

Aiding Salmon in the Upper Sacramento River

How farmers and ranchers are improving habitat for imperiled salmon populations.

If we want to boost population numbers for endangered Chinook salmon, we must look at supporting the fish throughout their entire freshwater life cycle. United in a desire to produce real results and change, a coalition of farmers, conservationists, water management agencies and state and federal fishery agencies are working together to provide salmon with vital habitats along the Sacramento River.

Support in the Upper River:

As a migratory species that spends only a few months in the river, supporting the Chinook salmon in a scientific and timely manner is critical to their long-term survival. The Sacramento River Settlement Contractors, a group of farms and water agencies, are involved in projects located from Sacramento to Redding with the goal of producing better habitats and practices for the benefit of salmon.

Specifically, the projects implemented in the Upper Sacramento River are a prime example of the collaborative effort underway. Together, these projects strive to produce more salmon who are born in and return to the Sacramento River each year.



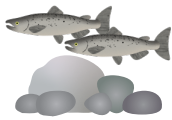
Why the Upper Sacramento River is Vital to the Health of Salmon



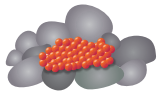
Photo: Ken "Creekman" Davis

The Sacramento River is home to four runs of Chinook salmon, but the Upper Sacramento River is specifically vital to the health of the endangered winter-run Chinook. It is in the upper reaches of the Sacramento River and its tributaries where returning adult salmon "hold" while they wait to spawn and once spawning occurs, egg incubation begins followed by fry and juvenile fish rearing.

Three of Chinook salmon's life stages are found in the Upper River



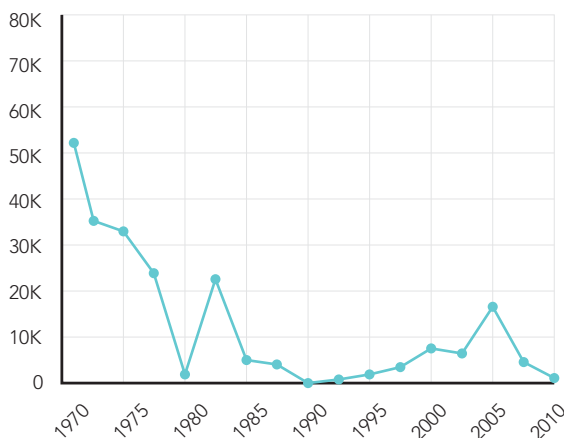
SPAWNING: Adult winter-run salmon seek out shallow waters and side channels to lay their eggs in the loose gravel that has collected in the river.



INCUBATION: Salmon eggs benefit from cold water during the period when the salmon redds (eggs) are incubating.



REARING AND EARLY LIFE STAGES: When the young salmon fry release from their eggs, they seek out shelter in woody debris or among rocks for protection from predators and the swift current. This allows the young fish to eat and grow before the journey down river to the ocean.



On the decline: Winter-run Salmon

The Sacramento River winter-run Chinook Salmon is a *Species in the Spotlight* considered at-risk of extinction by the National Oceanic and Atmospheric Administration (NOAA), which listed them as "endangered" in 1994. Drought conditions leave the salmon extremely vulnerable as limited access to habitats and water temperatures can adversely affect the fish.

On average less than 6,500 winter-run salmon return to spawn each year.

Taking Action for a Better Tomorrow

Many of the historic spawning and early life stage sites that salmon used to rely on have been altered by levees and Shasta Dam. To address this issue, the coalition is **creating and improving** viable and effective habitats, based on scientific recommendations, to better integrate with managed flows and temperatures below Shasta Lake.



Salmon Spawning Gravel Project

Aids in Spawning

Winter-run salmon historically spawned (laid their eggs) in the upper reaches of the Sacramento River and its tributaries, which is now above Shasta Lake. To mimic these sites, 15,000 tons of gravel has been placed in the river and side channels were opened to the river below Shasta Lake to provide new spawning habitat for salmon.



[Watch how the project came together and why it is vital to the salmon's survival.](#)



Temperature Release Management Project

Aids in Incubation

With salmon now spawning below Shasta Lake, cold water is released with precision at specific times from the deeper (and thus colder) parts of Shasta Lake to flow over the spawning gravels during egg incubation. The Settlement Contractors work with the Bureau of Reclamation and NOAA to schedule cold water releases to maximize egg incubation.

Salmon Shelter Project

Aids in Rearing and Early Life Stage

Juvenile salmon look to debris such as trees and rocks for protection from predators. Due to Shasta Dam and human development along the banks, fewer debris enters the river, leaving a bare channel with no shelter for fish. To change this, the coalition built 25 salmon shelter structures, which are made of walnut trunks and root wads bolted to limestone boulders, and placed them in strategic locations in the river. Finding shelter allows the salmon to eat and grow, increasing their odds of survival as they begin their journey to the ocean.



[Watch how we placed 25 salmon structures in the Sacramento River.](#)





Sacramento Valley Salmon Recovery Program

The efforts detailed above are part of the greater *Sacramento Valley Salmon Recovery Program*, a collaborative partnership to complete projects and improve science to promote recovery of salmon and other species of fish in the region. The success of the program relies on each organization bringing expertise in specific areas to help increase the chance of success. Over the past 20 years, more than 140 projects have been completed, many located in the Upper Sacramento River.

What's Next

Each season brings about new challenges and new opportunities, our coalition continues to seek out projects that will help the winter-run Chinook salmon in Northern California. We look forward to continuing the effort through the Sacramento Valley Salmon Recovery Program and building a larger coalition of landowners, water managers, conservation groups and state and federal agencies.

By implementing the recommendations set forth by the National Oceanic and Atmospheric Administration, we are working toward a more sustainable future for salmon. If our collective projects result in a return of winter-run salmon to healthy population numbers, we will have the opportunity to use and manage water resources to benefit more fish and wildlife throughout California. We look forward to the collaborative Sacramento River Science Partnership, which will inform the protection of fish and water management.

