

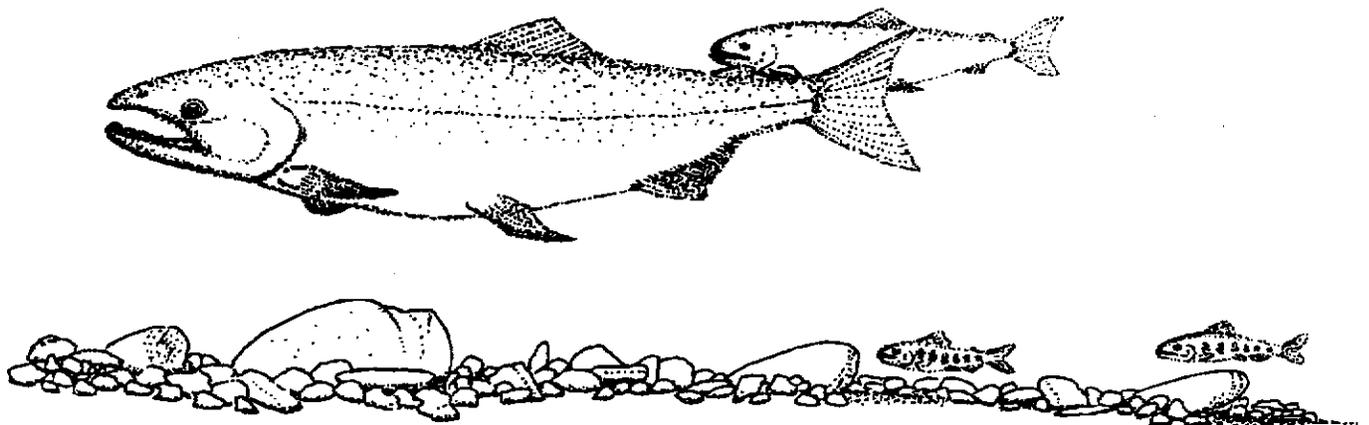


National Fish Hatchery Programming and Evaluation Activities for Puget Sound and Coastal Washington

Annual Progress Report 1995-1996

**Western Washington Office
Aquatic Resources Division**

**Lacey, Washington
December 1998**



NATIONAL FISH HATCHERY
PROGRAMMING AND EVALUATION ACTIVITIES
FOR PUGET SOUND AND COASTAL WASHINGTON
ANNUAL PROGRESS REPORT 1995-1996

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PREFACE

The purpose of this report is to document annual hatchery programming and evaluation activities at U.S. Fish and Wildlife Service fish hatcheries on the Olympic Peninsula of Washington. It fulfills the annual reporting requirement for the Service's Region 1 Vision Action Plan for Hatchery Evaluation. Although this report contains some analysis of existing data and may recommend changes to programming activities, the intent is to provide annual updates and not to provide comprehensive analysis of the various programs. Individual broodyear reports will also be prepared to describe what is known about the production and performance of different hatchery stocks by brood. Comprehensive analytical reports that encompass multiple broodyears will be produced intermittently to describe trends in survival and production of the hatchery stocks. While one person may be listed as the author of an individual report, all reports result from the collaborative efforts of the staffs of the National Fish Hatcheries, Fishery Resource Office, and Fish Health Center.

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INTRODUCTION

This report contains information regarding hatchery programming and evaluation activities at Quilcene, Makah, and Quinault National Fish Hatcheries (NFH) conducted from August 1, 1995 to July 31, 1996. The information is compiled using the Fisheries Resource Evaluation Database (FRED) (USFWS 1991), designed and maintained by the Western Washington Office, Aquatic Resources Division (Western Washington Fishery Resource Office (WWFRO)). This database provides administratively required information, biological data used to describe biological characteristics of hatchery stocks, and data to correlate fish rearing variables with survival characteristics of hatchery stocks. A general summary of the types of data routinely collected at each facility is presented in Table 1. Summarized data for this reporting period are contained in Tables 2 through 7. Specific details about the data or the database are available from WWFRO.

Fish production levels for all three hatcheries are determined in cooperation with representatives of the U.S. Fish and Wildlife Service (USFWS), tribal staffs, and the Washington Department of Fish and Wildlife (WDFW). Harvest levels, stock survival rates, wild stock interactions, and hatchery production capabilities are all considered when establishing production numbers. Programmed production goals for the broods reported in this document are presented in Table 2.

Hatchery evaluation teams for each hatchery met as specified by the USFWS Region 1 Vision Action Plan. The teams function as a focal point for involved Fish and Wildlife Service employees to participate in the programming and evaluation of the hatchery products. Membership includes hatchery staff, Olympia Fish Health Center staff, and WWFRO staff.

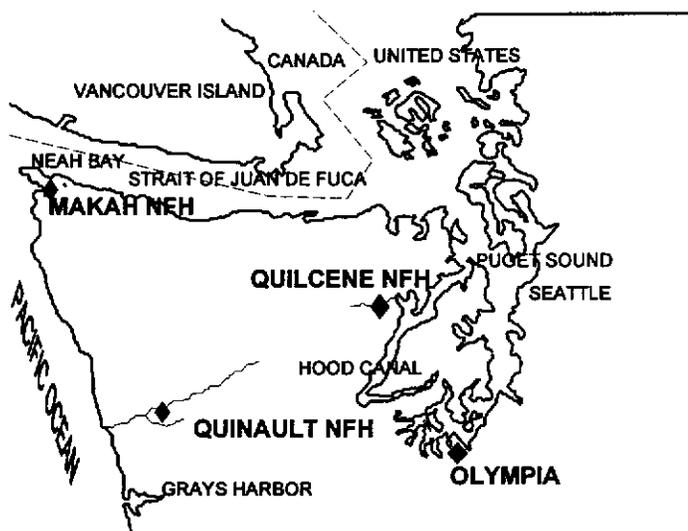


Figure 1. Western Washington locale map.

QUILCENE NATIONAL FISH HATCHERY

The Quilcene NFH production program operates under the guidance of the Hood Canal Management Plan and the Hood Canal Production Evaluation Program (brood years 1988-1993). Fish production levels are determined cooperatively with representatives from the USFWS, Point No Point Treaty Council, and WDFW. Summer chum continue as a high priority program at the hatchery. Hood Canal/Strait of Juan de Fuca summer chum are proposed by National Marine Fisheries Service for listing as threatened under the Endangered Species Act. Major construction at the hatchery included a rebuilding of the main raceway water control structure and installation of in-line flow monitoring equipment.

Coho

Releases and Transfers: Coho production at Quilcene NFH included 523,988 Quilcene stock yearlings, 24,923 fry released upstream in lieu of adult passage, and 156,972 excess sub-yearlings released to the Big Quilcene River in January and March of 1996. No coho pre-smolts from the 1994 brood were transferred to the Point No Point Treaty Council for rearing at their Quilcene Bay net-pen facility due to a fish shortage caused by flow interruption in spring 1995. One half million eyed eggs were transferred to the George Adams state fish hatchery for subsequent hatching, rearing, and transfer to the Port Gamble tribal net pen program.

Tags and Marks Applied: We coded-wire tagged 49,458 coho for the on-station release.

Terminal Area Returns, 1995: Adult returns provided sufficient spawners to meet program needs for 1995. Escapement to the hatchery was 20,063. Net fisheries harvested 2,773 coho in the terminal fishery in Quilcene Bay.

Recoveries of Coded-Wire Tags: All returning coho to the hatchery were sampled for coded-wire tags. One thousand four hundred and sixty-seven tags were recovered, representing ten different codes. Five hundred and eleven (35%) of these tag recoveries were from coho that originated from releases from net-pen programs in Port Gamble and Quilcene Bays. One tag was recovered from a fish released from Makah National Fish Hatchery and one tag was recovered from a fish released from the Agate Pass Net Pens operated by the Suquamish Tribe. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Quilcene NFH coho.

Discussion/Recommendations: The coho program at Quilcene continues to support a major terminal fishery in Quilcene Bay. Due to the earlier run timing of Quilcene stock coho, there is concern about the interception harvest of summer chum, which enter Quilcene Bay simultaneously. Fishery managers have modified the terminal fishery to emphasize beach seine methods, which allow fishers to return summer chum to the water alive.

A debris flow event in Penny Creek in January 1995 caused a gravel plug in the water line supplying the hatchery building. As a result, several thousand 1994 brood coho fry were lost. The loss was partially made up by a return transfer of 300,000 Quilcene stock coho fry sent to the Washington Department of Fish and Wildlife's George Adams Hatchery as eggs. The net effect was a loss of fish that resulted in insufficient fish for transfer to the Quilcene Bay net-pen program.

Spring Chinook

Releases and Transfers: The hatchery released no spring chinook during this period. This program has been terminated due to poor survival rates.

Terminal Area Returns, 1995: A total of 15 spring chinook returned to the hatchery rack. The run fell far short of the required escapement of 500 adults. We biosampled 33% of the return to find age composition. Age four fish were most common.

Recoveries of Coded-Wire Tags: All spring chinook returning to the hatchery were sampled for coded-wire tags. We recovered nine tags representing seven different codes. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries catch Quilcene spring chinook. No spring chinook from other locations strayed to the Quilcene rack this year.

Discussion/Recommendations: This program has been discontinued at Quilcene due to poor return rates and the lack of a genetically pure donor stock. All adults were disposed of this reporting period, as the state program at the Hood Canal Hatchery has also been discontinued.

Summer Chum

Releases and Transfers: The hatchery released a total of 441,167 feeding summer chum fry in 1996. No summer chum were marked or tagged.

Terminal Area Returns, 1995: Four hundred ninety-nine adult summer chum were handled at the hatchery. These fish came from returns to the hatchery rack and from the coho fishery conducted in Quilcene Bay. In addition, an estimated 4,100 fish remained in the river and spawned naturally. We biosampled 82% of the summer chum at the hatchery to determine age composition. Three-year-old fish predominated in the run taken to the hatchery. The Washington Department of Fish and Wildlife sampled summer chum carcasses from the hatchery spawning population to develop a genetic profile.

Recoveries of Coded-Wire Tags: All summer chum returning to the hatchery were sampled for coded-wire tags from fish released from the 1992 brood. We recovered 36 tags representing two different codes.

Discussion/Recommendations: The returns of tagged three-year-old fish indicate success from hatchery supplementation of the 1992 brood. The program is scheduled to continue through three generations, or twelve years.

Fall Chum

Releases and Transfers: The hatchery released 1,855,475 feeding chum fry into the Big Quilcene River.

Terminal Area Returns, 1995: A total of 4,574 adult fall chum returned to the hatchery rack. In addition, an estimated 16,500 fish remained in the river and spawned naturally. We biosampled 9% of the hatchery return to determine age composition. Most of the fish were four years old. Run reconstruction by WDFW shows that about 22,500 fall chum (17,500 natural origin, 5,000 hatchery origin) from the Quilcene River system were caught in 1995 net fisheries, primarily in northern Hood Canal.

Discussion/Recommendations: This program continues successfully as a composite of hatchery and natural production.

MAKAH NATIONAL FISH HATCHERY

Guidance for fish production at Makah NFH is provided through a steering committee with representation from the USFWS, the Makah Tribe, and WDFW. The parties met twice during the year and agreed to discontinue the chum salmon production program. We also discussed plans for a rod-and-reel coho harvest during the chinook run period. Brood 1995 coho will be treated with an experimental furunculosis vaccine. The coho, steelhead, and chinook programs are successfully building.

Coho

Releases and Transfers: Coho production at Makah NFH included 273,900 yearlings and 138,299 subyearlings released into the Sooes River. We transferred 51,030 subyearling coho to the Makah Tribe for further rearing, imprinting, and release at their Educket Creek facility on the Waatch River system.

Tags Applied: In December 1995 we applied coded-wire tags to 31,923 yearling coho for the Sooes River release and 24,014 coho for the transfer to Educket Creek.

Terminal Area Returns, 1995: Coho returns provided sufficient spawners to meet program needs for 1995. Escapement to the hatchery was 8,023. Of these, we passed 5,058 fish upstream of the weir to contribute to natural production. The Sooes River net fishery harvested 2,138 coho in the river below the hatchery.

Recoveries of Coded-Wire Tags: Thirty-seven percent of the coho returning to the hatchery were sampled for coded-wire tags. Four hundred seventy-nine tags were recovered, representing five different codes. Expansion of tags to account for subsampling of fish passed upstream yields an estimate of 1,193 tagged fish recovered. Ninety-nine of these tags, representing an estimated 266 tagged fish, originated from releases made at the Educket Creek facility. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Makah NFH coho.

Discussion/Recommendations: We abandoned our efforts to separate the timing of the coho run and the chinook run. We were unsuccessful in creating a separation in run timing during the relatively few years of the program, and the chinook run is building to a point where incidental or directed take of chinook during coho fisheries will not negatively impact the program.

Fall Chinook

Releases and Transfers: The hatchery released 845,264 fall chinook fingerlings. We are continuing to attempt a strategy of releasing chinook as late as possible (depending on water availability) to improve survival. This year all fish were released within a one week period, so no meaningful separation between tag groups was achieved. Since the hatchery did not meet its production goal, no chinook were available for transfer to the tribal facility at Educket Creek.

Tags Applied: A total of 278,636 fall chinook was coded-wire tagged in late April and May 1996. These fish are an indicator group for the Pacific Salmon Treaty chinook stock rebuilding program.

Terminal Area Returns, 1995: A total of 1,093 fall chinook returned to the hatchery rack. We biosampled 46% of the return to determine age composition. Age three fish were most common. We passed only two chinook above the hatchery to spawn in the Sooes River.

Recoveries of Coded-Wire Tags: All fall chinook kept at the hatchery were sampled for coded-wire tags. One hundred and thirteen tags were recovered, representing 15 different codes. Four tags were recovered from fish released from the Makah Tribe's Hoko River rearing facility. Expansion of tags to account for subsampling of fish passed upstream yields an estimate of 119 tagged fish recovered. Besides hatchery recoveries, Canadian, Alaskan, and Washington sport and commercial fisheries catch Makah NFH fall chinook.

Discussion/Recommendations: The chinook program continues to build at Makah. A recurring problem is the lack of water in the Sooes River when adult chinook return. The hatchery is unable to operate the fish ladder until fall flows increase and adults must hold in the river below the weir. No directed fishery has been held yet, but we project that surplus fish will be available in 1997.

Winter Steelhead

Releases and Transfers: The hatchery released a total of 186,580 steelhead yearlings and no subyearling fish into the Sooes River. Twenty-five thousand steelhead subyearlings were transferred to the Makah Tribe for rearing at their Educket Creek facility.

Marks Applied: No steelhead were marked. Previously marked year classes indicate that hatchery origin steelhead have a well-defined earlier return timing than wild origin steelhead.

Terminal Area Returns, 1995-96: A total of 824 adult steelhead returned to the hatchery rack from September 28 to January 17. After that time the ladder was closed and fish were allowed to pass upstream uncounted. Based on previous mark recoveries, we know that fish returning in the fall and winter are of hatchery origin and that fish returning in the early spring are of wild origin. We biosampled 44% of the hatchery steelhead to find age composition. Most of the fish were three-year-olds. Net fisheries in the Sooes and Waatch Rivers harvested a total of 2,000 steelhead.

Fall Chum

Releases and Transfers: The hatchery released 20,858 chum fry in 1996. This is the last release of fall chum from Makah. In the future all adults returning to the hatchery rack will be released upriver for natural spawning and production.

Terminal Area Returns, 1995: Twenty-two adult fall chum returned to the hatchery rack. We biosampled 50% of the hatchery return to determine age composition. Most of the fish were three years old.

Discussion/Recommendations: This program has been discontinued. The chum run in the Sooes River has historically been small as there is limited estuarine area for juvenile growth. The production program was founded with outside stocks, which have been unsuccessful at increasing the run size.

QUINALT NATIONAL FISH HATCHERY

Production levels for Quinault NFH are set through joint agreement between the Fish and Wildlife Service and the Quinault Tribe in a steering committee. At the annual meeting we finalized an experimental protocol for a coho production rearing density study. It was agreed to begin using Quinault Lake fall chinook broodstock to complement the eggs spawned from the Cook Creek rack return, in place of broodstocking in the Quinault River. This year the Service conducted weekly spawning surveys for fall chinook on the two miles of Cook Creek below the hatchery. Coded-wire tags from the surveys, numbers of live and dead fish observed, and redd counts were provided to Quinault Tribal fisheries for expansion and reporting. The Chinook Technical Committee of the Pacific Salmon Commission has requested the escapement information in order to use the Quinault River stock as an indicator group.

Coho

Releases and Transfers: Coho production at Quinault NFH included 241,374 yearlings released on-station.

Tags Applied: We applied coded-wire tags to 80,636 coho yearlings in November 1995 for the on-station release to Cook Creek.

Terminal Area Returns, 1995: Coho returns provided sufficient spawners to meet program needs for 1995. Escapement to the hatchery was 4,296 adults and jacks. Catch in terminal net fisheries was estimated at 2,419 adults.

Recoveries of Coded-Wire Tags: We sampled all coho returning to the hatchery for coded-wire tags. A total of 372 tags was recovered, representing 6 different codes. No tag recoveries were made from other coastal hatcheries. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Quinault NFH coho.

Discussion/Recommendations: Coho density levels are being held low in an attempt to produce smolts with a lower incidence of bacterial kidney disease. It is thought that kidney disease may be a factor limiting coho survival at Quinault NFH.

Fall Chinook

Releases and Transfers: The hatchery released 622,714 fall chinook fingerlings of both Cook Creek and Quinault Lake stocks.

Tags Applied: In late May and early June 1996 we coded-wire tagged 207,038 fall chinook for release into Cook Creek. This release is tagged as an indicator group for the Pacific Salmon Commission's chinook stock rebuilding program.

Terminal Area Returns, 1995: One hundred forty-seven fall chinook returned to the hatchery rack. We scale sampled 58% of the fish at the hatchery to determine age composition. Most of the fish were five years old.

Recoveries of Coded-Wire Tags: All fall chinook handled at the hatchery were sampled for coded-wire tags. We recovered 40 tags, representing 10 different codes. One tag recovery was from fish released at the Quinault Tribe's Quinault Lake net-pen facility. Besides hatchery recoveries, Canadian, Alaskan, and Washington sport and commercial fisheries catch Quinault NFH fall chinook.

Discussion/Recommendations: Full programmed production of 1995 brood chinook was achieved through the use of broodstock obtained at the tribal net-pen facility at Quinault Lake. This requires additional hatchery staff time for after-hours work, but has proven to be more effective than the previous method of broodstocking in the mainstem Quinault River.

Winter Steelhead

Releases and Transfers: The hatchery released 284,464 yearling steelhead at the hatchery and 49,574 at Allen's Bar on the Hoh River. A release of 22,705 sub-yearling steelhead was made into the Raft River. Transfers to tribal facilities included 54,000 fish to the Hoh Tribal facility at Chalaat Creek.

Tags and Marks Applied: Coded-wire tags were applied to 25,265 steelhead for the on-station release to Cook Creek. A total of 18,328 steelhead for transfer to the Chalaat Creek facility was coded-wire tagged and 35,961 fish were adipose-clipped only. A total of 20,131 steelhead for the release at Allen's Bar on the Hoh River was coded-wire tagged and an additional 29,820 fish for this release were adipose-clipped to identify them as hatchery fish.

Terminal Area Returns, 1995: A total of 3,021 adult steelhead returned to the hatchery rack. We biosampled 16% of the returning steelhead to determine age composition. Most of the fish were three-year-olds.

Recoveries of Coded-Wire Tags: All returning steelhead were sampled for coded-wire tags. Five hundred and forty-one tags were recovered, representing ten different codes. Twenty-seven of these tag recoveries were from the Quinault Tribal facility at Salmon River (Queets) or from Quinault NFH origin steelhead transferred to other facilities or released off-station, at Chalaat Creek, or Hoh River.

Discussion/Recommendations: The steelhead program continues to support a vigorous net fishery in the Quinault River and a sport fishery in both the Quinault River and Cook Creek.

Fall Chum

Releases and Transfers: The hatchery released a total 354,000 feeding chum fry in 1996.

Terminal Area Returns, 1995: A total of 482 adult fall chum returned to the hatchery rack. We biosampled 36% of the rack return to determine age composition. Age four fish were most common. Considerable spawning has recently been documented in Cook Creek below the hatchery rack.

Discussion/Recommendations: The large spawning population of chum in Cook Creek supports the notion that this stock is a successful wild/hatchery composite.

ACKNOWLEDGMENTS

Much of the data required for hatchery evaluation, programming, and coordination is collected solely by hatchery staff. That which is not is collected cooperatively with WWFRO staff. Many suggested program changes and evaluation ideas originate from hatchery personnel. Makah, Quinault, and Quilcene NFH staff have contributed significantly to the current success and future direction of the hatcheries through their innovative ideas and cooperative natures. Fishery catch data are the result of sampling programs conducted by the WDFW, Northwest Indian Fish Commission, Makah Tribal Fisheries, and the Quinault Department of Natural Resources.

LITERATURE CITED

USFWS. 1991. Fisheries Resource Evaluation Database Users Manual. Western Washington Fishery Resource Office. Olympia, Washington. 131pp.

Table 1. Fisheries Resource Evaluation Database (FRED) data collected from Olympic Peninsula hatcheries, August 1, 1995 to July 31, 1996.

	Quilcene NFH				Makah NFH				Quinalt NFH				
	Coho	Spring chinook	Summer chum	Fall chum	Coho	Fall chinook	Winter steelhead	Winter steelhead	Fall chinook	Winter steelhead	Fall chinook	Winter steelhead	Fall chum
Adult entry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fish removal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group spawning	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mark sampling	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mark recovery	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scale sample		✓		✓		✓		✓		✓		✓	✓
Marking	✓				✓	✓			✓	✓			
Fish/egg transfer	✓				✓	✓			✓	✓			
General release	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Specific release	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 2. Programmed production for broods released from Olympic Peninsula hatcheries, 8/1/95 - 7/31/96.

Hatchery	Species	Broodyear	Life stage	Number to release	Number to transfer
Quilcene NFH	Coho	1995	egg	0	450,000
	Coho	1994	smolt	410,000	360,000
	Summer chum	1995	fed-fry	400,000	0
	Fall chum	1995	fed-fry	2,200,000	0
Makah NFH	Coho	1994	smolt	250,000	50,000
	Fall chinook	1995	smolt	3,200,000	100,000
	Winter steelhead	1995	smolt	175,000	25,000
	Fall chum	1995	fed-fry	3,000,000	0
Quinault NFH	Coho	1994	smolt	660,000	0
	Fall chinook	1995	smolt	600,000	0
	Winter steelhead	1995	smolt	240,000	0
	Winter steelhead	1995	fingerling	0	50,000
	Fall chum	1995	fed-fry	1,500,000	0

Table 3. Release and tagging information for Olympic Peninsula hatcheries, August 1, 1995 to July 31, 1996.

Hatchery	Species	Brood	Stock	Release site	Release date(s)	Size at release (g)	Tagcode	Tags released	Ad-only released	Untagged released	Percent of		Month tagged	Size at tagging (g)	Tag retention rate (%)
											release tagged	release tagged			
Quilcene	Coho	94	"	"	11/08/95	4.8				54,000					
	"	94	"	"	05/14/96	21.5	054058	11,014	1,347	121,081	8.5	Jan 96	15.1	89.1	
	"	94	"	"	05/14/96	21.5	054059	11,350	551	116,575	8.5	Jan 96	15.1	95.4	
	"	94	"	"	05/14/96	21.5	054060	11,691	712	121,493	8.5	Jan 96	15.1	94.3	
	"	94	"	"	05/14/96	21.5	054061	10,462	1,411	116,301	8.5	Jan 96	15.1	88.1	
	"	95	"	"	01/18/96	0.4				107,000	0				
	"	95	"	"	03/08/96	0.6				49,972	0				
	"	95	"	"	03/26/96	1.0				24,923	0				
	Summer chum	"	95	"	03/27/96	1.1				441,167	0				
	Fall chum	"	95	Quilcene River	04/22-05/06/96	0.8				1,855,475	0				
Makah	Coho	94	"	"	04/08-09/96	29.5	054044	8,073	92	62,609	11.4	Dec 95	15.1	98.9	
	"	94	"	"	04/08-09/96	29.5	054045	8,087	20	62,164	11.4	Dec 95	15.1	99.8	
	"	94	"	"	04/08-09/96	29.5	054046	7,484	113	58,254	11.4	Dec 95	15.1	98.5	
	"	94	"	"	04/08-09/96	29.5	054047	7,622	108	59,274	11.4	Dec 95	15.1	98.6	
	"	95	"	"	01/23-02/23/96	0.4				125,314	0				
	"	95	"	"	04/02/96	1.5				12,985	0				
	Fall chinook	95	"	"	05/31/96	8.4	054048	46,405	25,362	147,294	26.5	Apr 96	4.3	64.7	
	"	95	"	"	05/28/96	8.4	054049	50,559	17,792	140,283	26.5	Apr 96	3.9	74.0	
	"	95	"	"	05/28/96	8.4	054050	60,301	7,263	138,667	26.5	May 96	4.5	89.2	
	"	95	"	"	06/04/96	8.4	054051	66,447	2,790	142,101	26.5	May 96	4.5	96.0	
Winter steelhead	95	"	"	04/07-04/19/96	65.9				186,580	0					
Fall chum	95	Sooes River	Sooes River	05/07/96	1.6				20,858	0					
Quinalt	Coho	94	"	"	04/09-23/96	26.7	053857	19,137	178	40,487	32.1	Nov 95	13.0	99.1	
	"	94	"	"	04/09-23/96	26.7	053858	19,566	79	41,178	32.1	Nov 95	13.0	99.6	
	"	94	"	"	04/09-23/96	26.7	053859	19,134	250	40,631	32.1	Nov 95	13.0	98.7	
	"	94	"	"	04/09-23/96	26.8	053860	19,538	78	41,118	32.1	Nov 95	13.0	99.6	
	Fall chinook	95	Quinalt Lake	"	07/22/96	0.3	053861	46,811	4,148	133,418	24.6	May 96	2.8	91.9	
	"	95	"	"	07/22/96	0.3	053952	40,767	6,754	124,416	24.6	May 96	2.8	85.8	
	"	95	Cook Creek	"	07/22/96	10.3	053953	49,274	4,755	84,717	94.1	Jun 96	4.5	91.2	
	"	95	"	"	07/22/96	10.3	053954	45,559	4,151	77,944	94.1	Jun 96	4.5	91.7	
	Winter steelhead	95	"	"	04/09-05/01/96	76.8	05010214	24,043	1,067	239,354	8.5	Nov 95		95.7	
	"	95	Hoh River	Hoh River	05/08-13/96	76.9	blank wire	19,460	30,114	0	39.3	Nov 95		97.4	
"	96	"	Raft River	07/30/96	4.5				22,705	0					
Fall chum	95	Cook Creek	Cook Creek	04/02/96	1.0				354,000	0					

Table 4. Transfer information for Olympic Peninsula hatcheries, August 1, 1995 to July 31, 1996.

Hatchery	Species	Brood	Stock	Transferred to	Date transferred	Number of fish	Size at transfer (g)
Makah	Coho	94	Sooes River	Educket Creek	03/20/96	51,030	16.2
"	Winter steelhead	95	Sooes River	Educket Creek	04/16/96	25,000	7.3
Quinault	Winter steelhead	95	Cook Creek	Chalaat Creek	03/07/96	54,000	11.5

Table 5. Rack return of salmon and steelhead to Olympic Peninsula hatcheries, August 1, 1995 to July 31, 1996.

Hatchery	Species	Number returned
Quilcene NFH	Coho	20,063
	Spring chinook	15
	Summer chum ¹	499
	Fall chum	4,574
	Pink	1
Makah NFH	Coho	8,023
	Fall chinook	1,093
	Winter steelhead	824
	Fall chum	22
	Pink	2
	Cutthroat	3
Quinault NFH	Coho	4,296
	Fall chinook	147
	Winter steelhead	3,021
	Fall chum	482

¹ From broodstocking efforts and rack return.

Table 6. Age composition of salmon and steelhead returning to Olympic Peninsula hatcheries, 1995-96, in percent.

Species	Hatchery	age	age	age	age	age	percent of run aged
		2	3	4	5	6	
Spring chinook	Quilcene	0	0	100	0	0	33
Fall chinook	Makah	10	49	14	25	2	45
	Quinault	1	24	21	53	1	58
Winter steelhead	Makah	0	94	6	0	0	44
	Quinault	1	79	20	0	0	16
Summer chum	Quilcene	0	96	4	0	0	82
Fall chum	Quilcene	0	8	79	13	0	9
	Makah	0	64	36	0	0	50
	Quinault	0	5	55	37	3	36

Table 7. Recoveries of coded-wire tags from Olympic Peninsula hatcheries, 8/1/95 - 7/31/96.

Hatchery	Species	Number of codes	Number of tags	Expansion factor
Quilcene NFH	Coho	10	1,467	1.02
	Spring chinook	7	9	1.00
	Summer Chum	2	36	1.06
Makah NFH	Coho	5	479	2.49
	Fall chinook	15	113	1.05
Quinault NFH	Coho	6	372	1.02
	Fall chinook	10	40	1.03
	Winter steelhead	10	541	1.01

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