California Water Law Symposium 2026 – UC Law San Francisco

State and Federal Approaches to Reforming Hatcheries to Further Salmon Recovery in California

- **Rebecca Akroyd,** General Counsel, San Luis and Delta-Mendota Water Authority
- **Darren Mierau,** Director of Science, California Trout
- **Jay Rowan,** Branch Chief, Fisheries, California Department of Fish and Wildlife
- **Professor Karrigan Bork,** Professor of Law, UC Davis School of Law and Director, UC Davis Center for Watershed Sciences (moderator)

Panel organized by Jessica Friley, 2L and Jasmine Garza, 2L, University of the Pacific, McGeorge School of Law

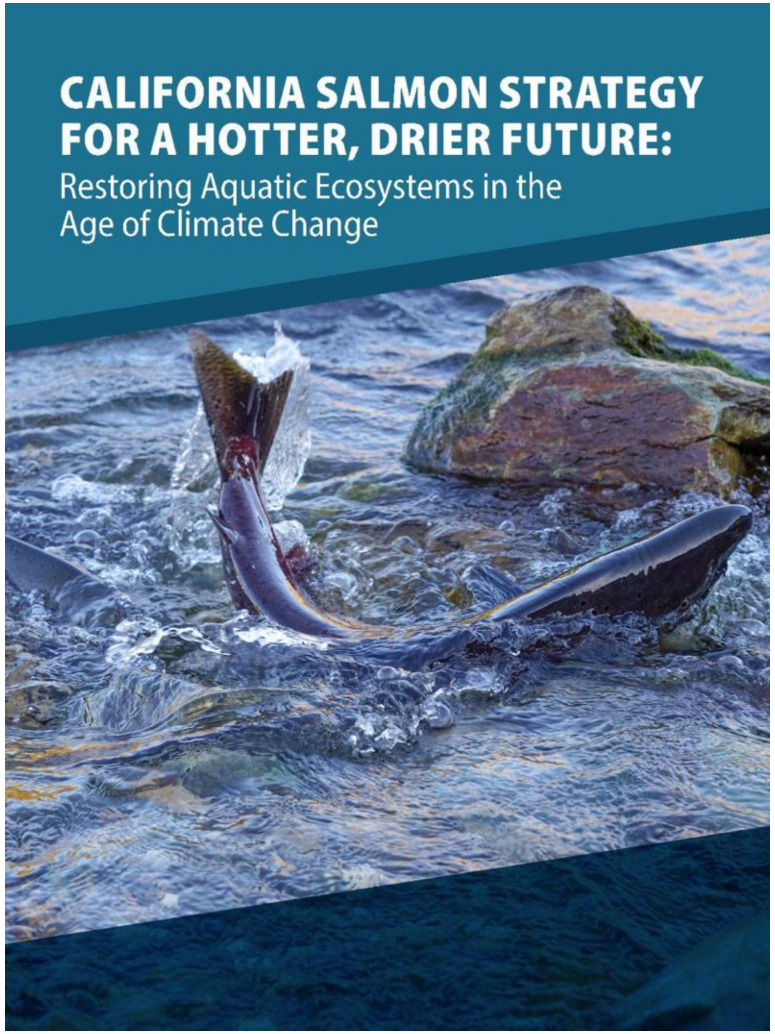
Just For Fun

CDFW Hatchery Program Mission

The Mission of California Department of Fish and Wildlife Fish Hatcheries and Stocking Programs is to provide fish for recreational and commercial angling and conservation purposes based on the best available science and ecological principles.

CDFW FISH HATCHERIES

Supporting Fish Conservation, Angling Opportunities & Economy



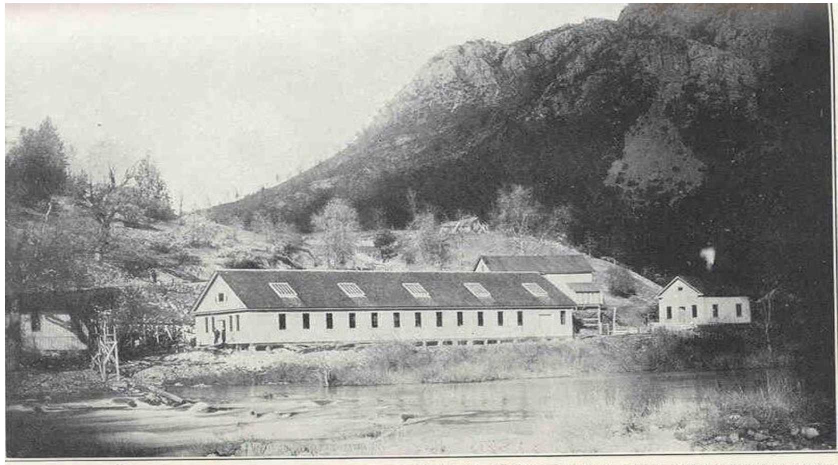


FIG. 47.—UNITED STATES BUREAU OF FISHERIES HATCHERY AT BAIRD, CALIF.; THE FIRST FISH-CULTURAL STATION ON THE PACIFIC COAST.

San Luis & Delta-Mendota Water Authority

San Luis & Delta-Mendota WATER AUTHORITY

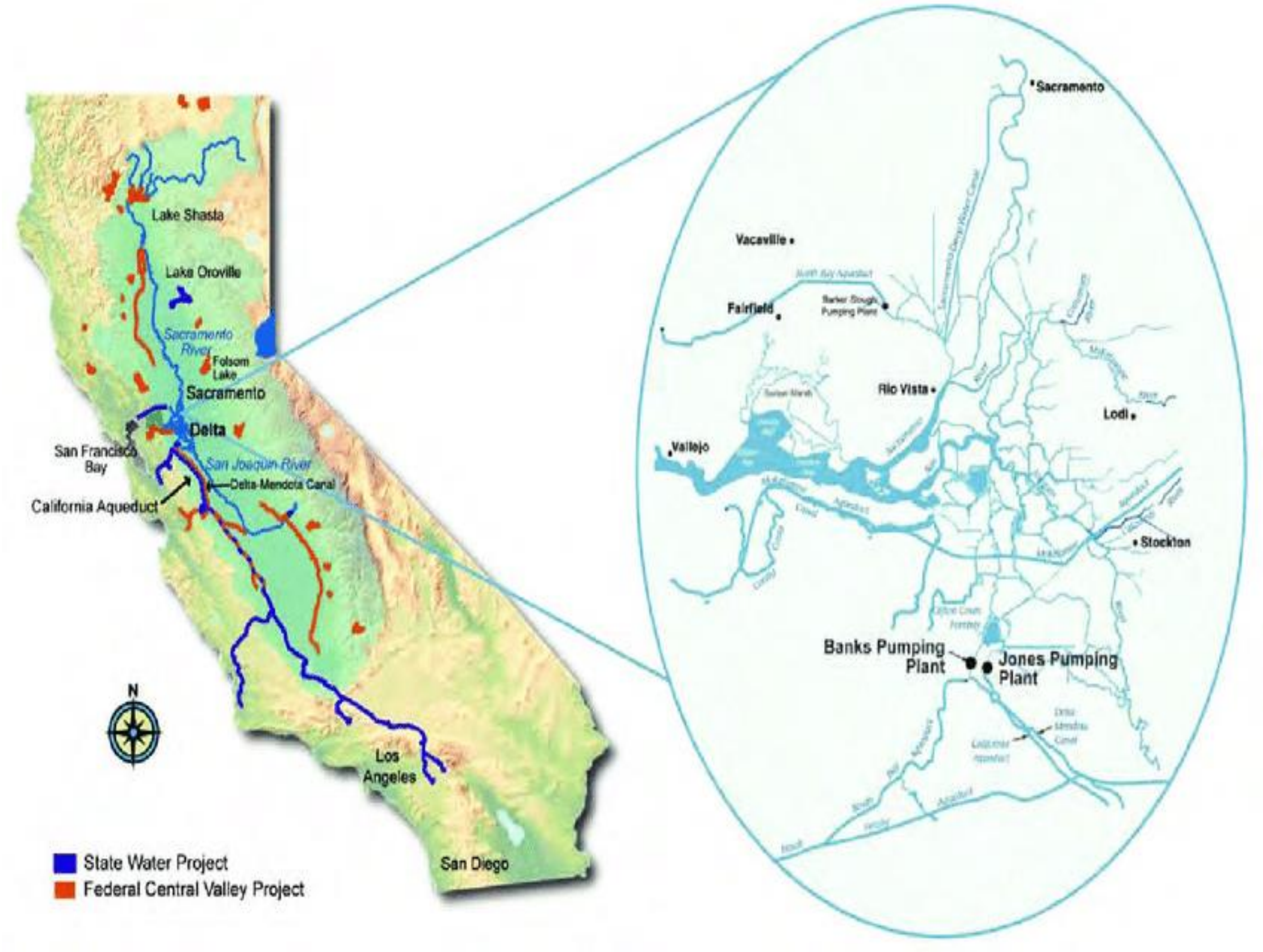
- Joint powers authority comprised of mostly Central Valley Project (**CVP**) contractors

- Members provide water to ~1.2M acres of farmland, ~2M California residents, and millions of waterfowl dependent upon ~200,000 acres of managed wetlands within the Pacific Flyway

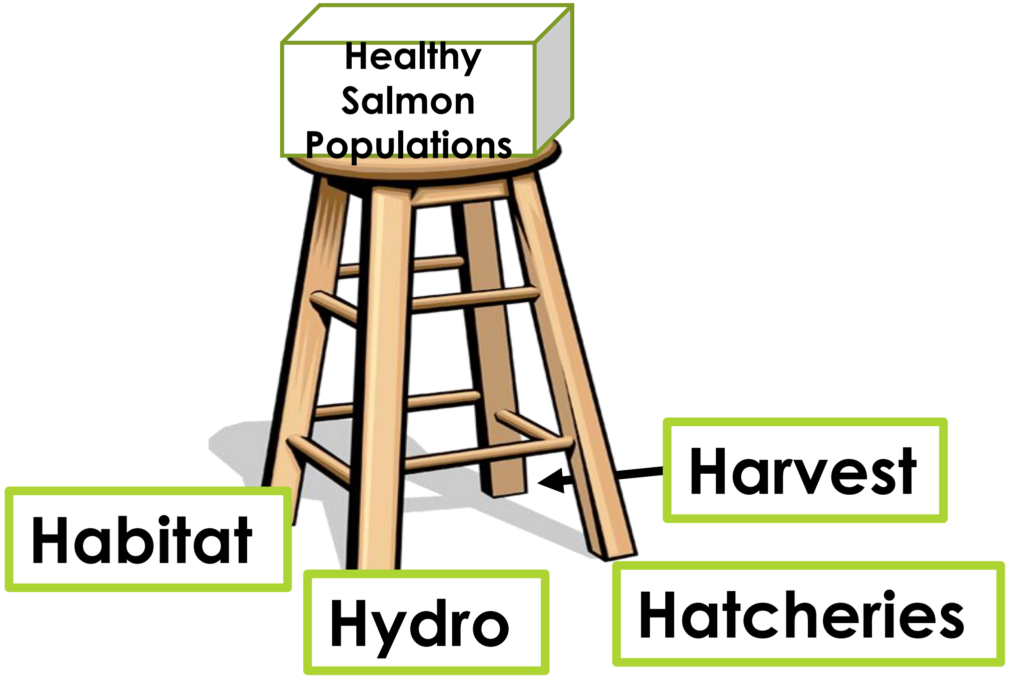
- Two Key Roles:
  - (1) To operate and maintain the Delta-Mendota Canal and related CVP facilities that the Water Authority's member agencies depend on for delivery of water supply reliably and cost-effectively, and
  - (2) To support member agencies in restoring and protecting adequate, affordable water supplies to benefit people, wildlife, and the economy

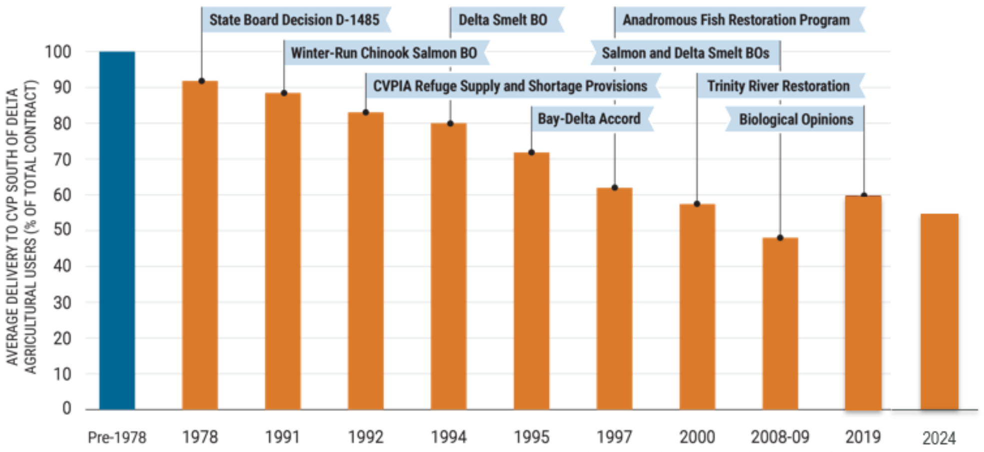
Central Valley Project and State Water Project

- Water projects operated by the U.S. Bureau of Reclamation and California Department of Water Resources that consist of storage facilities, pumping plants, hydroelectric power plants, and open canals and pipelines
- The Projects have multiple purposes, including providing water for irrigation and domestic use, power generation, fish and wildlife enhancement, etc.
- Since the 1990s, the decline of fish species listed under the federal and state Endangered Species Act (**ESA** and **CESA**) has resulted in operational restrictions on the Projects that have reduced contract allocations to CVP and SWP contractors



Interest of the Water Authority in Hatchery Reform





Sources: Pre-1978, CVP Water Delivery Records; 1978-2000, San Luis & Delta-Mendota Water Authority, extracted from various California Department of Water Resources (DWR) and U.S. Department of the Interior, Bureau of Reclamation (Reclamation) CalSim-II benchmark studies; 2008/2009, Reclamation & DWR CalSim-II Benchmark BO Study; 2020, Reclamation EIS on the Reinitiation of Consultation on the Long-Term Operation of the CVP and SWP.

- Any factor destabilizing California salmon populations will adversely impact CVP and SWP water supply reliability
- ESA Section 7 consultations result in Biological Opinions (**BiOps**) that evaluate impacts to protected species, and can include operational changes to reduce impacts
- Water Quality Control Plan updates can result in further operational restrictions, such as those linked to the salmon doubling objective
- Properly managing salmon produced by hatcheries is critical to achieving salmon recovery goals (one of 4 Hs)
- Hatchery reform balances the need to grow and conserve wild salmon while also supporting sustainable fisheries
- Implementing hatchery reform in California can:
  - Help hatcheries support fisheries and species viability
  - Improve the effectiveness of flow and habitat enhancements
  - Help protect the future of CVP and SWP contractors’ water supply

Who We Are

California Trout was founded over 50 years ago as a small team of concerned anglers protecting local waters and has grown into a conservation leader serving the needs of fish, water, and people across California. **Our mission is to revitalize waters for resilient wild fish and a better California.**

What We Believe

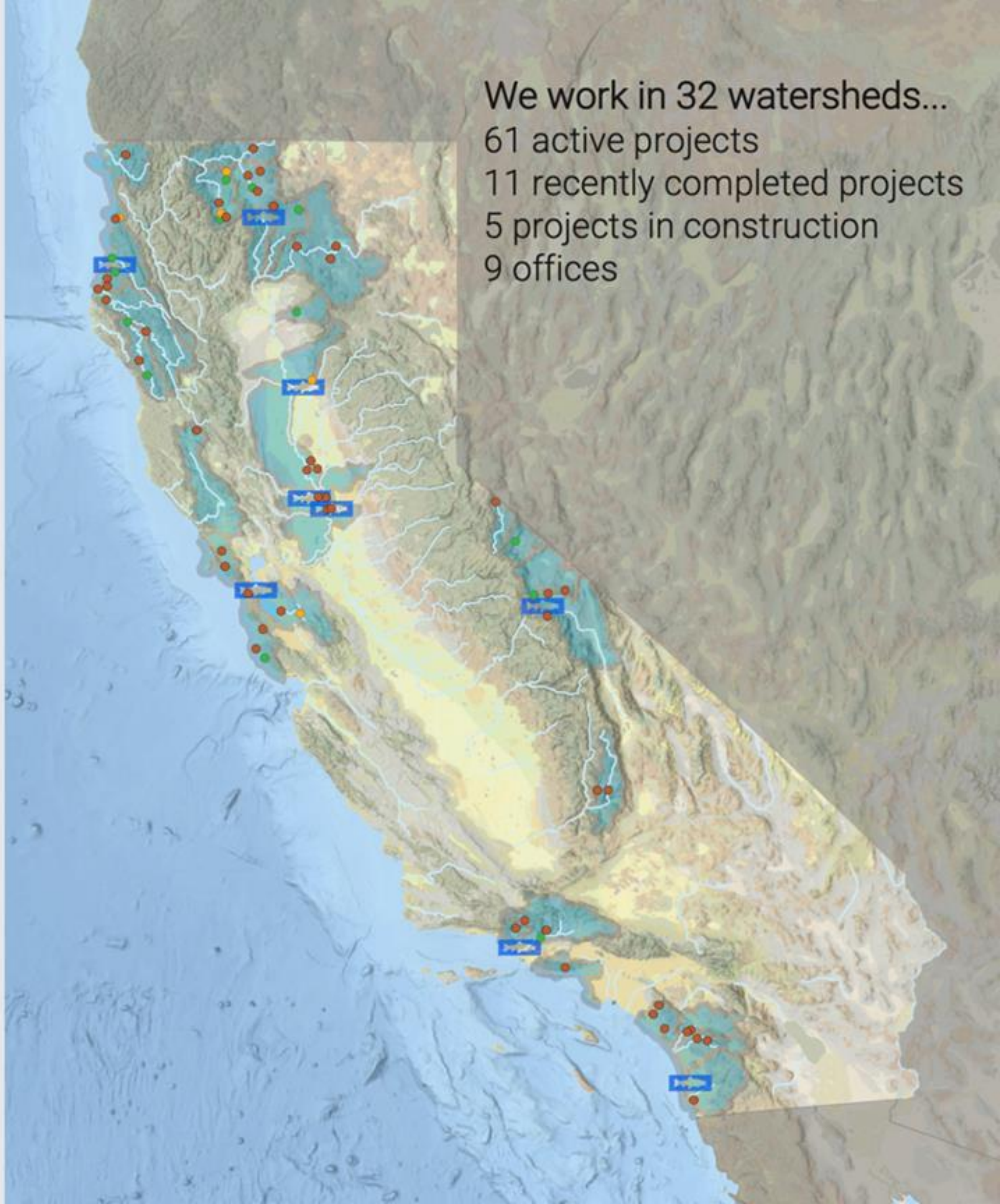
- Healthy rivers and abundant, native, wild (natural origin) fish are essential for a healthy and thriving California.
- Biodiversity is fundamental to ecosystem resiliency.

What We Do

Across the state, we reconnect habitat, restore river function, and improve water quality for fish and people alike.

CALIFORNIA TROUT

FISH·WATER·PEOPLE

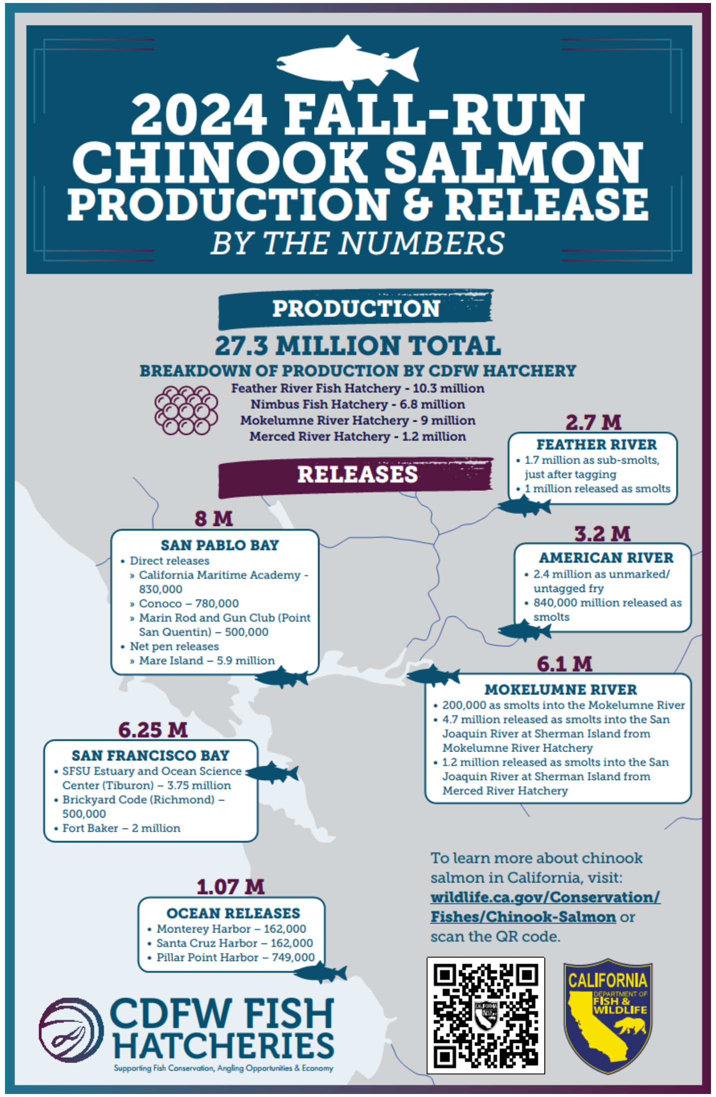


Roles of CDFW Hatcheries

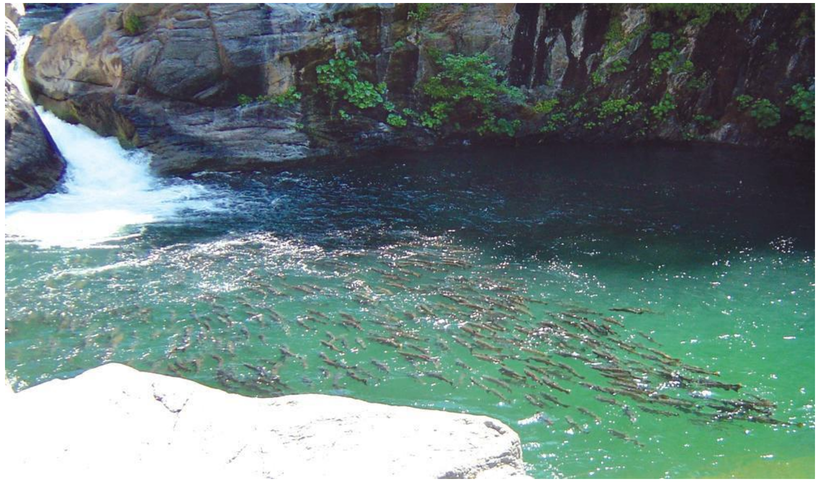
- Provide recreational opportunity for millions of Californian’s
  - $6.2B in annual economic impact 46,000 jobs
- Support commercial salmon fishing industry
  - $300M in economic impact
- Science and Research
- Species Conservation and Restoration
- Public Outreach and Education

CDFW FISH HATCHERIES
Supporting Fish Conservation, Angling Opportunities & Economy

Types of Salmon Hatchery Programs



- Mitigation
  - Lost habitat above dams and other impacts
- Enhancement
  - Increase recreational and commercial fish landings
- Conservation
  - Recovery
  - Reintroduction
  - Avoid extinction or catastrophic loss



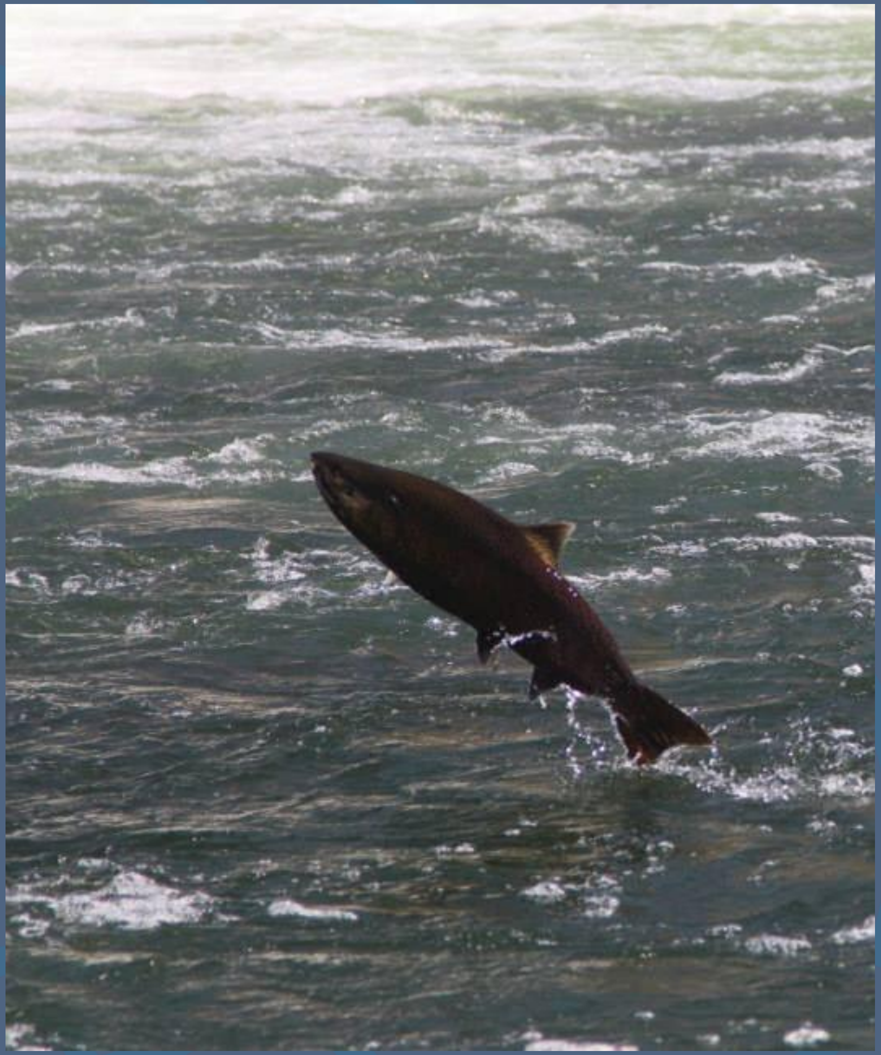
When Hatcheries Mask Ecosystem Decline

- **The original intent of California's Central Valley hatcheries was to mitigate the extensive habitat loss** caused by the Central Valley Project (CVP) and State Water Project (SWP)
- The initial baseline was river systems with **abundant, naturally spawning** salmon and steelhead populations
- Hatcheries were intended to **supplement**, not replace, wild populations

Now, decades later, hatcheries are operated to sustain nearly the entire commercial salmon harvest. They are no longer just a mitigation tool, but an **institutionalized substitute** for healthy river ecosystems.

Putting Wild Fish Back at the Center of Salmon Policy

- **Reorient CA's Conservation Goals, focusing on restoring wild salmon** instead of hatchery salmon to support native biodiversity and increase population abundance and resilience
- **Reverse the downward trajectory in abundance** and life history diversity that is currently leading toward extinction*
- **Reconcile CA's water management systems** to support robust ecological functions, water quality, and access to restored native habitats



** Ford et al. 2025: "Eight of the 10 DPS in California had declining trends"*

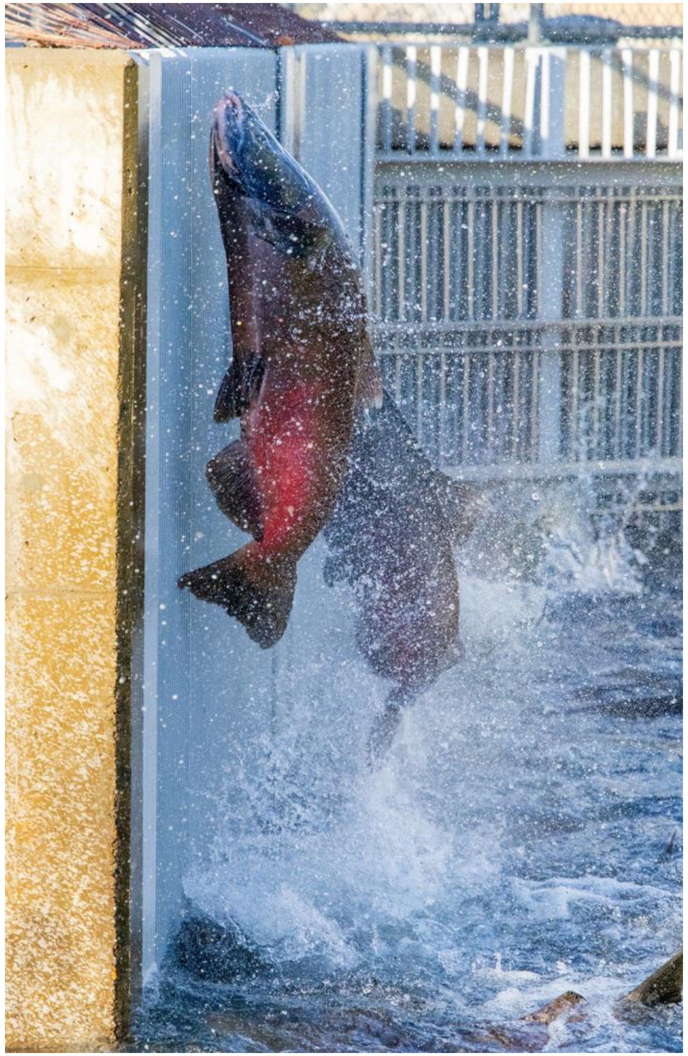
CALIFORNIA TROUT
FISH·WATER·PEOPLE

Top 3 Hatchery Reforms

1. Improved Monitoring and Science applications
   - Parental Based Tagging
   - Genetic analysis
   - Cohort Reconstruction
   - Cryopreservation

2. Diversify Release Strategies

3. Invest in Climate Resilience



Top 3 Hatchery Reform Actions for California

SLDMWA

1. Improve marking/tagging of hatchery fish to support conservation management of wild salmon

1. Minimize effects of domestication selection
   - Incorporate wild fish into hatchery broodstock
   - Reduce abundance of hatchery fish on spawning grounds

1. Define clear, measurable goals for all hatchery programs; acknowledge and address impacts to viability of wild fish

Fish collection tanks at Tracy Fish Collection Facility

Top Hatchery Reform Recommendations

1. **Refocus statewide hatchery policy** on conserving and recovering **wild salmon** populations.
   - Minimize adverse impacts of hatcheries on natural populations (e.g., genetic introgression, competition, disease) through monitoring and reforming hatchery practices.
   - Mark all hatchery fish so targeted management is possible.
   - Revitalize in-river fisheries, which can better target specific abundant runs of salmon compared to mixed-stock ocean fisheries.

2. **Update cost-benefit assessments** of CA's salmon hatcheries, comparing operations and maintenance (O&M) costs, dollar-per-fish caught, and the balance of public/private investment.

1. **Prioritize natural production of Chinook salmon on the North Coast** through minimizing production of Upper Klamath-Trinity River Chinook and avoiding hatchery influences on California Coastal Chinook.
   - Evaluate the economic and ecological cost-benefit of Fall Creek Hatchery and consider its closure after 2032.
   - Allow natural recolonization first, before considering hatchery intervention, as fish passage barriers are removed and habitats are restored.

Photo Credit: Steven Holt

CALIFORNIA TROUT

FISH · WATER · PEOPLE