

NATIONAL FISH HATCHERY
PROGRAMMING AND EVALUATION ACTIVITIES
FOR PUGET SOUND AND COASTAL WASHINGTON
ANNUAL PROGRESS REPORT 2000-2001

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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, Branch of Fisheries Assistance, and the Fish Health Center.

| | |
|--|----|
| INTRODUCTION | 1 |
| QUILCENE NATIONAL FISH HATCHERY | 2 |
| Coho | 2 |
| Chinook | 3 |
| Summer Chum | 4 |
| Fall Chum | 5 |
| MAKAH NATIONAL FISH HATCHERY | 6 |
| Coho | 6 |
| Fall Chinook | 7 |
| Winter Steelhead | 8 |
| Fall Chum | 8 |
| QUINAULT NATIONAL FISH HATCHERY | 9 |
| Coho | 9 |
| Fall Chinook | 10 |
| Winter Steelhead | 10 |
| Fall Chum | 11 |
| ACKNOWLEDGMENTS | 12 |
| LITERATURE CITED | 12 |
| Table 1. Fisheries Resource Evaluation Database (FRED) data collected from Olympic Peninsula National Fish Hatcheries | 13 |
| Table 2. Programmed production for broods released from Olympic Peninsula National Fish Hatcheries | 14 |
| Table 3. Release and tagging information for Olympic Peninsula National Fish Hatcheries | 15 |
| Table 4. Adipose clip status for coho smolts released from Olympic Peninsula National Fish Hatcheries | 17 |
| Table 5. Transfer information for Olympic Peninsula National Fish Hatcheries | 17 |

Table 6. Rack return of salmon and steelhead to Olympic Peninsula National Fish Hatcheries . . 18

Table 7. Age composition of salmon and steelhead returning to Olympic Peninsula National Fish
Hatcheries 18

Table 8. Recoveries of coded-wire tags from Olympic Peninsula National Fish Hatcheries 19

INTRODUCTION

This report contains information regarding hatchery programming and evaluation activities at Quilcene, Makah, and Quinault National Fish Hatcheries (NFH) conducted from August 1, 2000 to July 31, 2001. The information is compiled using the Fisheries Resource Evaluation Database (FRED) (USFWS, 1991), designed and maintained by the this office's Branch of Fisheries Assistance (BFA). 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 8. Specific details about the data or the database are available from the Branch of Fisheries Assistance.

Fish production levels for all three hatcheries are determined in cooperation with representatives of the U.S. Fish and Wildlife Service (Service), 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 Service 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 BFA staff.

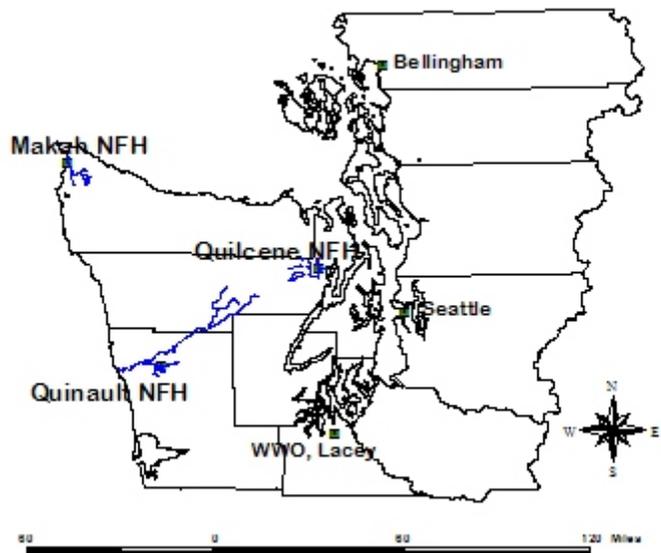


Figure 1. Western Washington locale map.

QUILCENE NATIONAL FISH HATCHERY

The Quilcene NFH production program operates under the guidance of the Hood Canal Salmon Management Plan. Fish production levels are determined cooperatively with representatives from the Service, Point No Point Treaty Council, and WDFW. Coho smolt production for the on-station release was mass marked with an adipose fin clip to identify them as hatchery fish for harvest in selective sport fisheries. Paired tag groups, both clipped and unclipped, were also released to model survival of unclipped wild stocks and to determine mortality effects on those fish caught in selective fisheries but released based on their adipose clip status. Summer chum production continues as a high priority program at the hatchery. Hood Canal summer chum were listed by National Marine Fisheries Service in March 1999 as threatened under the Endangered Species Act.

Coho

Releases and Transfers: Coho production at Quilcene NFH included 428,995 Quilcene stock yearlings. No fingerlings were released upstream in lieu of adult passage this year. In February 2001, we transferred 211,165 Quilcene coho pre-smolts from the 1999 brood to the Skokomish tribe for rearing at their Quilcene Bay net pen facility. We also transferred 450,200 eyed eggs 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 44,988 adipose-clipped coho and 45,905 unclipped coho for the Quilcene Bay net pen program. We coded-wire tagged 54,219 adipose-clipped coho and 48,757 unclipped coho for the on-station release. Another 366,866 adipose-clipped but untagged coho were marked for the Quilcene on-station release.

Terminal Area Returns, 2000: Adult returns provided sufficient spawners to meet program needs for 2000. Escapement to the hatchery was 15,594. Net fisheries harvested 7,682 coho in the terminal fishery in Quilcene Bay.

Recoveries of Coded-Wire Tags: Thirty-one percent (4,767) of the coho returning to the hatchery were sampled for coded-wire tags. One thousand four hundred and forty tags were recovered, representing 17 different codes. Expanding the tag recoveries to account for the sampling rate yields an estimated total of 4,902 tag recoveries. Two thousand four hundred and twenty-five (49%) of these tag recoveries were from coho that originated from releases from the net pen program in Quilcene Bay. 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 sport and commercial fisheries in Canadian and US waters and a 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 coho fishery to emphasize beach seine methods, which allow fishers to return summer chum to the water alive.

Chinook

Releases and Transfers: The hatchery released no spring chinook during this period. This program was terminated in 1994 due to poor survival rates.

Terminal Area Returns, 2000: No chinook adults returned to the hatchery rack.

Summer Chum

Releases and Transfers: The hatchery released a total of 414,353 feeding summer chum fry in 2001. We transferred 55,500 eyed summer chum eggs to WDFW for rearing and reintroduction into Big Beef Creek.

Marks Applied: We marked 417,300 summer chum with an adipose fin clip in February 2001. Returning fish with adipose clips will document the success of the hatchery program and will allow for separation of hatchery-origin and natural-origin adults.

Terminal Area Returns, 2000: Five hundred ninety-four adult summer chum were handled at the hatchery. These fish came from returns to the hatchery rack and from broodstocking conducted during the coho fishery held in Quilcene Bay. In addition, an estimated 4,914 fish remained in the river and spawned naturally. We scale sampled 64% of the summer chum at the hatchery to determine age composition. Four-year-old fish predominated in the run processed at the hatchery.

Recoveries of Adipose Marks: We examined a total of 444 unique summer chum at the hatchery, in the river, and on the bay to determine the number of returning marked fish from the 1997 brood. Thirty-one marks were observed. Information from our scale reading showed that 11.75% of the total return was 3-year-old fish, thus 52 of the fish we examined for marks were in the 3-year-old age class ($444 * 0.1175$). At release, the 1997 brood was marked at a rate of 91.9% ($313,212/340,744$), so accounting for unmarked hatchery fish in the return generates an overall hatchery-origin return of 34 fish ($31/0.919$) in the sample. Thus, hatchery-origin fish comprised 65.4% of the 3-year-olds returning ($34/52$). Applying the 3-year-old incidence (0.1175) to the entire run of 5,508 fish yields a return of 647 adults from the 1997 brood. With 65.4% of the 3-year-olds being hatchery origin, we conclude that 423 adults returned as 3-year-olds from the 1997 brood hatchery release of 340,744 fry.

Discussion/Recommendations: Total returns of large numbers of adults to the Big Quilcene River indicate positive results from hatchery supplementation and significant progress toward restoration of the run.

Fall Chum

Releases and Transfers: The hatchery released 47,432 feeding chum fry into the Big Quilcene River.

Terminal Area Returns, 2000: A total of 138 adult fall chum returned to the hatchery rack. In addition, an estimated 576 fish remained in the river and spawned naturally. We biosampled 44% of the hatchery return to determine age composition. Most of the fish were 3 years old. Run reconstruction by WDFW shows that 141 fall chum (18 natural origin, 123 hatchery origin) from the Quilcene River system were caught in 2000 net fisheries in Washington waters.

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 Service, the Makah Tribe, and WDFW. Coho smolt production was mass marked with an adipose fin clip to identify them as hatchery fish for harvest in selective sport fisheries. Paired tag groups, both clipped and unclipped, were released to determine mortality effects on those fish caught in selective fisheries but released based on their adipose clip status.

Coho

Releases and Transfers: Coho production at Makah NFH included 182,495 yearlings released into the Sooes River. We transferred 34,986 subyearling coho to the Makah Tribe for further rearing, imprinting, and release at their Educket Creek facility on the Waatch River system.

Tags and Marks Applied: In November 2000 we applied coded-wire tags to 41,611 adipose-clipped coho and 42,579 unclipped coho for the Sooes River release. Another 120,320 adipose-clipped but untagged coho were also marked for the Sooes River release. We also adipose-clipped 37,000 untagged coho for transfer to Educket Creek. No fish destined for Educket Creek received coded-wire tags.

Terminal Area Returns, 2000: Coho returns provided sufficient spawners to meet program needs for 2000. Escapement to the hatchery was 4,905. Of these, we passed 2,913 fish upstream of the weir to contribute to natural production. The Sooes River net fishery harvested 132 coho in the river below the hatchery.

Recoveries of Coded-Wire Tags: Twenty-one percent (1,012) of the coho returning to the hatchery were sampled for coded-wire tags. Two hundred seventy-seven tags were recovered, representing 16 different codes. Expansion of tags to account for subsampling of fish passed upstream yields an estimate of 1,386 tagged fish recovered. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Makah NFH coho.

Discussion/Recommendations: We abandoned our previous 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 1,979,850 fall chinook between mid-May and early June. A total of 49,500 fed fry was released into the upper Sooes River. We are continuing to attempt a strategy of releasing chinook as late as possible, depending on water availability, to improve survival. No fish were available for transfer to the tribal facility at Educket Creek.

Tags Applied: A total of 269,402 fall chinook were coded-wire tagged in April 2001. These fish are an indicator group for the Pacific Salmon Treaty chinook stock rebuilding program.

Terminal Area Returns, 2000: A total of 1,395 fall chinook returned to the hatchery rack. We biosampled 46% of the return to determine age composition. Age 4 fish were most common. We passed 251 chinook above the hatchery to spawn and enhance nutrients in the Sooes River. Only two of these chinook were females. One chinook was reported captured in coho fisheries in the lower Sooes River.

Recoveries of Coded-Wire Tags: Seventy-seven percent (1,071) of the fall chinook returning to the hatchery were sampled for coded-wire tags. Fifty-nine tags were recovered, representing 14 different codes. Expansion of tags to account for subsampling of fish passed upstream yields an estimate of 75 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 at the hatchery 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.

Winter Steelhead

Releases and Transfers: The hatchery released a total of 135,517 steelhead yearlings into the Sooes River. Nineteen thousand nine hundred eighty steelhead yearlings were released at the Educket Creek facility on the Waatch River.

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, 2000-01: A total of 623 adult steelhead returned to the hatchery rack from October 2 to February 21. 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 60% of the hatchery steelhead to find age composition. Most of the fish were 3 years old. A total of 1,480 steelhead was caught in net fisheries in the Sooes and Waatch Rivers.

Fall Chum

Releases and Transfers: The hatchery released no chum fry in 2000.

Terminal Area Returns, 2000: No adult fall chum are recorded as having returned to the hatchery rack.

Discussion/Recommendations: The hatchery production program for chum was discontinued in 1996. 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.

QUINAULT NATIONAL FISH HATCHERY

Production levels for Quinault NFH are set through joint agreement between the Service and the Quinault Tribe in a steering committee. We forwarded three items to policy representatives for resolution: language changes to the cooperative agreement, options for managing risk to the Quinault NFH fall chinook broodstock program, and plan for a coho rearing density study. This year the Service conducted weekly spawning surveys for fall chinook on the one mile 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 on-station releases of 595,314 yearlings. The hatchery also released 64,059 spring pre-smolts off-station to Camp 7 pond near the mainstem Quinault River.

Tags and Marks Applied: We applied coded-wire tags to 83,714 adipose-clipped coho yearlings and 84,262 unclipped coho in January 2001 for the on-station release to Cook Creek. Another 20,486 adipose-clipped yearlings were coded-wire tagged to evaluate the release into natural rearing habitat at Camp 7 near the mainstem Quinault River. The pairing of clipped and unclipped tagged fish will be used to model the survival of unclipped wild fish and to assess harvest mortality in selective ocean fisheries that use the adipose clip as an identifier for harvestable fish. The number of fish tagged was doubled to increase replication of the marine survival modeling groups and to gain acquiescence from the Quinault tribe to permit mass-marking of untagged coho. Totals of 51,519 untagged coho for the on-station release and 43,757 for the Camp 7 release were adipose-clipped before fish health problems prevented further handling.

Terminal Area Returns, 2000: Coho returns provided sufficient spawners to meet program needs for 2000. Escapement to the hatchery was 9,963 adults and jacks.

Recoveries of Coded-Wire Tags: We sampled 32% (3,217) of the coho returning to the hatchery for coded-wire tags. Eight hundred thirty tags were recovered, representing 20 different codes. Expansion of tags to account for subsampling of fish yields an estimate of 2,814 tagged fish recovered. Besides hatchery recoveries, Canadian and Washington sport and commercial fisheries also catch Quinault NFH coho.

Discussion/Recommendations: Coho density levels have been reduced since the 1991 brood in an attempt to produce smolts with a lower incidence of bacterial kidney disease. It is thought that kidney disease may be a factor in the lower coho survival rates (~2.0% mean) seen at Quinault NFH.

Fall Chinook

Releases and Transfers: The hatchery released 204,363 fall chinook fingerlings of mixed Cook Creek stock and Quinault Lake stock into Cook Creek.

Tags Applied: In June 2001 we coded-wire tagged 204,961 fall chinook for release into Cook Creek.

Terminal Area Returns, 2000: Forty-three fall chinook returned to the hatchery rack. We scale sampled 40% of the fish at the hatchery to determine age composition. Most of the fish were 4 years old.

Recoveries of Coded-Wire Tags: All fall chinook handled at the hatchery were sampled for coded-wire tags. We recovered eight tags, representing five different codes. Besides hatchery recoveries, Canadian, Alaskan, and Washington sport and commercial fisheries catch Quinault NFH fall chinook.

Discussion/Recommendations: Insufficient broodstock were obtained from the run into the hatchery to meet the programmed production of 600,000 chinook. Additional eggs were obtained from broodstock captured with tended gillnets fished at the tribe's Quinault Lake net pen facility.

Winter Steelhead

Releases and Transfers: The hatchery released 214,846 yearling steelhead at the hatchery and 49,939 at Allen's Bar on the Hoh River. Transfers to tribal facilities included 51,803 fish to the Hoh Tribal facility at Chalaat Creek.

Tags and Marks Applied: Coded-wire tags were applied to 25,974 steelhead for the on-station release to Cook Creek. A total of 15,204 steelhead for transfer to the Chalaat Creek facility were coded-wire tagged and 36,661 fish were adipose-clipped only. A total of 15,761 steelhead for the release at Allen's Bar on the Hoh River were coded-wire tagged and an additional 36,215 fish for this release were adipose-clipped to identify them as hatchery fish. Tagging and clipping was conducted in January 2001.

Terminal Area Returns, 2000-01: A total of 2,612 adult steelhead returned to the hatchery rack. We biosampled 9% of the returning steelhead to determine age composition. Most of the fish were 4 years old. An estimated 2,585 steelhead were caught in terminal fisheries in the 2000-01 catch year.

Recoveries of Coded-Wire Tags: All returning steelhead were sampled for coded-wire tags. One hundred eighty-six tags were recovered, representing seven different codes. Fifteen of these tag recoveries were from Quinault NFH origin steelhead transferred to other facilities or released off-station at Chalaat Creek and Hoh River.

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

Fall Chum

Releases and Transfers: The hatchery released a total 176,761 feeding chum fry in 2001.

Terminal Area Returns, 2000: A total of 221 adult fall chum returned to the hatchery rack. We biosampled 44% of the rack return to determine age composition. Age three fish were most common. Considerable spawning has 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.

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 BFA 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, 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 National Fish Hatcheries, August 1, 2000 to July 31, 2001.

| | Quilcene NFH | | | | Makah NFH | | | | Quinault NFH | | | |
|-------------------|--------------|---------|----------------|--------------|-----------|-----------------|---------------------|--------------|--------------|-----------------|---------------------|--------------|
| | Coho | Chinook | Summer chum | Fall chum | Coho | Fall chinook | Winter steelhead | Fall chum | Coho | 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 National Fish Hatcheries, August 1, 2000 to July 31, 2001.

| Hatchery | Species | Broodyear | Life stage | Number to release | Number to transfer |
|--------------|------------------|-----------|------------|-------------------|--------------------|
| Quilcene NFH | Coho | 2000 | egg | 0 | 450,000 |
| | Coho | 1999 | smolt | 450,000 | 300,000 |
| | Summer chum | 2000 | fed-fry | 400,000 | 200,000 |
| | Fall chum | 2000 | fed-fry | 2,200,000 | 0 |
| Makah NFH | Coho | 1999 | smolt | 250,000 | 50,000 |
| | Fall chinook | 2000 | smolt | 3,200,000 | 100,000 |
| | Winter steelhead | 2000 | smolt | 175,000 | 25,000 |
| Quinalt NFH | Coho | 1999 | smolt | 660,000 | 0 |
| | Fall chinook | 2000 | smolt | 600,000 | 0 |
| | Winter steelhead | 2000 | smolt | 240,000 | 0 |
| | Winter steelhead | 2000 | fingerling | 0 | 50,000 |
| | Fall chum | 2000 | fed-fry | 1,500,000 | 0 |

Table 3. Release and tagging information for Olympic Peninsula National Fish Hatcheries, August 1, 2000 to July 31, 2001.

| Hatchery | Species | Brood | Stock | Release site | Release date(s) | Size at release (g) | Tagcode | Tags released | Tag rejects released | Untagged released | Percent of release tagged | Month tagged | Size at tagging (g) | Tag retention rate (%) |
|----------|--------------|-------|----------------|----------------|-------------------|---------------------|---------|---------------|----------------------|-------------------|---------------------------|--------------|---------------------|------------------------|
| Quilcene | Coho | 99 | Quilcene River | Quilcene River | 05/01/01 | 23.2 | 050378 | 12,468 | 126 | 91,333 | 20.6 | Oct 00 | 15.1 | 99.0 |
| | " | " | " | " | " | " | 050379 | 9,387 | | | " | " | " | 100.0 |
| | " | " | " | " | " | " | 050380 | 10,611 | 28 | 77,155 | " | " | " | 99.7 |
| | " | " | " | " | " | " | 050381 | 12,971 | | | " | " | " | 100.0 |
| | " | " | " | " | " | " | 050382 | 11,113 | 431 | 83,718 | " | " | " | 96.3 |
| | " | " | " | " | " | " | 050383 | 9,020 | | | " | " | " | 100.0 |
| | " | " | " | " | " | " | 050384 | 12,077 | 23 | 87,751 | " | " | " | 99.8 |
| | " | " | " | " | " | " | 050385 | 10,551 | 232 | | " | " | " | 97.8 |
| | Summer chum | 00 | " | " | 03/05/01-03/19/01 | 1.0 | | | | 414,353 | | | | |
| | Fall chum | " | " | " | 05/08/01 | 0.7 | | | | 47,432 | | | | |
| Makah | Coho | 99 | Sooes River | Sooes River | 04/23/01-04/25/01 | 29.1 | 050386 | 8,682 | 1,285 | 24,876 | 42.3 | Nov 00 | 15.1 | 87.1 |
| | " | " | " | " | " | " | 050387 | 8,790 | 852 | | " | " | " | 91.2 |
| | " | " | " | " | " | " | 050388 | 8,510 | 732 | 23,066 | " | " | " | 92.1 |
| | " | " | " | " | " | " | 050389 | 9,099 | 774 | | " | " | " | 92.2 |
| | " | " | " | " | " | " | 050390 | 10,012 | 168 | 25,407 | " | " | " | 98.4 |
| | " | " | " | " | " | " | 050391 | 10,670 | 167 | | " | " | " | 98.4 |
| | " | " | " | " | " | " | 050392 | 10,762 | 245 | 27,472 | " | " | " | 97.8 |
| | " | " | " | " | " | " | 050393 | 10,668 | 258 | | " | " | " | 97.6 |
| | Fall Chinook | 00 | " | " | 05/19/01-06/04/01 | 7.1 | 050493 | 57,304 | 10,113 | 431,764 | 12.4 | Apr 01 | 3.0 | 85.0 |
| | " | " | " | " | " | " | 050494 | 62,136 | 4,548 | 427,070 | " | " | 2.4 | 93.2 |
| | " | " | " | " | " | " | 050495 | 62,751 | 3,442 | 423,925 | " | " | 2.3 | 94.8 |

| Hatchery | Species | Brood | Stock | Release site | Release date(s) | Size at release (g) | Tagcode | Tags released | Tag rejects released | Untagged released | Percent of release tagged | Month tagged | Size at tagging (g) | Tag retention rate (%) |
|----------|------------------|-------|------------|---------------|-------------------|---------------------|---------|---------------|----------------------|-------------------|---------------------------|--------------|---------------------|------------------------|
| | " | " | " | " | " | " | 050496 | 63,519 | 3,576 | 429,702 | " | " | 2.3 | 94.7 |
| | " | " | " | Shafter Creek | 04/24/01 | 0.9 | | | | 49,500 | | | | |
| | Winter steelhead | 00 | " | Sooes River | 4/17/01-04/18/01 | 73.5 | | | | 135,517 | | | | |
| Quinalt | Coho | 99 | Cook Creek | Cook Creek | 04/10/01-04/20/01 | 27.7 | 050369 | 20,344 | 553 | 12,861 | 25.9 | Jan 01 | 13.0 | 97.3 |
| | " | " | " | " | " | " | 050370 | 20,613 | 1,145 | 99,595 | " | " | " | 94.7 |
| | " | " | " | " | " | " | 050371 | 17,965 | 2,384 | 12,524 | " | " | " | 88.3 |
| | " | " | " | " | " | " | 050372 | 17,849 | 2,533 | 93,297 | " | " | " | 87.6 |
| | " | " | " | " | " | " | 050373 | 18,832 | 1,682 | 12,625 | " | " | " | 91.8 |
| | " | " | " | " | " | " | 050374 | 18,352 | 1,485 | 90,802 | " | " | " | 92.5 |
| | " | " | " | " | " | " | 050375 | 20,010 | 576 | 12,669 | " | " | " | 97.2 |
| | " | " | " | " | " | " | 050376 | 20,199 | 710 | 95,709 | " | " | " | 96.6 |
| | " | " | " | Quinalt River | 02/15/01 | 17.9 | 050377 | 19,370 | 1,052 | 43,637 | 30.2 | " | " | 94.9 |
| | Fall chinook | 00 | " | Cook Creek | 07/13/01 | 7.9 | 050475 | 52,819 | 2,923 | | 96.3 | Jun 01 | 3.0 | 94.8 |
| | " | " | " | " | " | " | 050476 | 49,296 | 967 | | " | " | " | 98.1 |
| | " | " | " | " | " | " | 050477 | 55,615 | 2,028 | | " | " | " | 96.5 |
| | " | " | " | " | " | " | 050478 | 39,173 | 1,542 | | " | " | " | 96.2 |
| | Winter steelhead | " | " | " | 05/08/01 | 98.3 | 210178 | 24,872 | 929 | 189,045 | 11.6 | Jan 01 | 30.2 | 96.4 |
| | " | " | " | Hoh River | 05/07/01-05/08/01 | 74.5 | blank | 14,558 | 585 | 34,796 | 29.2 | " | " | 97.4 |
| | Fall chum | | | | 04/04/01 | 0.9 | | | | 176,761 | | | | |

Table 4. Adipose clip status for coho smolts released from Olympic Peninsula National Fish Hatcheries, August 1, 2000 to July 31, 2001.

| Hatchery | Brood | Unclipped | | | Adipose clipped | | | percent of release with adipose clip |
|----------|-------|-----------|--------|----------|-----------------|--------|----------|--------------------------------------|
| | | Untagged | Tagged | Tagcodes | Untagged | Tagged | Tagcodes | |
| Quilcene | 99 | 232 | 41,929 | 050379 | 340,565 | 46,269 | 050378 | 90.2% |
| | | | | 050381 | | | 050380 | |
| | | | | 050383 | | | 050382 | |
| | | | | 050385 | | | 050384 | |
| | | | | | | | | |
| Quinalt | 99 | 385,276 | 77,013 | 050370 | 55,874 | 77,151 | 050369 | 22.3% |
| | | | | 050372 | | | 050371 | |
| | | | | 050374 | | | 050373 | |
| | | | | 050376 | | | 050375 | |
| | | | | | | | | |
| Makah | 99 | 2,051 | 39,227 | 050387 | 103,251 | 37,966 | 050386 | 77.4% |
| | | | | 050389 | | | 050388 | |
| | | | | 050391 | | | 050391 | |
| | | | | 050393 | | | 050393 | |
| | | | | | | | | |

Table 5. Transfer information for Olympic Peninsula National Fish Hatcheries, August 1, 2000 to July 31, 2001.

| Hatchery | Species | Brood | Stock | Transferred to | Date transferred | Size at transfer (g) | Number of fish |
|----------|------------------|-------|----------|-----------------------|------------------|----------------------|----------------|
| Quilcene | Coho | 99 | Quilcene | Quilcene Bay Net Pens | 02/14/2001 | 19.9 | 211,165 |
| Quilcene | " | 00 | " | USGS, Seattle | 06/07/2001 | 2.7 | 500 |
| Quilcene | Fall chum | 00 | " | USGS, Seattle | 05/08/2001 | 0.9 | 500 |
| Makah | Coho | 99 | Makah | Educket Creek | 02/28/2001 | 19.1 | 34,986 |
| Makah | Winter steelhead | 00 | " | " | 04/13/2001 | 61.3 | 19,980 |
| Quinalt | " | 00 | Quinalt | Chalaat Creek | 02/12/2001 | 40.8 | 51,803 |

Table 6. Rack return of salmon and steelhead to Olympic Peninsula National Fish Hatcheries, August 1, 2000 to July 31, 2001.

| Hatchery | Species | Number returned |
|--------------|--------------------------|-----------------|
| Makah NFH | Coho | 4,905 |
| | Fall chinook | 1,395 |
| | Winter steelhead | 623 |
| Quilcene NFH | Fall chum | 138 |
| | Coho | 15,594 |
| | Summer chum ¹ | 594 |
| Quinault NFH | Fall chum | 221 |
| | Coho | 9,963 |
| | Fall chinook | 43 |
| | Winter steelhead | 2,612 |

¹ From broodstocking efforts and rack return.

Table 7. Age composition of salmon and steelhead returning to Olympic Peninsula National Fish Hatcheries, 2000-01, in percent.

| Species | Hatchery | age2 | age3 | age4 | age5 | age6 | percent of run aged |
|------------------|----------|------|------|------|------|------|------------------------|
| Fall chum | Quilcene | 0 | 47 | 42 | 12 | 0 | 31 |
| | Quinault | 0 | 53 | 42 | 5 | 0 | 44 |
| Summer chum | Quilcene | 0 | 11 | 89 | 0 | 0 | 64 |
| Fall chinook | Makah | 10 | 34 | 44 | 11 | 1 | 46 |
| | Quinault | 0 | 6 | 65 | 29 | 0 | 40 |
| Winter steelhead | Makah | 5 | 48 | 46 | 0 | 0 | 60 |
| | Quinault | 1 | 47 | 52 | 0 | 0 | 9 |

Table 8. Recoveries of coded-wire tags from Olympic Peninsula National Fish Hatcheries, August 1, 2000 to July 31, 2001.

| Hatchery | Species | Number of codes | Number of tags | Expansion factor |
|--------------|------------------|-----------------|----------------|------------------|
| Quilcene NFH | Coho | 17 | 1,440 | 3.40 |
| Quinalt NFH | Fall chinook | 5 | 8 | 1.13 |
| | Coho | 20 | 830 | 3.39 |
| | Winter steelhead | 7 | 186 | 1.09 |
| Makah NFH | Fall chinook | 14 | 59 | 1.27 |
| | Coho | 16 | 277 | 5.00 |
| | | | 2,800 | |