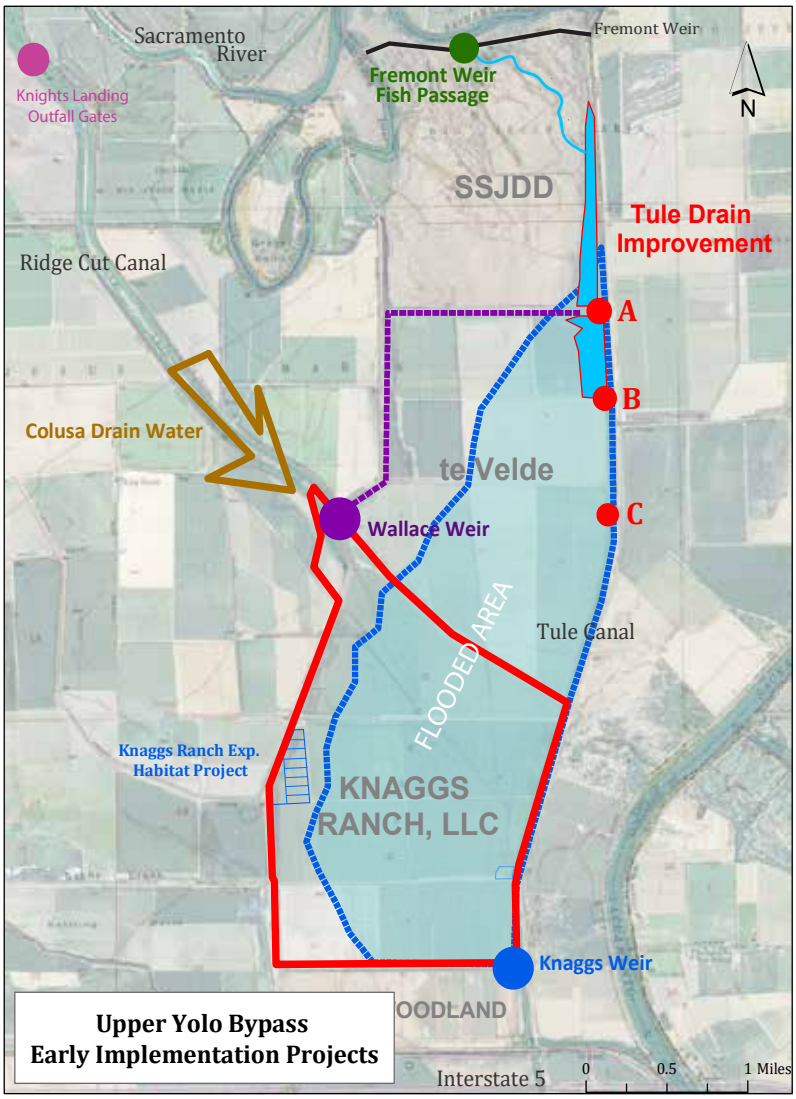
KNAGGS RANCH:
A Model for Ag and Habitat

The *Managed Agricultural Floodplain Habitat Investigation* at Knaggs Ranch is the science component of the Nigiri Project and includes a landscape-scale controlled experiment designed to determine which agricultural practices optimize benefits to fish.

Over the past five years of science, we have been able to study the wide range of benefits that floodplain habitat provides juvenile salmon:

YEAR	FOCUS	FINDING
2012	Water Quality & Temp.	Floodplain water quality supports salmon. Highest growth rates, ever.
2013	Preferred Field Substrate	Comparing post-harvest field management for fish preference.
2014	Predation and Refuge	Depth diversity provides predator refuge for juvenile salmon.
2015	Volitional Passage	Juveniles know when they are ready to leave the field and can at will.
2016	Food Production	Floodplain vs. River food production.
2017	1 Million Fish!	Whole life-cycle study.



FLOODPLAIN FATTIES:
Juvenile Salmon Feast on Flooded Fields

Year one demonstrated that winter flooded rice fields not only provide sufficient water quality to keep salmon alive but that they thrive and grow rapidly. Years two and three showed that rice farming practices are not simply compatible but provide high quality floodplain rearing habitat for juvenile Chinook salmon as evidenced by the fastest growth rates of juvenile salmon ever recorded in the Central Valley. Year four saw these finding replicated across five ag floodplains throughout the Sacramento and San Joaquin Valleys. This year we are studying how river habitats – river channel, canal and floodplain – differ in their food web productivity.

February 2014 - Two Chinook Juvenile Salmon, same age.

CONTACT INFORMATION

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THE NIGIRI CONCEPT:
Salmon Habitat on Rice Fields

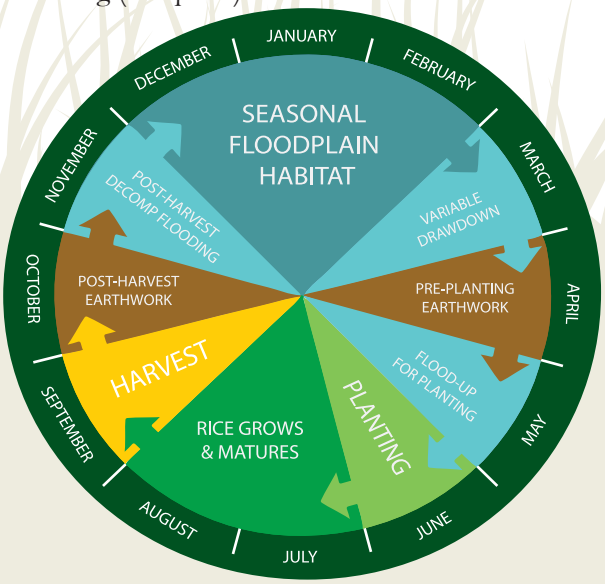
Nigiri is a form of sushi with a slice of fish atop a compact wedge of rice. The "Nigiri Project" is the name of a collaborative effort between farmers and researchers to help restore salmon populations by reintroducing young salmon onto winter-flooded rice fields. These "surrogate wetlands" mimic the 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 Ventures, 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.

A SUSTAINABLE MODEL:
Farms, Feathers and Fish

The Nigiri Project is proposed within 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 young Chinook salmon and waterbirds on lands that continue to be farmed during the summer months.

Targeted Goals:

- To create a multi-benefit revenue model to sustain agriculture in the Yolo Bypass
- To maintain bypass flood control capacity
- To improve seasonal flood plain rearing habitat for fish (BiOp 1.6.1) and waterbirds
- To increase bypass outflows rich in food nutrients to improve the Delta food web and recover endangered fish
- To improve adult fish passage and reduce stranding (BiOp 1.7)



2014 Winter-run Salmon Rescue Efforts

PROJECT PROPONENTS:
A Collaborative Effort

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.

California Trout
Cal Marsh and Farm Ventures, LLC
UC Davis Center for Watershed Sciences
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
California Water Foundation