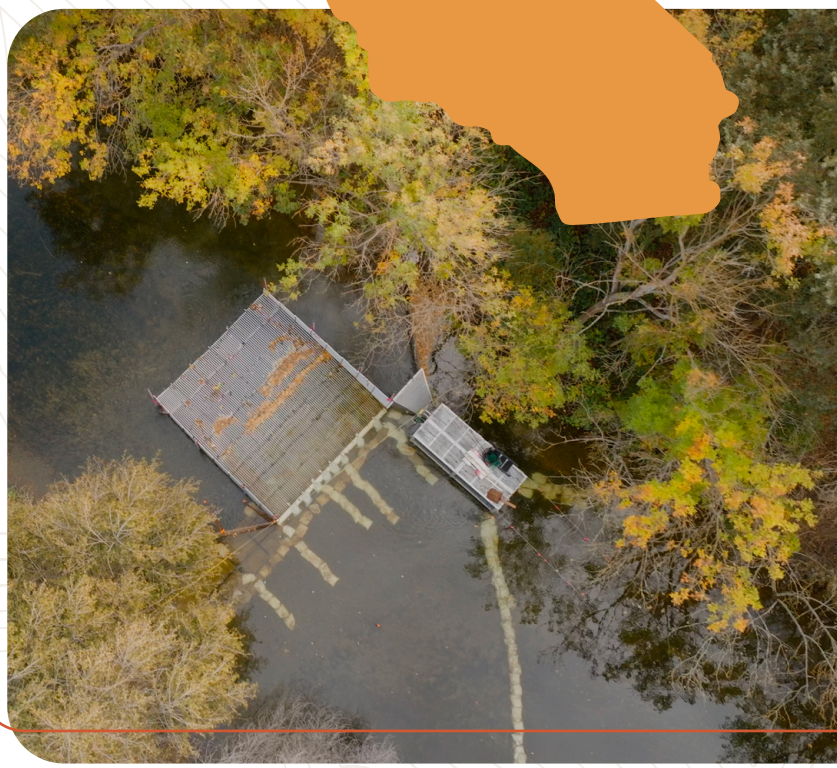
CONSERVATION PROJECT

HEALTHY RIVERS & LANDSCAPES

BUILDING A SALMON RUN *in Putah Creek*

How functional flows, habitat restoration, floodplain connectivity and improved passage helped bring salmon into Putah Creek.

While the creek had received consistent flows for almost a decade, adult salmon did not routinely seek out the creek until the additional actions occurred: improved fish passage through the Yolo Bypass Wildlife Area, gravel beds were restored to suit spawning needs, access to food was made available from the floodplains for juvenile salmon, and improved rearing habitat was created with trees and shrubs planted along the banks.

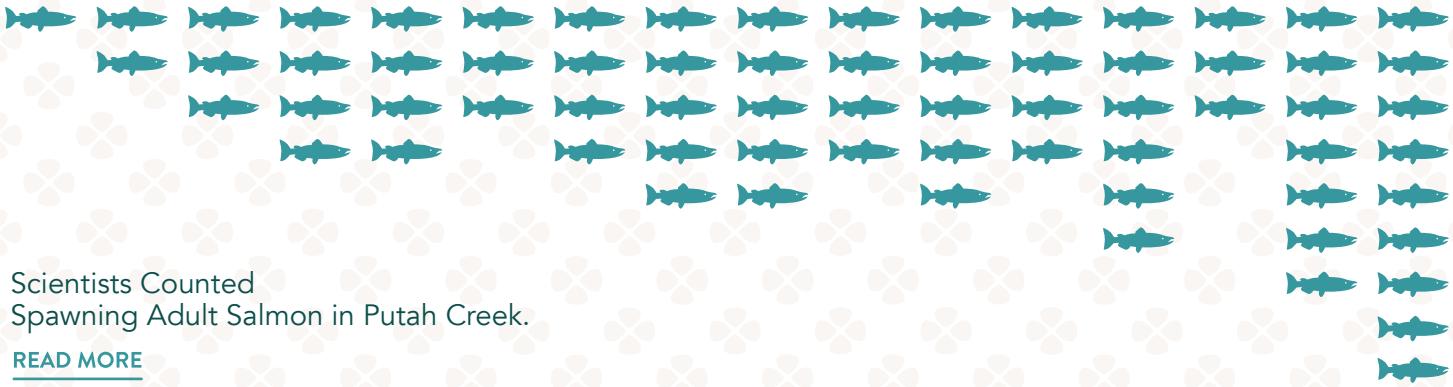


2026

HOW IT HAPPENED?

FALL 2013
8 ADULT SALMON

FALL 2025
RECORD SALMON RUN: 2,150 SPAWNED



Scientists Counted
Spawning Adult Salmon in Putah Creek.

READ MORE

IT IS UNDERSTOOD THAT SIX KEY PRACTICES MAY HAVE CONTRIBUTED TO BUILDING A SUCCESSFUL SALMON RUN.

- TIMELY COLD-WATER RELEASES
- FISH BARRIERS REMOVED
- OPTIMAL SPAWNING GRAVEL
- HABITAT RESTORATION
- FLOODPLAIN CONNECTION
- COLLABORATIVE EFFORT

2026

While the creek had received consistent flows for almost a decade, adult salmon did not routinely seek out the creek until the additional actions occurred: passage improved to the base of Lake Solano, gravel beds were restored to suit spawning needs, access to food was made available from the floodplains for juvenile salmon, and improved rearing habitat was created with trees and shrubs planted along the banks.

A **UC Davis Center for Watershed Sciences** study underscores how targeted restoration and smart management practices can successfully help fish populations rebound.

TIMELY COLD-WATER RELEASES

To help attract the salmon to the creek, the Solano County Water Agency releases enough water from the Putah Diversion Dam to maintain a healthy flow of water at the confluence of Putah Creek and the Toe Drain, which connects the creek to the Delta.

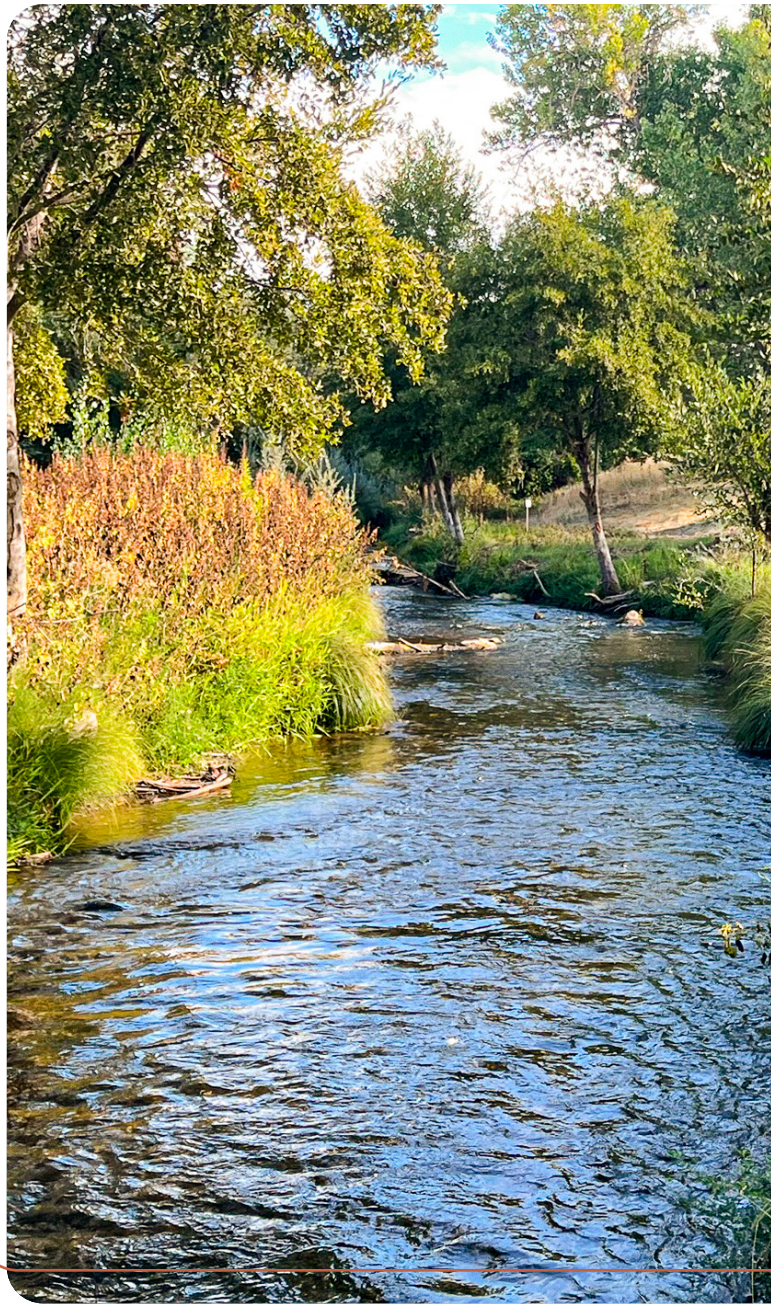
The increased flow creates a pulse that attracts salmon moving up the Toe Drain into Putah Creek, thus, the fish migrate into the river where there is suitable habitat, rather than collecting at the Fremont Weir.

FISH BARRIERS REMOVED

For more than 60 years, small wooden or dirt "check dams" were seasonally installed to support agricultural irrigation and waterfowl habitat. While these structures serve important purposes, when they remain in place during the spring, summer, and fall, they block migrating salmon from reaching upstream habitat. In addition, even when removed in fall, the timing doesn't always match with upstream migration.

To solve this problem, a temporary wooden fish ladder was successfully deployed on Putah Creek, demonstrating that agricultural water operations and salmon recovery can coexist. A more permanent fish passage solution is now being developed.

Low dissolved oxygen levels also limit fish passage in Putah Creek and the Toe Drain, which connects the creek to the Sacramento–San Joaquin Delta. For nearly a century, these waterways have been managed primarily for agricultural drainage. Today, they also support a returning salmon run. With thoughtful management of agricultural runoff, we can improve water quality for fish while maintaining essential agricultural functions. Embracing a "working landscapes" approach allows both agriculture and salmon to thrive.



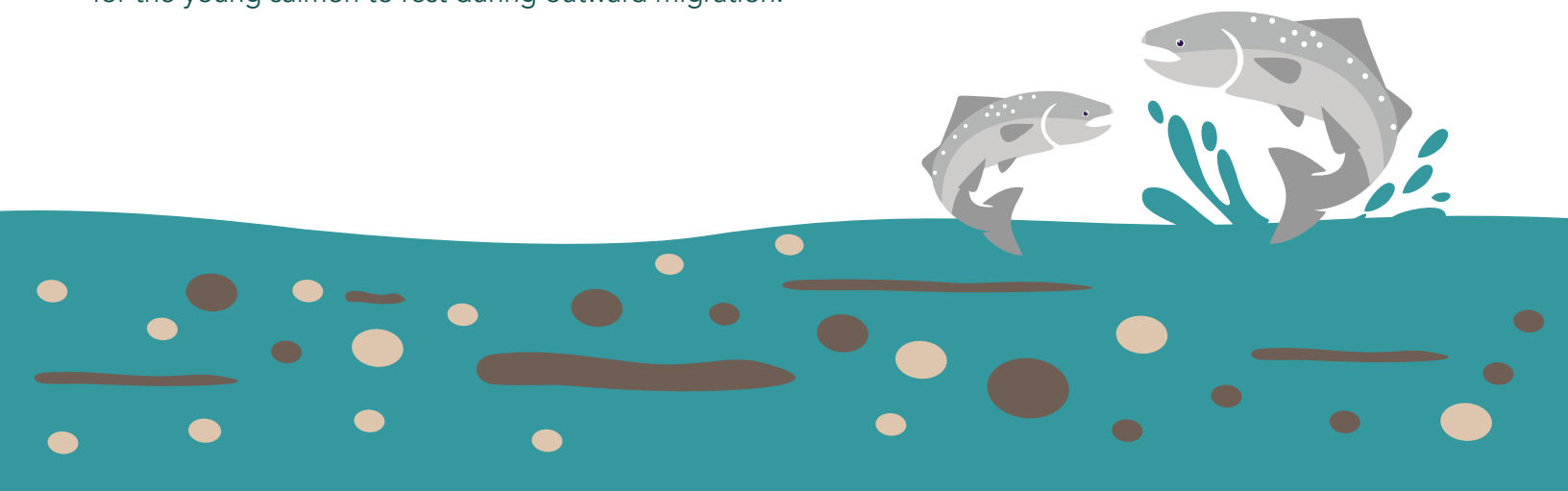
OPTIMAL SPAWNING GRAVEL

Decades of gravel mining created deep pools and a densely packed gravel bottom. Often times the shallow waters would create undesirable temperatures and with rocks bound together, salmon could not lay their eggs. To improve conditions, the creek bottom was dug up to loosen compacted silt and expose gravel beds ideal for spawning.

> *Seeing Putah Creek-origin salmon successfully return and spawn is a testament to the impact of these restoration efforts.*
>
> *- Chris Lee, General Manager, Solano County Water Agency*

HABITAT RESTORATION

What was once long stretches of dry creek beds and little vegetation surrounding the creek waters, has been replaced with lush canopies and root systems of native trees, plants and grasses. The shade helps maintain cooler water temperatures and offers rearing opportunities for the young salmon to rest during outward migration.



FLOODPLAIN CONNECTION

Juvenile salmon travelling down the Sacramento Valley have historically relied on food and refuge from predators offered by having access to the floodplains. The abundance of food (bugs) found on floodplains allows salmon to grow bigger and stronger, thus increasing their odds of avoiding predators and building reserves for the journey to the ocean. In addition, in-creek riparian zones and side channels offer salmon opportunities to seek refuge from predators as they migrate to the ocean.

Today, many of the valley's natural wetlands have been replaced with cities, roads, and agricultural fields. However, rice fields and bypasses post-harvest can serve as optimal sites for the salmon as these sites once did hundreds of years ago.

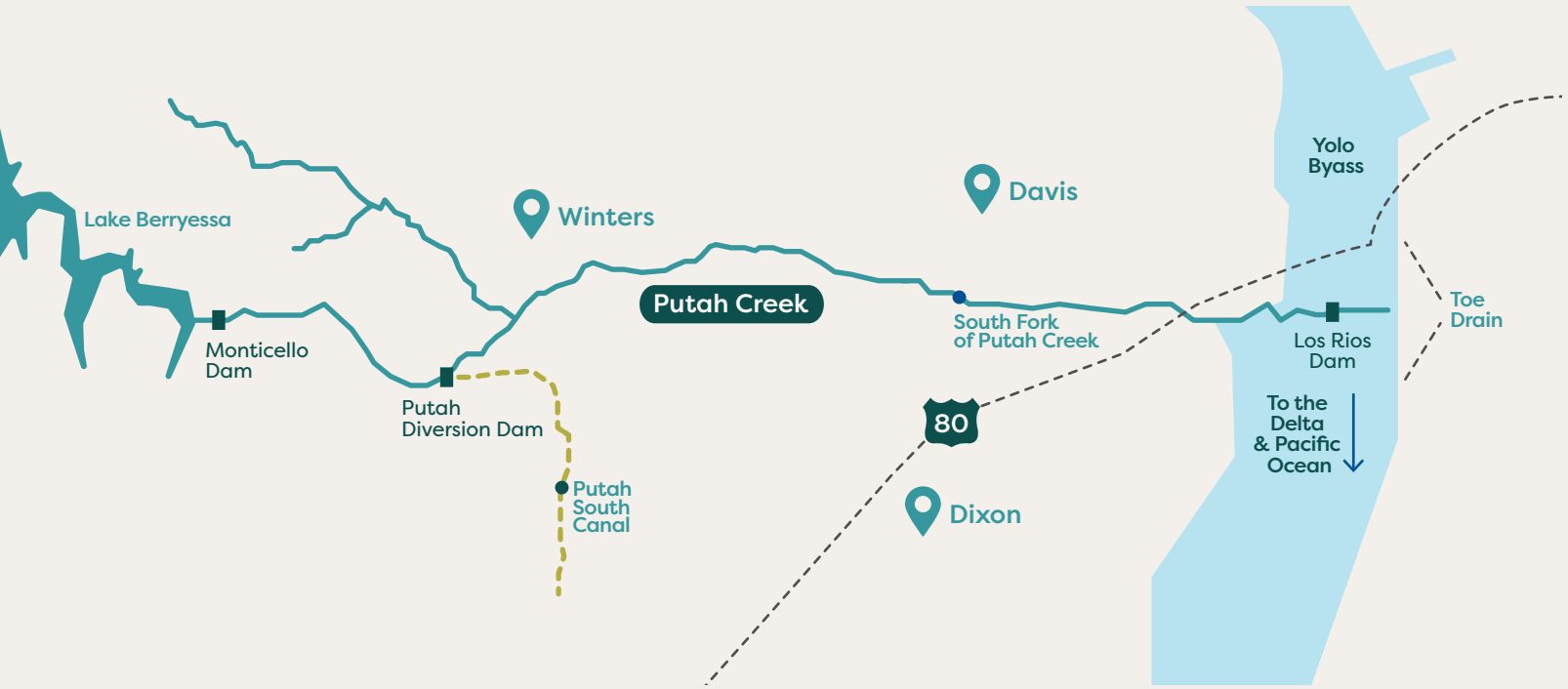
COLLABORATIVE EFFORT

None of the efforts described above would have been possible if not for the various interests coming together to help restore the creek for salmon. All of the partners brought a unique set of viewpoints, expertise, funding, and staff to help design, implement, and review each action.

Partners include: California Department of Water Resources, California Department of Fish and Wildlife, and members of the Lower Putah Creek Coordinating Committee: City of Davis, City of Fairfield, Suisun City, City of Vacaville, City of Vallejo, City of Winters, Solano County, Yolo County, Solano and Yolo Riparian Landowners, Maine Prairie Water District, Solano County Water Agency, Solano Irrigation District, Putah Creek Council, and the University of California, Davis.

WHERE IS *in Putah Creek*

Putah Creek is a tributary of the Sacramento River, flowing through the cities of Winters and Davis. The creek flowed during the winter as stormwater runoff made its way to the heart of the valley to connect to the Sacramento River. After the installation of Monticello Dam in the 1950s, which created Lake Berryessa, flows were drastically reduced to the point that in some years no water flowed into the creek.



Today, relatively modest flows, combined with habitat, benefit salmon for the life-cycle stages they experience in the creek. These substantial salmon benefits are occurring in one of thae smaller streams in the Sacramento Valley. Putah Creek is approximately 30 miles long from Monticello Dam.

THE STUDY WITH UCDAVIS

Hoping to uncover more about the origin of the salmon returning, the study's lead author, Lauren Hitt, used otoliths — or ear bones — from adult Chinook salmon carcasses recovered from Putah Creek between 2016 and 2021.

Salmon Ear Bones - A Travel Tracker

A salmon's ear bones carry within them the water chemistry of the streams they have traveled. This allows UCD scientists to map the movement and migration of the fish. Hitt was able to show that while hatchery-origin fish were most abundant, a handful — 11 of 407 — of returning salmon analyzed were born in Putah Creek, completing their full life cycle as wild salmon.

Read the UCD Release

Salmon's Ear Bone

UC Davis scientists measure adult fall-run Chinook salmon in Putah Creek

> *There's a lot of potential to have more Putah Creeks out there.*
>
> *- Andrew Rypel, Former Professor and Chair of Coldwater Fish Ecology at the University of California, Davis.*

PROVIDING HOPE FOR OTHER CREEKS & RIVERS

Putah Creek is demonstrating what is possible in creating and restoring wild runs of salmon. Putah Creek is an example of multiple actions all contributing to the health of a salmon run, and that no single action was responsible for the turn around. It is this holistic approach to water and fish management that gives hope to restoring other salmon runs across the Sacramento River Basin.

The habitat actions on Putah Creek replicate those implemented in Butte Creek, with similar results. Collectively, these efforts are providing guidance for regional efforts to promote salmon recovery in the Sacramento Valley.

THE BEST PATH FORWARD *for California*