



# 'In the Redd' Equals Conservation

## *Quilcene NFH Rebuilds Hood Canal Winter Steelhead Runs*

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Photo Credit: Paul Kaiser/USFWS

*Dewatto River winter steelhead 3 weeks after the start of feeding.*

First a phone call saying “we’re on our way,” then the crunch of tires on gravel in the parking lot, and now Quilcene National Fish Hatchery has just begun another season of rearing Hood Canal winter steelhead, which are listed as a threatened species under the Endangered Species Act.

It all started in the spring of 2007, when a large-scale, long-term study was undertaken within Washington’s Hood Canal, the narrow westernmost waterway in the Puget Sound Basin that comprises the eastern border of the Olympic Peninsula.

The goal is to determine whether a conservation hatchery program will provide long-term benefits to the natural productivity of these winter steelhead.

With NOAA Fisheries as the lead agency, the study represents a collaborative effort involving the U.S. Forest Service, Skokomish Tribal Nation, Jamestown S’Klallam Tribe, Port Gamble S’Klallam Tribe, Washington Department of Fish and Wildlife, Hood Canal Salmon Enhancement Group, Long Live The Kings and the U.S. Fish and Wildlife Service.

Three watersheds (the Skokomish, Dewatto and Duckabush) will receive inputs of hatchery-reared, natural origin winter steelhead. Four other watersheds (the Hamma Hamma, Dosewallips, Tahuya and Big Beef Creek) containing winter steelhead populations will serve as the non-supplemented control streams.

All watersheds and winter steelhead stocks inhabiting them were chosen based upon their wide geographical distribution within Hood Canal and the fact that they represent a broad range of habitat diversity (stream size and factors such as gradient and barriers to access by anadromous fish) and have relative close proximity of a control stream to the supplemented stream.

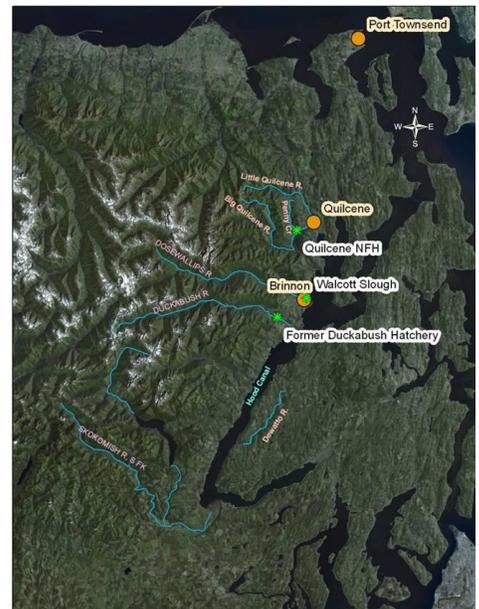


Photo Credit: Steve Dilley/USFWS

*Hood Canal, Washington; Winter steelhead reared at Quilcene NFH will be part of a collaborative effort to boost natural productivity of an ESA-threatened species.*



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No hatchery stocking of any stream in Hood Canal has taken place since 2004. And those were an earlier-timed fish not believed to have interbred with the natural populations to any significant degree. Furthermore, the lack of a hatchery-dependent harvest reduces the likelihood of a significant population reduction due to harvest.

For the purposes of the study, no adult winter steelhead will be captured or artificially-spawned, and the hatchery portion of the project will continue for two winter steelhead generations (eight years based upon a typical four-year life history).

Field work begins the last week of February with both the supplemented and non-supplemented control streams surveyed for winter steelhead redd abundance. When redds are located in the supplemented streams, the location is marked and recorded and water temperatures begin to be monitored to determine the time of eye-up, at which point the eggs can be safely handled. This red survey period concludes the first week of June.



Photo credit: Dan Magneson/USFWS

*Receiving winter steelhead eyed eggs from the Dewatto River.*

Numbers are collected from each redd in a manner that temporally represents the entire run and, if the situation warrants it, some early redds may be skipped entirely.

Once the eggs are sufficiently eyed, the redds are then hydraulically pumped, with a jet of water washing a portion of the eggs free of the gravel. These eggs are captured in a wire-mesh cage positioned just downstream, with a fine-mesh seine positioned immediately behind the cage to catch any errant specimens.

Eggs from the Skokomish system are taken to the Washington Department of Fish and Wildlife's McKernan hatchery facility, while those originating from the Dewatto and Duckabush Rivers are transported to Quilcene National Fish Hatchery.

An upper limit is imposed upon the annual collections of viable embryos, and for each of the respective systems it is 44,616 (Skokomish); 9,566 (Dewatto) and 8,620 (Duckabush).

Upon arrival at the parking area adjacent to our settling pond, the eggs are transferred from the moist confines of an insulated container into a 5-gallon bucket for an iodophor-based disinfection. Then the eggs are brought into the Quilcene NFH Isolation Building where any debris is first removed from the eggs, and each redd is then incubated individually within Heath-style incubation trays. Vexar mesh is added at hatching to simulate gravel within a streambed.



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The lower-gradient and smaller Dewatto system exhibits an annual cycle where spawning tends to begin and conclude earlier in the year, while egg collections from the Duckabush system generally extend later into the spring.

We chill our incubation flows early in the season, then we raise the water temperature until all chilling is concluded, which typically occurs near the end of April. This chilling process, in conjunction with a subsequent cycling of the fry on and off feed, helps to compress the size range of the fry into more manageable units as pooling of the fish from the different redds becomes necessary later on.

The Isolation Building at Quilcene National Fish Hatchery fulfills a critical role: fish health guidelines require a period of quarantine and pathogen screening, and this building utilizes a pathogen-free supply of well water coupled with the capability to disinfect the effluent via a chlorination/dechlorination process.

In July or August, following testing for regulated pathogens, the fish are transferred – at 300 to 450 fish/lb. – to a hatchery facility near Lilliwaup, Washington. Operated by Long Live The Kings, extended rearing takes place at this facility. The goal is production of a two-year-old smolt. Some of the fish will be retained for further growth into sexually-mature adults. All will be returned to their natal stream at numbers within estimated carrying capacity and at a time of natural emigration.



Photo Credit: Ron Wong/USFWS

Monitoring of the winter steelhead populations produced by these streams, including information gleaned from fish tagging and screw-trapping, and in combination with samples obtained through hook-and-line and seining events, should provide other valuable pieces that can be fitted into the life history puzzle of the Hood Canal winter steelhead.

*Preparing to transport Duckabush River winter steelhead to the Long Live The King's Lilliwaup hatchery facility*

Research and monitoring activities are slated to take place through 2022.

In the sheltered hatchery environment, 80% of the embryos collected are expected to survive to adulthood versus a 0.05% rate for embryos left in the natural environment. Given this, we believe that the spawning winter steelhead populations within the supplemented streams will be quickly amplified. And we are optimistic that once the period of hatchery supplementation ends, the momentum from the boost they received will carry them far into the future.



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