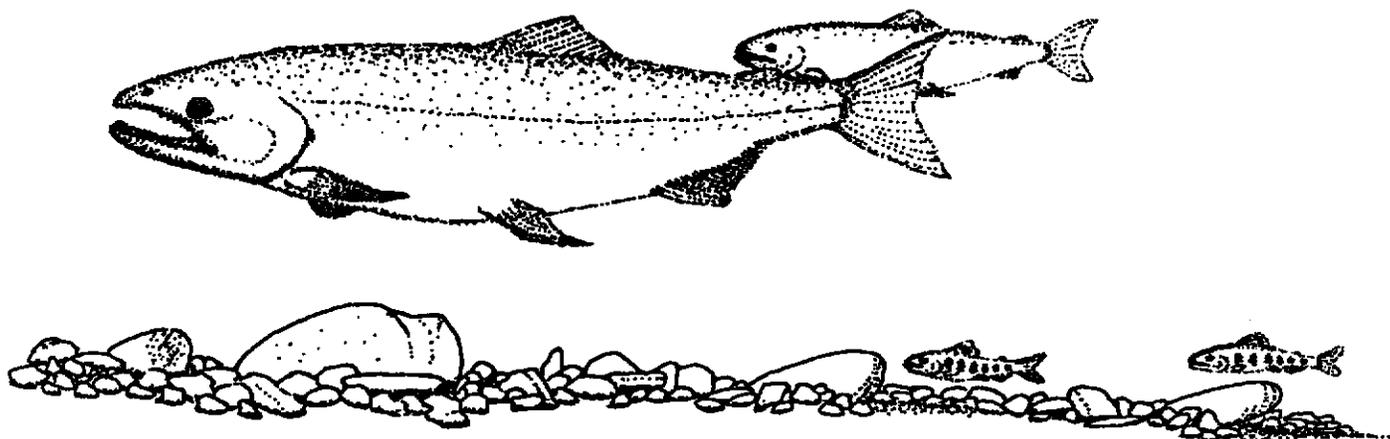




U.S. FISH AND WILDLIFE SERVICE

**ANNUAL PROGRESS REPORT OF
NATIONAL FISH HATCHERY
PROGRAMMING AND EVALUATION ACTIVITIES,
PUGET SOUND AND COASTAL WASHINGTON,
1994-1995**



WESTERN WASHINGTON FISHERY RESOURCE OFFICE

OLYMPIA, WASHINGTON

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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. 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.

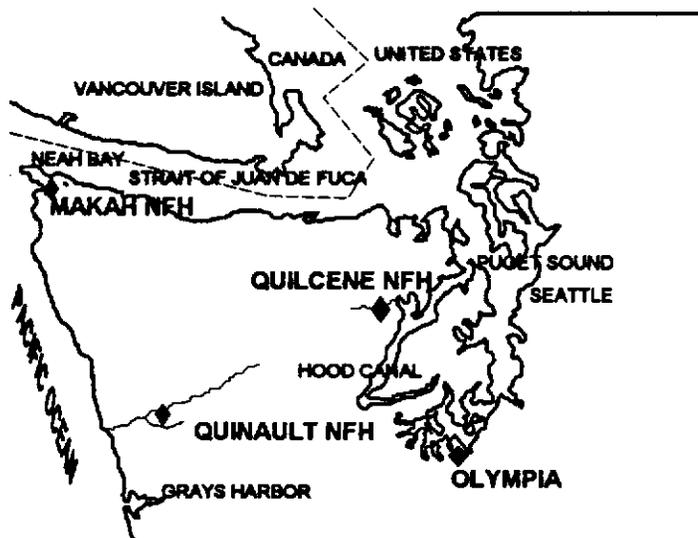
INTRODUCTION	1
QUILCENE NATIONAL FISH HATCHERY	2
Coho	2
Spring Chinook	3
Fall Chum	4
Summer Chum	4
MAKAH NATIONAL FISH HATCHERY	5
Coho	5
Fall Chinook	6
Fall Chum	6
Winter Steelhead	7
QUINAULT NATIONAL FISH HATCHERY	8
Fall Chinook	8
Coho	9
Fall Chum	9
Winter Steelhead	10
ACKNOWLEDGMENTS	10
LITERATURE CITED	11
Table 1. Fisheries Resource Evaluation Database (FRED) data collected from Olympic Peninsula hatcheries	12
Table 2. Programmed production for broods released from Olympic Peninsula hatcheries	13
Table 3. Release and tagging information for Olympic Peninsula hatcheries	14
Table 4. Transfer information for Olympic Peninsula hatcheries, August 1, 1994 to July 31, 1995. . .	15
Table 5. Rack return of salmon and steelhead to Olympic Peninsula hatcheries	15
Table 6. Age composition of salmon and steelhead returning to Olympic Peninsula hatcheries	16
Table 7. Summary of coded-wire tag recoveries from Olympic Peninsula hatcheries	16

INTRODUCTION

This report contains information regarding hatchery programming and evaluation activities at Quinalt, Makah, and Quilcene National Fish Hatcheries (NFH) conducted from August 1, 1994 to July 31, 1995. The information is compiled using the Fisheries Resource Evaluation Database (FRED) (USFWS, 1991), designed and maintained by the Western Washington Fisheries 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. A major accomplishment of the teams was the completion of a five-year hatchery operations plan for each hatchery.



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 Fish and Wildlife Service, Point No Point Treaty Council, and the Washington Department of Fish and Wildlife. Summer chum continue as a high priority program at the hatchery. Hood Canal summer chum are named as a stock of concern in a petition for listing under the Endangered Species Act. Fish production levels would have been reduced by contingencies in an application for an increased water right for the hatchery. Through negotiation with the Jefferson County Water Resource Council, we were able to increase water withdrawal when fish loads require it, and provide adequate natural fish spawning and rearing habitat in the stream reach affected by the water withdrawal.

Coho

Releases and Transfers: Coho production at Quilcene NFH included 425,333 Quilcene stock yearlings released to the Big Quilcene River. We transferred 218,000 Quilcene stock pre-smolt coho to the Point No Point Treaty Council for rearing at their Quilcene Bay net-pen facility.

Tags and Marks Applied: We coded-wire tagged 46,865 coho for the on-station release and 46,611 coho for the Quilcene Bay net-pens. The tagged fish for the Quilcene Bay net-pens and an additional 180,000 untagged coho received a left ventral fin clip to detect straying patterns within Hood Canal.

Terminal Area Returns, 1994: Adult returns provided sufficient spawners to meet program needs for 1994. Escapement to the hatchery was 14,331. Beach seine fisheries harvested 11,463 coho in the terminal fishery in Quilcene Bay.

Coded-Wire Tag Recoveries: All returning coho to the hatchery were sampled for coded-wire tags. 1,329 tags were recovered, representing nine different codes. One hundred and nine 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 the George Adams state fish hatchery. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Quilcene NFH coho.

Special studies:

We measured the fork length of returning fin-clipped coho to determine if differences exist in the stocks returning to the rack. Results show no significant difference ($p < 0.001$) between Quilcene stock released from the National Fish Hatchery (575mm FL, 44 mm SD) and Port Gamble Bay net-pens (581 mm FL, 64 mm SD). George Adams stock coho released from the Quilcene Bay net-pens (546 mm FL, 49 mm SD) were significantly shorter than the Quilcene stock releases.

We marked female coho held for spawning with unique opercle punches each week of entry to see if a correlation exists between entry time at the rack and spawn timing. Entry dates and days until spawning were significantly ($r^2 = 0.335$, $p < 0.001$) negatively correlated, i.e., early-returning fish had more days before spawning than late-returning fish. The majority of fish spawned within the same three-week period from November 1 to November 21 regardless of entry time. There was no strong indication that early-returning fish spawned earlier than late-returning fish. Entry to the hatchery does not define fresh water residence time since fish may hold in the three miles of river below the hatchery before entering the ladder.

Discussion/Recommendations: The coho program at Quilcene continues to support a major fishery in Quilcene Bay. Due to the early 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 caused a 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 is still a loss of fish that will affect the 1996 transfer to the Quilcene Bay net-pen program.

Spring Chinook

Releases and Transfers: The hatchery released no spring chinook into the Big Quilcene River. This program has been terminated due to poor survival rates.

Terminal Area Returns, 1994: A total of eight spring chinook returned to the hatchery rack. The run fell far short of the required escapement of 500 adults. We biosampled 75% of the return to find age composition. Age five fish were most common.

Coded-Wire Tag Recoveries: All spring chinook returning to the hatchery were sampled for coded-wire tags. We recovered seven tags representing five different codes. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries catch Quilcene spring chinook. No stray spring chinook returned to the Quilcene rack this year.

Discussion/Recommendations: This program is being phased out at Quilcene due to poor return rates. The returning adults are now discretely spawned according to stock of origin as determined from coded-wire tags. Eggs and milt are transferred to the Washington Department of Fish and Wildlife hatchery at Hoodport when necessary for their production needs.

Fall Chum

Releases and Transfers: The hatchery released 2,575,391 feeding chum fry into the Big Quilcene River.

Terminal Area Returns, 1994: A total of 12,285 adult fall chum returned to the hatchery rack. In addition, many fish remained in the river and spawned naturally. We biosampled 5% of the return to determine age composition. Most of the fish were four years old. Run reconstruction by WDFW shows that over 33,000 fall chum (23,000 natural origin, 10,000 hatchery origin) from the Quilcene River system were caught in 1994 net fisheries, primarily in northern Hood Canal.

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

Summer Chum

Releases and Transfers: The hatchery released a total of 343,550 feeding summer chum fry in 1995. No summer chum were marked or tagged.

Terminal Area Returns, 1994: Three hundred sixty-two adult summer chum were handled at the hatchery. These fish came from interagency broodstocking efforts conducted in the river and from the coho fishery conducted in Quilcene Bay. We biosampled 85% of the summer chum 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.

Discussion/Recommendations: The strong presence of three years old fish this year is a surprise considering the relatively low return of the parental 1991 brood. The conventional wisdom on summer

chum is that four year olds predominate. This may suggest good marine survival, with an expectation of increased four year olds in the 1995 return. A debris flow event in Penny Creek in January caused a plug in the water line supplying the hatchery building. As a result, about twenty-five thousand 1994 brood summer chum fry were lost.

MAKAH NATIONAL FISH HATCHERY

Guidance for fish production at Makah NFH is provided through a steering committee with representation from the Fish and Wildlife Service, the Makah tribe, and the Washington Department of Fish and Wildlife. The parties met once during the year and agreed to initiate a transfer of up to 100,000 chinook fry to the Educket Creek tribal facility. Also discussed were summertime fish health complications caused by using re-use water on yearling steelhead. The coho, steelhead, and chinook programs are successfully building.

Coho

Releases and Transfers: Coho production at Makah NFH included 281,853 yearlings and 107,644 subyearlings released into the Sooes River. We transferred 59,700 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 1994 we applied coded-wire tags to 30,139 yearling coho for the Sooes River release and 31,331 coho for the transfer to Educket Creek.

Terminal Area Returns, 1994: Coho returns provided sufficient spawners to meet program needs for 1994. Escapement to the hatchery was 5,031. Of these, we passed 2,595 fish upstream above the weir to contribute to natural production. The Sooes River net fishery harvested 1,832 coho in the river below the hatchery.

Coded-Wire Tag Recoveries: Forty-eight percent of the coho returning to the hatchery were sampled for coded-wire tags. Three hundred and forty tags were recovered, representing ten different codes. Expansion of tags to account for subsampling of fish passed upstream yields an estimate of 596 tagged fish recovered. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Makah NFH coho.

Discussion/Recommendations: We continue our efforts to separate the timing of the coho run and the chinook run. Early run coho are excessed and not spawned in the hatchery or passed upriver. This exception to our standard method of random spawning across the run is being done to allow for more effective fishery management, allowing harvest of coho when chinook numbers preclude fishing, and vice-versa. The early run coho are likely the progeny of Quilcene stock released in the 1970s.

Fall Chinook

Releases and Transfers: The hatchery released 3,204,540 fall chinook fingerlings. We are continuing a strategy of releasing chinook as late as possible (depending on water availability) to improve survival. This year four distinct releases were made, each with an associated coded-wire tag group. Most of the unmarked fish were released with the last two groups, between May 30 and June 9. Additionally, 101,083 were transferred to the tribal facility at Educket Creek for further rearing and release.

Tags Applied: A total of 275,638 fall chinook was coded-wire tagged in late April and May 1995. These fish are an indicator group for the Pacific Salmon Treaty chinook stock rebuilding program.

Terminal Area Returns, 1994: A total of 1,517 fall chinook returned to the hatchery rack. We biosampled 48% of the return to determine age composition. Age five fish were most common. We passed 358 chinook above the hatchery to spawn in the Sooes River.

Coded-Wire Tag Recoveries: All fall chinook kept at the hatchery were sampled for coded-wire tags. Seventy-nine tags were recovered, representing ten different codes. Two tags were recovered from fish released from the Makah tribe's Hoko rearing facility. Expansion of tags to account for subsampling of fish passed upstream yields an estimate of 115 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 1996.

Fall Chum

Releases and Transfers: The hatchery released no chum fry in 1995.

Terminal Area Returns, 1994: No adult fall chum returned to the hatchery rack.

Discussion/Recommendations: The chum program at Makah will continue to be small as there is limited estuarine area for juvenile growth. The program will rely only on returns to the rack and will probably never achieve the programmed release target.

Winter Steelhead

Releases and Transfers: The hatchery released a total of 175,291 steelhead yearlings and 72,500 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: As agreed to by the Makah NFH steering committee, no steelhead were marked. Previously marked year classes indicate that hatchery origin steelhead have an earlier return timing than wild origin steelhead.

Terminal Area Returns, 1994-95: A total of 646 adult steelhead returned to the hatchery rack from October 31 to February 22. After that time the ladder was closed and fish were allowed to pass upstream uncounted. Based on this and 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 63% of the hatchery steelhead to find age composition. Most of the fish were three-year-olds.

QUINAULT 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. We agreed to end steelhead transfers to the tribe's Salmon River facility, now that it is self-sufficient for steelhead production. The available space at Quinault NFH will be used to increase coho yearling production by 60,000 smolts and steelhead production by 30,000 smolts. 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 to complete survival information for the Quinault River stock as an indicator group.

Fall Chinook

Releases and Transfers: The hatchery released 458,400 fall chinook fingerlings.

Tags Applied: In early May 1995 we coded-wire tagged 209,118 fall chinook for release into Cook Creek. Tagging of this stock is done to provide an indicator group for the Pacific Salmon Commission chinook stock rebuilding program.

Terminal Area Returns, 1994: Two hundred ninety-six fall chinook were processed at spawning. These fish result from voluntary swim-ins to the hatchery rack and from broodstocking activities conducted by the Quinault tribe in the mainstem Quinault River. We scale sampled 61% of the fish at the hatchery to determine age composition. Most of the fish were five years old. Spawning escapement to the Quinault system was estimated to include 360 Quinault NFH origin adults. An estimated 819 chinook of Quinault NFH origin were caught in Quinault River fisheries.

Coded-Wire Tag Recoveries: All fall chinook handled at the hatchery were sampled for coded-wire tags. We recovered 24 tags, representing nine different codes. Two tag recoveries were 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: Insufficient broodstock were obtained to meet the programmed production of 600,000 chinook. This is a recurring problem, caused by inadequate attraction water in Cook Creek, and limited staff for in-river broodstocking.

Coho

Releases and Transfers: Coho production at Quinault NFH included 655,320 yearlings released on-station.

Tags Applied: We applied coded-wire tags to 77,827 coho yearlings in December 1994 for the on-station release to Cook Creek.

Terminal Area Returns, 1994: Coho returns provided insufficient spawners to meet program needs for 1994. Escapement to the hatchery was 446 adults and jacks. The Quinault River net fishery harvested an estimated 237 fish of Quinault NFH origin. Tribal fisheries staff estimate that 82 hatchery origin coho spawned naturally in the Quinault system.

Coded-Wire Tag Recoveries: We sampled all coho returning to the hatchery for coded-wire tags. Eighteen tags were recovered, representing eight different codes. Two tag recoveries were from other coastal hatcheries, Makah NFH and Soleduck State Fish Hatchery. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Quinault NFH coho.

Discussion/Recommendations: Coho density levels are being held low to try to produce smolts with a lower incidence of bacterial kidney disease. It is thought that kidney disease may be a factor in the low coho survival rates (~2.0% mean) seen at Quinault NFH. This year's return of coho showed extremely low survival of the 1991 brood. No abnormal hatchery conditions were linked to the poor survival.

Fall Chum

Releases and Transfers: The hatchery released a total 2,056,000 feeding chum fry in 1994.

Terminal Area Returns, 1994: A total of 2,098 adult fall chum returned to the hatchery rack. We biosampled 17% 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 should be considered a wild/hatchery composite.

Winter Steelhead

Releases and Transfers: The hatchery released 195,674 yearling steelhead at the hatchery and 53,117 at Allen's Bar on the Hoh River. A release of 61,958 sub-yearling steelhead was made into the Raft River. Transfers to tribal facilities included 52,468 fish to the Hoh Tribal facility at Chalaat Creek, and none during this reporting period to Salmon River. (163,800 from the 1994 brood were transferred to Salmon River in late July 1993)

Tags and Marks Applied: Coded-wire tags were applied to 29,835 steelhead for the on-station release to Cook Creek. A total of 19,531 steelhead for transfer to the Chalaat Creek facility was coded-wire tagged and 33,101 fish were adipose clipped only. A total of 21,076 steelhead for the release at Allen's Bar on the Hoh River was coded-wire tagged and an additional 32,583 fish for this release were adipose clipped to identify them as hatchery fish.

Terminal Area Returns, 1994: A total of 2,061 adult steelhead returned to the hatchery rack. We biosampled 17% of the returning steelhead to determine age composition. Most of the fish were three-year-olds. Quinault Tribal Fisheries staff estimate that more than four hundred Quinault NFH origin steelhead contributed to spawning in the Quinault system.

Coded-Wire Tag Recoveries: All returning steelhead were sampled for coded-wire tags. Two hundred thirty-five tags were recovered, representing nine different codes. Twenty-five of these tag recoveries were from Quinault NFH origin steelhead transferred to other facilities or released off-station, at Salmon River, 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. Over 1,000 steelhead were caught in terminal fisheries in the 1994-95 catch year.

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 hatchery staff have contributed significantly to the current success and future direction of the hatcheries through their innovative ideas and cooperative natures.

LITERATURE CITED

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

Table 1. Fisheries Resource Evaluation Database (FRED) data collected from Olympic Peninsula hatcheries, August 1, 1994 to July 31, 1995.

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

Table 2. Programmed production for broods released from Olympic Peninsula hatcheries, 8/1/94 - 7/31/95.

Hatchery	Species	Broodyear	Life stage	Number to release	Number to transfer
Quiloene NFH	Coho	1994	egg	0	450,000
	Coho	1993	smolt	410,000	360,000
	Fall chum	1994	fed-fry	2,200,000	0
	Summer chum	1994	fed-fry	400,000	0
Quinault NFH	Coho	1993	smolt	660,000	0
	Fall chinook	1994	smolt	600,000	0
	Fall chum	1994	fed-fry	1,500,000	0
	Winter steelhead	1994	smolt	240,000	0
	Winter steelhead	1994	fingerling	0	50,000
Makah NFH	Coho	1993	smolt	250,000	50,000
	Fall chinook	1994	smolt	3,200,000	100,000
	Fall chum	1994	fed-fry	3,000,000	0
	Winter steelhead	1994	smolt	175,000	25,000

Table 3. Release and tagging information for Olympic Peninsula hatcheries, August 1, 1994 to July 31, 1995.

Hatchery	Species	Brood	Stock	Release site	Release date(s)	Size at release (g)	Tagcode	Tags released	Ad-only released	Untagged released	Percent of release tagged	Month tagged	Size at tagging (g)	Tag retention rate (%)
Makah	Coho	93	Scoos River	Scoos River	04/10/95-04/12/95	30.3	053750	9,046	90	76,620	10.5	Dec 94	19.7	99
	"	93	"	"	04/10/95-04/12/95	30.3	053751	10,315	144	87,716	10.5	Jan 95	19.7	96.6
	"	93	"	"	04/10/95-04/12/95	30.3	053752	10,304	128	87,490	10.5	Jan 95	19.7	96.8
	"	94	"	"	03/06/95-03/19/95	0.6				107,644	0	-	-	0
	Fall Chinook	94	"	"	05/23/95	6.2	053753	69,316	383	124,948	8.5	Apr 95	3	99.4
	"	94	"	"	05/24/95-05/25/95	6.2	053754	66,257	139	781,938	8.5	May 95	3	99.8
	"	94	"	"	05/30/95-05/31/95	6.3	053755	68,614	693	782,571	8.5	May 95	2.7	99
	"	94	"	"	06/07/95-06/09/95	6.2	053756	66,838	668	1,242,175	8.5	May 95	2.7	99
	Winter Steelhead	94	"	"	04/18/95-04/20/95	65.5				175,291	0	-	-	0
	"	95	"	"	04/14/95-04/26/95	0.5				72,500	0	-	-	0
Quiltsne 4	Chum	94	Big Quiltsne River	Big Quiltsne River	05/04/95	0.8				2,575,391	0	-	-	0
	Coho	93	"	"	05/11/95	29.9	053747	13,065	2,595	127,918	9.4	Nov 94	15.1	83.4
	"	93	"	"	05/11/95	29.9	053748	12,652	2,699	125,394	9.4	Nov 94	15.1	82.4
	"	93	"	"	05/11/95	29.9	053749	14,377	1,003	125,631	9.4	Nov 94	15.1	93.5
	Summer Chum	94	"	"	03/27/95	1.1				343,550	0	-	-	0
	Chum	94	Cook Creek	Cook Creek	04/10/95	0.9				2,056,000	0	-	-	0
	Coho	93	"	"	04/20/95	26.2	053615	26,130	240	202,160	11.4	Dec 94	13	99.1
	"	93	"	"	04/20/95	26.2	053616	24,392	641	191,911	11.4	Dec 94	13	97.4
	"	93	"	"	04/20/95	26.3	053617	24,008	206	185,632	11.4	Dec 94	13	99.1
	Fall Chinook	94	"	"	07/17/95-07/30/95	11.0	053611	90,858	1,938	63,485	43.2	May 95	3.6	96.3
"	94	"	"	07/17/95-07/30/95	11.0	053612	52,050	825	63,580	43.2	May 95	3.6	98.4	
"	94	"	"	07/17/95-07/30/95	11.0	053613	46,840	5,181	62,553	43.2	May 95	2.5	90	
"	94	"	"	07/17/95-07/30/95	11.0	053614	48,174	2,265	60,651	43.2	May 95	2.5	95.5	
Winter Steelhead	94	"	"	04/27/95-05/10/95	86.1	212548	29,081	509	166,084	14.9	Dec 94	34.9	98.3	
"	94	"	Hoh River	Hoh River	05/09/95-05/11/95	82.5	212530	20,482	32,635	0	38.6	Dec 94	34.9	98.2
"	95	"	Red River	Red River	07/20/95	5.2				61,938	0	-	-	-

Table 4. Transfer information for Olympic Peninsula hatcheries, August 1, 1994 to July 31, 1995.

Hatchery	Species	Brood Stock	Transferred to	Date transferred	Size at transfer (g)	Number of fish	
Quilcene NFH	Coho	93	Quilcene Bay Net Pens	02/21/95	19.2	218,000	
Makah NFH	Fall chinook	94	Makah	Educket Creek	02/28/95	0.9	101,083
"	Winter steelhead	94	Makah	"	04/20/95	59.7	25,000
"	Coho	93	Makah	"	03/17/95	26.4	59,700
Quinault NFH	Winter steelhead	94	Quinault	Chalaat Creek	02/17/95	44.5	52,468

Table 5. Rack return of salmon and steelhead to Olympic Peninsula hatcheries.

Hatchery	Species	Number returned
Makah NFH	Fall chum	0
	Coho	5,031
	Fall chinook	1,517
	Winter steelhead	646
Quilcene NFH	Fall chum	12,285
	Coho	14,331
	Spring chinook	8
	Summer chum ¹	362
Quinault NFH	Fall chum	2,098
	Coho	446
	Fall chinook ¹	296
	Winter steelhead	2,061

¹ - from broodstocking efforts and rack return.

Table 6. Age composition of salmon and steelhead returning to Olympic Peninsula hatcheries, 1994-95, in percent.

Species	Hatchery	age 2	age 3	age 4	age 5	age 6	percent of run aged
Chum	Quilcene NFH	0	9	91	0	0	5
	Quinault NFH	0	2	77	21	0	17
Summer Chum	Quilcene NFH	1	92	6	1	0	85
	Quilcene Bay	6	94	0	0	0	100
Fall Chinook	Makah NFH	5	2	24	69	0	48
	Quinault NFH	5	4	34	55	2	61
Spring Chinook	Quilcene NFH	0	0	33	67	0	75
Winter Steelhead	Makah NFH	3	71	25	0	0	63
	Quinault NFH	0	75	23	1	0	17

Table 7. Summary of coded-wire tag recoveries from Olympic Peninsula hatcheries, 8/1/94 - 7/31/95.

Hatchery	Species	Number of codes	Number of tags	Expansion factor
Quilcene NFH	Spring chinook	5	6	1.17
	Coho	9	1,329	1.05
Quinault NFH	Fall chinook	8	24	1.08
	Coho	8	18	1.06
	Winter steelhead	9	235	1.04
Makah NFH	Fall chinook	10	79	1.46
	Coho	10	340	1.75
			2,031	