

**Pacific Salmon Treaty
National Marine Fisheries Service**

NA12NMF4380106

Final Report

September 1, 2012 through September 30, 2014

Nooksack and Dungeness Supplementation Program



*Washington
Department of*
**FISH and
WILDLIFE**

Submitted by
Fish Program
Washington Department of Fish and Wildlife
December 2014

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Project Progress Report for the following tasks and activities:

Task 1-Nooksack Supplementation Program
Task 2-Dungeness Supplementation Program

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Task 1: Nooksack Supplementation Program - FFY 2012 Objectives:

The purpose of the project is to assist in the recovery of the threatened South Fork Nooksack Chinook population. The Nooksack Supplementation Program is designed to identify native South Fork Nooksack Chinook fish and to rear them to maturity at Kendall Creek Hatchery. The project is being conducted at Kendall Creek Hatchery because of the abundance of well water on site and its proximity to the South Fork of the Nooksack River. The objective is to utilize DNA data to determine spawning pairs that will produce offspring with genetic diversity equivalent to that found in the wild. The progeny of the captive brood fish will be reared at Skookum Creek Hatchery and released into the South Fork of the Nooksack River as sub-yearlings. The project is being undertaken to rebuild this threatened stock and ensure it persists while habitat restoration is being implemented.

A. Kendall Creek Hatchery Chinook Captive Brood – Operations.

The primary role that Kendall Creek Hatchery plays is to receive juvenile fish from the Skookum Creek facility. The fish are identified as either yearling or sub-yearling and are placed in discrete rearing vessels. The fish are reared for a period of time before being passive integrated transponder (PIT) tagged for individual identification. Half of the fish are then transferred to the NOAA facility at Manchester for rearing in saltwater. The fish remaining at the Kendall Creek Hatchery are then reared to maturity in preparation for transfer back to the Skookum Creek Hatchery for spawning.

B. Kendall Creek Hatchery Coho – Operations.

The Skookum Creek Hatchery, located on the South Fork of the Nooksack River, has limited space as well as a limited supply of well water. Kendall Creek Hatchery will raise approximately half of the Skookum Coho program, one million fish, which will enable Skookum Creek Hatchery to raise the South Fork Spring Chinook sub-yearlings. The Skookum Coho will be brought to Kendall Hatchery as eggs and they will be reared to 20 fish per pound.

C. Kendall Creek Hatchery Juvenile Collection DNA – Operations.

This task previously included DNA sampling required for the increase in production of the sub-yearlings. The conversion from adult to juvenile sampling increased the DNA stock assignment fees tenfold. The goal of obtaining 1,000 juvenile fish from each brood year required capturing and sampling 2,500 juvenile fish from the river each year. Juvenile collection ceased when the goal of 1,000 fish was obtained with the 2011 brood year. Since then the focus of DNA collection and analysis has shifted to maturing fish. The yearly maturation of a portion of the brood year fish on hand requires testing of approximately 1,000 adults in order to determine appropriate pairing for spawning.

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ACCOMPLISHMENTS – NOOKSACK SUPPLEMENTATION PROGRAM

A. Kendall Creek Hatchery Chinook Captive Brood – Operations.

At the beginning of this grant period, the final brood year 2011 South Fork Nooksack Spring Chinook juveniles were transferred from Skookum Creek Hatchery to Kendall Creek Hatchery. The last transfer of juveniles brought the total number of brood year 2011 fish to 984, just shy of the goal of 1,000 juveniles per brood year to be raised in the captive brood program. The 2011 brood year is the last group of juveniles to be included in the captive brood program and there are no plans for further collection efforts for any additional brood years. From the inception of the captive brood program to the end of this grant period a total of 4,190 South Fork Nooksack Spring Chinook juveniles were collected from the wild, identified through DNA testing, and transferred to Kendall Creek Hatchery. All of the juvenile transfers from Kendall Creek Hatchery to Manchester Research Facility, a total of 1,995 fish, occurred prior to the grant period. During the grant period, ongoing rearing and health observation activities for all of the South Fork Spring Chinook at Kendall Creek Hatchery and Manchester Research Facility were conducted.

Maturing South Fork Nooksack Spring Chinook from Kendall Creek Hatchery and the Manchester Research Facility were identified and transferred to Skookum Creek Hatchery in the month prior to the grant period. For the 2012 spawning season, a total of 123 mature South Fork Nooksack Spring Chinook originated from the Kendall captive brood program and 180 mature fish originated from the Manchester program. Spawning began on September 26, 2012 and was completed on October 12, 2012 with a total of 91 pairs spawned. The total 2012 South Fork Nooksack Spring Chinook egg count was 290,000. There was significant loss during the early rearing of the fish at Skookum Creek Hatchery and the sub-yearling release in 2013 was 155,732 fish.

In preparation for the 2013 spawning season, a total of 262 mature South Fork Chinook were identified and transferred from Kendall Creek Hatchery to Skookum Creek Hatchery. In addition, 280 mature fish from the Manchester Research Facility were identified and transferred to Skookum Creek Hatchery. One hundred seventy-nine females and 83 males originated from Kendall Creek Hatchery, while 151 females and 129 males originated from the Manchester facility. The total egg take for the 2013 spawning season was 784,334. In the spring of 2014, a total of 677,540 sub-yearlings were released into the South Fork of the Nooksack River.

A total of 302 mature South Fork Nooksack Spring Chinook originating from the Kendall Creek Hatchery captive brood program were transferred to Skookum

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Creek Hatchery for the 2014 spawning season. There were 132 mature females and 131 mature males from the 2007, 2008, 2009, and 2010 brood year fish. There were 39 mature fish from the 2011 brood year of unconfirmed sex. A total of 134 mature female and 84 mature male South Fork Nooksack Spring Chinook originating from the Manchester Research Facility captive brood program were transferred to Skookum Creek Hatchery for the 2014 spawning season. As of the end of this grant period, none of the fish that were identified as mature for the 2014 spawning season had been spawned but the projected egg take was 900,000.

Bacterial Kidney Disease (BKD) treatments have been administered to all brood years during this grant period as directed by the Fish Health Specialist. During this grant period, all of the South Fork Spring Chinook fish located at Kendall Creek Hatchery were treated with Formalin as needed. Weekly salt treatments have been administered to all brood year fish at Kendall Creek Hatchery throughout this grant period. All brood year 2010 and 2011 fish at Kendall Creek Hatchery were PIT tagged during this grant period.

B. Kendall Creek Hatchery Coho – Operations.

At the beginning of this grant period, approximately half of fish for the Skookum Coho program for the 2011 brood year were being reared at Kendall Creek Hatchery. This was initiated in order to reduce well water demand at Skookum Creek Hatchery and to provide more rearing space for the South Fork Spring Chinook. In January and February of 2013, the brood year 2012 Coho eggs were transferred to Kendall Creek Hatchery. In March and April of 2013 a total of 996,240 yearling brood year 2011 Coho were transferred from Kendall Creek Hatchery to the Lummi Sea Ponds. In December of 2013 and January of 2014, the brood year 2013 Coho eggs were transferred to Kendall Creek Hatchery. In April 2014, 893,205 brood year 2012 Coho salmon were transferred from Kendall Creek Hatchery to the Lummi Sea Ponds. As of the end of this grant period, there are 1,029,825 brood year 2013 Coho being reared at Kendall Creek Hatchery which will be transferred in the spring of 2015.

C. Juvenile Collection DNA – Operations:

During the grant period, 261 juvenile DNA samples were analyzed. In addition, 1,365 DNA samples from adult fish were analyzed to determine appropriate pairing for spawning.

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EXPENDITURES – NOOKSACK SUPPLEMENTATION PROGRAM:

Expenditures for the Nooksack Supplementation Project for the performance period of September 1, 2012 through September 30, 2014 are provided below.

Table 1. Expenditures, Nooksack Supplementation Project, September 1, 2012 through September 30, 2014.*

Summary of Costs – Nooksack Supplementation Program	
Wages	\$76,797
Benefits	\$31,391
Goods & Services (supplies & materials, rentals)	\$210,479
Travel	\$3,193
Equipment	\$0
TOTAL DIRECT	\$321,860
Indirect	\$75,605
TOTAL	\$397,465

*Summary of costs shown is preliminary based on available fiscal reports to date. Amounts by category may change slightly upon fiscal close of this grant.

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Task 2: Dungeness Supplementation Program - FFY2012 Objectives:

The purpose of this project is to assist in the recovery and supplementation of the Puget Sound Chinook stock in the Dungeness River system. This specific task is focused on completing the second acclimation site on the Dungeness Fork. Completion of a second acclimation site will allow us to split the current zero-aged smolt production of 100,000 fish between two ponds. Raising both groups at the same time at different sites allows us to take advantage of optimum release time on all of the fish. It will also promote broader distribution of spawning adults to the more favorable habitat in the upper reaches of the Dungeness Fork and the Grey Wolf River.

Appropriate acclimation sites are not in abundance in the upper river system. Several sites were evaluated but most were proven to be unsuitable mainly due to a lack of road access and water supply. This region is in U. S. Forest Service ownership and land use restrictions are in place over broad areas. The best potential site is just upstream of the Dungeness Forks Campground at River Mile 15.8. This site has good road access and a level spot for rearing tank placement.

A. Dungeness Supplementation – Operations.

Provide operations at the Dungeness Hatchery, Hurd Creek Hatchery, and the acclimation sites supporting the Dungeness Chinook supplementation program. Adults are collected from a temporary in-stream trap in the lower Dungeness River. Trap maintenance includes daily cleaning, transporting broodstock to holding tanks and passing fish upstream. Adults are also collected directly from the river below the rack by netting, hook and line, and snorkeling.

Adults are held and spawned at Hurd Creek.

The Grey Wolf acclimation pond is an earthen rearing pond located at River Mile 1 on the Grey Wolf River. The pond must be set up and torn down every year. The Grey Wolf pond is operated from April to June each year. The site is remote, and staff must travel to the site twice daily to perform routine duties. The new upper Dungeness acclimation site consists of two fiberglass ponds at River Mile 16 on the Dungeness River. These ponds will operate from April through June and will be set up and torn down annually. Being a remote site with electrical and fuel demands, staff must remain on site 24/7. In addition, other staff must travel to the site twice daily to deliver fuel and other necessities.

The Dungeness Hatchery provides summertime rearing for all smolts slated for yearling release. Dungeness Hatchery staff also support the needs of the Grey Wolf and upper Dungeness ponds including stocking, daily maintenance and planting.

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ACCOMPLISHMENTS – DUNGENESS SUPPLEMENTATION PROGRAM

A. Dungeness Supplementation – Operations:

The upper Dungeness acclimation site project has been a very complex undertaking that has involved a great deal of effort by all the crew members within our hatchery complex, as well as by many other state and volunteer workers. The logistics of the project were put together primarily by the crew at the Dungeness Hatchery.

Two positions were funded by Pacific Salmon Treaty and logistics of this project were organized primarily by the Dungeness Hatchery crew. With relative ease personnel took on the challenge of this project by accessing rental equipment, tools, hardware, trucks and trailers capable of hauling large rearing vessels.

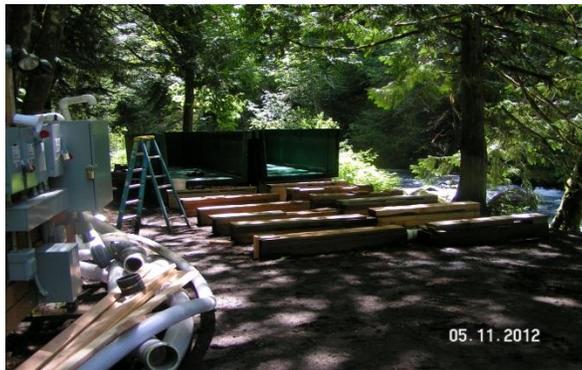


In the beginning of the grant period, the largest task was to find a suitable area that would work for our acclimation site. The area needed to supply adequate water, and be flat and large enough to hold the acclimation site rearing vessels. The area also needed to be large enough to accommodate a travel trailer, which housed employees looking after the site, as well as the generator, electrical panel and pumps. The site chosen was near the Upper Dungeness Fork camp ground at river mile 15.8. Once established and cleared with the U. S. Forest Service (USFS) we were able to proceed with construction of the site.

The construction process of the site itself generally takes about two days to complete after all equipment and materials have been rented or purchased. The use of a Gradall forklift was absolutely essential to lift the fiberglass tanks onto flatbed trailers, along with all the timber used to support the tanks. The forklift was driven

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ten miles up USFS roads to meet the loaded trailers at the acclimations site and offload the tanks and equipment. Much of the equipment purchased, including hand and power tools, were stored in two locking storage boxes that remained at the acclimation site. A laser level was used to set the foundation of the tanks so that they were at the correct slope and position. A second flatbed trailer was used for hauling supplies and is stored under a metal structure for protection when not in use. The storage boxes, covered storage shed, trailer and laser were essential to the success and goals of the project.



After construction is completed, the acclimation site and facility is operated by two temporary employees that are hired for three months. From early April to early June, Chinook are reared at the acclimation site. The two employees maintain a generator that operates around the clock, maintaining water flow for the entire duration of the acclimation process. Along with keeping the generator serviced and running, employees keep records on fish growth, feed consumption, and keep ponds clean and clear of debris. Employees also greet and inform curious visitors about the acclimation site. In addition, an employee from the Dungeness Hatchery visits the acclimation site twice daily to deliver fuel, drinking water and any other necessary supplies that the employee stationed on site may need.

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The release of the 50,000 Dungeness Chinook occurs during the second week of June depending on river and tide conditions. From hatch (1400 fish per pound) to release (40 fish per pound) this group of 50,000 fish will consume roughly 1100 lbs. of feed. Once conditions are correct, the Chinook are forced out of their rearing vessels and piped into the upper reaches of the Dungeness River.



Immediately after release, the acclimation site is disassembled and trucked ten miles back to the Dungeness Hatchery where all material and supplies are cleaned, inventoried, stored and winterized to be used again the following season.

To date, the Upper Dungeness Acclimation site is an ongoing success. Although the returning number of Chinook continues to be lower than desired, the acclimation site is important to restoring the desired population of returning Chinook adults into the Dungeness River.

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EXPENDITURES – DUNGENESS SUPPLEMENTATION PROGRAM:

Expenditures for the Dungeness Supplementation Project for the performance period of September 1, 2012 through September 30, 2014 are shown below in Table 2.

Table 2. Expenditures, Dungeness Supplementation Project, September 1, 2012 through September 30, 2014*.

Summary of Costs – Dungeness Supplementation Program	
Wages	\$47,806
Benefits	\$19,474
Goods & Services (supplies & materials, rentals)	\$27,898
Travel	\$0
Equipment	\$8,859
TOTAL DIRECT	\$104,037
Indirect	\$21,342
TOTAL	\$125,379

*Summary of costs shown is preliminary based on available fiscal reports to date. Amounts by category may change slightly upon fiscal close of this grant.