

## MISSION STATEMENT

To manage the water resources of California, in cooperation with other agencies to benefit the State's people and to protect, restore and enhance the natural and human environments.

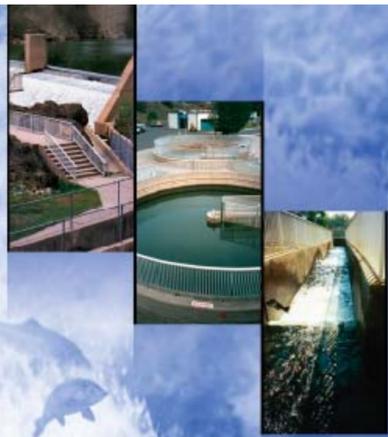
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6/01



## FEATHER RIVER FISH HATCHERY

The California Department of Water Resources

## WELCOME

As a visitor to the hatchery, you will witness how humans have intervened to help Mother Nature ensure the continuation of spring and fall run Chinook salmon and steelhead trout.

Salmon and steelhead, raised at the hatchery, are released in the river or in San Francisco Bay, to find their way to the Pacific Ocean where they mature. After two to three years in the ocean, they instinctively return to their natal origins - through the Delta, up the Sacramento River to the Feather River and the hatchery.

Though more fish spawn naturally in the Feather River below the hatchery, those that are artificially spawned at the hatchery produce offspring that have a relatively high survival rate. Hatchery fish eggs are protected from nature's adversities such as predation by other fish and birds, abrupt changes in river flows, and high water temperatures.

The Feather River Fish Hatchery is a successful and modern fish rearing facility. An estimated 20 percent of the ocean sport and commercial catch comes from fish reared at the hatchery.

Using the map inside this brochure, you'll follow the salmon as they complete their final journey to give life to future generations.

For information about DWR's programs or projects, you can visit DWR's Website at <http://www.dwr.water.ca.gov> or DWR's "Welcome to Lake Oroville" website at <http://www.dwr.water.ca.gov/LakeOroville>

*Shawn M. Hannigan*

Director  
Department of Water Resources

## THE STATE WATER PROJECT

Planned, designed, constructed, operated and maintained by the California Department of Water Resources (DWR), the State Water Project (SWP) is the largest state-built, multipurpose water project in the United States.

The SWP, spanning more than 600 miles from Northern California to Southern California, includes 32 storage facilities, 17 pumping plants, 3 pumping-generating plants, 5 hydroelectric power plants, approximately 660 miles of canals and pipelines, including the 444-mile long California Aqueduct.

The main purpose of the SWP is water supply - that is, to divert and store water during wet periods and distribute it to areas of need in Northern California, the San Francisco Bay area, the San Joaquin Valley, the Central Coast, and Southern California. Other SWP purposes include flood control, power generation, recreation, fish and wildlife enhancement, and water quality improvement in the Sacramento-San Joaquin Delta.

Twenty-nine urban and agricultural water agencies have long-term contracts for deliveries of SWP water. Approximately 70 percent goes to urban users and 30 percent to agricultural users.

These SWP contracting agencies are repaying the full cost, plus interest, of financing, building, operating, and maintaining the SWP water storage and delivery system.



## FEATHER RIVER FISH HATCHERY

Because construction of Oroville Dam by the Department of Water Resources altered the Feather River, a portion of the spawning and nursery grounds was lost to salmon and steelhead returning to their home stream to deposit eggs. To compensate for this loss, the Feather River Salmon and Steelhead Hatchery was opened in 1967.

The facility-one of the most advanced and successful fish hatcheries in California-was cooperatively planned by the Department of Fish and Game and the Department of Water Resources, with the advice and assistance of the U.S. Fish and Wildlife Service and other agencies. From 1981 to 1991, the return of spawning adult salmon increased from an average of 39,000 to an average of 51,000 per year. (The run now includes in-river and hatchery spawners.) Since the hatchery handles about 20 percent of the season's run, the remainder spawn naturally in the river, below the barrier dam.



## FEATHER RIVER FISH HATCHERY



## THE HATCHERY FACILITIES

The Feather River Fish Hatchery was designed as a facility where a large number of adult fish can be trapped, held and artificially spawned. Inside the modern hatchery building, water channels, a mechanical lift, and circular tanks were designed and constructed so fish remain in the water at all times. Once the eggs are hatched, the fry and young fish are reared with a minimum of handling and cost.



### 1 Barrier Dam, Fish Ladder, and Fish Ladder Window

Major features to guide the fish from the Feather River to the hatchery include the fish barrier dam and fish ladder. Near the barrier dam, viewing windows allow visitors to watch the fish as they leap and swim up the fish ladder toward the hatchery.

### 2 Gathering and Holding Tanks

As fish reach the end of the ladder, they swim into the gathering tank. A mechanical sweep moves the fish into the spawning building. Salmon and steelhead that are not ready to be artificially spawned are moved to one of four circular holding tanks.



### 3 Working (Spawning) Building

The main hatchery building houses the spawning operation area and the incubators. On either side of the building, just beyond the gathering tank, are viewing windows where the spawning operation (a-g) can be observed in the fall and winter.

**a. Artificial Spawning** The hatchery process is conducted by trained Department of Fish and Game employees.



**b. Tranquilizing** Inside the spawning operation area, the fish are first placed into the tranquilizing tank where carbon dioxide is added to the water. The nontoxic chemical displaces the oxygen in the water, slowing the fish down so the workers can handle them.



**c. Sorting** The fish are then sorted - those not ready to spawn swim through channels to the holding tanks. Those "ripe" for spawning are artificially spawned.

**d. Preparation** During the spawning operation, both male and female salmon are killed. (All Pacific coast salmon die naturally after spawning.)

## FEATHER RIVER FISH HATCHERY

**e. Fertilization** The female salmon's body is slit open along the body line. By hand, the worker scoops out the female salmon's eggs - 2,500 to 5,000 - into a plastic tray. The milt is squeezed from the males and mixed into the eggs for fertilization. Under the controlled conditions, a ratio of one to one is used when spawning.

The edible spawned salmon are donated to local charities and Native Americans.

Because steelhead do not die after spawning, the process is handled differently. The eggs are removed from the female by using low-pressure air injected into the abdominal cavity through a hypodermic needle. Milt taken from the male fertilizes the eggs. Both male and female are then returned to the river.



**f. Hatchery Incubators** The fertilized eggs of the Salmon are transferred to the hatchery incubators and placed into plastic trays, each containing about 9,000 eggs. Water is continuously circulated in the trays. Hatchery incubators can hold up to 20 million eggs.

In 25 days, black dots, the eyes of the fish, appear. After another 20 days, the egg hatches into an alevin (sac fry). Some eggs die. These white eggs are then sorted and discarded. The fry are ready to be transferred to the rearing channels in another 30 days.

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**g. Egg Jars** Steelhead fertilized eggs are also placed in incubation jars. This incubation method requires no chemicals to battle the fungus that can infect the eggs and needs less maintenance. Water flows in the bottom through the perforated plate at a rate to gently levitate the eggs before exiting at the top. Jars, which range from 3 inches to 20 inches in diameter, can store approximately 400 ounces of chinook or steelhead trout eggs (about 90 eggs per ounce or 36,000 chinook eggs and about 250 eggs per ounce or 100,000 steelhead trout eggs).

### 4 Raceways

The Raceways are located in the back of the hatchery building. Additional raceways are located at DWR's Thermalito Afterbay facility. Rearing raceways contain fry, fingerlings and yearlings. These fish are held at the facility until reaching the appropriate size. These rearing areas are protected by wire coverings to keep birds from feasting on the young fish. Steelhead are held for one year, and salmon are released when they reach a specific weight. Salmon are transported in fish tanker trucks to San Francisco Bay Delta and sometimes to Lake Oroville. Steelhead are released to the Feather River downstream of Oroville.



## FEATHER RIVER FISH HATCHERY

### THE LIFE CYCLE (see poster on reverse side)

Some adult spring-run chinook salmon start arriving below the fish barrier dam in June. They remain there until the fish ladder is opened in early September. Fall-run salmon and steelhead migrate up the river during September, October, and November with some steelhead entering the hatchery as late as December and January.

### HATCHERY FISH & THEIR ROLE

Each year, approximately 9,000 to 18,000 salmon and 2,000 steelhead are artificially spawned, a process which produces 18 million to 20 million eggs. Fish from the Feather River Hatchery play an essential role in maintaining sport fishing for salmon and steelhead in the Feather and Sacramento rivers, and in contributing to the commercial and sport catch in the Pacific Ocean. The facility also serves as an example of the multi-use concept of our water resources.



## FEATHER RIVER FISH HATCHERY

### INFORMATION



Operated by the Department of Fish and Game with funding by the Department of Water Resources and the State Water Contractors, the hatchery is open to the public year-round. Visiting hours are from 8 a.m. to sundown. The hatchery is located at 5 Table Mountain Boulevard, Oroville, CA 95965. For more information, call the hatchery at (530) 538-2222.

For more information about the State Water Project and accessibility, call the California Department of Water Resources' Office of Water Education at 1-800-272-8869. For TTY phone service, call (916) 653-6226. If you need this publication in an alternate form, contact the Office of Water Education at 1-800-272-8869.

### TOURS



To schedule a tour of the hatchery or other Oroville-Thermalito Complex facilities, call DWR's Oroville Field Division at (530) 534-2306. School classes and the public can visit the hatchery year-round, but the artificial spawning operation occurs on weekdays from late September through mid-November.

Guided group tours during the spawning season should be scheduled 45 days in advance.