

# DFG steps up to





# to help recover endangered species



**R**ussian River coho salmon numbers have been steadily declining in the Russian system for years. Today, these coho are listed as threatened under the Endangered Species Act. Despite massive restoration projects conducted by the Department of

*By Brett A. Wilson*

Fish and Game (DFG) to return historical habitat back to a useful condition, DFG feels that steelhead, with a stronger population, have responded to the improved habitat conditions while the coho have continued to decline. Something more had to be done for this fish, and DFG's fishery biologists Bob Coey and Bryan Freele decided to take a stronger hand in that recovery.

Coey, a senior fisheries biologist, and his staff realized that the numbers of returning adult coho had dropped to such low levels that some tributaries to the Russian River which had good habitat that was underutilized or habitat that had been restored, were not being used to the extent that they should. Coey and his staff, together with the Warm Springs hatchery staff, met with other agencies to develop the Russian River Coho Recovery Program.

The Russian River Coho Recovery Work Group includes the DFG, National Marine Fisheries Service, Army Corps of Engineers, Sonoma County Water Agency, Trout Unlimited, National Park Service, the Institute for Fisheries Resources, Pacific Coast Federation of Fishermen, Merritt Smith Consulting, and the Marin

Municipal Water District, and numerous community and environmental organizations. Following many meetings, there was agreement that immediate action was necessary, since at the returning levels biologists were seeing that the coho might not make it another year.

In an unusual step of implementing a program and filling in the details along the way, the Russian River Coho Recovery Program set about creating a different type of rearing facility than DFG currently has for mitigation purposes at Warm Springs Hatchery to respond to the emergency situation. The magnitude of the undertaking wasn't clear until DFG's hatchery manager Brett Wilson and hatchery supervisor Royce Gunter took a ride up north to visit other captive brood programs. Original concepts changed, and plans are now in motion to build a facility 150 feet by 100 feet with 12 20-foot circular tanks, and 12 16-foot start tanks. Because of the state's current financial problems, only cooperation and partnerships can help a plan of this magnitude succeed.

Raising captive wild salmon means that these fish will spend their entire lives in fresh water, without the migration to salt water stage of their life cycle. For DFG this is very different from raising production fish for mitigation, enhancement, or a put and take fisheries. The standard type raceway used to raise large numbers of fish that will be released is inadequate for raising captive salmon to sexual maturity.

When raising the captive wild salmon, DFG will use circular

tanks which allow hatcheries to maintain much deeper water and a strong current. This is to mimic as much as possible the ocean environment to minimize stress on the fish and to maintain low densities. All of these factors are very important for egg development in captive salmon. The state hatchery system has been involved in recovery programs for wild trout where a population has been lost due to a catastrophic event, pollution or chemical spill, but not with captive salmon to be raised to maturity, and never with a listed species.

There are three phases in the construction of the facility. The first phase includes six circular tanks and six rearing troughs, and is scheduled to be completed in April 2003 with 100 percent of the funding coming from the Army Corps of Engineers. The other phases are in development.

## Recovery begins

During the summer of 2001 and 2002, Coey's staff captured approximately 300 wild juvenile coho fingerlings by seining them in many different tributaries to the Russian River and some creeks in Marin County. To be conservative about the impacts of the capture program to any remaining wild remnant run, only 50 percent of the fish encountered in each pool were collected for the program with a maximum of 10 fish per pool collected, leaving the rest to rear in the stream. The fish were then transported to Warm Springs Hatchery where they are put in separate rearing troughs which were segregated by tributary. Immediately upon arrival the fish receive a three-day treatment to control any external

Top far left, tributary where coho brood stock are collected. Middle far left, preparing to give fish vaccination. Bottom far left, preparing the PIT tags. Top center, PIT tags. Bottom center, holding ponds at hatchery.

*Photos by DFG hatchery staff*



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parasites, fungus, or internal diseases they may have.

The first challenge for the hatchery staff is to get these wild coho to readily eat a good quality commercial feed. It took a lot of time and patience but within a few weeks they were all eating as well as can be expected for wild fish.

When the coho were about 4 inches in length, hatchery staff vaccinated the fish to control Bacterial Kidney Disease. Under the direction of Dr. Joe Maret from DFG's Fish Health Laboratory in Sacramento, the hatchery staff gave each of these precious endangered coho an injection of a drug called Renogen just under the belly wall.

When the coho were about five inches in length the hatchery staff tagged each fish. This is a crucial part of the program. A Passive Integrated Transponder, or PIT tag, is inserted with a 12-gauge needle into the belly cavity of the fish. Each tag has a unique code that can be read externally by a wand held near the fish. At the same time a fish is tagged, DFG also takes a tissue sample from the caudle fin. These tissue samples, which will be identified by the pit tag number that accompanies it, are sent to Dr. Carlos Garza at the National Marine

Fisheries Service Lab in Santa Cruz. Dr. Garza performs electrophoresis on each sample to ensure that DFG makes the best genetic matches when spawning, and to also ensure that there is no inbreeding. When these tests are complete Dr. Garza sends a Spawning Matrix to hatchery management to help with selection when spawning occurs.


The offspring from this brood stock will be reared at the hatchery and released into selected streams that have underutilized habitat or good habitat that is not being used. DFG hopes to release 100,000 fish into five different tributaries to the Russian River.

### Recovery as it stands now

The first year class, which arrived at the hatchery in August 2001, has been vaccinated, PIT tagged, and is out in a raceway pond that has been modified to accommodate the wild characteristics of these fish. The fish are totally screened in to protect from them predation. Covers over two sections of the pond provide shelter, and DFG has added belt feeders so the fish will not spook during feeding. DFG currently holds 305 fish from this class, just under

one pound each, and expects them to sexually mature next winter.

The second-year class, which arrived in the summer of 2002, is in the hatchery building in segregated troughs. The approximately 450 juvenile coho are all eating well and putting on weight. DFG vaccinated them in November and the PIT tagging took place in January 2003. DFG looks to have its first release of fingerlings in the spring of 2004, followed with additional releases in the summer and fall. There is some speculation that the broodstock will sexually mature a year later than their wild counterparts due to slower growth from being in captivity. This would delay the first release until 2005.

The goal of this program is to reestablish self-sustaining runs of coho salmon to the Russian River Basin. After assisting the coho with this program for a number of years, program participants hope to discontinue the program and let nature take care of itself. 

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Far left top, construction of coho holding ponds that will simulate coho life cycle in the ocean. Far left bottom, injecting PIT tag.

Top center, Warm Springs Hatchery. Middle center, first construction phase is funded by the US Army Corps of Engineers. Bottom center, brood stock in current holding pond.

Immediate left, anesthetized coho.