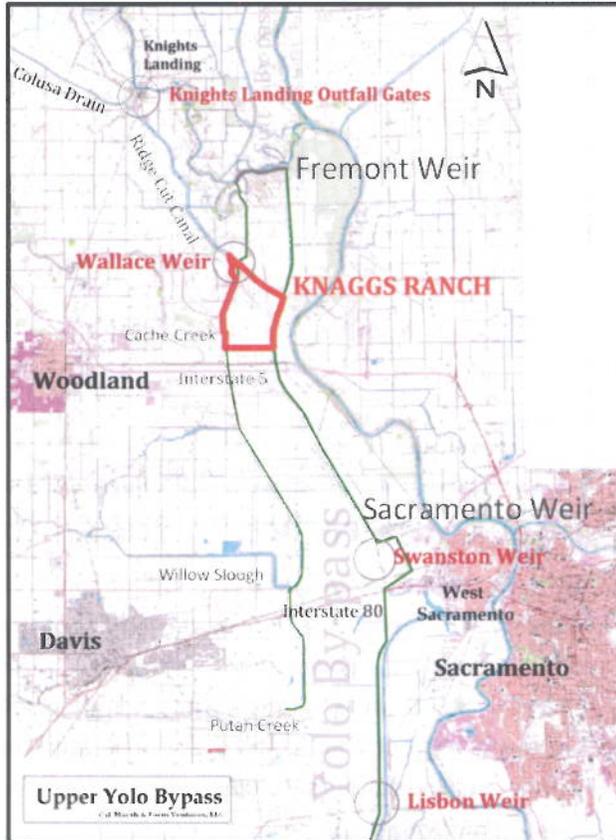




THE NIGIRI CONCEPT: Salmon Habitat on Rice Fields



Nigiri is a form of sushi with a slice of fish atop a compact wedge of rice. The “Nigiri Project” is the name of a collaborative effort between farmers and researchers to help restore salmon populations by reintroducing young salmon onto winter-flooded rice fields. These “surrogate wetlands” mimic the floodplain rearing habitat used historically by young salmon which has been largely eliminated by the development of the Central Valley. Spearheaded by CalTrout and Cal Marsh and Farm, this public/private partnership is demonstrating the multiple benefits of integrating conservation practices into working agricultural landscapes on the largest connected floodplain of the Sacramento-San Joaquin Delta, the 60,000-acre Yolo Bypass.



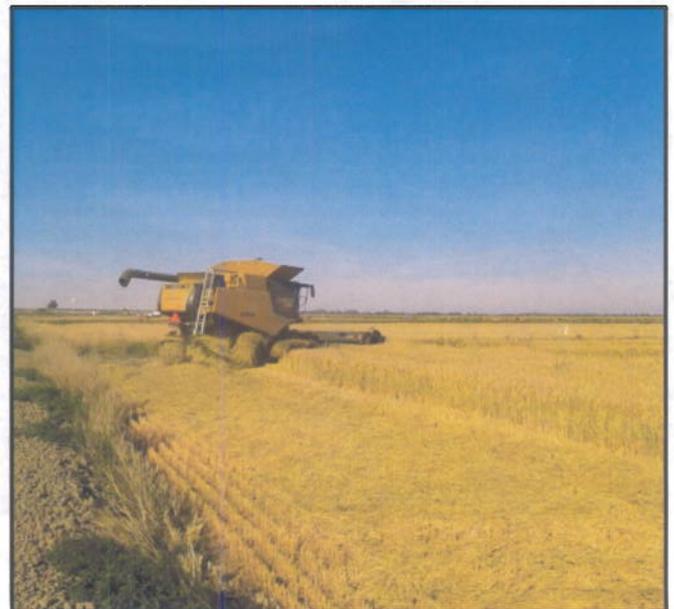
Goal: Fish & Farms

The Nigiri Project is located on the Knaggs Ranch, in the northern reaches of the Yolo Bypass between Interstate 5 and the Sacramento River. Cal Marsh and Farm Ventures manages the Knaggs property and aims to provide thousands of acres of winter floodplain habitat for Chinook salmon and waterbirds on lands that will continue to be farmed during summer. The overall project goals are:

- To create a multi-benefit revenue model to sustain agriculture in Yolo Bypass
- To maintain bypass flood control capacity
- To improve adult fish passage and reduce fish stranding
- To improve seasonal floodplain rearing habitat for fish and waterfowl
- To increase bypass outflows rich in food nutrients to improve the Delta food web

Yolo Bypass Win-Win-Win

The Yolo Bypass is central to multiple flood protection and habitat planning efforts, including the legal ruling (NMFS BiOp) controlling operation of the state and federal water projects that mandates restoration of thousands of acres of floodplain salmon habitat. Yolo Bypass is also a focus of the state and federal agencies writing the *Bay Delta Conservation Plan (BDCP)*, and the *Central Valley Flood Protection Plan*. Through innovative floodplain science and demonstrating that infrastructure improvements on working farms create multiple benefits for agriculture, flood protection and the environment, the Nigiri Project mutually supports the objectives of all of the various planning efforts.



Rice harvest on experimental salmon habitat in - Yolo Bypass

Knaggs Ranch: A Model for Ag and Habitat

The *Managed Agricultural Floodplain Habitat Investigation* at Knaggs Ranch is the science arm of the Nigiri Project and includes a landscape-scale controlled experiment designed to determine which agricultural practices maximize benefits to salmon. During winter 2013-14, 20 acres of post-harvest rice ground was prepped to provide habitat for 50,000 hatchery juvenile salmon. This year's study will be focusing on PREDATION, TEMPERATURE, and VOLITIONAL PASSAGE.

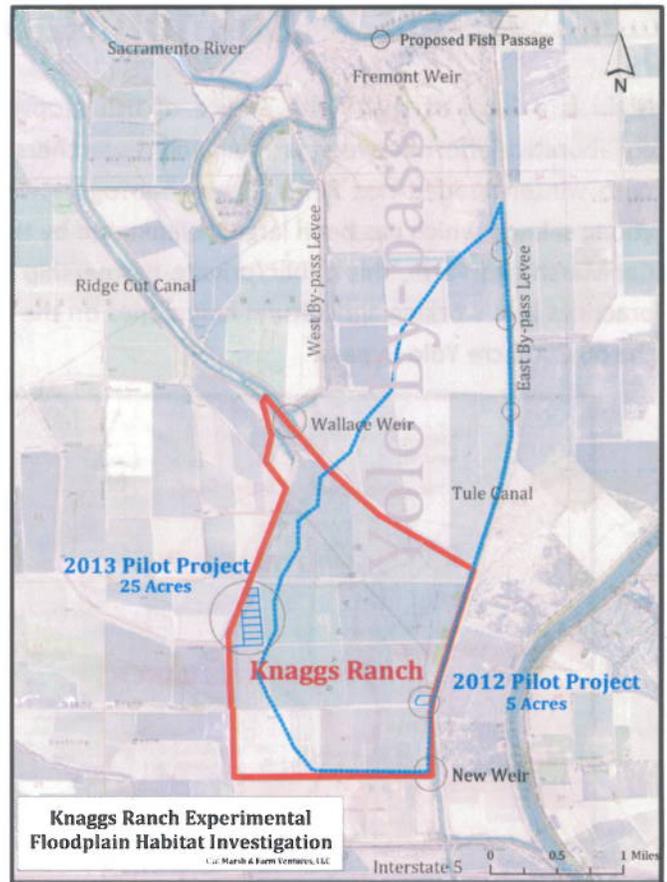
“Floodplain Fatties”

Salmon Feast on Flooded Fields

Results from the second year of experiments in 2013 showed the dramatic benefits of allowing salmon to access floodplain rearing habitats. Both wild and hatchery salmon fry released onto inundated rice fields of the Knaggs Ranch during the winter non-growing season were measured and tagged to study growth rates and habitat preferences. Researchers from CalTrout, UCD and the California Department of Water Resources re-measured the fish six weeks later as the fields were drained, documenting the fastest growth rates and highest health indexes ever recorded in Delta salmon research before releasing the salmon to migrate downstream to the Pacific Ocean.



Frozen juvenile salmon (left) from 40 days previous are tiny compared to fish that have spent 40 days on the Knaggs Ranch rice fields (right).



A Cooperative Partnership

The *Managed Agricultural Floodplain Habitat Investigation* represents a private-public partnership with landowners, government agencies, NGOs and university researchers all dedicated to finding solutions that work for both agriculture and the environment. Participants and funders include:

- California Trout
- Cal Marsh and Farm Ventures, LLC
- UC Davis Center for Watershed Sciences
- Knaggs Ranch, LLC
- California Waterfowl Association
- California Department of Water Resources
- California Department of Fish and Wildlife
- NOAA - SW Fisheries Science Center
- U.S. Bureau of Reclamation
- State & Federal Contractors Water Agency
- Resources Legacy Fund

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