

# Fish Food on Floodplain Farm Fields

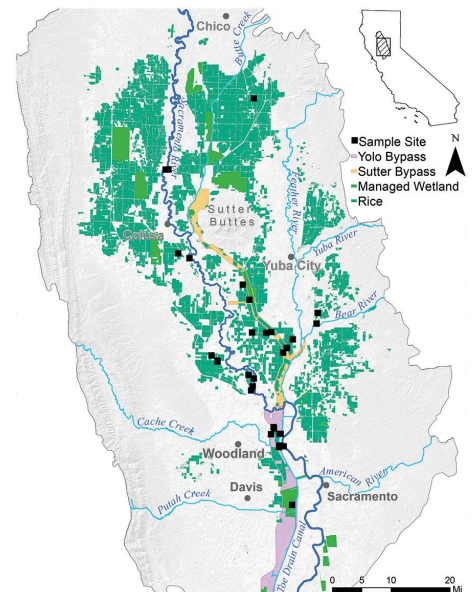
## Re-integrating Floodplain Food Resources into the River Ecosystem

The Fish Food on Floodplain Farm Fields Project examines the potential for managed aquatic habitats—including hundreds of thousands of acres of floodplain farmland (primarily ricelands) and managed wetlands (duck clubs and refuges)—to contribute fish food to the Sacramento Valley ecosystem where it can benefit fish. The project brings together government agencies, conservation groups, growers and water suppliers to pioneer new practices aimed at re-activating our critical floodplains to contribute food resources into the river ecosystem, bolster in-river and Delta food webs, and help support recovery of endangered fish populations.

Launched in the fall of 2016, the Fish Food project has documented abundant zooplankton and invertebrate production (fish food) in managed floodplain/wetland habitat types including: ricelands, duck clubs, wildlife refuges and flood bypasses. In every floodplain habitat type sampled, zooplankton densities were far greater than those found in adjacent river channels. In 2018, results verified that this “standing stock” of floodplain derived zooplankton fish food can be exported to the river when fields are drained. In 2019, the project will assess how to optimize the impact of floodplain fish food “subsidy” to the river ecosystem. Specifically, the partners will be undertaking a series of experiments to evaluate how draining 5,000-acres of intentionally inundated ricelands affects juvenile salmon growth rates in the Sacramento River at the location where the floodplain-enhanced water enters the river.

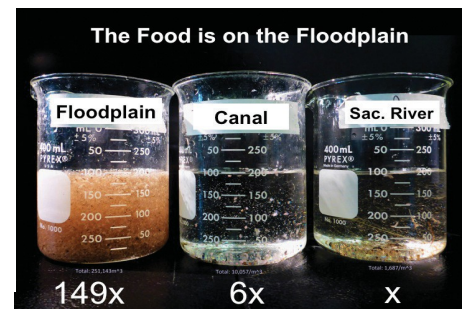
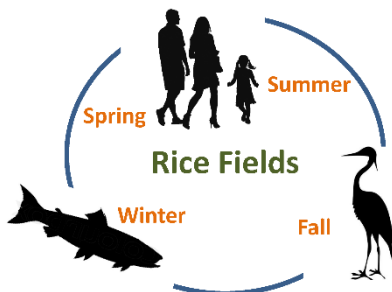
## Cultivating Ecological Solutions on Agricultural Lands

Floodplains act as “solar panels” for large rivers by powering the aquatic food webs and fueling the creation of abundant populations of fish and wildlife. Shallowly inundated floodplain wetlands generate a tremendous biomass of bugs and zooplankton—the foundation of the aquatic food web. Floodplains make bugs, and bugs make healthy fish. Now science has shown that if farmers mimic natural flood patterns by inundating their floodplain farm land during fall and winter when they are not growing food for people, these same fields can generate tremendous biomass of food for fish. This project will pioneer on-farm water management practices to re-integrate natural food web productivity and deliver floodplain-derived nutrients and fish food resources back to the river and Delta where fish populations can access them. Without hydrologically reconnecting floodplain food factories to river channels, recovery of historical numbers of fish and wildlife in of California’s Central Valley will be impossible.



## Win-Win

Even during times of drought, California can get far more pop per drop from water by putting it to work to create multiple benefits for both fish and people on its way downstream. The innovative water management pioneered in our projects demonstrates that California can have both robust populations of fish, birds and wildlife and productive agriculture. Together we are integrating a working scientific knowledge of rivers, fish and wildlife into farm and water operations. This is the new way forward.



# Reactivating the Floodplain

## Turning Science into Action

More than a hundred years ago, before the Central Valley was developed, leveed and drained, food made on inundated floodplains supported large fish and wildlife populations in the Central Valley and downstream in the Delta. Today, rivers are cut off from these floodplain food factories by levees leaving salmon and smelt populations starving. The Sacramento Valley has more than 500,000 acres of managed agricultural floodplain on the dry side of the levees. Named *Operation FATFISH* because we are **Flooding Agricultural Tracts For Improved Salmon Habitat**, this project works with growers and water suppliers to develop new operations and practices that reintegrate natural floodplain fish food production into farm and water management. Our goal is to have fish food produced in floodplain "wetlands" once again connected to the river so that it may contribute to the resiliency of the river ecosystem,

food webs, and help recover Central Valley fish and wildlife populations.

Just like the rest of us, fish need to eat. For California's water system to function effectively, threatened fish populations in the river must have access to the abundant food resources created in wetlands when winter flood waters spread out and slow down across floodplains. By improving our understanding of food web dynamics across multiple wetland habitats on both sides of the levees this project lays the foundation for functional integration of agricultural floodplains into the operations and management of California's water system. Reactivating California's floodplains in an era of severe storms and a changing climate will help restore salmon and smelt populations, enhance bird populations, sustain farms, recharge aquifers, improve food safety, and help deliver water supply security to 25 million Californians.

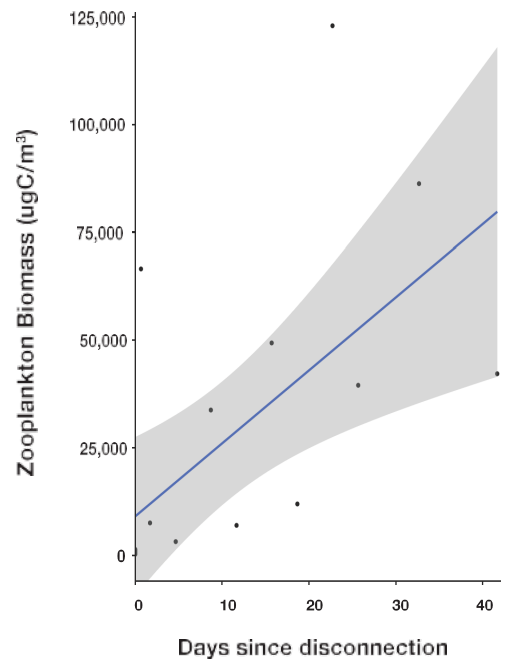


## A Cooperative Partnership

The Fish Food on Floodplain Farm Fields Project represents a private-public partnership with landowners, water districts, government agencies, NGOs, and university researchers all dedicated to finding solutions that work for water supply, agriculture, and the environment. Participants and funders include:



**Knaggs Ranch   Davis Ranches   Next Generation Foods**



*Bug density in floodplain habitats increases with residence time of water. Longer inundation = more fish food.*

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