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UMATILLA HATCHERY SATELLITE FACILITIES
OPERATION AND MAINTENANCE

MAY 1996

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UMATILLA HATCHERY SATELLITE FACILITIES OPERATION AND MAINTENANCE

ANNUAL REPORT 1995

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Project Number 83-435
Contract Number DE-BI79-84BP17622

May 1996

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ABSTRACT

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Oregon Department of Fish and Wildlife (ODFW) are cooperating in a joint effort to enhance steelhead and re-establish salmon runs in the Umatilla River Basin. As an integral part of this program, Bonifer Pond, Minthorn Springs, Imeques C-mem-ini-kem and Thornhollow facilities are operated for acclimation and release of juvenile summer steelhead (*Oncorhynchus mykiss*), fall and spring chinook salmon (*O. tshawytscha*) and coho salmon (*O. kisutch*). Minthorn is also used for holding and spawning adult summer steelhead, fall chinook and coho salmon.

Acclimation of juvenile salmon and steelhead in 1995 occurred only in the spring. Summer steelhead were acclimated at both Bonifer (96,480) and Minthorn (49,983). At Thornhollow, 227,088 yearling and 561,423 subyearling fall chinook were acclimated. At Imeques C-mem-ini-kem, 673,331 yearling spring chinook and 1,904,875 subyearling fall chinook were acclimated. No coho were acclimated in 1995.

A total of 86 unmarked and 68 marked summer steelhead were collected for broodstock at Three Mile Dam from October 13, 1994 through April 20, 1995. Utilizing a 3 x 3 spawning matrix whenever possible, an estimated 223,525 green eggs were taken from 41 females. The eggs were transferred to Umatilla Hatchery for incubation and rearing.

A total of 860 coho salmon were collected for broodstock at Three Mile Dam from September 28 through November 17, 1995. Using a 1:1 spawning ratio, an estimated 945,828 green eggs were taken from 337 females. The eggs were transferred to Irrigon Hatchery for eyeing and then were transferred to Cascade Hatchery for final incubation and rearing. Fall chinook salmon broodstock were not collected in 1995.

Personnel from the ODFW Eastern Oregon Fish Pathology Laboratory in La Grande took samples of tissues and reproductive fluids from Umatilla River summer steelhead and coho salmon broodstock for monitoring and evaluation purposes. Infectious hematopoietic necrosis virus was detected in 31 of 81 summer steelhead spawned and 40 of 65 tested positive for bacterial kidney disease (*Renibacterium salmoninarum*). Tests for replicating viral agents on 56 spawned female coho salmon were negative.

Regularly scheduled maintenance of pumps, equipment and facilities was performed in 1995. Routine facility maintenance work consisted mostly of weed abatement and maintenance of the electric fence at Bonifer. The Minthorn summer steelhead brood holding and spawning area was modified to improve holding and spawning conditions.

Coded-wire tag recovery information was accessed to determine the contribution of Umatilla River releases to ocean, Columbia River and Umatilla River fisheries. Total estimated adult survival rates for summer steelhead releases made from 1988 to 1992 have ranged from 0.005 to 0.97%. Survival rates to the Umatilla River have ranged from 0.00 to

0.72%. Total estimated adult coho survival rates for releases made from 1987 to 1994 have ranged from 0.16 to 4.49%. Survival rates to the Umatilla River have ranged from 0.02 to 0.99%. Total estimated survival rates (through age-6, preliminary data) for spring chinook yearlings released in the spring from 1988 through 1991 have ranged from 0.18 to 0.95%. Survival rates to the Umatilla River have ranged from 0.16 to 0.77%. The total estimated adult survival rates for spring chinook released in the fall of 1988 through 1990 have ranged from 0.005 to 0.10%, while escapement to the Umatilla River has ranged from 0.003 to 0.08%. Total estimated survival rates (through age-7, preliminary data) for fall chinook yearling releases made from 1983 through 1988 have ranged from 0.08 to 3.23%. Umatilla River survival rates have ranged from 0.00 to 0.90%. Total estimated survival rates for fall chinook subyearling spring releases made from 1982 to 1989 have ranged from 0.07 to 0.87%. Umatilla River survival rates have ranged from 0.00 to 0.02%. The total estimated adult survival rates for fall chinook subyearlings released in the fall of 1985 and 1988 have ranged from 0.43 to 0.67%. Escapement to the Umatilla River has ranged from 0.006 to 0.07%.

The progress of outmigration for juvenile releases was monitored at the Westland Canal fish trapping facility by CTUIR and ODFW personnel. The majority of the juveniles migrated downstream by early June.

ACKNOWLEDGEMENTS

This project was funded by Bonneville Power Administration (BPA). The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) thank Jerry Bauer, Jay Marcotte and other BPA personnel for their assistance. Thanks are extended to Ray Hill, Jack Hurst, Warren Groberg, Sam Onjukka, Karen Waln and other Oregon Department of Fish and Wildlife (ODFW) personnel for providing assistance in the spawning of summer steelhead and coho salmon and for monitoring the fish for the presence of pathogens. Bill Duke (ODFW) assisted with collection and transport of steelhead and coho salmon broodstock and collection of data at Three Mile Dam and Westland Canal. Dennis Issac and Bill Murray (ODFW) retrieved and decoded coded-wire tags from adult fish snouts. Charlie Corrarino and Pat Frazier (ODFW), Ken Johnson (Regional Mark Processing Center, Pacific States Marine Fisheries Commission) and Susan Markey (Washington Department of Fish and Wildlife), provided coded-wire tag recovery information. Bob Becker (ODFW) supervised and coordinated fish transfers to the acclimation facilities. Thanks go to Mike Hayes, Shannon Focher, Candi Healy and John Meriwether (ODFW) for sharing their juvenile pre-release data. We thank landowners Rosemary and Wes Gladow and Richard Kaye for their cooperation and Union Pacific Railroad for providing access to the facilities.

Thanks go to the CTUIR staff for their cooperation and contributions to this report. Brian Zimmerman, Brian Conner, Larry Cowapoo, Vern Spencer and Jim Marsh collected data from adults returning to Three Mile Dam and migration data for juvenile salmonids captured at the Westland Canal fish trapping facility and assisted in the collection and transport of steelhead and coho salmon broodstock. Paul Kissner and Melvin Farrow collected data and snouts from spawning ground surveys. Other biologists and technicians assisted in field sampling. Joe Richards provided the administration of the agreement and Julie Burke and Celeste Reves provided office management and secretarial services. Gary James provided technical oversight and critical review of this report and Craig Contor and Brian Zimmerman also provided critical review.

Thanks go to Mike McCloud, Louis Case and other technicians for the long hours and weekends spent operating the facilities and for collecting data.

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INTRODUCTION

Background

The Umatilla River Basin historically supported large runs of anadromous salmonids, including summer steelhead (*Oncorhynchus mykiss*), fall and spring chinook salmon (*O. tshawytscha*) and coho salmon (*O. kisutch*). The runs of chinook and coho salmon were essentially eliminated in the early 1900's. The losses have generally been attributed to the development of hydroelectric dams and to forestry, agriculture and irrigation practices. The single indigenous naturally spawning anadromous stock left in the Umatilla River Basin is a run of approximately 1,000 to 3,000 summer steelhead.

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Oregon Department of Fish and Wildlife (ODFW) began efforts to enhance steelhead and re-establish salmon runs in the Umatilla River Basin in the early 1980's. As an integral part of these efforts, Bonifer Pond (Bonifer), Minthorn Springs (Minthorn), Imeques C-mem-ini-kem and Thornhollow facilities were constructed on the Umatilla Indian Reservation. The facilities were constructed and are operated under the Fish and Wildlife Program of the Northwest Power Planning Council, and are funded by Bonneville Power Administration (BPA).

The facilities are operated by CTUIR in cooperation with ODFW. Bonifer, Minthorn, Imeques C-mem-ini-kem and Thornhollow facilities are operated for acclimation and release of juvenile salmon and summer steelhead and Minthorn is also used for holding and spawning summer steelhead, fall chinook and coho salmon. The main goal of acclimation is to reduce stress from trucking prior to release and improve imprinting of juvenile salmonids in the Umatilla River Basin. Juveniles are transported to the acclimation facilities primarily from Umatilla and Bonneville Hatcheries.

This report details activities associated with operation, maintenance and evaluation of the Bonifer, Minthorn, Imeques C-mem-ini-kem and Thornhollow acclimation facilities in 1995.

Facility Descriptions and Operations

The Bonifer facility is located adjacent to Meacham Creek at rivermile (RM) 2 (Figure 1). The pond spills into Boston Canyon Creek which flows approximately 20 yards before entering Meacham Creek. Meacham Creek flows into the Umatilla River at RM 79. The facility consists of a 1.75-acre earthen pond and concrete outlet water control structure which also functions as a fish trap. The pond holds approximately 4.5 acre-feet of water and is fed by three nearby springs. Flows range from approximately 750 to 1,850 gallons per minute (gpm). Operations began in 1984.

Figure 1. Confederated Tribes of the Umatilla Indian Reservation and Bonifer, Minthorn, Thornhollow and Imeques C-mem-ini-kem Acclimation Facilities.

The Minthorn facility is located approximately four miles east of Mission, Oregon (Figure 1). The facility is located on Minthorn Springs Creek which is formed from the inflow of several springheads located immediately south of the Umatilla River. The creek is approximately one mile long, with the facility located near the mouth at Umatilla RM 63.8. The facility includes two concrete raceways (120 x 12 x 4 feet), pump station, and concrete outlet water control structure which also functions as a fish trap and summer steelhead broodstock holding area. Water through the brood holding area is supplied by gravity and ranges from approximately 500 to 2,100 gpm. Water supply to the raceways is pumped from the creek. Water depth is usually held at three feet with a single-pass water pumping rate of 800 gpm through each raceway. Two valves control the effluent water to allow for either recycling of flows into the intake pond or discharge downstream of the intake and adult holding area. Minthorn was completed in 1985 and first operated in 1986.

The Imeqes C-mem-ini-kem facility is located on the upper Umatilla River at RM 79.5 (Figure 1). The facility includes a concrete water intake structure with automatic screen cleaner, concrete water headbox/distribution system, four concrete acclimation ponds (approximately 13,000 cubic feet each) and concrete water outlet and fish release structure. Water is supplied by gravity flow (approximately 1,600 gpm per pond). Imeqes C-mem-ini-kem was completed and began operations in 1994.

The Thornhollow facility is located on the upper Umatilla River at RM 73.5 (Figure 1). The facility includes a concrete water intake structure with automatic screen cleaner, pump station, concrete water headbox/distribution system, two concrete acclimation ponds (approximately 13,000 cubic feet each) and concrete water outlet and fish release structure. Water is supplied by gravity flow to the pump station where it is pumped into the headbox. Water flow is approximately 1,600 gpm per pond. Thornhollow was completed and began operations in 1995.

Project Objectives

The following project objectives for 1995 are part of overall objectives to operate, maintain and evaluate the acclimation facilities:

Objective 1: Hold groups of juvenile salmonids at Bonifer, Minthorn, Imeqes C-mem-ini-kem and Thornhollow acclimation facilities prior to release into the Umatilla River Basin.

Task 1.1: Hold juvenile salmon and summer steelhead in facilities prior to release into the Umatilla River Basin.

Task 1.2: Monitor temperature and dissolved oxygen daily during acclimation.

Objective 2: Provide summer steelhead, fall chinook and coho salmon eggs to ODFW for rearing and later release into the Umatilla River Basin.

Task 2.1: Collect, transport, hold and spawn summer steelhead, fall chinook and coho salmon.

Objective 3: Maintain the facilities in good working order.

Task 3.1: Repair, maintain and service electrical and mechanical equipment, ponds, pumps, water supply systems, screens, fencing, fishways, buildings and grounds.

Objective 4: Determine the benefits of acclimating salmon and summer steelhead at Bonifer and Minthorn and return rates for fish acclimated at Imeqes C-mem-ini-kem and Thornhollow.

Subobjective 4.1: Determine contribution of adults to ocean and Columbia River fisheries and survival to the Umatilla River for all acclimated and control groups.

Task 4.1.1: Collect snouts and physical data from coded-wire tagged fish and deliver snouts to ODFW for retrieval and decoding.

Task 4.1.2: Determine contribution of adults to ocean and in-river fisheries by collecting and organizing data from appropriate sources and by calculating expansion factors based on marked to unmarked ratios.

Task 4.1.3: Determine adult survivals to the Umatilla River for all acclimated and control groups.

Subobjective 4.2: Monitor outmigration characteristics of fish captured at lower Umatilla River fish traps.

Task 4.2.1: Cooperate in operation of Westland and/or Three Mile Dam juvenile salmonid traps during outmigration periods to collect species composition, numbers of fish trapped and marks.

Task 4.2.2: Compare information collected at the traps with pre-release data to give an indication of outmigration timing.

Objective 5: Disseminate information associated with the completion of above tasks.

Task 5.1: Write and submit an Annual Report to BPA summarizing operation, maintenance and evaluation of the juvenile acclimation and adult holding and spawning facilities.

Objective 6: Participate in planning process for new Umatilla Hatchery satellite facilities.

Task 6.1: Review and comment on engineering designs and follow up with engineers as necessary during planning and construction of Umatilla Hatchery satellite facilities located in the Umatilla and Walla Walla River Basins.

METHODS

Objective 1: Juvenile Acclimation

Task 1.1: Juvenile Holding

Juvenile summer steelhead and spring and fall chinook salmon were transported by ODFW from Umatilla and Bonneville Hatcheries to the acclimation facilities using 3,000 and 5,000 gallon fish transport trucks. Proposed acclimation periods were two weeks for fall chinook subyearlings and four weeks for spring and fall chinook yearlings and summer steelhead. The fish were fed Biomoist Feed (Bioproducts Inc., Warrenton, Oregon) twice each day. Fish were to be fed at a rate of approximately 1% body weight per day (BWD). Mortalities were removed daily and ODFW pathology personnel were available to address specific disease problems.

The total number of fish at release was estimated using ODFW Fish Liberation Reports and acclimation mortality records. The number of fish reported as tagged was estimated using ODFW Coded-Wire Tagging Operation Summaries, hatchery and acclimation mortality records and tag retention sampling prior to release.

ODFW and CTUIR personnel sampled the fish prior to release for weight, fork length and descaling. Partial descaling was defined as loss of greater than 3.0% and less than 16.0% of the scales on at least one side of the fish. Severe descaling was defined as loss of greater than 16.0% of the scales on at least one side.

Task 1.2: Water Quality Monitoring

Temperature and dissolved oxygen (DO) measurements were taken at the facilities during acclimation. Temperatures were recorded hourly by automatic digital temperature recorders (Ryan TempMentors). Dissolved oxygen measurements were taken daily with a YSI portable DO meter.

Objective 2: Summer Steelhead, Fall Chinook and Coho Salmon Spawning

Task 2.1: Adult Collection, Holding and Spawning

Collection, Holding and Spawning of Summer Steelhead

Summer steelhead were collected for broodstock through the cooperative efforts of CTUIR and ODFW. Fish were trapped at Three Mile Dam, located approximately four miles upstream from the mouth of the Umatilla River and were transported to Bonifer and Minthorn by CTUIR and ODFW Trap and Haul personnel using 370 or 3,000 gallon fish transport units.

To help maintain the genetic integrity of the hatchery population, the first priority for broodstock was to collect unmarked fish at a male to female ratio of 1:1 and at a rate of 10% of the total unmarked run by month. Due to an expected low run of unmarked fish, coded-wire tagged hatchery fish (adipose and left ventral clipped) were also collected to ensure meeting the broodstock goal of 106 adults. The collection rate for coded-wire tagged fish was one coded-wire tagged fish for every unmarked fish collected and at a male to female ratio of 1:1.

Beginning the first week in April, broodstock were sorted weekly to determine maturation. Ripe fish were spawned by CTUIR and Umatilla Hatchery personnel using standard hatchery practices. A 3 x 3 spawning matrix was utilized whenever possible and matings were random except no hatchery x hatchery crosses were made. Eggs from each family group were water hardened in iodophor (Argentyne, Argent Chemical Laboratories) at 75 ppm for one hour and transferred to Umatilla Hatchery for incubation and rearing.

After the spawning season was completed, all remaining fish were sacrificed. Fork and MEHP lengths were taken on prespawn mortalities, spawned fish and excess fish sacrificed. MEHP length was defined as the distance from the middle of the eye to the end of the hypural plate. Weights¹ and fin marks were recorded and snouts were collected from all coded-wire tagged fish. Scale samples were also collected from both hatchery and unmarked fish.

Disease Sampling of Summer Steelhead Broodstock

All spawned adult steelhead were sampled for the presence of selected pathogens by ODFW Northeast Oregon Fish Pathology Laboratory (NOFPL) in La Grande for monitoring and evaluation purposes as part of the Umatilla Hatchery Fish Health Monitoring Program. All spawned fish were sampled for replicating viral agents. Reproductive fluid (ovarian fluid from females or milt from males), pyloric caeca, kidney and spleen were sampled for infectious hematopoietic necrosis virus (IHNV) and infectious pancreatic necrosis virus (IPNV). Kidney samples were also examined for bacterial kidney disease (BKD).

Prespawn mortalities were also sampled. Kidney samples were taken to test for BKD and other typical bacterial pathogens and samples of the lower intestine were examined for *Ceratomyxa shasta*.

Collection, Holding and Spawning of Coho Salmon

Coho salmon broodstock were also collected at Three Mile Dam and transported to Minthorn by Trap and Haul personnel using 370 or 3,000 gallon fish transport units. The

¹ Weights on spawned fish were taken after spawning.

fish were held in the lower raceway which was covered with nylon netting to prevent fish from jumping out.

Fish were sorted and spawned a minimum of once per week by CTUIR and ODFW personnel. A spawning ratio of 1:1 was utilized, but after fertilization, the eggs from four females were pooled to form one family group. The eggs were water hardened in iodophor at 75 ppm and transferred to Irrigon Hatchery for eyeing. The eggs were then transferred to Cascade Hatchery for final incubation and rearing.

After the spawning season was completed, remaining coded-wire tagged fish were sacrificed for coded-wire tag recovery and unmarked fish were released into the Umatilla River. Fork and MEHP lengths were taken on prespawn mortalities, spawned fish and excess fish sacrificed. Fin marks were recorded and snouts were collected from all coded-wire tagged fish. Scale samples were also collected from a portion of both marked and unmarked fish.

Disease Sampling of Coho Salmon Broodstock

Female coho salmon were sampled for IHNV and IPNV. Samples for BKD were not taken.

Collection, Holding and Spawning of Fall Chinook Salmon

Fall chinook salmon broodstock were not collected. Washington Department of Fish and Wildlife and ODFW hatcheries supplied all 1995 broodstock eggs for the Umatilla River program.

Objective 3: Facility Maintenance

Task 3.1: Facility Maintenance and Repair

Maintenance, repair and service of electrical and mechanical equipment, ponds, pumps, water supply systems, screens, fencing, fishways, buildings and grounds was performed. Other maintenance was conducted as necessary. Thompson-McDougal construction company modified the Minthorn summer steelhead brood holding and spawning area to improve holding and spawning conditions.

Objective 4: Acclimation Evaluation

Subobjective 4.1: Adult Survival and Contributions

Task 4.1.1: Snout and Data Collection

Snouts and associated biological data from coded-wire tagged salmonids were collected at Three Mile Dam and Minthorn. Snouts were also collected from Umatilla River creel and spawning ground surveys conducted through other CTUIR and ODFW programs. Snouts were sent to ODFW for tag removal and decoding.

Task 4.1.2 and 4.1.3: Coded-Wire Tag Data Analysis

Acclimation Research

A research program was initiated in 1987 to determine the effects of acclimation on juvenile salmon and summer steelhead releases in the Umatilla River Basin. Control (non-acclimated) groups were released instream concurrent with test (acclimated) groups to compare survival differences. The last experiment was conducted in 1992 and the last adults from these releases returned to the Umatilla River in 1995.

Adult Survival and Umatilla River Returns

Data was accessed to compile adult survival and return information for all groups of coded-wire tagged fish released in the Umatilla River Basin. Coded-wire tagged recoveries from 1983 through 1995 were retrieved from the Pacific States Marine Fisheries Commission (Ken Johnson, Regional Mark Processing Center). Additional Oregon and Washington freshwater recoveries from 1995 were obtained from ODFW (Charlie Corrarino) and the Washington Department of Fish and Wildlife (Susan Markey). Some data are incomplete and should be considered as such. When the expanded coded-wire tagged recovery number was not available, the observed number was used.

Expanded estimates of all recoveries in the ocean, Columbia River and Umatilla River are calculated using observed coded-wire tag recoveries, sampling rates and total number of fish released. All age groups are used in the expansion estimates². In instances where untagged fish were not treated the same as tagged fish (e.g. untagged fish were reared at a different hatchery or were released at a different age than the tagged fish), these fish were not used in calculating expansions. Detailed information on recoveries is presented in Appendices A, B, C and D.

² Subjacks were not included in estimates of fall chinook straying but are included in survival and contribution estimates.

Exploitation rates were calculated for all representative release groups. Total exploitation rate is defined as all harvest and is divided into ocean commercial, Columbia River gillnet, ocean and freshwater sport, and ceremonial and subsistence treaty catches. Individual exploitation rates are calculated as a percent of the total exploitation rate.

Adult Returns to Minthorn

An adult V-trap was placed in the outlet water control structure at Minthorn in late January, 1995, and was in operation through June, 1995. The trap was monitored daily and all adult returns were removed and marks and sex were recorded.

Adult Returns to Bonifer

An adult V-trap was placed in the outlet water control structure at Bonifer in mid-March, 1995, and was in operation through June, 1995. The trap was monitored daily and all adult returns were removed and marks and sex were recorded.

Subobjective 4.2: Juvenile Outmigration Monitoring

Task 4.2.1 and 4.2.2: Outmigration Data Collection and Analysis

Juvenile salmonids were collected at the Westland Canal juvenile facility (RM 27) during trapping operations. The trap was monitored daily and fish were hauled as necessary by CTUIR and ODFW Trap and Haul personnel (Zimmerman et. al. 1995). The trap is located approximately 36.8, 46.5, 52.5 and 54.0 rivermiles downstream from Minthorn, Thornhollow, Imeques C-mem-ini-kem and Bonifer, respectively.

Juveniles were sampled a minimum of once per week during the entire juvenile trapping period. Species and fin marks were recorded on all fish and lengths were recorded on a portion of them. Weight samples were taken using standard hatchery practices to estimate the average size of the fish. The weight samples were used to estimate the total number of fish hauled on sampling days by multiplying the number of fish per pound by the number of pounds loaded.

Objective 5: Information Dissemination

Task 5.1: Annual Report

Data and information associated with the above tasks were compiled and this annual report, summarizing operation, maintenance and evaluation of the juvenile acclimation and adult holding and spawning facilities, was written and submitted to BPA for dissemination.

Objective 6: Umatilla Satellite Facilities Planning

Task 6.1: Umatilla Satellite Facilities Review

Meetings with CTUIR, BPA, ODFW and engineering and architectural firms were held to discuss designs for new Umatilla Hatchery satellite facilities scheduled for completion in the Umatilla and Walla Walla River Basins.

RESULTS AND DISCUSSION

Objective 1: Juvenile Acclimation

Task 1.1 and 1.2: Juvenile Holding and Water Quality Monitoring

Acclimation and Release of Juvenile Salmonids

Fall chinook salmon have been released in the Umatilla River Basin every year since 1982 and from acclimation facilities from 1983 to 1991 and in 1995 (Table 1). The 1982 release was from Spring Creek tule stock (Table 2). Since then, all releases have been of upriver bright stock. Spring chinook salmon from Carson stock have been released since 1986 (Table 3) and from acclimation facilities from 1986 to 1992 and in 1994 and 1995 (Table 1). Summer steelhead of Skamania and Oxbow stocks were released from 1967 through 1970 (Table 4). In 1975, one release of Umatilla stock steelhead occurred and fish releases every year since 1981 have been from this stock. Summer steelhead have been released from acclimation facilities since 1984 (Table 5). Coho salmon have been released since 1987, and a portion have been acclimated when facilities and fish were available (Tables 5 and 6).

Three groups of acclimated summer steelhead (146,463 fish), four groups of acclimated spring chinook (673,331 fish) and three groups of acclimated fall chinook (2,693,386 fish) were among the 5,027,446 salmon and steelhead released into the Umatilla River Basin in 1995 (Table 7). No releases of non-acclimated spring and fall chinook salmon and summer steelhead occurred in 1995. No coho salmon were acclimated in 1995.

Acclimation at Minthorn

Summer Steelhead

One group of 49,983 summer steelhead was acclimated at Minthorn for 29 days and released on April 13, 1995, at 4.7/lb. (Table 7). Included were 18,812 coded-wire tagged fish (Appendix E) and 31,171 adipose clipped only fish. They were fed 0.72% BWD and total mortality was 0.46% (Table 8). The mean temperature and DO during acclimation was 8.5 degrees C and 7.6 mg/l, respectively (Table 8).

The average length taken at release was 210mm (Table 9). The length frequency distribution is shown in Figure 2. An estimated 20.6% were partially descaled at release while none were severely descaled (Table 9).

Table 1. Juvenile fall and spring chinook salmon releases in the Umatilla River Basin (1982-1995). [1]

Species	Fall Chinook					Spring Chinook			
	Lower Umatilla	Upper Umatilla	Bonlier	Minthorn	Thornhillow	Ineques C-mem-ial-ken	Lower Umatilla	Upper Umatilla	Ineques C-mem-ial-ken
Year									
1982	3,807,171 (sy)[2]	0	0	0			0	0	0
1983	0	80,564 (y)	20,000 (y)	0			0	0	0
1984	966,250 (sy)[3]	175,104 (y)	63,308 (y)	0			0	0	0
1985	3,223,172 (sy)[3]	60,507 (y)	137,655 (y)	0			0	0	0
1986	2,029,602 (sy)[3]	0	115,779 (y)	91,036 (y)			0	300,438 (sy)	99,970 (y)
1987	1,476,830 (sy)[5]	0	102,363 (y)	111,143 (sy)[4]			0	169,100 (sy)	99,897 (y)
1988	3,316,007 (sy)[5&7]	79,681 (sy)[8]	99,550 (y)	115,199 (y)			156,312 (y)[7]	210,496 (y)	107,427 (y)
1989	2,393,710 (sy)	295,575 (y)	0	78,625 (sy)[8]			0	164,786 (y)	160,734 (y)
1990	0	255,614 (y)	0	71,864 (sy)[8]			99,775 (y)	195,425 (y)	194,783 (y)
1991	10,462 [11](sy)	3,132,127 (sy)[10]	0	79,672 (sy)			5,937 [11](y)	265,428 (y)	181,649 (y)
1992	7,837 [11](sy)	3,166,079 (sy)	0	0			5,272 [11](y)	1,874,465 (y)	109,101 (y)
1993	28,681 [14](sy)	3,182,712 (sy)	0	0			10,952 [14](y)	480,864 (y)	0
1994	22,174 [14](sy)	2,628,917 (sy)						1,128,176 (y)	1,217,602 (y)
1995		134,837 (y)			227,088 (y)	1,904,875 (sy)	8,890 [14](y)	610,245 (y)	673,331 (y)

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- [1] y = yearling releases; sy = subyearling releases.
 [2] Releases in 1982 were Tule stock; all others have been upriver brights.
 [3] Released below Threemile Dam to avoid loss in irrigation diversions.
 [4] Acclimated during the summer and released in the fall.
 [5] Released at Steelhead Park near Hermiston.
 [6] Includes yearling spring and subyearling fall releases.
 [7] Released below Westland Dam.
 [8] Released in the fall.
 [9] Includes yearling spring and fall releases.
 [10] Includes subyearling spring and fall releases.
 [11] Passage evaluation releases at Threemile Dam.
 [12] Includes yearling spring and fall releases and subyearling spring releases.
 [13] Released at Barnhart (RM 42.5).
 [14] Passage evaluation releases.
 [15] Includes subyearling spring and yearling fall releases.

Table 2. Hatchery releases of fall chinook salmon in the Umatilla River Basin.

Year of Release	Hatchery	No. Released	No./lb.	Stock
1982	Bonneville	978,336	79.0	Tule
1982	Bonneville	2,828,835	92.0	Tule
1983	Bonneville	100,564	5.9	Bonneville URB
1984	Bonneville	228,412	8.6	Bonneville URB
1984	Bonneville	966,250	85.1	Bonneville URB
1985	Bonneville	3,223,172	92.3	Bonneville URB
1985	Bonneville	198,162	7.8	Bonneville URB
1985	Bonneville	51,000	16.2	Bonneville URB
1986	Irrigon	91,036	5.0	Bonneville URB
1986	Irrigon	115,779	4.7	Bonneville URB
1986	Irrigon	2,029,602	86.0	Bonneville URB
1986	Irrigon	35,574	11.6	Bonneville URB
1987	Irrigon	1,476,830	60.4	Priest Rapids URB
1987	Bonneville	109,143	8.1	Bonneville URB
1987	Bonneville	102,363	8.6	Bonneville URB
1987	Irrigon	2,000	20.0	Priest Rapids URB
1988	Irrigon	1,886,757	68.3	Priest Rapids URB
1988	Irrigon	1,429,250	93.1	Bonneville URB
1988	Irrigon	14,408	9.8	Priest Rapids URB
1988	Irrigon	79,681	8.6	Priest Rapids URB
1988	Bonneville	99,550	10.2	Bonneville URB
1988	Bonneville	100,791	8.8	Bonneville URB
1989	Bonneville	217,443	8.6	Bonneville URB
1989	Irrigon	2,393,710	66.6	Priest Rapids URB
1989	Irrigon	156,957	10.9-11.1	Priest Rapids URB
1990	Bonneville	255,614	8.2	Bonneville URB
1990	Irrigon	2,425,681	87.5	Bonneville URB
1990	Irrigon	629,800	82.4	Priest Rapids URB
1990	Irrigon	71,864	9.2	Bonneville URB
1990	Irrigon	76,646	8.8	Bonneville URB
1991	Bonneville	194,847	7.8	Bonneville URB
1991	Irrigon	3,091,214	81.8	Bonneville URB
1991	Irrigon	2,774	194.0	Bonneville URB
1991	Irrigon	7,688	80.0	Bonneville URB
1991	Irrigon	79,672	80.5	Bonneville URB
1991	Irrigon	74,865	86.0	Bonneville URB
1992	Bonneville	122,639	7.7	Bonneville URB
1992	Bonneville	97,801	7.6	Bonneville URB
1992	Umatilla	2,678,343	55.2-70.6	Bonneville URB
1992	Umatilla	2,670	112.0	Bonneville URB
1992	Irrigon	504,369	53.4	Umatilla River
1992	Irrigon	5,167	62.8	Umatilla River
1993	Bonneville	134,837	9.1	Bonneville URB
1993	Umatilla	2,629,917	62.7	Upriver Brights /a
1993	Umatilla	29,681	95.5-142.0	Upriver Brights /a
1994	Bonneville	283,453	8.5-10.4	Bonneville URB
1994	Umatilla	2,843,212	65.2	Upriver Brights /b
1994	Umatilla	22,174	85.0-171.0	Upriver Brights /b
1995	Bonneville	227,088	8.0	Bonneville URB
1995	Umatilla	561,423	64.7	Priest Rapids URB
1995	Umatilla	1,904,875	63.1	Priest Rapids URB

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/a Bonneville and Umatilla River stock.

/b Priest Rapids and Umatilla River stock.

Table 3. Hatchery releases of spring chinook salmon in the Umatilla River Basin.

Year of Release	Hatchery	No. Released	No./lb.	Stock
1986	Carson	99,970	22.8	Carson
1986	Irrigon	300,438	87.0	Carson
1986	Irrigon	75,000	15.0	Carson
1987	Carson	99,897	10.4	Carson
1987	Oxbow	169,100	199.0	Carson
1988	Bonneville	1,196	21.4	Carson /a
1988	Carson	99,895	20.6	Carson
1988	Bonneville	297,377	8.3-10.3	Carson
1988	Bonneville	75,767	11.1	Carson /a
1989	Bonneville	160,917	10.6	Carson /a
1989	Bonneville	164,603	12.0	Carson /a
1990	Carson	99,775	18.6	Carson
1990	Bonneville	231,772	9.0-9.6	Carson /a
1990	Bonneville	80,438	11.5	Carson /a
1990	Bonneville	77,998	13.4	Carson /a
1991	Carson	90,796	20.6	Carson
1991	Carson	5,937	16.9	Carson
1991	Bonneville	100,505	10.1	Carson /a
1991	Bonneville	96,152	11.8	Carson /a
1991	Bonneville	81,144	16.5	Carson /b
1991	Bonneville	78,480	16.8	Carson /b
1992	Carson	90,982	18.7	Carson
1992	Carson	5,272	18.7	Carson
1992	Bonneville	109,101	9.2	Carson /a
1992	Bonneville	98,928	8.5	Carson /a
1992	Umatilla	955,752	35.4	Carson
1992	Irrigon	294,458	32.5	Carson
1992	Bonneville	132,929	11.5	Carson
1992	Umatilla	101,416	19.4	Carson
1993	Bonneville	186,948	14.5	Carson
1993	Umatilla	208,782	8.3	Carson
1993	Carson	85,134	20.3	Carson
1993	Carson	10,952	20.0-20.5	Carson
1993	Umatilla	667,367	27.6	Carson
1993	Umatilla	460,809	19.9	Carson
1994	Umatilla	205,143	8.4	Carson
1994	Bonneville	152,854	11.5	Carson
1994	Bonneville	252,248	12.3	Carson
1994	Umatilla	8,890	8.1-8.3	Carson
1994	Umatilla	839,377	30.4	Carson
1994	Umatilla	378,225	8.7	Carson
1995	Bonneville	247,871	10.3	Carson
1995	Umatilla	275,804	7.9	Carson
1995	Bonneville	74,735	14.4	Carson
1995	Bonneville	74,921	11.4	Carson

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/a Carson via Lookingglass stock.

/b Carson via Lookingglass, Umatilla River and Big Canyon stock.

Table 4. Hatchery releases of summer steelhead in the Umatilla River Basin.

Year of Release	Hatchery	No. Released	No./lb.	Stock
1967	Gnat Creek	109,805	75.0	Skamania
1967	Oak Springs	238,020	117.0	Idaho (Oxbow)
1967	Wallowa	142,240	240.0	Idaho (Oxbow)
1968	Gnat Creek	23,100	66.0	Skamania
1968	Gnat Creek	150,000	Eggs	Skamania
1969	Oak Springs	174,341	145.0	Skamania
1970	Carson	23,400	9.0	Skamania
1970	Carson	16,089	8.0	Skamania
1975	Wizard Falls	11,094	9.0	Umatilla River
1981	Oak Springs	17,558	6.0-9.0	Umatilla River
1981	Oak Springs	9,400	145.0	Umatilla River
1982	Oak Springs	59,494	7.0-8.0	Umatilla River
1982	Oak Springs	67,940	124.0	Umatilla River
1983	Oak Springs	60,500	11.0	Umatilla River
1983	Oak Springs	52,700	62.0	Umatilla River
1984	Oak Springs	57,939	6.5	Umatilla River
1984	Oak Springs	22,000	135.0	Umatilla River
1985	Oak Springs	53,850	7.0	Umatilla River
1985	Oak Springs	39,134	150.0	Umatilla River
1986	Oak Springs	54,137	8.4	Umatilla River
1987	Oak Springs	1,485	5.5	Umatilla River
1988	Oak Springs	95,290	6.5-10.3	Umatilla River
1988	Oak Springs	10,033	57.5	Umatilla River
1988	Irrigon	24,618	3200.0	Umatilla River
1989	Oak Springs	29,852	6.6	Umatilla River
1989	Oak Springs	29,586	5.6	Umatilla River
1989	Oak Springs	22,274	5.5	Umatilla River
1990	Oak Springs	29,522	7.7	Umatilla River
1990	Oak Springs	30,225	5.9	Umatilla River
1990	Oak Springs	29,446	5.5	Umatilla River
1991	Oak Springs	30,221	6.2	Umatilla River
1991	Oak Springs	29,325	8.7	Umatilla River
1991	Oak Springs	12,389	7.5	Umatilla River
1991	Oak Springs	3,998	12.5	Umatilla River
1992	Umatilla	19,977	5.8	Umatilla River
1992	Umatilla	47,458	5.8	Umatilla River
1992	Umatilla	64,550	5.0	Umatilla River
1992	Umatilla	67,419	5.5	Umatilla River
1992	Umatilla	5,443	5.8	Umatilla River
1993	Umatilla	44,824	4.5	Umatilla River
1993	Umatilla	47,979	5.6	Umatilla River
1993	Umatilla	65,465	6.1	Umatilla River
1994	Umatilla	51,403	4.9	Umatilla River
1994	Umatilla	49,598	5.1	Umatilla River
1994	Umatilla	52,097	5.2	Umatilla River
1994	Umatilla	1,732	5.7	Umatilla River
1995	Umatilla	48,539	5.6	Umatilla River
1995	Umatilla	49,983	4.7	Umatilla River
1995	Umatilla	47,941	5.5	Umatilla River

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Table 5. Juvenile summer steelhead and coho salmon releases in the Umatilla River Basin (1981–1995) [1].

Species	Summer Steelhead				Coho		
	Lower Umatilla	Upper Umatilla	Minthorn	Bonifer	Lower Umatilla	Upper Umatilla	Minthorn
Year							
1981	0	17,558 (y) 9,400 (sy)	0	0	0	0	0
1982	0	59,494 (y) 67,940 (sy)	0	0	0	0	0
1983	0	60,500 (y) 52,700 (sy)	0	0	0	0	0
1984	0	0	0	57,939 (y) 22,000 (sy)	0	0	0
1985	0	0	0	53,850 (y) 39,134 (sy)	0	0	0
1986	0	0	0	54,137 (y)	0	0	0
1987	0	1,485 (y)[2]	0	0	786,660 (y)[3]	0	161,889 (y)
1988	33,984 (y)[3]	40,790 [4&5]	30,549 (y)	0	996,433 (y)[3]	0	0
1989	0	29,586 (y)	29,852 (y)	22,274 (y)	0	829,607 (y)	157,299 (y)
1990	0	29,446 (y)	0	59,747 (y)	202,315 [6](y)	654,209 (y)	132,404 (y)
1991	3,998 [7](y)	29,325 (y)	0	42,610 (y)	0	802,655 (y)	152,974 (y)
1992	5,443 [7](y)	131,969 (y)	47,458 (y)	19,977 (y)	0	961,386 (y)	0
1993	0	0	47,979 (y)	110,289 (y)	437,884 [8](y)	454,794 (y)	0
1994	1,732 [7](y)		49,598 (y)	103,500 (y)	418,222 [8](y)	465,883 (y)	
1995			49,983 (y)	96,480 (y)	824,963 [8](y)	689,303 (y)	

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- [1] y = yearling releases; sy = subyearling releases
 [2] Small release due to IHN & IPN problems in eggs.
 [3] Fish released below Westland Dam.
 [4] Includes both experimental control group and gradeouts from 88 brood year.
 [5] Does not include any unfed fry that were released.
 [6] Released at RM 23
 [7] Passage evaluation releases.
 [8] Released at RM 42.5

Table 6. Hatchery releases of coho salmon in the Umatilla River Basin.

Year of Release	Hatchery	No. Released	No./lb.	Stock
1966	Little White Salmon	500,000	1312.0	Little White Salmon
1967	Little White Salmon	200,000	1087.0	Little White Salmon
1967	Cascade	500,000	Eggs	Tanner Creek
1968	Little White Salmon	750,000	Eggs	Little White Salmon
1969	Carson	200,040	23.0	Little White Salmon
1987	Cascade	948,549	13.5–14.0	Tanner Creek
1988	Cascade	996,433	16.6	Tanner Creek
1989	Cascade	753,637	15.3–19.7	Tanner Creek
1989	Cascade	233,269	17.2–19.1	Tanner Creek
1990	Cascade	796,842	14.7	Tanner Creek
1990	Cascade	192,086	11.2–13.5	Tanner Creek
1991	Cascade	152,974	15.4	Tanner Creek
1991	Cascade	228,293	16.5	Tanner Creek
1991	Cascade	221,385	16.6	Tanner Creek
1991	Cascade	143,054	16.4	Tanner Creek
1991	Cascade	209,923	17.1	Tanner Creek
1992	Cascade	489,165	15.7	Tanner Creek
1992	Cascade	472,221	15.5	Tanner Creek
1993	Cascade	437,884	17.5	Tanner Creek
1993	Cascade	454,794	17.6	Tanner Creek
1994	Cascade	465,883	17.1	Tanner Creek
1994	Cascade	418,222	18.1	Tanner Creek
1995	Cascade	502,105	14.7	Tanner Cr. & Umatilla R.
1995	Cascade	497,449	14.5	Tanner Cr. & Umatilla R.
1995	Sandy	191,854	13.9	Tanner Creek
1995	Lower Herman Cr.	322,858	20.3	Tanner Creek

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TABLE 7. JUVENILE SALMON AND SUMMER STEELHEAD RELEASES IN THE UMATILLA RIVER BASIN IN 1995.

SPECIES	BROOD	STOCK	HATCHERY	NUMBER	#/L.B.	LOCATION	IN FACILITY	IN RIVER	FISH MARK	# MARKED
FALL CHINOOK	93	COL. R. URB	BONNEVILLE	227,088	8.0	THORNHOLLOW (FM73.5)	MAR 8/11	APRIL 7	RVBWT ADRCVWT	177,849 49,239
FALL CHINOOK	94	WASH. URB	UMATILLA	581,423	64.7	THORNHOLLOW (FM73.5)	MAY 17	MAY 31	RVBWT ADRCVWT	503,018 58,407
FALL CHINOOK	94	WASH. URB	UMATILLA	<u>1,904,875</u>	63.1	IMEQUES C-MEM-INI-KEM(FM 80)	MAY 17/19	MAY 31	RVBWT ADRCVWT	1,869,085 235,790
SUBTOTAL				2,683,386						
SPRING CHINOOK	93	CARSON	BONNEVILLE	247,871	10.3	IMEQUES C-MEM-INI-KEM(FM 80)	Mar 22/23	APRIL 21	RV ADRCVWT	201,594 46,277
SPRING CHINOOK	93	CARSON	UMATILLA	275,804	7.9	IMEQUES C-MEM-INI-KEM(FM 80)	FEB 14/23	MAR 13	RV ADRCVWT	164,848 111,158
SPRING CHINOOK	93	CARSON	BONNEVILLE	74,735	14.4	IMEQUES C-MEM-INI-KEM(FM 80)	FEB 23	MAR 13	RV ADRCVWT	51,128 23,607
SPRING CHINOOK	93	CARSON	BONNEVILLE	<u>74,921</u>	11.4	IMEQUES C-MEM-INI-KEM(FM 80)	MAR 15	APRIL 14	RV ADRCVWT	48,158 28,765
SUBTOTAL				673,331						
COHO	93	TANNER CR. & UMATILLA R.	CASCADE	502,105	14.7	UMATILLA RM 42.5	-----	MAR 31/APR 4	ADCWT	52,802
COHO	93	TANNER CR. & UMATILLA R.	CASCADE	497,449	14.5	UMATILLA RM 60	-----	Mar 29/31	ADCWT	28,488
COHO	93	TANNER CR.	SANDY	191,854	13.9	UMATILLA RM 60	-----	APRIL 6/7	NONE	NONE
COHO	93	TANNER CR.	L. HERMAN CR.	<u>322,858</u>	20.3	UMATILLA RM 42.5	-----	FEB 21/MAR 1	NONE	NONE
SUBTOTAL				1,514,266						
SUMMER STHD.	94	UMATILLA R.	UMATILLA	48,539	5.6	BONIFER (FM2)	MAR 14	APRIL 11	AD ONLY ADLCVWT	28,249 19,280
SUMMER STHD.	94	UMATILLA R.	UMATILLA	49,983	4.7	MINTHORN (FM83)	MAR 15	APRIL 13	AD ONLY ADLCVWT	31,171 18,812
SUMMER STHD.	94	UMATILLA R.	UMATILLA	<u>47,941</u>	5.5	BONIFER (FM2)	APRIL 17	MAY 12	AD ONLY ADLCVWT	28,159 19,782
SUBTOTAL				146,463						
TOTAL				<u>5,027,448</u>						

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Table 8. Food rations, mortalities, temperatures and D.O. concentrations during acclimation of juvenile summer steelhead and spring and fall chinook salmon at Bonifer, Minthorn, Thornhollow and Imeques C-mem-lri-kem acclimation facilities in 1995.

Species	Release Location	Release Date	Days Held	Food Fed (%/day)	Mortality			Temperature (C)			D.O. (mg/l)		
					5 Day	Total	%	Min.	Max.	Mean	Min.	Max.	Mean
Summer Steelhead	Minthorn	April 13	29	0.72	175	229	0.46	6.1	11.2	8.5	5.9	11.4	7.6
Summer Steelhead	Bonifer	April 11	28	0.52	57	123	0.25	6.5	10.5	8.0	4.4	10.7	7.8
Summer Steelhead	Bonifer	May 12	25	0.79	8	24	0.05	8.0	13.1	10.0	5.4	11.0	7.5
Spring Chinook	Imeques C-mem-lri-kem	March 13	18-27	0.38	9723/a	10439	3.65	1.2	6.2	4.2	9.4	12.4	11.0
Spring Chinook	Imeques C-mem-lri-kem	March 13	18	0.38	229	246	0.33	1.2	6.2	4.2	9.4	12.4	11.0
Spring Chinook	Imeques C-mem-lri-kem	April 14	30	0.82	50	111	0.15	3.5	7.5	5.6	7.2	11.7	9.9
Spring Chinook	Imeques C-mem-lri-kem	April 21	29-30	0.68	242	354	0.14	3.5	7.5	5.6	7.9	11.8	9.7
Fall Chinook	Thornhollow	April 7	27-30	0.49	269	1606	0.70	4.9	10.0	6.2	6.9	11.6	9.1
Fall Chinook	Thornhollow	May 31	14	1.24	384	1009	0.18	7.6	12.3	9.5	7.2	9.7	8.7
Fall Chinook	Imeques C-mem-lri-kem	May 31	12-14	0.67	625	2617	0.14	6.5	13.3	9.4	6.5	9.8	8.5

Revised: 9/5/95

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/a An estimated 9,073 were lost within hours after unloading the first transport truck. Subsequent loads were postponed for five days. The losses were attributed to stress at Umatilla Hatchery (personal communication, Ray Hill 1995) and temperature shock.

Table 9. Size and descaling data for juvenile summer steelhead and spring and fall chinook salmon released in the Umatilla River Basin in 1995.

Species	Release Location	Release Date	Days Held	No./lb.			Fork Ln. (mm)			Descaling (%)			
				Mean	Std.	n=	Mean	Std.	n=	Total	Partial	None	n=
Summer Steelhead	Minthorn	April 13	29	4.7	1.2	100	210	17	300	0.0	20.6	79.4	199
Summer Steelhead	Bonifer	April 11	28	5.6	1.3	117	206	15	316	8.7	41.5	49.7	195
Summer Steelhead	Bonifer	May 12	25	5.5	1.7	128	206	20	315	13.3	38.5	48.2	195
Spring Chinook	Imeques C-men-ini-kem	March 13	18-27	7.9	3.6	649	158	22	1836	1.1	17.7	81.2	1200
Spring Chinook	Imeques C-men-ini-kem	March 13	18	14.4	5.8	104	134	13	302	0.0	2.4	97.6	211
Spring Chinook	Imeques C-men-ini-kem	April 14	30	11.4	5.2	107	149	17	211	0.0	2.8	97.2	142
Spring Chinook	Imeques C-men-ini-kem	April 21	29-30	10.3	6.2	338	148	19	934	0.7	4.7	94.6	426
Fall Chinook	Thornhollow	April 7	27-30	8.0	2.1	200	171	15	200	--	--	--	--
Fall Chinook	Thornhollow	May 31	14	64.7	15.9	211	90	7	400	10.7	45.1	44.2	430
Fall Chinook	Imeques C-men-ini-kem	May 31	12-14	63.1	14.6	447	91	7	864	4.9	49.3	45.8	1619

Revised: 9/5/95

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Figure 2. Length frequency distribution of juvenile summer steelhead released at Minthorn Acclimation Facility on 4/13/95.

Acclimation at Bonifer

Summer Steelhead

An estimated 48,539 fish at 5.6/lb. were released from Bonifer on April 11, 1995, after being acclimated for 28 days (Table 7). This included 19,290 coded-wire tagged fish (Appendix E) and 29,249 adipose clipped only fish. They were fed 0.52% BWD and total mortality was 0.25% (Table 8). The mean temperature and DO was 8.0 degrees C and 7.8 mg/l, respectively (Table 8).

The average fork length taken at release was 206mm (Table 9). The length frequency distribution of this group is shown in Figure 3. An estimated 8.7 and 41.5% were severely and partially descaled, respectively (Table 9).

A second group of summer steelhead (47,941 fish at 5.5/lb.) was released from Bonifer on May 12, 1995, after being acclimated for 25 days (Table 7). Included were an estimated 19,782 coded-wire tagged fish (Appendix E) and 28,159 adipose clipped only fish. They were fed 0.79% BWD and total mortality was 0.05% (Table 8). The mean temperature and DO was 10.0 degrees C and 7.5 mg/l, respectively (Table 8).

Figure 3. Length frequency distribution of juvenile summer steelhead released at Bonifer Acclimation Facility on 4/11/95.

The average fork length taken at release for this group (206mm) was the same as for the group released in April (Table 9). The length frequency distribution is shown in Figure 4. An estimated 13.3 and 38.5% were severely and partially descaled, respectively (Table 9).

Acclimation at Imeqes C-mem-ini-kem

Spring Chinook

An estimated 275,804 spring chinook yearlings at 7.9/lb. were released from Imeqes C-mem-ini-kem on March 13, 1995, after being acclimated for 18 to 27 days (Table 7). This included 111,158 coded-wire tagged fish (Appendix F) and 164,646 right ventral clipped fish. They were fed 0.38% BWD and total mortality was 3.65% (Table 8). An estimated 86.9% of the total mortality occurred within hours after unloading the first transport truck. Subsequent loads were postponed for five days. The losses were attributed to a combination of erythromycin toxicity at Umatilla Hatchery (personal communication, Ray Hill 1995) and temperature shock at unloading. The mean temperature and DO was 4.2 degrees C and 11.0 mg/l, respectively (Table 8).

Figure 4. Length frequency distribution of juvenile summer steelhead released at Bonifer Acclimation Facility on 5/12/95.

The average fork length taken at the hatchery prior to transport was 158mm (Table 9). The length frequency distribution of this group is shown in Figure 5. An estimated 1.1 and 17.7% were severely and partially descaled, respectively (Table 9).

A second group of spring chinook yearlings was acclimated at Imeqes C-mem-ini-kem along with the previous group. An estimated 74,735 fish at 14.4/lb. were released on March 13, 1995, after being acclimated for 18 days (Table 7). This included 23,607 coded-wire tagged fish (Appendix F) and 51,128 right ventral clipped fish. They were fed 0.38% BWD and total mortality was 0.33% (Table 8). The mean temperature and DO was 4.2 degrees C and 11.0 mg/l, respectively (Table 8).

The average fork length taken at the hatchery prior to transport was 134 mm (Table 9). The length frequency distribution of this group is shown in Figure 6. An estimated 2.4% were partially descaled, while none were considered severely descaled (Table 9).

A third group 74,921 spring chinook yearlings at 11.4/lb. were released from Imeqes C-mem-ini-kem on April 14, 1995, after being acclimated for 30 days (Table 7). This included 28,765 coded-wire tagged fish (Appendix F) and 46,156 right ventral clipped fish. They were fed 0.82% BWD and total mortality was 0.15% (Table 8). The mean temperature and DO was 5.6 degrees C and 9.9 mg/l, respectively (Table 8).

Figure 5. Length frequency distribution of juvenile spring chinook salmon released at Imeqes C-mem-ini-kem Acclimation Facility on 3/13/95.

Figure 6. Length frequency distribution of juvenile spring chinook salmon released at Imeqes C-mem-ini-kem Acclimation Facility on 3/13/95.

The average fork length taken at release was 149 mm (Table 9). The length frequency distribution of this group is shown in Figure 7. An estimated 2.8% were partially descaled, while none were considered severely descaled (Table 9).

A fourth group of 247,871 spring chinook yearlings at 10.3/lb. were released from Imeqes C-mem-ini-kem on April 21, 1995, after being acclimated for 29 to 30 days (Table 7). This included 46,277 coded-wire tagged (Appendix F) and 201,594 right ventral clipped fish. They were fed 0.68% BWD and total mortality was 0.14% (Table 8). The mean temperature and DO was 5.6 degrees C and 9.7 mg/l, respectively (Table 8).

The average fork length taken at the hatchery prior to transport was 148 mm (Table 9). The length frequency distribution of this group is shown in Figure 8. An estimated 0.7 and 4.7% were severely and partially descaled, respectively (Table 9).

Fall Chinook

An estimated 1,904,825 fall chinook subyearlings at 63.1/lb. were released from Imeqes C-mem-ini-kem on May 31, 1995, after being acclimated for 12 to 14 days (Table 7). This included 235,790 coded-wire tagged fish (Appendix G) and 1,669,085 right ventral clipped and blank wire tagged fish. They were fed 0.67% BWD and total mortality was 0.14% (Table 8). The mean temperature and DO was 9.4 degrees C and 8.5 mg/l, respectively (Table 8).

The average fork length taken at release was 91 mm (Table 9). The length frequency distribution of this group is shown in Figure 9. An estimated 4.9 and 49.3% were severely and partially descaled, respectively (Table 9).

Acclimation at Thornhollow

Fall Chinook

An estimated 227,088 fall chinook yearlings at 8.0/lb. were released from Thornhollow on April 7, 1995, after being acclimated for 27 to 30 days (Table 7). This included 49,239 coded-wire tagged fish (Appendix G) and 177,849 right ventral clipped and blank wire tagged fish. They were fed 0.49% BWD and total mortality was 0.70% (Table 8). The mean temperature and DO was 6.2 degrees C and 9.1 mg/l, respectively (Table 8).

The average fork length taken at release was 171mm (Table 9). The length frequency distribution is shown in Figure 10. This group of fish was not examined for descaling prior to release.

An estimated 561,423 fall chinook subyearlings at 64.7/lb. were released from Thornhollow on May 31, 1995, after being acclimated for 14 days (Table 7). This included 58,407 coded-wire tagged fish (Appendix G) and 503,016 right ventral clipped and blank

Figure 7. Length frequency distribution of juvenile spring chinook salmon released at Imeqes C-mem-ini-kem Acclimation Facility on 4/14/95.

Figure 8. Length frequency distribution of juvenile spring chinook salmon released at Imeqes C-mem-ini-kem Acclimation Facility on 4/21/95.

Figure 9. Length frequency distribution of juvenile fall chinook salmon released at Imeqes C-mem-ini-kem Acclimation Facility on 5/31/95.

Figure 10. Length frequency distribution of juvenile fall chinook salmon released at Thornhollow Acclimation Facility on 4/7/95.

wire tagged fish. They were fed 1.24% BWD and total mortality was 0.18% (Table 8). The mean temperature and DO was 9.5 degrees C and 8.7 mg/l, respectively (Table 8).

The average fork length taken at release was 90 mm (Table 9). The length frequency distribution of this group is shown in Figure 11. An estimated 10.7 and 45.1% were severely and partially descaled, respectively (Table 9).

Direct Stream Releases

Four groups of juvenile coho salmon were released directly into the Umatilla River in 1995 (Table 7 and Appendix H). Two groups from Cascade Hatchery were representively coded-wire tagged for stock identification, while groups from Sandy Hatchery and Lower Herman Creek Ponds were not marked.

Objective 2: Summer Steelhead, Fall Chinook and Coho Salmon Spawning

Task 2.1: Adult Collection, Holding and Spawning

Collection, Holding and Spawning of Summer Steelhead

Sixty-eight hatchery and 86 unmarked steelhead were collected for broodstock from October 13, 1994 through April 20, 1995. Fish were selected throughout the run to provide a representative cross-section of the population (Figure 12). Broodstock collected by month are listed in Appendix I.

Fish collected in October were transported to Minthorn. In early November, they were moved to Bonifer for temporary holding because of modifications being made to the Minthorn brood holding area. Fish collected from November through January were transported to Bonifer. The modifications were completed in late January and fish collected from February through April were transported to Minthorn. The unmarked fish and all but 24 hatchery fish held at Bonifer were moved to Minthorn in early March. The 24 hatchery fish were considered excess and were sacrificed for coded-wire tag recovery.

A total of 41 females (28 wild and 13 hatchery) and 40 males (31 wild and 9 hatchery) were spawned from March 29 to May 24, 1995 (Table 10 and Appendix J). Due to a shortage of mature males, 16 of 26 males spawned from April 19 to the end of the spawning season were spawned live and returned to the holding pond. This resulted in three males being spawned a second time and one male was used to fertilize the eggs from two females. An estimated 223,525 green eggs were taken with a mean fecundity of 5,452.

Total prespawn mortality during the adult holding period was 29.9% (Table 10). In comparison, prespawn mortality at Minthorn has ranged from 7.6% to 39.0% for previous brood years. Prespawn mortality was similar for both males (30.1%) and females (29.6%).

Figure 11. Length frequency distribution of juvenile fall chinook salmon released at Thornhollow Acclimation Facility on 5/31/95.

Figure 12. Return timing of summer steelhead to the Umatilla River in 1994-95 and percentage of 1995 summer steelhead broodstock collected by month.

Table 10. Summer steelhead broodstock collection, spawning and mortality in 1994-95. /a/

Number of females spawned and eggs taken on Individual spawn days																											
No. of Females Collected	March 29		April 5		April 12		April 19		April 26		May 3		May 10		May 17		May 24		Total Spawned		%	Total Eggs Taken		Mortality	%	Excess Killed	
	No.	Eggs	No.	Eggs	No.	Eggs	No.	Eggs	No.	Eggs	No.	Eggs	No.	Eggs	No.	Eggs	No.	Eggs	No.	Eggs		No.	Eggs			No.	Eggs
81 /b	6	34,030	4	22,656	4	27,830	7	42,595	4 /c	17,225	8	37,391	3 /d	18,479	3	13,474	2	9,845	41	50.6	223,525	24	29.6	14	17.3		

No. of Males Collected	Number of males spawned on individual spawn days										Total Spawned	%	Mortality	%	Excess Killed	
	March 29	April 5	April 12	April 19	April 26	May 3	May 10	May 17	May 24						%	
73 /e	6	4	4	7 /f	4	8 /g	3 /h	3 /i	1 /j	40 /k	54.8	22	30.1	12	16.4	

Revised: 9/1/95

File Name: C:\123R3\DATA\TABLE10

- a/ Broodstock were collected at Three Mile Dam and spawned at Minthorn Acclimation Facility.
b/ Three Mile Dam records indicate that 77 females were collected for broodstock, however, 81 were sacrificed at Minthorn.
c/ Does not include one green female.
d/ Does not include one female with bad eggs.
e/ Three Mile Dam records indicate that 77 males were collected for broodstock, however, fifty-nine males were sacrificed at Minthorn and fourteen broodstock were unaccounted for. They were all assumed to be males.
f/ Includes two spawned live.
g/ All were spawned live.
h/ All were spawned live. Two were spawned for a second time.
i/ All were spawned live. One was spawned for a second time.
j/ This male was used to fertilize both females. Does not include one green male.
k/ Includes 16 spawned live.

Table 11. Results of disease sampling of Umatilla River summer steelhead and coho salmon broodstock in 1995. /a

Species	Test	Incidence	Comments
<u>Summer Steelhead</u>			
Spawned Fish	IHN	31/81	Type 2 IHN isolate typical of the Columbia River Basin (22 of 41 females and 9 of 40 males)
	IPNV	0/81	
	BKD	40/65	One fish had a high ELISA (OD ₄₀₅) reading (3.056), one fish had a moderate reading (0.349) and 38 fish had low readings (0.144 or less)
Killed but not Spawned	IHN	3/3	All had low ELISA (OD ₄₀₅) readings (0.024, 0.024 and 0.025)
	IPNV	0/3	
Mortalities	BKD	31/39	All had low OD ₄₀₅ readings (0.152 or less)
	<u>Ceratomyxa shasta</u>	9/39	Detected at a low level in eight fish and moderate level in one fish
	<u>Aeromonas Pseudomonas</u>	31/33	
<u>Coho</u>			
Spawned	IHN	0/56	
	IPNV	0/56	

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/a Data provided by ODFW Eastern Oregon Fish Pathology Laboratory.
All broodstock were spawned at Minthorn Acclimation Facility.

The high number of mortalities was primarily due to a combination of not treating with formalin and live spawning males.

Disease Sampling of Summer Steelhead Broodstock

Cell culture assays for IPNV virus on all 81 spawned fish were negative, however, IHN was detected in 31 fish (Table 11). Kidney samples from 65 spawned fish were taken to test for BKD and 40 tested positive. Thirty-eight fish had ELISA readings (OD₄₀₅) of 0.144 or less, indicating low or negative Rs antigen levels. One fish had a moderate level

(0.349) and one fish had a high reading (3.056), which would be considered to be a clinical level. Three fish killed for spawning but not used were also tested and all had low antigen levels.

Spores of *C. shasta* were detected in nine of 39 mortalities sampled. Levels were considered to be low in eight fish and moderate in one fish. Thirty-nine mortalities were also sampled for BKD and 31 tested positive. These all had OD₄₀₅ readings of 0.152 or less, indicating low or negative antigen levels. Aeromonad-pseudomonad bacteria were cultured from the kidneys of 31 of 33 fish sampled.

Collection, Holding and Spawning of Coho Salmon

A total of 425 female and 435 male coho salmon were collected for broodstock from September 28 to November 17, 1995 (Table 12). Three hundred thirty-seven females and 337 males were spawned from October 30 to November 30, 1995 and an estimated 945,828 green eggs were taken (Appendix K). The mean fecundity was 2,807.

Total prespawn mortality was 16.2%. This included 65 males (14.9%) and 74 females (17.4%). In comparison, total prespawn mortality in 1993 was 15.5%.

Table 12. Coho salmon broodstock collection, spawning and mortality in 1995.

No. Collected /a			No. Spawned				Prespawn Mortality							
Males	Females	Total	Males	%	Females	%	Total	%	Males	%	Females	%	Total	%
435	425	860	343 /b	78.9	342 /c	80.5	685	79.7	65	14.9	74	17.4	139	16.2

Revised: 12/31/95

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/a Broodstock were collected from September 28 to November 17, 1995 and held and spawned at Minthorn.

After spawning was completed, one male was sacrificed and 26 males and 9 females were released into the Umatilla River.

/b Includes six green.

/c Includes one overripe, one green and three with bad eggs.

Disease Sampling of Coho Salmon Broodstock

Tests for IHNV and IPNV on 56 spawned female coho salmon were negative.

Collection, Holding and Spawning of Fall Chinook Salmon

Fall chinook broodstock were not collected. Washington Department of Fish and Wildlife and ODFW hatcheries supplied all 1995 broodstock eggs for the Umatilla River program.

Objective 3: Facility Maintenance

Task 3.1: Facility Maintenance and Repair

Repair and maintenance were performed at Bonifer, Minthorn, Imeques C-mem-ini-kem and Thornhollow in 1995. Routine maintenance work consisted mostly of weed abatement and maintenance of the electric fence at Bonifer. The Minthorn summer steelhead brood holding and spawning area was modified by Thompson-McDougal construction company to improve holding and spawning conditions.

Objective 4: Acclimation Evaluation

Subobjective 4.1: Adult Survival and Contributions

Task 4.1.1: Snout and Data Collection

Snouts were collected from 35 spring chinook salmon at Three Mile Dam and 78 spring chinook during spawning ground surveys. Snouts were also collected from 193 fall chinook salmon at Three Mile Dam and 105 snouts were collected from coho broodstock held at Minthorn. Snouts from 32 summer steelhead were collected at Three Mile Dam in 1994-95 and 60 snouts were collected from broodstock held at Minthorn. Six snouts were also collected during creel and spawning ground surveys.

Snouts were collected at Three Mile Dam by Trap and Haul personnel, on spawning ground surveys by CTUIR Natural Production Monitoring and Evaluation personnel, and on creel surveys by other CTUIR and ODFW personnel. Snouts were delivered to ODFW in Clackamas, Oregon for code identification.

Task 4.1.2 and 4.1.3: Coded-Wire Tag Data Analysis

Adult Survival and Umatilla River Returns

Summer Steelhead

Since 1975, all Umatilla River summer steelhead releases have been from Umatilla River broodstock. The first coded-wire tagged releases were in April of 1988 (Table 13). An acclimated group was released from Minthorn while a control group was released into the Umatilla River near Minthorn.

The estimated recovery of adults from the acclimated release was higher than from the control release (0.69 versus 0.53%) despite the larger size of the non-acclimated group at release (Table 13 and Figure 13). Adult returns to the Umatilla River however, were only slightly higher from the acclimated release than from the control release (0.47 versus 0.41%) (Appendix L and Figure 14). An estimated 73.6% of the adults recovered from both

Table 13. Liberation and survival information for summer steelhead released in the Umatilla River Basin.

Brood Year	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
87	30,549	7.4	Minthorn	April 88	212	0.69
87	64,741 /a	6.5	Nr. Minthorn	April 88	341	0.53
88	10,033 /b	57.5	Umatilla RM 89	Dec 88	NA	NA
88	52,126 /c	6.6	Minthorn	May 89	20	0.04
88	29,586	5.6	Nr. Minthorn	May 89	20	0.07
89	59,747 /d	5.9	Bonifer	May 90	553	0.93
89	29,446	5.5	Nr. Bonifer	May 90	287	0.97
90	42,610 /e	6.2	Bonifer	May 91	369	0.87
90	33,323 /f	8.7	Nr. Bonifer	May 91	276	0.83
91	67,435	5.8	Bonifer & Minthorn	Mar 92	136	0.20
91	64,550	5.0	Mouth of Meacham Cr.	April 92	13	0.02
91	72,862 /g	5.5	Mouth of Meacham Cr.	Apr/May 92	4	<0.01
92	44,824	4.5	Bonifer	April 93	170	0.38
92	47,979	5.6	Minthorn	April 93	174	0.36
92	65,465	6.1	Bonifer	May 93	4	<0.01

Revised: 4/16/96

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/a The number released includes 33,984 adipose clipped fish at 10.3/lb. released at Umatilla RM 23 in May

/b None of these fish were coded-wire tagged

/c The number released includes 22,274 adipose clipped fish at 5.5/lb. acclimated and released at Bonifer in April and May

/d The number released includes 29,522 adipose clipped fish at 7.7/lb. acclimated and released with the coded-wire tagged fish in May

/e The number released includes 12,389 adipose clipped fish at 7.5/lb. acclimated and released with the coded-wire tagged fish in May

/f The number released includes 3,998 adipose clipped fish at 12.5/lb. released at Umatilla RM 3 in April

/g The number released includes 5,443 adipose clipped fish at 5.8/lb. released at Umatilla RM 3 in April

releases were captured at Three Mile Dam on the Umatilla River and 19.7% were recovered in the Columbia River gillnet fishery (Appendix L). An estimated 5.4% were caught in the Columbia River sport fishery.

A second acclimation evaluation study was conducted at Minthorn in May of 1989 (Table 13). Although no apparent problems were encountered with these releases, (Lofy et al. 1990), recoveries were poor. Estimated adult recoveries from the acclimated and control groups were 0.04 and 0.07%, respectively (Table 13 and Figure 13). An estimated 85.0% of all recoveries were from the Umatilla River and 15.0% were from the Columbia River sport fishery (Appendix L).

Figure 13. Estimated ocean and Columbia River Basin recoveries of adult summer steelhead from releases of acclimated and non-acclimated juveniles in the Umatilla River (1987-1990 brood years).

Figure 14. Estimated Umatilla River recoveries of adult summer steelhead from releases of acclimated and non-acclimated juveniles in the Umatilla River (1987-1990 brood years).

Summer steelhead releases in 1990 were also made in May (Table 13). An acclimated group was released from Bonifer and a control group was released into Meacham Creek concurrent with the acclimated group. Recoveries from the acclimated group (0.93%) were similar to the control group (0.97%), even though the control group was slightly larger at release (Table 13 and Figure 13). Umatilla River recoveries from the acclimated and control groups were also similar (0.72 and 0.67%, respectively) (Appendix L and Figure 14). An estimated 74.8% of the recoveries from both releases were from the Umatilla River, while an estimated 16.4 and 8.8% of the recoveries were from the Columbia River gillnet and Columbia River sport fisheries, respectively (Appendix L).

A fourth acclimation study was conducted at Bonifer in May of 1991. Recoveries were similar for both the acclimated and control groups (0.87 and 0.83%, respectively), although the fish from the control group were significantly smaller at release (Table 13 and Figure 13). Recoveries in the Umatilla River from the acclimated and control groups were also similar (0.58 and 0.62%, respectively) (Appendix L and Figure 14). An estimated 70.4% of the recoveries from both releases were from the Umatilla River, while an estimated 19.1 and 10.5% of the recoveries have been from the Columbia River gillnet and Columbia River sport fisheries, respectively (Appendix L).

Three coded-wire tagged groups of summer steelhead were released in 1992 (Table 13). One group was acclimated at both Bonifer and Minthorn and released in late March. The other two groups were released directly into Meacham Creek in late April. Estimated adult recoveries from all groups are preliminary. Estimated adult recoveries from the acclimated group are 0.20%, while estimated recoveries from the two groups released into Meacham Creek are 0.02 and less than 0.01%. An estimated 66.0% of the recoveries from all releases have been from the Umatilla River, while an estimated 31.4 and 2.6% of the recoveries have been from the Columbia River gillnet and Columbia River sport fisheries, respectively (Appendix L).

Three coded-wire tagged groups of summer steelhead were also released in 1993 (Table 13). Two groups were acclimated at Bonifer and one group was acclimated at Minthorn. One of the groups acclimated at Bonifer was released in May, while the other two groups were released in April. Estimated adult recoveries from all groups are incomplete. Recoveries from the groups released in April are 0.38 and 0.36%, while the estimated recoveries from the group released in May are less than 0.01%. An estimated 91.1% of the recoveries from all releases have been from the Umatilla River, while an estimated 2.6 and 5.7% of the recoveries have been from the Columbia River gillnet and Columbia River sport fisheries, respectively (Appendix L).

Results from the summer steelhead acclimation studies are inconclusive. Survival rates for both the acclimated and control groups in the 1989 study were poor, and survival rates for the acclimated and control groups were similar in both the 1990 and 1991 studies. The 1988 study however, suggests that acclimation may have provided a benefit in both total survival and Umatilla River escapement.

Adult Returns to Minthorn

A total of 656 hatchery summer steelhead returned to Three Mile Dam on the Umatilla River in 1994-95 (Figure 15) and 555 were released upriver. Seven hatchery fish were trapped at Minthorn and several other fish were observed in Minthorn Springs Creek below the ladder. Five of the trapped fish were coded-wire tagged and were sacrificed for snout and data recovery. The other two fish were adipose clipped only and were released back into Minthorn Springs Creek.

Adult Returns to Bonifer

One summer steelhead was observed in the ladder at Bonifer and several fish were observed at the confluence of Meacham Creek and Boston Canyon Creek. It is unknown whether these fish were marked or unmarked.

Fall Chinook - Spring Creek Tule Stock

Releases in 1982 of fall chinook salmon in the Umatilla River were subyearlings from Spring Creek tule stock (Table 14). One group of fish was tagged by the National Marine Fisheries Service and reared at Spring Creek Hatchery and one group was tagged by ODFW and reared at Bonneville Hatchery (Appendix M). All fish were from eggs collected at Spring Creek Hatchery. The Spring Creek Hatchery fish were released at 79.0/lb. at Umatilla RM 1.5 and 51.5. The Bonneville Hatchery fish were released at 92.0/lb. at Umatilla RM 1.5.

Total survival rates for the groups reared at Spring Creek and Bonneville Hatcheries were 0.53 and 0.46%, respectively (Table 14). These rates are at the lower end of the range experienced by Spring Creek Hatchery (0-2.1%), but higher than many other releases of Spring Creek tule stock released at other locations. Most fish were recovered as age-3 fish, similar to reports for fish from the 1978 and 1979 brood years released elsewhere (Howell et al. 1985) (Appendix M).

Total exploitation rate of Spring Creek tule stock was 98.9%. Individual exploitation rates for ocean commercial and Columbia River gillnet catches were 47.1 and 38.2%, respectively. Sport and treaty exploitation rates were 12.3 and 2.4%.

Fall Chinook - Bonneville and Umatilla Upriver Bright (URB) Stock

All releases of yearling fall chinook salmon in the Umatilla River have been from Bonneville URB stock. Releases have been made in the upper Umatilla River (RM 56 to RM 87) and in Meacham Creek (RM 2 and RM 30) (Table 15). All releases have been made in March and April and fish have ranged in size from 5.0 to 10.4/lb..

Figure 15. Returns of wild and hatchery summer steelhead to Three Mile Dam on the Umatilla River, 1972-1995 (Return numbers from the fall of 1972 to the spring of 1987 are estimates, while return numbers beginning in the fall of 1987 are from actual counts).

Table 14. Liberation and survival information for fall chinook salmon (Spring Creek tule stock) released in the Umatilla River Basin.

Brood Year	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
1981	978,336	79.0	Umatilla RM 1.5 & 51.5	Apr 82	5,153	0.53
1981	2,828,835	92.0	Umatilla RM 1.5	Apr 82	12,930	0.46

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Table 15. Liberation and survival information for fall chinook salmon (Bonneville URB and Umatilla River stock) released in the Umatilla River Basin (1983–1995).

Brood Year/Stock /a	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
81 B	100,564	5.9	Bonifer & Meacham Cr.	Apr 83	169	0.17
82 B	228,412	8.6	Bonifer & Meacham Cr.	Apr 84	178	0.08
83 B	966,250	85.1	Umatilla RM 1.5	June 84	7,594	0.79
83 B	198,162	7.8	Umatilla RM 87 & Bonifer	Mar 85	1,593	0.80
84 B	3,223,172	92.3	Umatilla RM 1.5	June 85	28,170	0.87
84 B	51,000	16.2	Bonifer	Oct 85	342	0.67
84 B	206,815	5.0	Bonifer & Minthorn	Mar 86	6,560	3.17
85 B	2,029,602	86.0	Umatilla RM 1.5	June 86	10,252	0.51
85 B	35,574 /b	11.6	Minthorn	Oct 86	NA	NA
85 B	109,143	8.1	Minthorn	Mar 87	2,408	2.21
85 B	102,363	8.6	Bonifer	Mar 87	2,442	2.39
86 B	100,791	8.8	Minthorn	Mar 88	3,255	3.23
86 B	99,550	10.2	Bonifer	Mar 88	2,495	2.51
87 B	1,429,250 /b,c	93.1	Umatilla RM 9	June 88	NA	NA
87 B	217,443 /b	8.6	Umatilla RM 63 – 73.5	Mar 89	NA	NA
88 B	255,614 /b	8.2	Umatilla RM 70	Mar 90	NA	NA
89 B	3,055,481 /d	87.5	Umatilla RM 70 – 79	May–June 90	5,593	0.18
89 B	71,863	9.2	Minthorn	Oct 90	48	0.07
89 B	76,646	8.8	Nr. Minthorn	Oct 90	29	0.04
89 B	194,847 /b	7.8	Umatilla RM 56 – 79	Mar 91	NA	NA
90 B	3,101,676 /e	73–82	Umatilla RM 70 – 79	May 91	3,765	0.12
90 B	79,672	80.5	Minthorn	May 91	154	0.19
90 B	74,865	86.0	Nr. Minthorn	May 91	127	0.17
90 B	220,440	7.7	Umatilla RM 56 – 70	Mar 92	43	0.02
91 B	2,681,013 /f	55.2–70.6	Umatilla RM 42.5	May 92	26	<0.01
91 U	504,369 /b	53.4	Umatilla RM 42.5	May 92	NA	NA
91 U	5,167 /b	62.8	Umatilla RM 3	May 92	NA	NA
91 B	134,837	9.1	Umatilla RM 73.5	Mar 93	54	0.04

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Table 15. (cont.)

Brood Year/Stock /a	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
92 B & U	2,659,598 /g	59.3-68.0	Umatilla RM 73.5	May 93	724	0.03
92 B	233,629	10.4	Umatilla RM 73.5	Mar 94	502	0.21
92 B	49,824	8.5	Umatilla RM 73.5	Apr 94	38	0.08
93 B	227,088	8.0	Thornhollow (RM 73.5)	April 95	339	0.15

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/a B = Bonneville URB stock; U = Umatilla River stock

/b These fish were not coded-wire tagged.

/c To estimate adult contribution, these fish were included in the Priest Rapids URB stock subyearling release in 1988 (075007). Both stocks were reared at Irigon Hatchery.

/d The number released includes 629,800 non-tagged Priest Rapids URB stock subyearlings released at 82.4/lb. in May at Umatilla RM 70-79.

/e The number released includes 10,462 non-tagged fish at 80-194/lb. released at Umatilla RM 3 in April and May.

/f The number released includes 2,670 non-tagged fish at 112/lb. released at Umatilla RM 3 in April and May.

/g The number released includes 29,681 non-tagged fish at 95.5-142.0/lb. released between Umatilla RM 0 and RM 27.3 in March, April and May.

The estimated total survival rates (through age-7) from yearling releases made from 1983 to 1988 (1981 to 1986 brood years) have ranged from 0.08 to 3.23% (Table 15). Survival rates to the Umatilla River have ranged from 0.00 to 0.90% (Appendix N). Yearling releases made from 1989 through 1991 were not representively coded-wire tagged. Recovery data for the 1992 through 1995 releases (1990 to 1993 brood years) are incomplete. Preliminary survival rates have ranged from 0.02 to 0.19%. Survival rates to the Umatilla River have ranged from less than 0.01 to 0.15% (Appendix N).

Total exploitation of yearlings (through 1986 brood) is 84.5%. Individual exploitation rates for ocean commercial and Columbia River gillnet catches are 49.3 and 37.4%, respectively. Sport and treaty exploitation rates are 11.0 and 2.3%.

Spring releases of subyearling fall chinook from Bonneville URB stock have been made from 1984 through 1993, excluding 1987 and 1989 (Table 15). Subyearlings from Umatilla River broodstock were also released in 1992 and 1993.

Prior to 1990, all spring subyearling releases were made near the mouth of the river because of potential for fish loss due to unscreened or partially screened irrigation diversions (Table 15). All groups were released in June. Fish ranged in size from 85.1 to 93.1/lb..

The estimated total survival rates (through age-7) from spring subyearling releases in 1984, 1985 and 1986 (1983 through 1985 brood years) were 0.79, 0.87 and 0.51%,

respectively (Table 15). Releases made in 1988 were not representively coded-wire tagged. Survival rates to the Umatilla River have ranged from 0.00 to 0.001% (Appendix O).

Beginning in 1990, all spring subyearling releases have been in the upper Umatilla River (RM 42.5 to RM 79), other than small numbers of non-tagged fish released between RM 0 and 27.3 as part of ODFW juvenile passage evaluation studies (Table 15). An acclimation evaluation experiment was conducted in 1991. One group of fish was acclimated at Minthorn and a control group was released concurrently. All releases have been made in May and June. Fish have ranged in size from 53.4 to 87.5/lb..

Recovery data for the 1990 through 1993 direct stream releases (1989 through 1992 brood years) are incomplete. Preliminary survival rates for the 1990, 1991 and 1992 releases are 0.18, 0.12 and 0.001%, respectively (Table 15). Survival rates to the Umatilla River are 0.017, 0.025 and 0.001%, respectively (Appendix O). Preliminary recoveries for the 1993 release include age-3 fish only and are not discussed in this report.

Recoveries from the acclimated group are similar to the control group (0.19 versus 0.17%, respectively). Umatilla River recoveries are 0.028 and 0.023% (Appendix O).

Estimated total exploitation of spring subyearling releases (through 1990 brood) is 83.0%. Individual exploitation rates for ocean commercial and Columbia River gillnet catches are 43.4 and 51.8%, respectively. Sport and treaty exploitation rates are 4.2 and 0.6%.

Subyearling fall releases from Bonneville URB stock have been made in 1985, 1986 and 1990. All releases occurred in October at either Bonifer or Minthorn acclimation facilities (Table 15). One acclimation evaluation experiment was conducted at Minthorn in 1990. Fish ranged in size from 8.8 to 16.2/lb..

The estimated total survival rate (through age-7) from the 1985 subyearling fall release (1984 brood year) was 0.67% (Table 15). Survival rate to the Umatilla River was 0.006% (Appendix O). Recovery data for the 1990 acclimation evaluation releases are incomplete. Preliminary survival rates for the acclimated and non-acclimated groups are 0.07 and 0.04%, respectively. Survival rates to the Umatilla River are 0.01 and 0.001%.

Total exploitation of the subyearling fall releases (1984 and 1989 brood years) is 91.9%. Individual exploitation rates for ocean commercial and Columbia River gillnet catches are 43.7 and 52.9%, respectively. Sport and treaty exploitation rates are 2.6 and 0.8%.

Survivals (through age-7 fish) of the 1984, 1985 and 1986 subyearling spring releases (1983 through 1985 brood years) and the 1985 subyearling fall release (1984 brood year) were 0.79, 0.87, 0.51 and 0.67%, respectively (Table 15). In comparison, survival of the same brood years released as yearlings in 1985, 1986 and 1987, were 0.80, 3.17 and 2.29%,

respectively. Although the survival rates of the 1983 brood subyearling and yearling releases are similar, data from the 1984 and 1985 brood and preliminary data from subsequent brood years suggest that yearlings survive at a higher rate than either spring or fall subyearling releases.

Data from early releases (1989 brood and earlier) of yearling and subyearling fall chinook salmon show that most are recovered as age-4 fish (Appendix B), similar to results from this stock released elsewhere (Howell et al. 1985). Very few age-7 adults have been recovered.

Fall Chinook - Priest Rapids and Umatilla URB Stock

Releases of Priest Rapids URB stock were made from 1987 to 1990 and a mix of Priest Rapids and Umatilla River URB stock were released in 1994 (Table 16). Fish were released as subyearlings from spring through fall. Subyearling spring releases made from 1987 through 1989 all occurred in May in the lower Umatilla River. Releases in 1990 and 1994 were made in the upper Umatilla River. Fish ranged in size from 60.4 to 82.4/lb..

The estimated total survival rates (through age-7) for the 1987, 1988 and 1989 spring releases (1986 through 1988 brood years) are 0.82, 0.07 and 0.12%, respectively (Table 16). Survival rates to the Umatilla River are 0.017, 0.008 and 0.008% (Appendix P). Releases in 1990 were not representively coded-wire tagged. Recoveries for the 1994 release include age-2 fish only and are not discussed in this report.

Total estimated exploitation of the subyearling spring releases (1986 through 1988 brood years) is 82.6%. Individual exploitation rates for ocean commercial and Columbia River gillnet catches are 53.5 and 40.0%, respectively. Sport and treaty exploitation rates are 5.7 and 0.8%.

One group of subyearling fish was acclimated at Minthorn and released in July, 1987 (Table 16). Due to low dissolved oxygen levels and pump failure (Lofy et al. 1988), very few juveniles were released and total recovery is estimated to be five adults.

Subyearling fall releases have occurred in October and November at, or near, Minthorn Acclimation Facility (Table 16). Fish ranged in size from 8.6 to 11.1/lb..

Two groups of fish (1987 brood) were released at Minthorn in November, 1988, as part of an acclimation evaluation study (Table 16). The acclimated group suffered severe losses due to *Ichthyophthirius multifiliis* (Lofy 1989). Estimated total survival rates (through age-7) for the acclimated and control groups are 0.43 and 0.51%, respectively. Survival rates to the Umatilla River are 0.01 and 0.07% (Appendix P).

A second acclimation experiment was conducted at Minthorn in October, 1989 (Table 15). Estimated total survival rates (through age-7) for the acclimated and control groups

Table 16. Liberation and survival information for fall chinook salmon (Priest Rapids URB and Umatilla River stock) released in the Umatilla River Basin (1987–1994).

Brood Year/Stock /a	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
86 P	1,476,830	60.4	Umatilla RM 9	May 87	12,039	0.82
86 P	2,000	20.0	Minthorn	July 87	5	0.25
87 P	3,316,007 /b	68.3	Umatilla RM 23	May 88	2,458	0.07
87 P	14,408	9.8	Minthorn	Nov 88	62	0.43
87 P	79,681	8.6	Nr. Minthorn	Nov 88	405	0.51
88 P	2,393,710	66.6	Umatilla RM 23	May 89	2,858	0.12
88 P	78,825	10.9	Minthorn	Oct 89	79	0.10
88 P	78,132	11.1	Nr. Minthorn	Oct 89	67	0.09
89 P	629,800 /c	82.4	Umatilla RM 70 – 79	May 90	NA	NA
93 P & U	2,865,386 /d	59.1 – 72.4	Umatilla RM 73.5	May 94	168	0.01

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/a P = Priest Rapids stock; U = Umatilla River stock

/b The number released includes 1,429,250 Bonneville URB stock subyearlings released at 93.1/lb. in June at Umatilla RM 9.

/c These fish were not coded—wire tagged. To estimate adult contribution, they were included in the Bonneville URB stock subyearling release in 1990. Both stocks were reared at Irrigon Hatchery.

/d The number released includes 22,174 non-tagged fish at 85–171/lb. released between Umatilla RM 27.3 and RM 32.5 in April and May.

were 0.10 and 0.09%, respectively. Survival rates to the Umatilla River are 0.02 and 0.01% (Appendix P). Recoveries from the 1994 release include age-2 fish only and are not discussed in this report.

Total estimated exploitation of the subyearling fall releases (1987 and 1988 brood years) is 77.4 %. Individual exploitation rates for ocean commercial and Columbia River gillnet catches are 49.9 and 33.3 %, respectively. Sport and treaty exploitation rates are 14.1 and 2.7%.

The total estimated exploitation rate of Priest Rapids URB subyearling spring releases (82.6%) is similar to the exploitation rate of Bonneville URB subyearling spring releases (83.0%).

Fall Chinook - Straying

Returning adults from juvenile URB stock fall chinook salmon releases in the Umatilla River have strayed above McNary Dam to Columbia and Snake River terminal locations (hatcheries, fish traps and spawning grounds). It is believed that straying is partially the result of low attraction flow at the mouth of the Umatilla River during the adult return season and, in the case of subyearling spring releases made from 1982 through 1989, lack of imprinting because they were released in the lower river (below RM 23).

Stray levels appear to be affected by age at release. When comparing estimated adult recoveries from the Umatilla River with recoveries above McNary Dam, the data indicate that releases of subyearlings have resulted in higher levels of adult straying than releases of yearling fish. Adult recoveries above McNary Dam have been the highest from subyearling spring releases (Bonneville and Priest Rapids URB stock) made from 1984 through 1992. An estimated 84.3% of the terminal recoveries from those releases have been from terminal locations above McNary Dam (Table 17). Adult recoveries above McNary Dam from subyearling fall releases (Bonneville and Priest Rapids URB stock) made from 1985 through 1990 has averaged 59.0%. Adult recoveries above McNary Dam from yearling releases (Bonneville URB stock) made from 1983 through 1993 have been the lowest and has averaged 38.5%.

Release location (upper versus lower river) also appears to affect stray levels. Prior to 1990, all subyearling spring releases were made in the lower Umatilla River. An estimated 7.0% of the terminal recoveries from those releases have been from the Umatilla River (Table 17). In comparison, Umatilla recoveries from the 1990 through 1993 subyearling spring releases made in the upper Umatilla River are 45.9%. This would suggest that releases made into the upper Umatilla River increase homing.

An estimated 65.0% of all adult strays recovered above McNary Dam from Umatilla River juvenile fall chinook releases made from 1983 through 1994, have been recovered from Columbia River terminal locations (Table 17). An estimated 35.0% have been recovered from Snake River terminal locations.

Beginning in 1990, all releases of fall chinook salmon juveniles have been in the upper Umatilla River (RM 56 to RM 79) and all future releases will be in the upper river. Fall chinook salmon from Umatilla River broodstock were included from 1992 through 1994. Permanent adult fall chinook broodstock holding and spawning facilities, capable of meeting full Umatilla River production goals, are scheduled for completion at Three Mile Dam on the Umatilla River in 1996. All fall chinook juvenile releases in the Umatilla River will eventually be progeny of Umatilla River broodstock. Additional acclimation facilities are proposed for the Umatilla River basin and will be used to acclimate juvenile fall chinook salmon prior to release. The Umatilla Basin Project will help provide better attraction and fish passage flows in the Umatilla River. Phase I of the project is currently in operation and exchanges Columbia River water for water which is currently being taken directly from the

Table 17. Straying of adult fall chinook salmon from juvenile releases in the Umatilla River (1982-1994). /1

Brood Year	Number Released	Date of Release	Size at Release	Release Location	Estimated Adult Survival															
					Washington															
					Umatilla River		Washington /2		Lyons Ferry Hatchery		Snake River /3		Priest Rapids /4		Hanford Reach		Wells Dam Hatchery		Yakima River	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<u>Subyearling spring releases (Tule stock)</u>																				
81	978,336	Apr 82	79.0	Uma. RM 1.5 & 51.5	0	0.0	0	0.0												
81	<u>2,828,635</u>	Apr 82	92.0	Umatilla RM 1.5	<u>0</u>	<u>0.0</u>	<u>111</u>	<u>100.0</u>	<u>83</u>	<u>75</u>			<u>28</u>	<u>25</u>						
	3,807,171				0	0.0	111	100.0	83	75			28	25						
<u>Subyearling spring releases (Bonneville URB stock)</u>																				
83	966,250	June 84	85.1	Umatilla RM 1.5	0	0.0	1,648	100.0	133	8			60	4	1,458	88				
84	3,223,172	June 85	92.3	Umatilla RM 1.5	47	2.0	2,260	98.0	125	6			62	3	2,073	92				
85	2,029,602	June 86	88.0	Umatilla RM 1.5	0	0.0	2,116	100.0	417	20			138	6	1,562	74				
89	2,425,681	May-Jun 90	87.5	Umatilla RM 70 & 79	412	31.4	900	68.6	92	10	458	51			214	24			137	15
90	3,101,676	May 91	81.8	Umatilla RM 70 & 79	789	48.1	922	53.9	70	8	658	71	97	11	61	7			35	4
90	79,872	May 91	80.5	Minthorn	22	48.9	23	51.1	2	9	20	87							1	4
90	74,865	May 91	88.0	Nr. Minthorn	17	41.5	24	58.5	1	4	15	63	5	21	1	4			2	8
91	<u>2,681,013</u>	May 92	85.2-70.8	Umatilla RM 42.5	<u>26</u>	<u>100.0</u>	<u>0</u>	<u>0.0</u>												
	14,581,831				1,313	14.3	7,893	85.7	840	11	1,151	15	360	5	5,367	68			175	2
<u>Subyearling spring releases (Bonneville URB and Umatilla River stock)</u>																				
92	2,659,566	May 93	82.7	Umatilla RM 73.5	399	81.6	90	18.4	54	60	18	20	18	20						
<u>Subyearling spring releases (Priest Rapids URB stock)</u>																				
86	1,476,830	May 87	80.4	Umatilla RM 1.5	244	14.7	1,415	85.3	622	44	97	7	342	24	317	22	12	1	24	2
88	2,000	July 87	20.0	Minthorn	0	0.0	1	100.0	1	100										
87	1,888,757	May 88	88.3	Umatilla RM 23	143	48.9	182	53.1	67	41	67	41	19	12					10	6
88	<u>2,393,710</u>	May 89	88.6	Umatilla RM 23	<u>166</u>	<u>23.0</u>	<u>621</u>	<u>77.0</u>	<u>140</u>	<u>23</u>	<u>279</u>	<u>45</u>	<u>124</u>	<u>20</u>					<u>78</u>	<u>13</u>
	5,759,297				573	20.7	2,199	79.3	830	38	443	20	485	22	317	14	12	1	112	5
<u>Subyearling fall releases (Bonneville URB stock)</u>																				
84	51,000	Oct 85	18.2	Bonifer	3	15.0	17	85.0	17	100										
89	71,663	Oct 90	9.2	Minthorn	5	71.4	2	28.6			1	50							1	50
89	<u>79,846</u>	Oct 90	8.8	Nr. Minthorn	<u>1</u>	<u>20.0</u>	<u>4</u>	<u>80.0</u>			<u>4</u>	<u>100</u>								
	199,509				9	28.1	23	71.9	17	74	5	29							1	4

Revised: 4-29-95

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Table 17. (cont.)

Brood Year	Number Released	Date of Release	Size at Release	Release Location	Estimated Adult Survival											
					Washington											
					Umatilla River		Washington/2		Lyons Ferry Hatchery		Snake River /3		Priest Rapids /4		Hanford Reach	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<u>Subyearling fall releases (Priest Rapids URB stock)</u>																
87	14,408	Nov 88	9.8	Minthorn	2	3.4	57	98.6	10	18	38	67	10	18		
87	78,681	Nov 88	8.6	Nr. Minthorn	53	67.1	28	32.9	8	31	13	50	1	4		
88	78,825	Oct 89	10.9	Minthorn	16	59.3	11	40.7	4	38	7	64				
88	78,132	Oct 89	11.1	Nr. Minthorn	9	45.0	11	55.0	3	27	7	64	1	9		
	251,048				80	43.2	105	58.8	25	24	65	62	12	11		
<u>Yearling spring releases (Bonneville URB stock)</u>																
81	100,564	April 83	5.9	Bonifer & Meacham Cr.	0	0.0	2	100.0	2	100						
82	228,412	April 84	8.6	Bonifer & Meacham Cr.	0	0.0	7	100.0	7	100						
83	198,162	Mar 85	7.8	Uma. RM 87 & Bonifer	2	3.6	54	98.4	54	100						
84	208,815	Mar 86	5.0	Bonifer & Minthorn	129	35.1	239	64.9	105	44			2	1	131	55
85	109,143	Mar 87	8.1	Minthorn	220	65.3	117	34.7	18	15	2	2	4	3	92	79
85	102,383	Mar 87	8.6	Bonifer	128	63.7	73	36.3	67	92	6	8				
86	100,791	Mar 88	8.8	Minthorn	291	77.8	83	22.2	20	24	39	47			24	29
86	99,550	Mar 88	10.2	Bonifer	218	81.2	50	18.8	13	28	36	72	1	2		
89	220,440	Mar 82	7.7	Uma. RM 58-70	5	100.0	0	0.0								
91	134,837	Mar 83	9.1	Uma. RM 73.5	14	82.4	3	17.6	3	100						
92	233,629	Mar 84	10.4	Uma. RM 73.5	59	85.5	10	14.5	10	100						
92	49,824	April 84	8.5	Uma. RM 73.5	4	68.7	2	33.3							2	100
	1,784,530				1,068	62.5	640	37.5	299	47	83	13	7	1	249	39

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/1 Subjacks are not included.

/2 Estimated Washington recoveries above McNary Dam.

/3 Estimated recoveries from Snake and Tucannon River spawning ground surveys and fish traps.

/4 Estimated recoveries from Priest Rapids spawning channel and fish trap.

Umatilla River for irrigation and provides flow from three Mile Dam to the mouth of the river during the adult return season. Phase II, scheduled for completion in 1997, will be an exchange of Columbia River water for natural stream flow and McKay Reservoir storage water and will increase flow in the lower Umatilla River (below McKay Creek confluence) during the adult return and juvenile outmigration seasons.

Spring Chinook

Beginning in 1988, spring chinook from Carson stock have been released in the Umatilla River as yearlings and subyearlings in the spring and fall. Juveniles from Umatilla River broodstock were also released in the fall of 1991.

Yearling releases have been made in the mainstem Umatilla River from RM 23 to RM 89 and in Meacham Creek at RM 2 (Table 18). In addition, a small number have been released at Three Mile Dam as part of ODFW passage evaluation studies. Releases have occurred from March through May and fish have ranged in size from 8.3 to 20.5/lb..

The estimated total survival rates (through age-6) from yearling releases made in 1988, 1989, 1990 and 1991 (1986 through 1989 brood years) are 0.78, 0.31, 0.61 and 0.21%, respectively (Table 18). Survival rates to the Umatilla River are 0.64, 0.25, 0.46 and 0.18% (Appendix Q). Recovery data for the 1992 and 1993 releases are incomplete. Preliminary survival rates are 0.018 and 0.077%, respectively. Survival rates to the Umatilla River are 0.015 and 0.071%. An estimated 80.8% of all recoveries are from the Umatilla River, 16.9% are from Columbia River fisheries, and 2.3% are from terminal areas outside the Umatilla River. Recoveries for the 1994 release are not discussed in this report.

An acclimation evaluation study was conducted with yearlings every year from 1988 through 1992 (Table 18). All test groups were acclimated at Bonifer, while all control groups were released in Meacham Creek (adjacent to Bonifer), or in the Umatilla River.

The 1988 and 1989 studies encountered several problems (Lofy 1989 and Lofy et al. 1990) which essentially eliminates any possible evaluation of acclimation. The 1990 study shows that the estimated survival rate of the acclimated group is lower than the survival rate of the non-acclimated group (0.54 versus 0.68%) (Table 18 and Figure 16). Umatilla River recoveries from the acclimated group are also lower than from the control group (0.41 versus 0.50%) (Appendix Q and Figure 17). The 1991 study shows that the estimated survival rate of the acclimated group (0.24%) is higher than the survival rate of the non-acclimated group (0.18%) (Figure 16). Umatilla River recoveries from the acclimated group are also higher than from the non-acclimated group (0.21 versus 0.16%) (Figure 17). The estimated survival rates (preliminary data) for the acclimated and non-acclimated groups released in 1992 are similar (0.027 and 0.025%, respectively) (Figure 16). Survival rates to the Umatilla River are 0.025 and 0.018% (Figure 17).

Table 18. Liberation and survival information for spring chinook salmon released in the Umatilla River Basin.

Brood Year	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
86	99,895 /a	20.6	Umatilla RM 23	Apr 88	NA	NA
86	106,231	10.1	Bonifer	Mar-Apr 88	1,006	0.95
86	191,146 /b	8.6	Umatilla RM 23 & Nr. Bonifer	Apr 88	1,311	0.69
87	1,196	21.4	Bonifer	Nov 88	2	0.17
87	75,767	11.1	Umatilla RM 89	Nov 88	65	0.09
87	79,984	10.6	Bonifer	Mar-May 89	227	0.28
87	80,932	10.6	Nr. Bonifer	Mar 89	270	0.33
88	80,750	12.0	Bonifer	Oct 89	77	0.10
88	83,853	12.0	Nr. Bonifer	Oct 89	63	0.08
88	99,775 /a	18.6	Umatilla RM 23	Apr 90	NA	NA
88	114,345	9.0	Bonifer	Mar 90	613	0.54
88	117,427	9.6	Nr. Bonifer	Mar 90	793	0.68
89	80,438	11.5	Bonifer	Oct 90	5	0.01
89	77,998	13.4	Nr. Bonifer	Oct 90	4	0.01
89	100,506	10.1	Bonifer	Mar 91	237	0.24
89	96,151	11.8	Nr. Bonifer	Mar 91	171	0.18
89	96,733	20.3	Umatilla RM 3 & 89	Apr-May 91	NA/c	NA/c
90	81,145	16.5	Bonifer	Nov 91	64	0.08
90	78,480	16.8	Nr. Bonifer	Nov 91	39	0.05
90	96,254	18.7	Umatilla RM 3 & 89	Apr-May 92	0	0.00
90	109,101	9.2	Bonifer	Apr 92	30	0.03
90	98,929	8.5	Mouth of Meacham Cr.	Apr 92	25	0.03
91	955,752	35.4	Umatilla RM 80	May 92	0	0.00
91	294,458 /a	32.5	Umatilla RM 80	May 92	NA	NA
91	132,929	11.5	Umatilla RM 80	Nov 92	66	0.05
91	101,416	19.4	Umatilla RM 80	Nov 92	0	0.00
91	186,948	14.5	Umatilla RM 80	Mar 93	308	0.16
91	208,782	8.3	Umatilla RM 80	Mar 93	69	0.03
91	96,086	20.3	Uma. RM 3, 27, 3 & 89	Apr 93	0	0.00
92	667,367	27.6	Umatilla RM 80	June 93	0	0.00
92	460,809	19.9	Umatilla RM 80	Nov 93	1	0.00

Revised: 4/16/96

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Table 18. (cont.)

Brood Year	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
92	205,143	8.4	Umatilla RM 80	Mar 94	0	0.00
92	152,854	11.5	Umatilla RM 73.5	Mar 94	34	0.02
92	261,138 /d	12.3	Umatilla RM 80	Mar 94	32	0.01

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/a None of these fish were coded—wire tagged.

/b The number released includes 89,268 non—tagged fish at 10.3/lb. released in the upper Umatilla River in April, 1988.

/c The same coded—wire tag code was released both in the Wind River (Washington) and Umatilla River. This eliminates any possible evaluation of survival from Umatilla River releases.

/d The number released includes 8,890 non—tagged fish at 8.1–8.3/lb. released at Umatilla RM 3 and 29.2 in March and April, 1994.

Fall releases have been made in the mainstem Umatilla River (RM 80 and 89) and in Meacham Creek at RM 2 (Table 18). Releases have occurred in October and November and fish have ranged in size from 8.7 to 21.4/lb..

The estimated total survival rates (through age-6) from the 1988, 1989 and 1990 fall releases (1987 through 1989 brood years) are 0.087, 0.085 and 0.006%, respectively (Table 18). Survival rates to the Umatilla River are 0.083, 0.062 and 0.004% (Appendix Q). Recovery data for the 1991 and 1992 releases are incomplete. Preliminary survival rates are 0.06 and 0.028%, respectively. Survival rates to the Umatilla River are 0.06 and 0.026%. An estimated 87.8% of all recoveries are from the Umatilla River, 8.8% are from Columbia River fisheries, and 3.4% are from terminal areas outside the Umatilla River. Recoveries from the 1993 and 1994 releases are not discussed in this report.

Acclimation evaluation studies were conducted with fall releases every year from 1988 through 1991 (Table 18). All test groups were acclimated at Bonifer, while all control groups were released in Meacham Creek (adjacent to Bonifer), or in the Umatilla River.

The 1988 study encountered disease problems (Lofy 1989) which essentially eliminates any possible evaluation of acclimation. The 1989 study shows that the estimated survival rates of the acclimated and non-acclimated groups were similar (0.10 and 0.08%, respectively) (Table 18 and Figure 16). Umatilla River recoveries from both groups were also similar (0.07 and 0.05%) (Appendix Q and Figure 17). Survival rates of the 1990 study were poor and only an estimated nine adults were recovered from both groups. The 1991 study shows that the estimated survival rate (preliminary data) of the acclimated group (0.08%) is slightly higher than the survival rate of the non-acclimated group (0.05%). All recoveries from this release have been from the Umatilla River.

Spring releases of subyearlings have been made in 1992, 1993 and 1994. All releases have occurred at RM 80 in May and June and fish have ranged in size from 27.6 to 35.9/lb. No recoveries have yet been reported.

Figure 16. Estimated Columbia River Basin recoveries of adult spring chinook salmon from releases of acclimated and non-acclimated juveniles in the Umatilla River (1987-1990 brood years).

Figure 17. Estimated Umatilla River recoveries of adult spring chinook salmon from releases of acclimated and non-acclimated juveniles in the Umatilla River (1987-1990 brood years).

Comparison of fall releases and yearling releases from the 1987 through 1989 broods shows that the survival rates of the yearling releases were higher. The survival rates were 3.5 to 36.5 times higher for yearlings and averaged 7.3 times higher. Recovery data for the 1990 and 1991 broods are incomplete. Preliminary survival rates for the 1990 brood are higher for the fall releases than the yearling releases (0.07 versus 0.02%). However, the yearling releases were outmigrating during extreme flood conditions which may have had a negative impact on juvenile survival. Preliminary survival rates for the 1991 brood are higher for the yearling releases (0.07 versus 0.02%).

Results from spring chinook acclimation studies are inconclusive. The estimated survival rate of the acclimated group released in the spring of 1990 was lower than the survival rate of the control group. However, survival rates of the acclimated groups released in the fall of 1989 through 1991 and spring of 1991 and 1992 were similar to or higher than the survival rates of the control groups.

Coho

Coho salmon from Tanner Creek stock have been released in the Umatilla River every year beginning in 1987 (Table 19). Juveniles from Umatilla River broodstock were also released in 1995. All fish have been released as yearlings in the mainstem Umatilla River from RM 9 to RM 70. Releases have occurred in March and April and fish have ranged in size from 11.2 to 19.1/lb..

The estimated total survival rates of releases made from 1987 through 1994 have ranged from 0.16 to 4.49% (Table 19). Survival rates to the Umatilla River have ranged from 0.04 to 0.99% (Appendix R). Recovery data for the 1995 release are incomplete and is not discussed in this report.

Total exploitation of coho (1985 through 1988 brood) is 83.4%. Individual exploitation rates for ocean commercial and Columbia River gillnet catches are 33.6 and 23.6%, respectively. Sport and treaty exploitation rates are 41.7 and 1.1%. Total exploitation of coho (1989 through 1992 brood) is 58.1%. Individual exploitation rates for ocean commercial and Columbia River gillnet catches are 3.4 and 60.5%, respectively. Sport and treaty exploitation rates are 33.8 and 2.3%.

Acclimation evaluation studies were conducted from 1989 through 1991 (Table 19). Test groups were acclimated at Minthorn, while control groups were released at Minthorn and in the Umatilla from RM 56 to RM 70.

The 1989 study shows that the estimated survival rate of the acclimated group was nearly twice that of the control group (1.06 versus 0.57%) (Table 19 and Figure 18). Umatilla River recoveries from the acclimated group (0.14%) were twice that of the control group (0.07%) (Appendix R and Figure 19). Three groups of coho were released as part of the 1990 study (Table 19). One group was acclimated for 21 days and released in March,

Table 19. Liberation and survival information for coho salmon released in the Umatilla River Basin. /a

Brood Year	Number of Juveniles Released	Size at Release	Release Location	Date of Release	Number of Adults Recovered	% Survival
85	948,549 /b	13.5	Minthorn	Apr 87	15,936	1.68
86	996,433	15.7–17.3	Uma Rm 9–23	Mar–Apr 88	44,725	4.49
87	157,299	18.2	Minthorn	Mar 89	1,674	1.06
87	829,607 /c	17.2	Nr. Minthorn	Mar 89	4,690	0.57
88	67,309	13.5	Minthorn	Mar 90	2,069	3.07
88	856,524 /d	13.3	Nr. Minthorn	Mar 90	26,606	3.11
88	65,095	11.2	Minthorn	Apr 90	2,630	4.04
89	152,974	15.4	Minthorn	Mar 91	305	0.20
89	802,655	16.5–17.1	Uma Rm 56–70	Mar 91	1,302	0.16
90	961,386	15.5–15.7	Uma Rm 56–60	Mar 92	7,833	0.81
91	892,678	17.6	Uma Rm 42.5–60	Apr 93	1,851	0.21
92	884,105	17.6	Uma Rm 42.5–60	Apr 94	2,078	0.24
93	999,554 /e	14.6	Uma Rm 42.5–60	Mar–Apr 95	38	0.00

Revised: 4/16/96

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/a Survival data for the 1993 brood includes age–2 fish only (1995 returns).

/b The number released includes 786,660 non–tagged fish at 14.0/lb. released at Umatilla RM 23 in April

/c The number released includes 753,637 non–tagged fish at 15.3 to 19.7/lb. released at Umatilla RM 56 and 70 in March.

/d The number released includes 594,527 non–tagged fish at 14.8/lb. released at Umatilla RM 70 in March and April and 202,315 non–tagged fish at 14.5/lb. released at Umatilla RM 23 in March.

/e The number released does not include 191,854 non–tagged fish at 13.9/lb. released at Umatilla RM 60 in April or 322,858 non–tagged fish at 20.3/lb. released at Umatilla RM 42.5 in February and March. The coded–wire tagged fish were reared at Cascade Hatchery, while the non–tagged fish were reared at Sandy Hatchery and Lower Herman Creek Ponds, respectively.

while a control group was released concurrently. A third group was given the opportunity to release volitionally (Rowan 1991). Few fish volitionally migrated from the pond and they were force released in April after being held for 36 days. Estimated survival rates for the test and control groups released concurrently were similar (3.07 and 3.11%, respectively) (Table 19 and Figure 18). Umatilla River recoveries were also similar for both groups (0.29

Figure 18. Estimated ocean and Columbia River Basin recoveries of adult coho salmon from releases of acclimated and non-acclimated juveniles in the Umatilla River (1987-1989 brood years).

Figure 19. Estimated Umatilla River recoveries of adult coho salmon from releases of acclimated and non-acclimated juveniles in the Umatilla River (1987-1989 brood years).

and 0.27%) (Appendix R and Figure 19). Total survival of the volitional release group was much higher (4.04%) (Figure 18). Umatilla River recoveries were also higher (0.35%) (Figure 19). However, it is difficult to know whether the increase in survival of the volitional group was a result of increased acclimation time, later release time, or larger size at release. The size of the volitional group (11.2/lb.) was larger than the size of the acclimated and control groups (13.5 and 13.3/lb., respectively). The estimated survival rates of both groups in the 1991 study were low. The estimated survival rate of the acclimated group (0.20%) was higher than the survival rate of the control group (0.16%) (Table 19 and Figure 18). Conversely, Umatilla River recoveries from the acclimated group (0.02%) were lower than recoveries from the control group (0.04%) (Appendix R and Figure 19).

Survival rates from the coho acclimation studies suggest that acclimation may provide a benefit in both total survival and Umatilla River escapement. However, other factors such as time and size at release may be more important than acclimation in increasing survival. Additional survival benefits from acclimation may be dependent upon releasing juveniles at the proper time and size. For example, the additional increase in survival realized from acclimation may be higher for coho released in April at 10/lb. than for fish released in March at 20/lb.

Subobjective 4.2: Juvenile Outmigration Monitoring

Task 4.2.1 and 4.2.2: Outmigration Data Collection and Analysis

In 1995, high spring flows allowed the Westland Canal juvenile facility to operate in the bypass mode until June 7. Trapping began on June 8 and continued until the close of the trap on July 19 (Table 20). An estimated 1,560 pounds of fish were hauled, indicating the majority of the hatchery released juveniles migrated downstream prior to the trap being opened.

A total of 4,185 fish were sampled from June 8 to July 19, 1995 (Appendix S). An estimated 76.2% were from subyearling fall chinook hatchery releases. Only one yearling chinook and three summer steelhead from hatchery releases were observed. Twenty-three unmarked coho and 870 unmarked chinook were also sampled. A small number of these could have been unmarked fish from hatchery releases, however, based on size, fin condition and coloration, most were thought to be naturally produced. Based on size variation, it appears that both subyearling and yearling naturally produced chinook and coho were present in the samples. Five hatchery rainbow trout "legals" (*O. mykiss*), one whitefish (*Prosopium williamsoni*) and 93 non-game and warm water species were also sampled.

Table 20. Estimated number of fish captured at the Westland Canal fish trapping facility in 1995. /a

Date	All Species /lb			Salmonids								Non-game & Warm Water Species
				Marked			Unmarked					
	Lbs.	No./lb.	Number	Fall Chinook (SY)	Chinook (Y)	STS (Y)	Coho (SY)	Coho (Y)	Chinook	Rainbow Trout	Whitefish	
08-Jun	70	61.0	4273	4110	0	11	0	0	130	0	0	22
09-Jun	139	59.5	8266	7833	0	0	0	35	298	0	0	0
10-Jun												
11-Jun	185											
12-Jun	210	70.9	14895	14101	0	0	0	0	794	0	0	0
13-Jun	90											
14-Jun	50	47.3	2364	2083	0	7	0	0	216	29	0	29
15-Jun	85											
16-Jun	92	52.4	4817	4319	0	0	0	0	462	0	0	36
17-Jun												
18-Jun												
19-Jun	196	49.1	2261	2044	0	0	0	13	204	0	0	0
20-Jun	60											
21-Jun	92	44.8	4120	3419	0	0	12	0	582	0	0	107
22-Jun	50											
23-Jun	30	30.7	919	625	0	0	8	4	230	0	0	52
24-Jun												
25-Jun												
26-Jun	30	53.0	1589	690	0	3	10	14	852	3	0	17
27-Jun	20											
28-Jun	6	45.8	274	98	0	0	0	2	163	0	0	11
29-Jun												
30-Jun	15	51.3	768	179	0	0	4	8	557	0	0	20
01-Jul												
02-Jul												
03-Jul	23											
04-Jul												
05-Jul	23	48.3	1111	368	0	0	0	22	662	0	0	59
06-Jul												
07-Jul	11											
08-Jul												
09-Jul												
10-Jul	48	10.4	480	97	5	0	0	5	261	0	5	107
11-Jul												
12-Jul	3											
13-Jul												
14-Jul	3	37.5	112	89	0	0	0	0	0	0	0	23
15-Jul												
16-Jul												
17-Jul	20											
18-Jul												
19-Jul	11											
Total	1560		46249	40155	5	21	34	103	5411	32	5	483

Revised: 8/7/95

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/a Y = yearling; SY = subyearling

Fish were hauled on 25 days but sampled on only 14 days.

Fish totals are only for the days the fish were sampled.

/b Includes non-game and warmwater game fish.

Objective 5: Information Dissemination

Task 5.1: Annual Report

Data and information associated with the operation, maintenance and evaluation of Minthorn, Bonifer, Imeques C-mem-ini-kem and Thornhollow Acclimation Facilities were compiled and summarized. This annual report was written and submitted to BPA for dissemination.

Objective 6: Umatilla Satellite Facilities Planning

Task 6.1: Umatilla Satellite Facilities Review

Meetings with CTUIR, BPA, ODFW and engineering and architectural firms were held to discuss designs for planned construction of other Umatilla Hatchery satellite facilities. These include three acclimation facilities located near Mission, ODFW and Barnhart on the Umatilla River and two adult holding and spawning facilities located at Three Mile Dam (presently under construction) and on the South Fork Walla Walla River. Review and comments were provided. In addition, follow ups with engineers were performed as necessary during construction of Thornhollow and Three Mile Dam facilities.

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Appendix A. Liberation and survival information for summer steelhead released in the Umatilla River.

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recovered	Age at Recovery	Oregon			Other
				Number	%			Col. R. Net /1	Sport /2	Umatilla River	
87	073859	9829	10187	24	0.24	89	2	6		18	
				32	0.33	90	3	6		26	
			Totals	56	0.57						
87	073860	9721	10075	34	0.35	89	2	14		20	
				45	0.46	90	3	20		25	
			Totals	79	0.81						
87	073861	9925	10287	37	0.37	89	2	10		27	
				32	0.32	90	3	10	2	20	
			Totals	69	0.70						
87	073856	9689	21940	36	0.37	89	2		10	26	
				36	0.37	90	3	11		23	2/3
			Totals	72	0.74						
87	073857	9455	21409	32	0.34	89	2	7		25	
				13	0.14	90	3			13	
				3	0.03	91	4			2	1/4
			Totals	48	0.51						
87	073858	9448	21392	9	0.10	89	2			9	
				21	0.22	90	3		2	19	
			Totals	30	0.32						
88	074720	8784	17372	0	0.00	90	2				
				5	0.06	91	3		3	2	
			Totals	5	0.06						
88	074723	8789	17382	0	0.00	90	2				
				2	0.02	91	3			2	
			Totals	2	0.02						
88	074724	8784	17372	0	0.00	90	2				
				3	0.03	91	3			3	
			Totals	3	0.03						
88	074715	8800	9873	1	0.01	90	2			1	
				6	0.07	91	3			6	
			Totals	7	0.08						
88	074717	8791	9864	1	0.01	90	2			1	
				9	0.10	91	3			9	
			Totals	10	0.11						
88	074718	8778	9849	0	0.00	90	2				
				1	0.01	91	3			1	
			Totals	1	0.01						
89	075212	9331	20240	57	0.61	91	2	5	9	43	
				24	0.26	92	3	5		19	
			Totals	81	0.87						

Revised: 4-1-96

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Appendix A (cont.)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recovered	Age at Recovery	Oregon			Other
				Number	%			Col. R. Net /1	Sport /2	Umatilla River	
89	075213	9133	19811	63	0.69	91	2	5	2	56	
				28	0.31	92	3	2		26	
			Totals	91	1.00						
89	075214	9080	19696	45	0.50	91	2	7	6	32	
				38	0.42	92	3	15		23	
			Totals	83	0.91						
89	075215	9511	9830	67	0.70	91	2	9	5	53	
				27	0.28	92	3	9	2	16	
			Totals	94	0.99						
89	075216	9525	9845	62	0.65	91	2	5	2	55	
				39	0.41	92	3	14	2	23	
				1	0.01	93	4			1	
			Totals	102	1.07						
89	075217	9454	9771	56	0.59	91	2		25	31	
				26	0.28	92	3	14		12	
			Totals	82	0.87						
90	075340	9835	14221	34	0.35	92	2	7	7	20	
				47	0.48	93	3	7	9	31	
				6	0.06	94	4			6	
			Totals	87	0.88						
90	075341	9819	14198	32	0.33	92	2	2	4	26	
				40	0.41	93	3	15	3	22	
				1	0.01	94	4			1	
			Totals	73	0.74						
90	075342	9814	14191	47	0.48	92	2	4	7	36	
				48	0.49	93	3	13	6	29	
			Totals	95	0.97						
90	075343	9432	11084	46	0.49	92	2	10	4	32	
				37	0.39	93	3	6	2	29	
			Totals	83	0.88						
90	075344	9467	11125	30	0.32	92	2	3	1	26	
				36	0.38	93	3	5	5	26	
				1	0.01	94	4			1	
			Totals	67	0.71						
90	075345	9458	11114	43	0.45	92	2	14		29	
				42	0.44	93	3	7	2	33	
			Totals	85	0.90						
91	075838	10562	24283	1	0.01	93	2			1	
				0	0.00	94	3				
			Totals	1	0.01						
91	075839	10275	24492	0	0.00	93	2				
				0	0.00	94	3				
			Totals	0	0.00						

Appendix A (cont.)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recovered	Age at Recovery	Oregon			
				Number	%			Col. R. Net /1	Sport /2	Umatilla River	Other
91	075840	10105	24087	0	0.00	93	2				
				1	0.01	94	3			1	
			Totals	1	0.01						
91	075841	10108	22262	0	0.00	93	2				
				2	0.02	94	3	2			
			Totals	2	0.02						
91	075842	9498	21365	0	0.00	93	2				
				0	0.00	94	3				
			Totals	0	0.00						
91	075843	9747	20923	0	0.00	93	2				
				4	0.04	94	3	4			
			Totals	4	0.04						
91	074127	10203	22059	5	0.05	93	2			5	
				21	0.21	94	3			21	
			Totals	26	0.25						
91	073862	10594	22902	2	0.02	93	2			2	
				12	0.11	94	3	6		6	
			Totals	14	0.13						
91	073759	10394	22474	15	0.14	93	2	6		9	
				8	0.08	94	3	4	2	2	
			Totals	23	0.22						
92	076058	10194	15115	40	0.39	94	2	5	3	32	
92	076059	9792	14922	23	0.23	94	2		2	21	
92	076060	9440	14787	49	0.52	94	2		5	44	
92	076055	10031	16016	40	0.40	94	2			39	1 /3
92	076056	9418	15940	29	0.31	94	2	1		28	
92	076057	9643	16023	37	0.38	94	2		3	34	
92	076052	13117	23862	1	0.01	94	2			1	
92	076053	11410	21644	0	0.00	94	2				
92	076054	9907	19959	1	0.01	94	2			1	

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/1 Bonneville, Dalles and John Day Pools.

/2 Columbia River and fresh water sport.

/3 ODFO Net & Seine

/4 Dworshak National Fish Hatchery.

Appendix B. Liberation and survival information for fall chinook salmon released in the Umatilla River. /1

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon									
				No.	%			Ocean			Freshwater						
								Com	Trawl	Spt	Col. R. Gillnet	Test Net. Fishery	Spt	Hatch	Trap	Treaty Subsis	Spawn Ground
81	050851	46707	306279	19	0.04	83	2			2	10						
				178	0.38	84	3	10			69						2
				20	0.04	85	4				16						
			Totals	217	0.46												
81	051057	102331	672057	52	0.05	83	2				8						
				480	0.45	84	3	27	1		161		3				9
				50	0.05	85	4				39		1				
				6	0.01	86	5				5						
			Totals	588	0.56												
81	072663	102386	2828835	39	0.04	83	2				2						
				357	0.35	84	3	14			120		3				7
				63	0.06	85	4			2	52			1			
				9	0.01	86	5							Spn.			
			Totals	468	0.46												
81	072741	99570	100564	7	0.01	83	2				4			3			
				16	0.02	84	3				11			Spn.			1
				104	0.10	85	4	2		2	27	1		1	1	Spn. Ladder	
				40	0.04	86	5				27			Spn.	1	Spn. Ladder	
			Totals	167	0.17												
82	072829	96448	228412	12	0.01	85	3	3									
				54	0.06	86	4	3			15						
				5	0.01	87	5										
				4	0.00	88	6				4						
			Totals	75	0.08												
83	073124	210441	966250	2	0.00	84	1										2
				82	0.04	85	2				16						
				501	0.24	86	3	18			205						
				873	0.41	87	4	3			419	1	3		1	Spn. Ladder	
				195	0.09	88	5				115		4				
				1	0.00	89	6										
			Totals	1654	0.79												
83	073127	88306	198162	28	0.03	85	2				13						
				116	0.13	86	3	5			27				1		
				484	0.55	87	4	51		6	185		6		1	Spn. Ladder	
				82	0.09	88	5	4			31						
				0	0.00	89	6										
			Totals	710	0.80												
84	073326	206756	3223172	34	0.02	86	2				13				2		
				358	0.17	87	3	11			128						
				853	0.41	88	4	9			509		7				
				537	0.26	89	5	6			239		3		1		
				25	0.01	90	6				9						
			Totals	1807	0.87												
84	073162	30838	51000	18	0.06	87	3				4						
				83	0.27	88	4				38						
				98	0.32	89	5	8			56				2		
				8	0.03	90	6				8						
			Totals	207	0.67												

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Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean Net & Seine	Alaska Ocean	FWS Freshwater		NMFS Marine	
		Ocean				Freshwater										
		Com.	Spt.	Net & Seine	Treaty Troll	Spt.	Hatch.	Trap	Spawn Ground				Com.	Spt.		Hatch.
050851	83			7												
	84	8			4	3				77	3	4				
	85									4						
051057	83			32	2					6		4		SCNRH		
	84	24		17	2		12			197		4		1		2
	85			6						4						
	86													1		
														NE Bypass		
072663	83			21	1					7		8		SCNRH		
	84	14		11		5	6	2		170	4			1		
	85	2						2		4						
	86			6					3							
072741	83															
	84															
	85				20			2		32		4	2			
	86									11			1			
072829	85			7							2					
	86	4		2				1		19		4	6			
	87							2		3						
	88															
073124	84															
	85					5	8		44				5			2
	86	4		6			8		86	155	5	4	9	1		
	87			2			18	1	187	142	6		88			
	88	2					6			28	3		38	1		
	89						1									
073127	85							15								
	86	5		4		7				37	19	4	2			5
	87	6		23		2	8	17		165			12			2
	88					6		7		23	2					
	89															
073326	86										14					5
	87	3				22	2		21	5	6	4	26	1		2
	88	21			2	7	5		43		5	7	79	2	LWSH	
	89	7				8	5		69		5		125		1	
	90										13		3			
073162	87									9	4			1		
	88				2		3			30		4	6			
	89						7			20	2		3			
	90															

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Appendix B. (cont.)

Appendix B (Cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon									
				No.	%			Ocean			Freshwater			Treaty Subsis	Spawn Ground		
								Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt			Hatch	Trap
84	073327	88396	206815	123	0.14	86	2				29				70		
				331	0.37	87	3	4		13	93		5				
				1556	1.76	88	4	38		4	476	1	17		32		
				712	0.81	89	5	2		4	336				13	9	
				81	0.09	90	6				34				1		
				1	0.00	91	7										
			Totals	2804	3.17												
85	073833	20636	197432	2	0.01	87	2										
				50	0.24	88	3				17						
				59	0.29	89	4				34						
				22	0.11	90	5										
				21	0.10	91	6										
			Totals	154	0.75												
85	073834	21335	198153	16	0.07	88	3						9				
				45	0.21	89	4				20						
				18	0.08	90	5				10						
				0	0.00	91	6										
			Totals	79	0.37												
85	073835	20690	197488	4	0.02	87	2			4							
				8	0.04	88	3	4									
				24	0.12	89	4				15						
				37	0.18	90	5				14						
				4	0.02	91	6										
			Totals	77	0.37												
85	073836	20170	196952	26	0.13	88	3	2			7		3				
				60	0.30	89	4				29						
				13	0.06	90	5				13						
				3	0.01	91	6				3						
			Totals	102	0.51												
85	073837	20982	197788	5	0.02	87	2										
				34	0.16	88	3				7						
				35	0.17	89	4				7						
				32	0.15	90	5				22						
				1	0.00	91	6										
			Totals	107	0.51												
85	073838	20815	208103	2	0.01	87	2										
				13	0.06	88	3				6						
				40	0.19	89	4				18						
				25	0.12	90	5				13						
				1	0.00	91	6										
			Totals	81	0.39												
85	073839	21659	208958	5	0.02	87	2				4						
				22	0.10	88	3	4			15						
				60	0.28	89	4				40						
				29	0.13	90	5				24						
				3	0.01	91	6										
			Totals	119	0.55												
85	073840	20269	207550	5	0.02	87	2										
				15	0.07	88	3				4						
				68	0.34	89	4	1			25						
				25	0.12	90	5				13						
				0	0.00	91	6										
			Totals	113	0.56												

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Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean		Canada Ocean Net & Seine			Alaska Ocean		FWS Freshwater		NMFS Marine
		Ocean				Freshwater				Com.	Spt.	Com.	Seine	Spt.	Com.	Spt.	Hatch.	Trap	
		Com.	Spt.	Seine	Troll	Spt.	Hatch.	Trap	Spawn Ground										
073327	86						3	6				5	9		1				14
	87		22	2	10	18	8				25	68	38	9	2				
	88	89	28	1	69	24	17		21		680	1	8	49	1				
	89	12	9			14	20		35		196	4	6	49					
	90										11		4	31					
	91						1												
073833	87														2				
	88				2		1		21		4	5							
	89						3				17				5				
	90						2				15				5				
	91								21										
073834	88						1				2		4						
	89				1						22				2				
	90										6				2				
	91																		
073835	87																		
	88						4												
	89						3				4				2				
	90		8				2				3				10				
	91										4								
073836	88										12				2				
	89						4		17		3	2			5				
	90																		
	91																		
073837	87												5						
	88						1		21		5								
	89						3		17		8								
	90						1				3				6				
	91						1												
073838	87												2						
	88					5	2												
	89						3				4				15				
	90						1				11				1				
	91																		
073839	87						1												
	88										3								
	89						3		1 from Cd Rset @ P.R.		11				5				
	90					1	1				4								
	91										3								
073840	87						1						4						
	88						2				8								
	89						5				36				2				
	90						2								10				
	91																		

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Appendix B. (cont.)

								Oregon									
Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Ocean			Freshwater						
				No.	%			Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch	Trap	Treaty Subs	Spawn Ground
85	073841	20895	208184	37	0.18	88	3				12						
				44	0.21	89	4				19						
				46	0.22	90	5				8						
				0	0.00	91	6										
				Totals	127	0.61											
85	073842	21694	208994	17	0.08	88	3	4			13						
				45	0.21	89	4				31						
				34	0.16	90	5				17						
				0	0.00	91	6										
				Totals	96	0.44											
85	073823	10103	22216	4	0.04	87	2				4						
				24	0.24	88	3			4				4			
				113	1.12	89	4	2			43				9	2	
				71	0.70	90	5				36				4	3	
				12	0.12	91	6				3				3	1	
Totals	224	2.22															
85	073824	10243	22523	4	0.04	87	2				3			1			
				27	0.26	88	3					4	1	4			
				122	1.19	89	4	5		2	55			3		2	
				58	0.57	90	5				23			1	1	4	
				1	0.01	91	6						1	1			
Totals	212	2.07															
85	073825	9917	21807	5	0.05	87	2				3			1			
				23	0.23	88	3				7			1	8		
				102	1.03	89	4	9			30				8	4	
				85	0.86	90	5				45				4	3	
				4	0.04	91	6										
1	0.01	92	7														
Totals	220	2.22															
85	073826	9496	20881	4	0.04	87	2				3			1			
				26	0.27	88	3				9			1			
				92	0.97	89	4	1			31		3	1	5		
				92	0.97	90	5				28				7		
				7	0.07	91	6				3				2		
4	0.04	92	7				4										
Totals	225	2.37															
85	073827	9876	21716	8	0.08	87	2				8						
				12	0.12	88	3			2					7		
				107	1.06	89	4			1	36				8		
				43	0.44	90	5	3			11				3		
				44	0.45	91	6				2						
Totals	214	2.17															
85	073828	10253	20786	15	0.15	88	3				4				1		
				111	1.08	89	4	10		1	35		3		2		
				100	0.98	90	5				45		15		2		
				7	0.07	91	6									3	
				Totals	233	2.27											
85	073829	9970	20212	26	0.26	88	3				7			4	1		
				117	1.17	89	4	6			27		10		1		
				75	0.75	90	5				35				2		
				8	0.08	91	6				5					4	
				Totals	226	2.27											

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Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean			Alaska Ocean		FWS Freshwater		NMFS Marine
		Ocean Net & Seine		Treaty Troll	Freshwater			Spawn Ground	Com.		Seine	Spt.	Com.	Spt.	Hatch.	Trap		
		Com.	Spt.		Spt.	Hatch.	Trap											
073841	88		1			2		21			1							
	89					3		17			3			2				
	90				4			26			3			5				
	91																	
073842	88																	
	89				1		5				7			1				
	90										9			8				
	91																	
073823	87																	
	88		3			1						5	4	1	2			
	89	2			2	1					39	4	7	6	1			
	90				3						8			10				
	91										4				1			
073824	87																	
	88					10					6	2		1				
	89	5	4		3	5	1				24			13				
	90						1				19			9				
	91																	
073825	87																1	
	88					2												
	89	2	8		1		1				31	2	4	7	1			
	90						1				22			10				
	91										4							
	92						1											
073826	87																	
	88		2			5								2				
	89	5				5	1				31	3	4	1				
	90					43					9			10				
	91												4					
	92																	
073827	87																	
	88																1	
	89	2	6		7	5	1				31	2	4	10				
	90						1				13			5				
	91								1								42	
073828	88		3								2	4			1			
	89				1	9					40	5		2	1			
	90	2					2				20	4		7				
	91										3			4				
073829	88		2														1	
	89																	
	90	7				4	2				48	3	8	12			N Bona Byrnes	
	91				1		5				9			18	1			
								2			1							

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Appendix B. (cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon									
				No.	%			Ocean			Freshwater				Treaty Subsis	Spawn Ground	
								Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch			Trap
85	073830	10135	20546	9	0.09	87	2										
				29	0.29	88	3				4					3	
				130	1.28	89	4				62			1		3	
				95	0.94	90	5				25		16	Scn.		3	2
				14	0.14	91	6				10						Includes 1 Creel
			Totals	277	2.73												
85	073831	10053	20381	27	0.27	88	3				7					7	
				109	1.08	89	4	2			33					8	2
				82	0.82	90	5				40					1	3
				4	0.04	91	6				4						
			Totals	222	2.21												
85	073832	10081	20438	6	0.06	87	2				4						
				16	0.16	88	3						3			1	
				109	1.08	89	4	3			55					7	2
				93	0.92	90	5				35						3
				23	0.23	91	6				14			1		2	
			Totals	247	2.45									Scn.			
86	073912	40793	497572	10	0.02	88	2				3					3	
				88	0.22	89	3				39						2
				166	0.41	90	4	7			71						1
				27	0.07	91	5				10						Creel
				0	0.00	92	6										
			Totals	291	0.71												
86	073913	41096	501266	17	0.04	88	2				4						
				108	0.26	89	3			2	42	1				1	
				201	0.49	90	4				88					3	
				34	0.08	91	5				6						
				0	0.00	92	6										
			Totals	360	0.88												
86	073914	39187	477992	16	0.04	88	2				4					7	
				96	0.24	89	3	5		2	24		6			3	
				194	0.50	90	4				69						
				30	0.08	91	5				8						
				0	0.00	92	6										
			Totals	336	0.86												
86	073915	643	670	0	0.00	90	4										
				0	0.00	91	5										
				0	0.00	92	6										
			Totals	0	0.00												
86	073916	645	672	0	0.00	90	4										
				0	0.00	91	5										
				0	0.00	92	6										
			Totals	0	0.00												
86	074035	632	658	5	0.79	89	3				4						
				0	0.00	90	4										
				0	0.00	91	5										
				0	0.00	92	6										
			Totals	5	0.79												
86	074038	42068	52317	279	0.66	88	2				3		18			258	
				150	0.36	89	3	5		4	40					37	
				764	1.82	90	4	25		6	223		8			46	6
				179	0.43	91	5	2			45		9			31	1
				26	0.06	92	6				4					3	
			Totals	1398	3.32												

Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean Net & Seine			Alaska Ocean		FWS Freshwater		NMFS Marine	
		Ocean				Freshwater					Com.	Seine	Spt.	Com.	Spt.	Hatch.	Trap		
		Com.	Spt.	Net & Seine	Trawl	Spt.	Hatch.	Trap	Spawn Ground										
073830	87					3						6	6						
	88											6	6	6		4			
	89	5	2			15	4					28		4		6			
	90						4					18				27			
	91						1					3							
073831	88					5							8						
	89	7	5			1	5					31		6		8	1		
	90						7					21				10			
	91																		
073832	87																		2
	88		5		7														
	89					4	1					19	2	10		6			
	90						2					23	6			24			
	91							1				4				1			
	92																		
073912	88						1						3			2			
	89		2		1		17		1			24				33			
	90		4			3	8		1			38							
	91						3	2				8	3			1			
	92																		
073913	88						2						3	4		4			
	89		1		1	6	9					30	6			8	1		
	90	2					9		27			47	3			22			
	91	2					2	1				3		4		16			
	92																		
073914	88						2						3						
	89				5		13			5		32				1			
	90				2	11	13		1			51	2			44	1		
	91						1	3				11				7			
	92																		
073915	90																		
	91																		
	92																		
073916	90																		
	91																		
	92																		
074035	89						1												
	90																		
	91																		
074038	88																		2
	89		5	6	9	6						3	25	4		4			2
	90	23	20		20	10	6					301	6			61	1		2
	91						3	11				41		4		24			
	92	1							7										
									19										

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Appendix B. (cont.)

								Oregon									
Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Ocean			Freshwater					Treaty Subsis	Spawn Ground
				No.	%			Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch	Trap		
86	074039	39978	48474	237	0.61	88	2						2		233		
				119	0.31	89	3				7				53		
				701	1.80	90	4	27		5	230		3		34	5	
				154	0.40	91	5				39		9	1	15	2	
				9	0.02	92	6							None	1		
			Totals	1220	3.13												
88	074038	39509	50480	175	0.44	88	2								174		
				147	0.37	89	3			7	29				44	Includes 1 Chetco	
				505	1.28	90	4	13		2	132		22		21	4	
				120	0.30	91	5			2	40				13		
				5	0.01	92	6								1		
			Totals	952	2.41												
88	074037	38405	49070	188	0.44	88	2				3				185		
				110	0.29	89	3			12	26				34		
				527	1.37	90	4	27		5	145				30	4	
				181	0.50	91	5				77		19		18	1	
				5	0.01	92	6										
			Totals	1001	2.61												
87	075007	198285	3316007	20	0.01	89	2								10		
				44	0.02	90	3				13				1		
				67	0.03	91	4				23				4		
				16	0.01	92	5										
				0	0.00	93	6										
			Totals	147	0.07												
87	074539	4438	4823	1	0.02	90	3										
				17	0.38	91	4				5				1		
				1	0.02	92	5										
				0	0.00	93	6										
			Totals	19	0.43												
87	074540	4289	4660	2	0.05	90	3								1		
				5	0.12	91	4				2						
				3	0.07	92	5				2						
				0	0.00	93	6										
			Totals	10	0.23												
87	074541	4533	4925	10	0.22	90	3				3						
				14	0.31	91	4										
				4	0.09	92	5				4						
				0	0.00	93	6										
			Totals	28	0.62												
87	074538	24658	26858	2	0.01	89	2								2		
				18	0.06	90	3				5				4		
				67	0.27	91	4				22			1	6		
				12	0.05	92	5				7				1		
				0	0.00	93	6										
			Totals	97	0.39												
87	074537	23403	25493	3	0.01	89	2								1		
				33	0.14	90	3				2				8		
				89	0.38	91	4	3			26				6		
				19	0.08	92	5				2				1		
				0	0.00	93	6										
			Totals	144	0.62												

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Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean		Canada Ocean Net & Seine			Alaska Ocean		FWS Freshwater		NMFS Marine
		Ocean				Freshwater				Com.	Spt.	Com.	Seine	Spt.	Com.	Spt.	Hatch.	Trap	
		Com.	Spt.	Net & Seine	Trawl	Spt.	Hatch.	Trap	Spawn Ground										
074039	88							2											2
	89			2	2	11		1				6	26	4	5				
	90	14	21		23	16		5				224	11		83				
	91	2	2					1	7	7	2	37		7	23				
	92											6			2				
074038	88							1											2
	89		23		6	5							22	6	2	1			
	90	15	27		6	6		4			4	201	3		45				
	91								9			40			16				
	92								1			3							
074037	88																		
	89		4		1	12		1				4	15		1				
	90	4	22		9	1		6			4	210	3	5	52				
	91	2	5						10	7		29	4		19				
	92								1			4							
075007	89							4					6						
	90		2					1				16	3		8				
	91							2	4			17			17				
	92							2	3	1		7			3				
	93																		
074539	90												1						
	91							1	1			9							
	92								1										
	93																		
074540	90				1														
	91											3							
	92								1										
	93																		
074541	90							1				6			2				
	91								1			11							
	92																		
	93																		
074536	89																		
	90							3	2						1	1			
	91					2			4			14		12	6				
	92											3			1				
	93																		
074537	89												2						
	90		9		1			1		2		4	6						
	91		3					1	3			24			22				
	92							1	1			7			7				
	93																		

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Appendix B. (cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon									
								Ocean			Freshwater					Treaty Subsis	Spawn Ground
				No.	%			Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch	Trap		
87	074538	25089	27330	2	0.01	89	2									2	
				32	0.13	90	3	15			2					4	
				69	0.28	91	4			1	18	1	2			11	
				26	0.10	92	5				8					3	
				3	0.01	93	6				2						
			Totals	132	0.53												
88	074758	26790	27071	0	0.00	90	2									1	
				1	0.00	91	3										
				13	0.05	92	4				6					2	
				12	0.04	93	5									1	
				1	0.00	94	6										
			Totals	27	0.10												
88	074760	24285	25428	0	0.00	90	2										
				1	0.00	91	3										
				18	0.07	92	4				4					1	
				4	0.02	93	5										
				0	0.00	94	6										
			Totals	23	0.09												
88	074763	25350	25633	0	0.00	90	2									2	
				3	0.01	91	3									2	
				13	0.05	92	4				3						
				0	0.00	93	5										
				0	0.00	94	6										
			Totals	16	0.06												
88	074753	26358	26770	2	0.01	90	2									1	
				7	0.03	91	3			3							
				14	0.05	92	4	2			5						
				9	0.03	93	5				6					1	
				1	0.00	94	6										
			Totals	33	0.13												
88	074754	25028	26617	6	0.02	90	2									6	
				10	0.04	91	3				4					1	
				5	0.02	92	4				2						
				5	0.02	93	5				2						
				0	0.00	94	6										
			Totals	26	0.10												
88	074757	25438	25438	2	0.01	90	2									2	
				4	0.02	91	3				2					2	
				12	0.05	92	4				2						3
				1	0.00	93	5										
				0	0.00	94	6										
			Totals	19	0.07												
88	074646	52228	797904	4	0.01	90	2									2	
				12	0.02	91	3				7					3	
				48	0.09	92	4				11					1	
				2	0.00	93	5									1	
				0	0.00	94	6										
			Totals	64	0.12												
88	074647	49771	797903	8	0.02	90	2				3					1	
				9	0.02	91	3									2	
				34	0.07	92	4									1	
				11	0.02	93	5				4						
				0	0.00	94	6				6						
			Totals	82	0.12												

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Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean		Canada Ocean Net & Seine			Alaska Ocean		FWS Freshwater		NMFS Marine
		Ocean				Freshwater				Com.	Spt.	Com.	Seine	Spt.	Com.	Spt.	Hatch.	Trap	
		Com.	Spt.	Seine	Troll	Spt.	Hatch.	Trap	Spawn Ground										
074538	89																		
	90		6		3		2												
	91				3	7	1	1	2			15			7				
	92					8						5			2				
	93								1										
074758	90																		
	91						1	2				3		4	1				
	92							3				3							
	93																		
	94																		
074760	90						1												
	91						1	1				10							
	92				2										3				
	93																		
	94																		
074763	90						1												
	91							1				6			1				
	92																		
	93																		
	94																		
074753	90												2						
	91																		
	92							2				5			3				
	93																		
	94																		
074754	90						1							4					
	91																		
	92				2		1	1											
	93						1	2											
	94																		
074757	90																		
	91						1	2					4						
	92																		
	93						1												
	94																		
074646	90						1						1						
	91						1	1											
	92						3	2	1			12			16				
	93							1											
	94																		
074647	90																		
	91						3	3	1			3	1	3					
	92						3	3	3			11	2		7				
	93						3		2										
	94																		

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Appendix B. (cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon												
				No.	%			Ocean			Freshwater				Treaty Subs	Spawn Ground				
								Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch			Trap			
88	074648	52244	797903	5	0.01	90	2													
				14	0.03	91	3					7								
				30	0.06	92	4					2								
				9	0.02	93	5					2						1		
				0	0.00	94	6													
			Totals	58	0.11															
88	075403	52612	1018502	8	0.02	91	2					3							5	
				24	0.05	92	3					2							1	
				59	0.11	93	4					13							5	
				14	0.03	94	5					3								
			Totals	105	0.20															
88	075404	53160	1018493	12	0.02	91	2					6							3	
				18	0.03	92	3					2								
				67	0.13	93	4					24		4						
				18	0.03	94	5					6							3	
				1	0.00	95	6													
			Totals	116	0.22															
88	075405	53248	1018486	8	0.02	91	2												7	
				10	0.02	92	3					3								
				41	0.08	93	4					6							2	
				11	0.02	94	5					4							1	
			Totals	70	0.13															
88	075325	23396	25311	4	0.02	91	2													
				1	0.00	92	3													
				2	0.01	93	4													
				0	0.00	94	5					2								
			Totals	7	0.03															
88	075326	21929	23724	2	0.01	91	2													
				10	0.05	92	3												1	
				11	0.05	93	4													
				1	0.00	94	5					10							1	
			Totals	24	0.11															
88	075327	21101	22828	2	0.01	91	2												2	
				4	0.02	92	3					3								
				7	0.03	93	4					4							1	
				1	0.00	94	5												1	
			Totals	14	0.07															
88	075322	23413	25472	0	0.00	91	2													
				2	0.01	92	3													
				7	0.03	93	4					3								
				2	0.01	94	5					2								
			Totals	11	0.05															
88	075323	23617	25694	0	0.00	91	2													
				1	0.00	92	3													
				0	0.00	93	4													
				0	0.00	94	5													
			Totals	1	0.00															
88	075324	23420	25480	0	0.00	91	2													
				2	0.01	92	3					2								
				10	0.04	93	4												1	
				0	0.00	94	5													
				3	0.01	95	6													
			Totals	15	0.06															

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Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean Net & Seine	Alaska Ocean	FWS Freshwater	NMFS Marine	
		Ocean				Freshwater									
		Com.	Spt.	Net & Seine	Treaty Troll	Spt.	Hatch.	Trap	Spawn Ground						
074548	90						1	1			3				
	91						3	3	1						
	92						2	3	2		13		8		
	93							2			4				
	94														
075403	91														
	92						1	3			13		4		
	93						2	10	16		13				
	94								1		8		4		
075404	91										3				
	92				2		1	4	2		7				
	93				2	4	2	4	1		17	3	6		
	94							2				1	2		
	95							1							
075405	91							1							
	92		4					3							
	93							4	1		18		6		
	94										3		3		
075325	91											4			
	92														
	93														
	94														
075326	91											2			
	92										3		6		
	93							1							
	94														
075327	91														
	92							1							
	93		2												
	94														
075322	91														
	92							2							
	93							1			3				
	94														
075323	91														
	92							1							
	93														
	94														
075324	91														
	92														
	93										5	4			
	94														
	95										3				

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Appendix B. (cont.)

Appendix B (Cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon											
				No.	%			Ocean			Freshwater						Treaty Subsis	Spawn Ground	
								Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch	Trap				
90	075225	52252	1347858	1	0.00	92	2												
				5	0.01	93	3											1	
				29	0.06	94	4				5							12	
				20	0.04	95	5				6							4	
			Totals	55	0.11														
90	075228	51728	1347587	0	0.00	92	2												
				6	0.01	93	3											2	
				34	0.07	94	4				3							3	
				15	0.03	95	5				2							3	
			Totals	55	0.11														
90	075328	48266	100983	3	0.01	92	2											3	
				29	0.06	93	3				8							3	
				103	0.21	94	4				8							7	54
				18	0.04	95	5	3										4	
			Totals	153	0.32														
90	075449	48481	100300	7	0.01	92	2								3			2	
				15	0.03	93	3											1	
				44	0.09	94	4				11							12	
				19	0.04	95	5				6							4	
			Totals	85	0.18														
90	070018	48301	99561	1	0.00	92	2												
				17	0.04	93	3				10							1	
				45	0.09	94	4				9							6	
				24	0.05	95	5				2							4	
			Totals	87	0.18														
90	075450	51814	52503	2	0.00	92	2											1	
				16	0.03	93	3				2			2				2	
				72	0.14	94	4				11							17	
				30	0.06	95	5				2			3				6	
			Totals	120	0.23														
90	075451	52444	52884	8	0.02	92	2											2	
				27	0.05	93	3				5							3	
				60	0.11	94	4				17							7	
				21	0.04	95	5				2							2	
			Totals	116	0.22														
90	075583	26173	26481	0	0.00	92	2												
				5	0.02	93	3											3	
				23	0.09	94	4				8							2	
				6	0.02	95	5											2	
			Totals	34	0.13														
90	075601	24762	26585	1	0.00	92	2												
				11	0.04	93	3				7							1	
				27	0.11	94	4				2							1	
				18	0.07	95	5				4							3	
			Totals	57	0.23														
90	075602	25476	26606	2	0.01	92	2											1	
				16	0.06	93	3		4					3				3	
				29	0.11	94	4				6					1		4	
				10	0.04	95	5						1					2	
			Totals	57	0.22														

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Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean			Alaska Ocean		FWS Freshwater		NMFS Marine
		Ocean		Treaty Troll	Freshwater			Spawn Ground	Com.		Spt.	Com.	Spt.	Com.	Spt.	Hatch.	Trap	
		Com.	Spt.		Net & Seine	Spt.	Hatch.											
075225	92							1										
	93							1						3				
	94					1		2						6				
	95							2						8				
075226	92																	
	93							4										
	94							3		13				11				
	95						1	4		3				2				
075328	92																	
	93							1		6				11				
	94							12		6				14				
	95							1		3				5				
075449	92							1										
	93							1										
	94					1		5		9				4				
	95							3		3				2				
070016	92							1										
	93		3					1						2				
	94					1		3		11				6		1		
	95							1		8				6				
075450	92																	
	93		1					2		5				1				
	94							1		23				10		1		
	95							2		10		1		2				
075451	92											3						
	93							3										
	94		4					1		9			4	1				
	95							2		19		1		11				
								3		3				11				
075563	92																	
	93							2										
	94							2		8		1		2				
	95							2						2				
075601	92							1										
	93							1										
	94							4		11				2				
	95							1		9				1				
075602	92																	
	93							1										
	94							1		11		1		4				
	95							3		4								

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Appendix B. (cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon											
				No.	%			Ocean			Freshwater				Treaty Subsels	Spawn Ground			
								Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch			Trap		
90	075560	25720	25862	7	0.03	92	2					6							
				8	0.02	93	3											1	
				18	0.07	94	4					1						4	
				14	0.05	95	5					5							
			Totals	45	0.17														
90	075561	25425	25708	1	0.00	92	2												
				17	0.07	93	3					6						2	
				15	0.08	94	4					8						1	
				7	0.03	95	5					4						1	
			Totals	40	0.16														
90	075562	22309	23295	3	0.01	92	2												
				8	0.04	93	3					3						2	
				24	0.11	94	4					2						4	
				5	0.02	95	5											2	
			Totals	40	0.18														
90	075618	26178	97801	0	0.00	93	3												
				5	0.02	94	4												
				0	0.00	95	5												
			Totals	5	0.02														
90	075619	26160	122639	0	0.00	93	3												
				1	0.00	94	4											1	
				4	0.02	95	5							4					
			Totals	5	0.02														
91	071480	23863	68492	3	0.01	93	2											3	
				1	0.00	94	3											1	
				3	0.01	95	4												
			Totals	7	0.03														
91	071461	23239	66345	3	0.01	93	2											3	
				9	0.04	94	3											4	
				0	0.00	95	4												
			Totals	12	0.05														
91	071429	31892	286864	1	0.00	94	3											1	
				0	0.00	95	4												
				1	0.00														
91	071430	32287	281630	0	0.00	94	3												
				0	0.00	95	4												
				0	0.00														
91	071431	28951	183113	0	0.00	94	3												
				0	0.00	95	4												
				0	0.00														
91	071432	29425	191448	0	0.00	94	3												
				0	0.00	95	4												
				0	0.00														
91	071433	29066	304181	0	0.00	94	3												
				0	0.00	95	4												
				0	0.00														
91	071434	31224	307108	0	0.00	94	3												
				0	0.00	95	4												
				0	0.00														

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Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean Net & Seine	Alaska Ocean	FWS Freshwater		NMFS Marine		
		Ocean				Freshwater							Com.	Spt.		Hatch.	Trap
		Com.	Spt.	Net & Seine	Treaty Troll	Spt.	Hatch.	Trap	Spawn Ground								
075560	92							1									
	93							1					3				
	94						1	5				7					
	95							1	1				4	2	1		
075561	92														1		
	93											9					
	94						2					4			2		
	95							2									
075562	92				2				1								
	93							3							4		
	94							3				8			3		
	95																
075618	93											5					
	94																
	95																
075619	93																
	94																
	95																
071460	93																
	94																
	95											3					
071461	93																
	94						1							4			
	95																
071429	94																
	95																
071430	94																
	95																
071431	94																
	95																
071432	94																
	95																
071433	94																
	95																
071434	94																
	95																

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Appendix B. (cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon									
				No.	%			Ocean			Freshwater				Treaty Subs	Spawn Ground	
								Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch - Trap			
91	071435	30326	297627	0	0.00	94	3										
				0	0.00	95	4										
				0	0.00												
91	071438	30365	302857	0	0.00	94	3										
				1	0.00	95	4							1			
				1	0.00												
91	071437	30508	224053	1	0.00	94	3										
				0	0.00	95	4							1			
				1	0.00												
91	071438	30924	302132	0	0.00	94	3										
				0	0.00	95	4										
				0	0.00												
92	070125	29360	275571	6	0.02	94	2									2	
				10	0.03	95	3								4		
				16	0.05												
92	076329	30706	206030	1	0.00	94	2				1						
				5	0.02	95	3							2			
				6	0.02												
92	076330	28964	296200	3	0.01	94	2										
				2	0.01	95	3				2				2		
				5	0.02												
92	076331	28537	285309	2	0.01	94	2									1	
				5	0.02	95	3				2				3		
				7	0.02												
92	076332	29451	281068	4	0.01	94	2									4	
				3	0.01	95	3								2		
				7	0.02												
92	076333	29718	276750	2	0.01	94	2				1						
				5	0.02	95	3								2		
				7	0.02												
92	076334	29958	285360	2	0.01	94	2									2	
				3	0.01	95	3								3		
				5	0.02												
92	076335	30462	209908	2	0.01	94	2									2	
				11	0.04	95	3								7		
				13	0.04												
92	070127	27092	272376	0	0.00	94	2										
				9	0.03	95	3								3		
				9	0.03												
92	070126	28594	271026	0	0.00	94	2										
				6	0.02	95	3								6		
				6	0.02												
92	070252	23470	49624	15	0.06	94	2									15	
				3	0.01	95	3								2		
				18	0.08												

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Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean			Alaska Ocean	FWS Freshwater		NMFS Marine		
		Ocean				Freshwater					Com.	Seine	Spt.		Com.	Spt.		Hatch.	Trap
		Com.	Spt.	Net & Seine	Troll	Spt.	Hatch.	Trap	Spawn Ground										
071435	94 95																		
071436	94 95																		
071437	94 95																		
071438	94 95																		
070125	94 95								1			4 5							
076329	94 95						1		1				1						
076330	94 95								1										
076331	94 95								1										
076332	94 95								1										
076333	94 95						1 1		1 1										
076334	94 95																		
076335	94 95											4							
070127	94 95						6												
070128	94 95																		
070252	94 95								1										

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Appendix B. (cont.)

Appendix B (cont.)

Br. Yr.	CWT Code	CWT Rel.	Total Rel.	Estimated Recoveries		Year Rec.	Age	Oregon										
				No.	%			Ocean			Freshwater						Treaty Subsis	Spawn Ground
								Com	Trawl	Spt	Col. R. Gillnet	Test Net Fishery	Spt	Hatch	Trap			
92	070255	23699	233629	34 17	0.14 0.07	94 95	2 3											33 8
				51	0.22													
93	070683	31182	325385	2	0.01	95	2											2
93	070719	31658	330256	4	0.01	95	2											3
93	070720	30528	316971	2	0.01	95	2											2
93	070723	30447	328954	2	0.01	95	2											1
93	070722	30950	306213	2	0.01	95	2											1
93	070721	28474	308492	0	0.00	95	2											
93	070682	31239	282230	0	0.00	95	2											
93	070718	31040	282149	2	0.01	95	2											2
93	070716	30502	182813	2	0.01	95	2											
93	070717	32481	191924	2	0.01	95	2											2
93	070658	24865	111817	47	0.19	95	2											47
93	070659	24374	115271	27	0.11	95	2											27

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/1 Adult returns from the 1989 to 1993 brood years are incomplete.

Appendix B. (cont.)

Appendix B. (cont.)

CWT Code	Year Rec.	Washington								Calif. Ocean	Canada Ocean Net & Seine			Alaska Ocean		FWS Freshwater		NMFS Marine
		Ocean				Freshwater					Com.	Seine	Spt.	Com.	Spt.	Hatch.	Trap	
		Com.	Spt.	Net & Seine	Troll	Spt.	Hatch.	Trap	Spawn Ground									
070255	94							1										
	95												4					
070683	95																	
070719	95																	
070720	95																	
070723	95																	
070722	95							1										
070721	95																	
070662	95																	
070718	95																	
070716	95												2					
070717	95																	
070658	95																	
070659	95																	

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Appendix C. Liberation and survival information for spring chinook salmon released in the Umatilla River.

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/ Spawn Ground	Col. R Sport	Col. R Gillnet
86	074325	26640	35946	3	0.011	88	2	2		
				8	0.030	89	3	Boon.		
				177	0.664	90	4		1	2
				65	0.244	91	5			2
			Totals	253	0.950					
86	074326	25863	35148	0	0.000	88	2			
				4	0.015	89	3			
				173	0.669	90	4		26	3
				67	0.259	91	5		13	6
			Totals	244	0.943					
86	074327	25853	35137	0	0.000	88	2			
				4	0.015	89	3			
				166	0.642	90	4		7	
				74	0.286	91	5		1	
			Totals	244	0.944					
86	074328	26319	64142	1	0.004	88	2	1		
				6	0.023	89	3	Boon.		
				125	0.475	90	4	2		
				40	0.152	91	5	1 Boon. 1 LG		
			Totals	172	0.654					
86	074329	25722	62991	2	0.008	88	2	2		
				4	0.016	89	3	Boon.		
				80	0.311	90	4	2		
				38	0.148	91	5	1 LG	1	4
			Totals	124	0.482			1 Hole Canyon Dam trap		
86	074330	26252	64013	0	0.000	88	2			
				0	0.000	89	3			
				169	0.644	90	4		1	
				72	0.274	91	5		12	
			Totals	241	0.918					
87	074420	410	416	0	0.000	89	2			
				0	0.000	90	3			
				0	0.000	91	4			
			Totals	0	0.000					
87	074423	393	399	0	0.000	89	2			
				0	0.000	90	3			
				1	0.254	91	4			
			Totals	1	0.254					
87	074424	376	381	0	0.000	89	2			
				0	0.000	90	3			
				1	0.266	91	4			
			Totals	1	0.266					

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Appendix C (cont)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
074325	88							1	
	89							Cowlitz	
	90		11	15	148				
	91		6	2	55				
074326	88								
	89			4					
	90		12	15	114	3	Freshwater		
	91	1	8	10	29		42001 R67		
074327	88								
	89			4					
	90	1	17	9	125			7	
	91		6	8	59			Tucannon	
074328	88								
	89			6					
	90	1	11	9	102				
	91	1	6	12	21				
074329	88								
	89			4					
	90		15	16	46			1	
	91	1	9	10	13			IDFG Hatch. 4F-1706030503000.00	
074330	88								
	89								
	90	2	11	17	137			1	
	91	1	11	14	34			IDFG Hatch. 4F-1706020106901.25	
074420	89								
	90								
	91								
074423	89								
	90								
	91			1					
074424	89								
	90								
	91			1					

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Appendix C (cont)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/ Spawn Ground	Col. R Sport	Col. R Gillnet
87	074427	25987	26109	0	0.000	89	2			
				0	0.000	90	3			
				15	0.058	91	4			
			Totals	15	0.058					
87	074429	24070	24183	0	0.000	89	2			
				2	0.008	90	3			
				21	0.087	91	4			
				5	0.021	92	5			
			Totals	28	0.116					
87	074430	25356	25475	0	0.000	89	2			
				0	0.000	90	3			
				21	0.083	91	4			
				1	0.004	92	5			
			Totals	22	0.087					
87	074433	25427	26135	0	0.000	89	2			
				5	0.020	90	3			
				85	0.334	91	4			
				0	0.000	92	5			
			Totals	90	0.354					
87	074434	27004	27756	0	0.000	89	2			
				2	0.007	90	3			
				57	0.211	91	4			
				8	0.030	92	5			
			Totals	67	0.248					
87	074436	25386	26093	0	0.000	89	2			
				3	0.012	90	3			
				54	0.213	91	4			
				8	0.032	92	5			
			Totals	65	0.256					
87	074439	27585	28153	1	0.004	89	2	1		
				0	0.000	90	3	Boon.		
				76	0.276	91	4			
				12	0.044	92	5			
			Totals	89	0.323				10	
87	074440	27550	28116	0	0.000	89	2			
				3	0.011	90	3			
				84	0.305	91	4			
				5	0.018	92	5			
			Totals	92	0.334					
87	074443	24165	24663	2	0.008	89	2	2		
				2	0.008	90	3	Boon.		
				74	0.306	91	4			
				7	0.029	92	5			
			Totals	85	0.352					

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Appendix C (cont)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
074427	89								
	90								
	91			7	8				
074429	89								
	90			2					
	91		3	5	13				
	92				5				
074430	89								
	90								
	91			8	13				
	92			1					
074433	89								
	90			5					
	91		11	19	55				
	92								
074434	89								
	90			2					
	91		9	23	25				
	92			3	5				
074436	89								
	90			3					
	91	1	11	13	29				
	92		2	1	5				
074439	89								
	90								
	91	1	10	23	42				
	92		2						
074440	89								
	90			2	1				
	91	1	11	30	42				
	92		2	1		2 Ocean			
074443	89								
	90			2					
	91	2	11	19	42				
	92			2	5				

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Appendix C (cont)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/Spawn Ground	Col. R. Sport	Col. R. Gillnet
88	075063	24801	24968	1	0.004	90	2	1	Boon.	
				2	0.008	91	3	1	Boon.	
				9	0.036	92	4	1	Pekoa Dam trap	
				5	0.020	93	5			
			Totals	17	0.069					
88	075101	28109	28299	1	0.004	90	2			
				0	0.000	91	3			
				12	0.043	92	4	2	Pekoa Dam trap	
				22	0.078	93	5			
			Totals	35	0.125					
88	075102	27299	27483	1	0.004	90	2	1	Boon.	
				2	0.007	91	3			
				10	0.037	92	4			
				12	0.044	93	5			
			Totals	25	0.092					
88	075103	27137	27287	2	0.007	91	3			
				6	0.022	92	4			
				10	0.037	93	5			
			Totals	18	0.066					
88	075104	28560	28718	5	0.018	91	3			
				18	0.063	92	4			
				9	0.032	93	5			7
			Totals	32	0.112					
88	075105	27695	27848	1	0.004	91	3			
				4	0.014	92	4			
				8	0.029	93	5			
			Totals	13	0.047					
88	075106	26638	38224	3	0.011	90	2	1	Boon.	
				2	0.008	91	3			
				67	0.252	92	4			2
				58	0.218	93	5			
			Totals	130	0.488					
88	075107	26160	37538	1	0.004	91	3			
				86	0.329	92	4			
				83	0.317	93	5			10
			Totals	170	0.650					
88	075108	26888	38583	0	0.000	91	3			
				58	0.216	92	4	1		
				70	0.260	93	5	Sask R. spawn ground		16
			Totals	128	0.476					

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Appendix C (cont.)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
075063	91			1					
	92	1	2	2				3	
	93		2	1	2			Tucannon R. Spawn Ground	
075101	90							1	
	91							Dwornhak Hatch.	
	92			4	5			1	
	93			2	20			Dwornhak Hatch.	
075102	90								
	91			2					
	92		4	6					
	93			2	10				
075103	91			2					
	92			6					
	93		2		8				
075104	91			5					
	92		7	4					
	93		2	1	6				
075105	91			1					
	92			4					
	93				8				
075106	90							2	
	91			2				Dwornhak Hatch.	
	92	1	13	28	23				
	93		7	5	46				
075107	91			1					
	92		17	22	32			5	
	93		9	4	70			1 Tucannon Hatch. 1 Dwornhak Hatch. 3 Tucannon River Spawn Ground	
075108	91								
	92		7	24	9			1	
	93		9	7	54			Chewack R. gaff	

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Appendix C (cont)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/ Spawn Ground	Col. R. Sport	Col. R. Gillnet
88	075109	25611	39012	3	0.012	90	2	2		
				2	0.008	91	3	Bonn.		
				73	0.285	92	4			20
				108	0.422	93	5	1		
								LG		
			Totals	186	0.726					
88	075110	26307	40072	6	0.023	91	3			
				87	0.331	92	4			9
				105	0.399	93	5		5	
			Totals	198	0.753					
88	075111	25172	38343	2	0.008	90	2			
				3	0.012	91	3			
				54	0.215	92	4			2
				77	0.306	93	5			3
			Totals	136	0.540					
89	075114	25947	33473	0	0.000	92	3			
				59	0.227	93	4	1	5	
				5	0.019	94	5	Walla Walla		
			Totals	64	0.247					
89	075115	25921	33440	2	0.008	92	3			
				45	0.174	93	4			
				9	0.035	94	5			
			Totals	56	0.216					
89	075116	26039	33593	0	0.000	92	3			
				62	0.238	93	4			
				3	0.012	94	5			
			Totals	65	0.250					
89	075440	24365	31932	30	0.123	93	4			
				3	0.012	94	5			
				3	0.012	95	6			
			Totals	36	0.148					
89	075441	24559	32187	34	0.138	93	4			
				16	0.065	94	5		5	
			Totals	50	0.204					
89	075442	24441	32032	32	0.131	93	4			
				12	0.049	94	5			
			Totals	44	0.180					
89	074505	26670	26757	3	0.011	93	4			
				0	0.000	94	5			
			Totals	3	0.011					
89	074506	26717	26805	2	0.007	93	4			
				0	0.000	94	5			
			Totals	2	0.007					

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Appendix C (cont)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
075109	90							1	
	91			2				Dwornhak Hatch.	
	92		7	31	14			1	
	93	1	7	11	88			Chiwawa R. Spawn Ground	
075110	91			6				1 Dwornhak H.	
	92	2	22	24	27		1	1 Nason Cr. Spawn Gr.	
	93		13	10	76			2	
								1	
075111	90							Tacannon Hatch.	
	91			3				2	
	92	1	11	22	9			Dwornhak Hatch.	
	93		11	5	58			9	
075114	92							1 Kookia Hatch.	
	93		9	12	32			1 Leavenworth Hatch.	
	94			2	3			1 Dwornhak Hatch.	
								1 Wells Dam sp. ch.	
075115	92			2				3 Tuc. R. Spawn Gr.	
	93		5	14	26			1 Nason Cr. Spawn Gr.	
	94			1	8			1 Ickle Cr. Spawn Gr.	
075116	92								
	93		5	29	28				
	94				3				
075440	93			12	18				
	94				3				
	95				3				
075441	93			17	14				
	94				11				
075442	93		5	13	14				
	94			1	11				
074505	93			1	2				
	94								
074506	93				2				
	94								

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Appendix C (cont.)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/ Spawn Ground	Col. R Sport	Col. R Gillnet
89	074507	26788	26876	0	0.000	93	4			
				0	0.000	94	5			
				Totals	0	0.000				
89	074508	25876	26050	2	0.008	93	4			
				0	0.000	94	5			
				Totals	2	0.008				
89	074509	26104	26279	0	0.000	93	4			
				0	0.000	94	5			
				Totals	0	0.000				
89	074510	25497	25669	2	0.008	93	4			
				0	0.000	94	5			
				Totals	2	0.008				
89	635661	23797	96733	146	0.614	93	4			
				8	0.034	94	5			4
				Totals	154	0.647				
90	075826	26769	27040	3	0.011	93	3			
				19	0.071	94	4			
				Totals	22	0.082				
90	075827	26737	27007	4	0.015	93	3			
				12	0.045	94	4			
				Totals	16	0.060				
90	075828	26827	27098	2	0.007	93	3			
				21	0.078	94	4			
				3	0.011	95	5			
				Totals	26	0.097				
90	075829	25499	26019	0	0.000	93	3			
				12	0.047	94	4			
				Totals	12	0.047				
90	075830	25382	25900	1	0.004	93	3			
				12	0.047	94	4			
				3	0.012	95	5			
				Totals	16	0.063				
90	075831	26029	26561	1	0.004	93	3			
				10	0.038	94	4			
				Totals	11	0.042				
90	075835	26570	36351	1	0.004	93	3			
				5	0.019	94	4			
				Totals	6	0.023				

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Appendix C (cont.)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
074507	93 94								
074508	93 94		2						
074509	93 94								
074510	93 94				2				
635661	93 94	1	16	6	14 2	94		15' 2	
075826	93 94			3 2	17				
075827	93 94			3 1	1 11				
075828	93 94 95			1 4	1 17 3				
075829	93 94			1	11				
075830	93 94 95			1 4	8 3				
075831	93 94			1 2	8				
075835	93 94		2		1 3				

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Appendix C (cont.)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/Spawn Ground	Col. R. Sport	Col. R. Gillnet
90	075836	26426	36154	0	0.000	93	3			
				5	0.019	94	4			
			Totals	5	0.019					
90	075837	26750	36596	0	0.000	93	3			
				6	0.022	94	4			
				5	0.019	95	5			
			Totals	11	0.041					
90	075832	25503	32994	0	0.000	93	3			
				4	0.016	94	4			
				3	0.012	95	5			
			Totals	7	0.027					
90	075833	25472	32953	1	0.004	93	3			
				9	0.035	94	4		5	
			Totals	10	0.039					
90	075834	25493	32982	2	0.008	93	3			
				1	0.004	94	4			
			Totals	3	0.012					
90	633962	31851	96254	0	0.000	94	4			
91	071443	50611	97013	0	0.000	94	3			
91	071444	48051	63585	0	0.000	94	3			
91	071445	49498	63305	0	0.000	94	3			
91	071446	50045	95456	0	0.000	94	3			
91	071447	50047	104670	0	0.000	94	3			
91	071448	51707	104929	0	0.000	94	3			
91	071449	51518	109528	0	0.000	94	3			
91	071450	51271	109997	0	0.000	94	3			
91	071451	52128	98617	0	0.000	94	3			
91	071452	51659	108652	0	0.000	94	3			
91	076042	25104	25104	0	0.000	94	3			
				15	0.060	95	4			
				15	0.060					
91	076043	24992	25075	1	0.004	94	3			
				8	0.032	95	4			
				9	0.036					
91	076044	15423	15730	0	0.000	94	3			
				5	0.032	95	4			
				5	0.032					

1
Pelkon Dam

Appendix C (cont.)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
075836	93 94			2	3				
075837	93 94 95				6 5				
075832	93 94 95	1			3 3				
075833	93 94			1 1	3				
075834	93 94			2 1					
633962	94								
071443	94								
071444	94								
071445	94								
071446	94								
071447	94								
071448	94								
071449	94								
071450	94								
071451	94								
071452	94								
076042	94 95				14				
076043	94 95		3	1	5				
076044	94 95				5				

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Appendix C (cont)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/ Spawn Ground	Col. R Sport	Col. R Gillnet
91	076045	24638	24638	1	0.004	94	3			
				8	0.032		4			
				9	0.037					
91	076046	24221	24715	1	0.004	94	3			
				19	0.078	95	4			
				20	0.083					
91	076047	17269	17667	0	0.000	94	3			
				8	0.046	95	4			
				8	0.046					
91	071542	26135	50736	0	0.000	94	3			
91	071543	25633	50680	0	0.000	94	3			
91	071455	19951	92728	1	0.005	94	3			
				38	0.190	95	4			
				39	0.195					
91	071456	20022	94220	0	0.000	94	3			
				27	0.135	95	4			
				27	0.135					
91	075739	21499	50310	0	0.000	94	3			
				0	0.000	95	4			
				0	0.000					
91	075740	20880	50109	0	0.000	94	3			
				3	0.014	95	4			
				3	0.014					
91	075741	21157	54347	0	0.000	94	3			
				16	0.076	95	4			
				16	0.076					
91	075742	20307	54016	0	0.000	94	3			
				8	0.039	95	4			
				8	0.039					
91	635950	31421	96086	0	0.000	94	3			
92	076136	52588	105290	0	0.000	95	3			
92	076135	51680	109473	0	0.000	95	3			
92	076132	52893	113852	0	0.000	95	3			
92	076137	52172	111103	0	0.000	95	3			
92	076134	51963	111333	0	0.000	95	3			
92	076133	52335	116316	0	0.000	95	3			

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Appendix C (cont)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
076045	94 95			1	8				
076046	94 95			1	19				
076047	94 95				8				
071542	94								
071543	94								
071455	94 95		3	1	35				
071456	94 95		3		24				
075739	94 95								
075740	94 95				3				
075741	94 95				16				
075742	94 95				8				
635950	94								
076136	95								
076135	95								
076132	95								
076137	95								
076134	95								
076133	95								

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Appendix C (cont)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age at Recov.	Oregon		
				Number	%			Hatchery/Trap/ Spawn Ground	Col. R. Sport	Col. R. Gillnet
92	070159	34541	49694	0	0.000	95	3			
92	070161	35657	52211	0	0.000	95	3			
92	070216	36102	47867	1	0.003	95	3			
92	070160	35408	49081	0	0.000	95	3			
92	070162	35467	48343	0	0.000	95	3			
92	070163	36157	49318	0	0.000	95	3			
92	070155	35710	40661	0	0.000	95	3			
92	070157	34857	39656	0	0.000	95	3			
92	070156	33999	42734	0	0.000	95	3			
92	070158	31430	41244	0	0.000	95	3			
92	070220	20982	51938	0	0.000	95	3			
92	070219	20971	52620	0	0.000	95	3			
92	070217	20070	51210	0	0.000	95	3			
92	070218	19920	49375	0	0.000	95	3			
92	070251	26305	75835	1	0.004	94	2			
				6	0.023	95	3			
				7	0.027					
92	070250	26716	77019	5	0.019	95	3			
92	075945	20219	130925	3	0.015	95	3			
92	075944	20109	130213	2	0.010	95	3			

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/1 Columbia River.

Appendix C (cont)

CWT Code	Year Recov.	Oregon				Wash.		Wash./Idaho	Alaska Ocean Comm.
		Test Net Fishery /1	Indian Ceremonial /1	Umatilla R. Fish Trap	Uma. R. Spawn Surveys/Sport	Sport	Treaty Troll	Hatchery/Trap/ Spawn Ground	
070159	95								
070161	95								
070216	95			1					
070160	95								
070162	95								
070163	95								
070155	95								
070157	95								
070156	95								
070158	95								
070220	95								
070219	95								
070217	95								
070218	95								
070251	94								
	95			6					
070250	95			5					
075945	95			3					
075944	95			2					

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Appendix D. Liberation and survival information for coho salmon released in the Umatilla River, Ia

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age	Oregon						
				No.	%			Ocean		Freshwater				
								Comm.	Sport	Col. R. Gillnet	Test Net Fishery	Sport	Hatch.	Uma.R.
85	073617	13440	212266	1	0.01	87	2						1 Case	
				260	1.93	88	3	83	20	76	1	14	2 Case	15
				Total	261	1.94								
85	073624	19879	313981	0	0.00	87	2							
				333	1.68	88	3	96	52	82		27	6 Case	10
				Total	333	1.68								
85	073625	26740	422322	0	0.00	87	2							
				415	1.55	88	3	160	49	100		17	5 4 Case 1 Bone	12
				Total	415	1.55								
88	074356	20592	334038	44	0.21	88	2			16				28
				900	4.37	89	3	204	126	171			8 7 Case 1 Trout	147
				Total	944	4.58								
88	074357	18983	300689	32	0.17	88	2							32
				804	4.24	89	3	206	116	128		3	4 2 Case 1 Rock Cr 1 Salmon R 305	170
				Total	836	4.41								
88	074358	18513	301706	28	0.15	88	2							28
				801	4.33	89	3	191	129	117	1	6	8 7 Case 1 Bone	168
				Total	829	4.48								
87	074609	27062	829607	10	0.04	89	2							10
				143	0.53	90	3	32	24	1		32	4 Case	9
				Total	153	0.57								
87	074610	26416	72627	18	0.07	89	2							18
				257	0.97	90	3	24	68	24	1		8 7 Case 1 Bone	19
				Total	275	1.04								
87	074611	26739	84672	22	0.08	89	2		2					20
				268	1.00	90	3	57	35	16			12 11 Case 1 Bone	18
				Total	290	1.08								
88	074614	28033	67309	36	0.13	90	2		3	5			6 Case	16
				826	2.95	91	3	130	85	238	2	37	42 34 Case 11 Bone 1	65
				Total	862	3.07								
88	074613	26881	856524	49	0.18	90	2			18			5 Case	25
				786	2.92	91	3	104	130	192		48	31 17 Case 14 Bone	47
				Total	835	3.11								
88	074615	27226	85095	43	0.16	90	2			3			8 Case	28
				1057	3.88	91	3	163	146	216	3	99	69 49 Case 28 Bone	67
				Total	1100	4.04								
89	075535	24584	152974	4	0.02	91	2							4
				45	0.18	92	3		15	6				2
				Total	49	0.20								
89	075534	25338	449678	7	0.03	91	2						1 Case	6
				35	0.14	92	3		13	10		4	2 Case	2
				Total	42	0.17								

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Appendix D. (cont.)

Appendix D. (cont.)

CWT Code	Year Recov.	Washington							California Ocean		Canada Ocean			FWS Hatch.
		Ocean			FW				Comm.	Spt.	Comm.	Spt.	Net & Seine	
		Comm.	Spt.	Net & Seine	Treaty Troll	Buoy 10	Hatch.	Spt.						
073817	87 88		6			27			4	7	5			
073824	87 88		5			15			13	17	10			
073825	87 88					27	1	10	10	7	16			1 LWS
074356	88 89	11	52	4	18	56	1		20	30	38	5	9	
074357	88 89	6	44		16	57			8	12	31	3		
074358	88 89	19	52		22	42		1	11	17	11		6	
074609	89 90		4			6			19	12				
074610	89 90	2	33		3	11			35	21	8			
074611	89 90	37	29		5	6			28	18	7			
074814	90 91	28	31			3 105			14	48			3	Kalame Spenn
074813	90 91	10	24			1 116			32	34	18			
074815	90 91	18	2 36			94		40	49	49	7		2	LW
075535	91 92	2	13			7								
075534	91 92		4											

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Appendix D. (Cont)

Appendix D, (Cont.)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age	Oregon								
				No.	%			Ocean		Freshwater					Uma.R.	
								Comm.	Sport	Col. R. Gillnet	Test Net Fishery	Sport	Hatch.			
89	075533	25407	352977	2	0.01	91	2									2
				38	0.15	92	3	3	8	4	1			10		
				Total	40	0.16										
90	075620	27908	472221	2	0.01	92	2									2
				197	0.71	93	3	2	29	48		20	14	43		
				Total	199	0.71										
90	075621	27705	244615	1	0.00	92	2									1
				296	1.07	93	3	1	40	71	4	10	19	72		
				Total	297	1.07										
90	075622	27458	244550	3	0.01	92	2									3
				204	0.74	93	3	1	9	65		8	16	43		
				Total	207	0.75										
91	071521	28273	454794	2	0.01	93	2			2						
				54	0.19	94	3			8		5	3	36		
				Total	56	0.20										
91	071522	27821	218618	2	0.01	93	2									2
				71	0.26	94	3			13		5	11	42		
				Total	73	0.26										
91	071523	27984	219286	0	0.00	93	2									
				48	0.17	94	3			3		3	4	33		
				Total	48	0.17										
92	070337	27166	418222	4	0.01	94	2									4
				55	0.20	95	3		1			4	4	25		
				Total	59	0.22										
92	070338	27452	233105	4	0.01	94	2									4
				79	0.29	95	3			5			5	45		
				83	0.30											
92	070339	27010	232778	3	0.01	94	2									3
				51	0.19	95	3		6	2			2	38		
				54	0.20											
93	070557	26421	250970	1	0.00	95	2									1
93	070558	26381	251135	1	0.00	95	2									1
93	070559	26498	497449	1	0.00	95	2									1

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File Name: C:\123R2\FILES\COHSURV3

/a Survival data for the 1993 brood includes age-2 fish only (1995 returns).

/b Includes one fish recovered on spawn ground survey in Big White Salmon River.

/c Includes one fish recovered on spawn ground survey in Rogue River.

/d Unknown test fishery.

Appendix D. (Cont.)

Appendix B: (Cont.)

Brood	CWT Code	CWT Released	Total Released	Estimated Recoveries		Year Recov.	Age	Oregon								
				No.	%			Ocean		Freshwater						
								Comm.	Sport	Col. R. Gillnet	Test Net Fishery	Sport	Hatch.	Uma.R.		
89	075533	25407	352977	2	0.01	91	2									2
				38	0.15	92	3	3	8	4	1				10	
				Total	40	0.16										
90	075620	27908	472221	2	0.01	92	2									2
				197	0.71	93	3	2	29	48		20	14		43	
				Total	199	0.71										
90	075621	27705	244615	1	0.00	92	2									1
				296	1.07	93	3	1	40	71	4	10	19		72	
				Total	297	1.07										
90	075622	27458	244550	3	0.01	92	2									3
				204	0.74	93	3	1	9	65		8	16		43	
				Total	207	0.75										
91	071521	28273	454784	2	0.01	93	2			2						
				54	0.19	94	3			8		5	3		36	
				Total	56	0.20										
91	071522	27821	218618	2	0.01	93	2									2
				71	0.26	94	3			13		5	11		42	
				Total	73	0.26										
91	071523	27984	219266	0	0.00	93	2									
				48	0.17	94	3			3		3	4		33	
				Total	48	0.17										
92	070337	27166	418222	4	0.01	94	2									4
				55	0.20	95	3		1			4	4		25	
				Total	59	0.22										
92	070338	27452	233105	4	0.01	94	2									4
				79	0.29	95	3			5			5		45	
				83	0.30											
92	070339	27010	232778	3	0.01	94	2									3
				51	0.19	95	3		6	2			2		36	
				54	0.20											
93	070557	26421	250970	1	0.00	95	2									1
93	070558	26381	251135	1	0.00	95	2									1
93	070559	26498	497449	1	0.00	95	2									1

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- /a. Survival data for the 1993 brood includes age-2 fish only (1995 returns).
 /b. Includes one fish recovered on spawn ground survey in Big White Salmon River.
 /c. Includes one fish recovered on spawn ground survey in Rogue River.
 /d. Unknown test fishery.

Appendix E. Liberation information for summer steelhead coded—wire tagged and released in the Umatilla River Basin.

Brood	Number Released /a	Release Date	No./lb.	Number tagged	CWT code	Release location
87	10,187	April 88	7.4	9,829	073859	Minthorn
87	10,075	April 88	7.4	9,721	073860	Minthorn
87	<u>10,287</u>	April 88	7.4	<u>9,925</u>	073861	Minthorn
	30,549			29,475		
87	10,423	April 88	6.5	9,689	073856	Nr. Minthorn
87	10,171	April 88	6.5	9,455	073857	Nr. Minthorn
87	<u>10,163</u>	April 88	6.5	<u>9,448</u>	073858	Nr. Minthorn
	30,757			28,592		
88	9,949	May 89	6.6	8,784	074720	Minthorn
88	9,954	May 89	6.6	8,789	074723	Minthorn
88	<u>9,949</u>	May 89	6.6	<u>8,784</u>	074724	Minthorn
	29,852			26,357		
88	9,873	May 89	5.6	8,800	074715	Nr. Minthorn
88	9,864	May 89	5.6	8,791	074717	Nr. Minthorn
88	<u>9,849</u>	May 89	5.6	<u>8,778</u>	074718	Nr. Minthorn
	29,586			26,369		
89	10,239	May 90	5.9	9,331	075212	Bonifer
89	10,022	May 90	5.9	9,133	075213	Bonifer
89	<u>9,964</u>	May 90	5.9	<u>9,080</u>	075214	Bonifer
	30,225			27,544		
89	9,830	May 90	5.5	9,511	075215	Nr. Bonifer
89	9,845	May 90	5.5	9,525	075216	Nr. Bonifer
89	<u>9,771</u>	May 90	5.5	<u>9,454</u>	075217	Nr. Bonifer
	29,446			28,490		
90	10,086	May 91	6.2	9,835	075340	Bonifer
90	10,070	May 91	6.2	9,819	075341	Bonifer
90	<u>10,065</u>	May 91	6.2	<u>9,814</u>	075342	Bonifer
	30,221			29,468		
90	9,754	May 91	8.7	9,432	075343	Nr. Bonifer
90	9,790	May 91	8.7	9,467	075344	Nr. Bonifer
90	<u>9,781</u>	May 91	8.7	<u>9,458</u>	075345	Nr. Bonifer
	29,325			28,357		
91	22,474	March 92	5.8	10,394	073759	Bonifer/Minthorn
91	22,902	March 92	5.8	10,594	073862	Bonifer/Minthorn
91	<u>22,059</u>	March 92	5.8	<u>10,203</u>	074127	Bonifer/Minthorn
	67,435			31,191		

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Appendix E. (Cont.)

Brood	Number Released	Release Date	No./lb.	Number tagged	CWT code	Release location
91	22,262	April 92	5.0	10,108	075841	Mouth of Meacham Cr.
91	21,365	April 92	5.0	9,498	075842	Mouth of Meacham Cr.
91	<u>20,923</u>	April 92	5.0	<u>9,747</u>	075843	Mouth of Meacham Cr.
	64,550			29,353		
91	22,469	April/May 92	5.5	10,562	075838	Mouth of Meacham Cr.
91	22,662	April/May 92	5.5	10,275	075839	Mouth of Meacham Cr.
91	<u>22,288</u>	April/May 92	5.5	<u>10,105</u>	075840	Mouth of Meacham Cr.
	67,419			30,942		
92	15,115	April 93	4.5	10,194	076058	Bonifer
92	14,922	April 93	4.5	9,792	076059	Bonifer
92	<u>14,787</u>	April 93	4.5	<u>9,440</u>	076060	Bonifer
	44,824			29,426		
92	16,016	April 93	5.6	10,031	076055	Minthorn
92	15,940	April 93	5.6	9,418	076056	Minthorn
92	<u>16,023</u>	April 93	5.6	<u>9,643</u>	076057	Minthorn
	47,979			29,092		
92	23,862	May 93	6.1	13,117	076052	Bonifer
92	21,644	May 93	6.1	11,410	076053	Bonifer
92	<u>19,959</u>	May 93	6.1	<u>9,907</u>	076054	Bonifer
	65,465			34,434		
93	26,347	May 94	5.2	8,595	070139	Bonifer
93	<u>25,750</u>	May 94	5.2	<u>8,400</u>	070140	Bonifer
	52,097			16,995		
93	24,783	April 94	5.1	9,952	070141	Minthorn
93	<u>24,815</u>	April 94	5.1	<u>9,965</u>	070142	Minthorn
	49,598			19,917		
93	26,749	April 94	4.9	10,471	070143	Bonifer
93	<u>24,654</u>	April 94	4.9	<u>9,651</u>	070144	Bonifer
	51,403			20,122		

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Appendix E. (Cont.)

Brood	Number Released	Release Date	No./lb.	Number tagged	CWT code	Release location
94	48,539	April 95	5.6	19,290	070657	Bonifer
94	49,983	April 95	4.7	18,812	070656	Minthorn
94	47,941	May 95	5.5	19,782	070655	Bonifer

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/a The following releases are not included in the table:

33,984 adipose clipped fish at 10.3/lb. were released at Umatilla RM 23 in May, 1988
 10,033 adipose clipped fish at 67.5/lb. were released at Umatilla RM 89 in December, 1988
 22,274 adipose clipped fish at 6.5/lb. were acclimated and released from Bonifer in April and May, 1989
 29,522 adipose clipped fish at 7.7/lb. were acclimated and released with the coded-wire tagged fish at Bonifer in May, 1990
 12,389 adipose clipped fish at 7.5/lb. were acclimated and released with the coded-wire tagged fish at Bonifer in May, 1991
 3,998 adipose clipped fish at 12.5/lb. were released at Umatilla RM 3 in April, 1991
 6,443 adipose clipped fish at 6.8/lb. were released at Umatilla RM 3 in April, 1992
 1,732 adipose clipped fish at 6.7/lb. were released at Umatilla RM 27.3 in April, 1994

Appendix F. Liberation information for spring chinook salmon coded--wire tagged and released in the Umatilla River Basin.

Brood	Number Released /a	Release Date	No./lb.	Number Tagged	CWT Code	Release Location
86	35,948	Mar-Apr 88	10.1	26,840	074325	Bonifer
86	35,148	Mar-Apr 88	10.1	25,863	074326	Bonifer
86	35,137	Mar-Apr 88	10.1	25,853	074327	Bonifer
	108,231			78,356		
86	34,187	April 88	8.6	26,318	074328	Uma RM 23 & Nr. Bonifer
86	33,573	April 88	8.6	25,722	074329	Uma RM 23 & Nr. Bonifer
86	34,118	April 88	8.6	26,252	074330	Uma RM 23 & Nr. Bonifer
	101,878			78,293		
87	418	Nov 88	21.4	410	074420	Bonifer
87	399	Nov 88	21.4	393	074423	Bonifer
87	381	Nov 88	21.4	376	074424	Bonifer
	1,198			1,179		
87	28,109	Nov 88	11.1	25,987	074427	Uma RM 89
87	24,183	Nov 88	11.1	24,070	074429	Uma RM 89
87	25,475	Nov 88	11.1	25,356	074430	Uma RM 89
	75,767			75,413		
87	26,135	Mar-May 89	10.6	25,427	074433	Bonifer
87	27,758	Mar-May 89	10.6	27,004	074434	Bonifer
87	26,083	Mar-May 89	10.6	25,386	074436	Bonifer
	79,984			77,817		
87	28,153	March 89	10.6	27,585	074439	Nr. Bonifer
87	28,116	March 89	10.6	27,550	074440	Nr. Bonifer
87	24,683	March 89	10.6	24,165	074443	Nr. Bonifer
	80,932			79,300		
88	24,968	Oct 89	12.0	24,801	075063	Bonifer
88	28,299	Oct 89	12.0	28,109	075101	Bonifer
88	27,483	Oct 89	12.0	27,299	075102	Bonifer
	80,750			80,209		
88	27,287	Oct 89	12.0	27,137	075103	Nr. Bonifer
88	28,718	Oct 89	12.0	28,580	075104	Nr. Bonifer
88	27,848	Oct 89	12.0	27,895	075105	Nr. Bonifer
	83,853			83,382		
88	38,224	March 90	9.0	26,638	075106	Bonifer
88	37,538	March 90	9.0	26,160	075107	Bonifer
88	38,583	March 90	9.0	26,888	075108	Bonifer
	114,345			79,888		
88	39,012	March 90	9.6	25,611	075109	Nr. Bonifer
88	40,072	March 90	9.6	26,307	075110	Nr. Bonifer
88	38,343	March 90	9.6	25,172	075111	Nr. Bonifer
	117,427			77,090		
89	26,757	Oct 90	11.5	26,870	074505	Bonifer
89	26,805	Oct 90	11.5	26,717	074506	Bonifer
89	26,876	Oct 90	11.5	26,788	074507	Bonifer
	80,438			80,175		
89	26,050	Oct 90	13.4	25,876	074508	Nr. Bonifer
89	26,279	Oct 90	13.4	26,104	074509	Nr. Bonifer
89	25,689	Oct 90	13.4	25,497	074510	Nr. Bonifer
	77,998			77,477		

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Appendix F. (cont)

Brood	Number Released	Release Date	No./lb.	Number Tagged	CWT Code	Release Location
89	33,473	March 91	10.1	25,947	075114	Bonifer
89	33,440	March 91	10.1	25,921	075115	Bonifer
89	33,583	March 91	10.1	26,039	075116	Bonifer
	100,505			77,907		
89	31,932	March 91	11.8	24,365	075440	Nr. Bonifer
89	32,187	March 91	11.8	24,559	075441	Nr. Bonifer
89	32,032	March 91	11.8	24,441	075442	Nr. Bonifer
	96,152			73,368		
89	90,796	April 91	20.8	22,336	635661	Uma RM 89
89	5,937	Apr-May 91	16.9	1,461	635661	Uma RM 3
	96,733			23,797		
90	27,040	Nov 91	16.5	26,769	075828	Bonifer
90	27,007	Nov 91	16.5	26,737	075827	Bonifer
90	27,098	Nov 91	16.5	26,827	075828	Bonifer
	81,144			80,333		
90	26,019	Nov 91	16.8	25,499	075829	Nr. Bonifer
90	25,900	Nov 91	16.8	25,382	075830	Nr. Bonifer
90	26,561	Nov 91	16.8	26,029	075831	Nr. Bonifer
	78,480			76,910		
90	90,982	April 92	18.7	30,106	633962	Uma RM 89
90	5,272	Apr-May 92	18.7	1,745	633962	Uma RM 3
	96,254			31,851		
90	36,351	April 92	9.2	26,570	075835	Bonifer
90	36,154	April 92	9.2	26,426	075836	Bonifer
90	36,596	April 92	9.2	26,750	075837	Bonifer
	109,101			79,748		
90	32,994	April 92	8.5	25,503	075832	Mouth of Meacham Cr.
90	32,953	April 92	8.5	25,472	075833	Mouth of Meacham Cr.
90	32,982	April 92	8.5	25,493	075834	Mouth of Meacham Cr.
	98,928			76,468		
91	97,013	May 92	32.1	50,811	071443	Uma RM 80
91	63,585	May 92	31.2	48,051	071444	Uma RM 80
91	63,305	May 92	32.2	49,498	071445	Uma RM 80
91	95,456	May 92	32.1	50,045	071446	Uma RM 80
91	104,670	May 92	36.4	50,047	071447	Uma RM 80
91	104,929	May 92	36.3	51,707	071448	Uma RM 80
91	109,528	May 92	36.3	51,518	071449	Uma RM 80
91	109,897	May 92	37.8	51,271	071450	Uma RM 80
91	98,617	May 92	39.2	52,128	071451	Uma RM 80
91	108,652	May 92	36.8	51,659	071452	Uma RM 80
	955,752			506,535		
91	25,104	Nov 92	13.0	25,104	076042	Uma RM 80
91	25,075	Nov 92	13.0	24,992	076043	Uma RM 80
91	15,730	Nov 92	13.1	15,423	076044	Uma RM 80
91	24,638	Nov 92	9.9	24,638	076045	Uma RM 80
91	24,715	Nov 92	10.0	24,221	076046	Uma RM 80
91	17,687	Nov 92	10.1	17,289	076047	Uma RM 80
	132,929			131,647		
91	50,736	Nov 92	19.3	26,135	071542	Uma RM 80
91	50,880	Nov 92	19.5	25,633	071543	Uma RM 80
	101,416			51,768		

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Appendix F. (cont)

Brood	Number Released	Release Date	No./lb.	Number Tagged	CWT Code	Release Location
91	92,728	March 93	14.7	19,951	071455	Uma RM 80
91	<u>94,220</u>	March 93	14.3	<u>20,022</u>	071458	Uma RM 80
	186,948			39,973		
91	50,310	March 93	8.3	21,499	075739	Uma RM 80
91	50,109	March 93	8.3	20,880	075740	Uma RM 80
91	54,347	March 93	8.3	21,157	075741	Uma RM 80
91	<u>54,018</u>	March 93	8.3	<u>20,307</u>	075742	Uma RM 80
	208,782			83,843		
91	85,134	April 93	20.3	27,839	635950	Uma RM 89
91	1,626	April 93	20.0	532	635950	Uma RM 3
91	<u>9,328</u>	April 93	20.5	<u>3,050</u>	635950	Uma RM 27.3
	96,086			31,421		
92	105,290	June 93	27.0	52,588	078138	Uma RM 80
92	109,473	June 93	27.3	51,680	078135	Uma RM 80
92	113,852	June 93	28.5	52,893	078132	Uma RM 80
92	111,103	June 93	27.1	52,172	078137	Uma RM 80
92	111,133	June 93	27.4	51,963	078134	Uma RM 80
92	<u>116,316</u>	June 93	28.1	<u>52,335</u>	078133	Uma RM 80
	667,367			313,631		
92	49,694	Nov 93	20.3	34,541	070159	Uma RM 80
92	52,211	Nov 93	21.5	35,857	070161	Uma RM 80
92	47,887	Nov 93	20.8	36,102	070216	Uma RM 80
92	49,081	Nov 93	20.9	35,408	070160	Uma RM 80
92	48,343	Nov 93	20.2	35,487	070162	Uma RM 80
92	49,318	Nov 93	20.8	36,157	070163	Uma RM 80
92	40,681	Nov 93	18.5	35,710	070155	Uma RM 80
92	39,658	Nov 93	18.0	34,857	070157	Uma RM 80
92	42,734	Nov 93	18.8	33,999	070158	Uma RM 80
92	<u>41,244</u>	Nov 93	19.2	<u>34,130</u>	070158	Uma RM 80
	480,809			352,028		
92	51,938	March 94	8.4	20,982	070220	Uma RM 80
92	52,820	March 94	8.8	20,971	070219	Uma RM 80
92	51,210	March 94	8.5	20,070	070217	Uma RM 80
92	<u>49,375</u>	March 94	8.1	<u>19,920</u>	070218	Uma RM 80
	205,143			81,943		
92	75,835	March 94	11.5	26,305	070251	Uma RM 73.5
92	<u>77,019</u>	March 94	11.5	<u>26,716</u>	070250	Uma RM 73.5
	152,854			53,021		
92	128,488	March 94	12.3	20,219	075945	Uma RM 80
92	<u>125,780</u>	March 94	12.3	<u>20,109</u>	075944	Uma RM 80
	252,248			40,328		
93	140,591	May 94	30.7	49,728	070734	Uma RM 80 /b
93	141,901	May 94	30.7	52,298	070735	Uma RM 80 /b
93	139,717	May 94	30.1	52,636	070736	Uma RM 80 /b
93	142,513	May 94	30.1	53,172	070737	Uma RM 80 /b
93	139,887	May 94	30.5	51,042	070738	Uma RM 80 /b
93	<u>134,968</u>	May 94	30.5	<u>52,317</u>	070739	Uma RM 80 /b
	839,377			311,191		

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Appendix F. (cont.)

Brood	Number Released	Release Date	No./lb.	Number Tagged	CWT Code	Release Location
93	38,234	Nov 94	9.5	34,808	070728	Uma RM 80 /b
93	39,551	Nov 94	10.5	35,158	070726	Uma RM 80 /b
93	39,548	Nov 94	9.0	34,124	070724	Uma RM 80 /b
93	40,383	Nov 94	9.4	35,160	070729	Uma RM 80 /b
93	39,487	Nov 94	9.2	34,819	070727	Uma RM 80 /b
93	39,517	Nov 94	9.3	34,827	070725	Uma RM 80 /b
93	37,088	Nov 94	7.8	35,750	070731	Uma RM 80 /b
93	34,849	Nov 94	9.8	34,220	070733	Uma RM 80 /b
93	37,073	Nov 94	7.2	34,915	070730	Uma RM 80 /b
93	32,687	Nov 94	7.4	32,251	070732	Uma RM 80 /b
	378,225			348,030		
93	49,001	March 95	8.3	18,864	070651	Uma RM 80 /b
93	44,077	March 95	7.4	19,052	070652	Uma RM 80 /b
93	47,848	March 95	7.9	19,091	070654	Uma RM 80 /b
93	44,188	March 95	8.2	18,175	070653	Uma RM 80 /b
93	50,007	March 95	7.5	20,308	071453	Uma RM 80 /b
93	40,885	March 95	8.1	15,668	071454	Uma RM 80 /b
	275,804			111,158		
93	123,257	April 95	10.5	22,189	070649	Uma RM 80 /b
93	124,814	April 95	10.2	24,088	070650	Uma RM 80 /b
	247,871			46,277		
93	74,735	March 95	14.4	23,807	070660	Uma RM 80 /b
93	74,921	April 95	11.4	28,765	070861	Uma RM 80 /b

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/a The following releases are not included in the table:

89,895 non-tagged fish at 20.6/lb. were released at Umatilla RM 23 in April, 1988

89,268 non-tagged fish at 10.3/lb. were released into the upper Umatilla River in April, 1988

99,775 non-tagged fish at 18.6/lb. were released at Umatilla RM 23 in April, 1990

294,458 non-tagged fish at 32.5/lb. were released at Umatilla RM 80 in May, 1992

8,890 non-tagged fish at 8.1 to 8.3/lb. were released at Umatilla RM 3 and 292 in March and April, 1994

/b Acclimated at Imeques C-mem-inl-kem prior to release.

Appendix G. Liberation information for fall chinook salmon coded—wire tagged and released in the Umatilla River Basin.

Brood	Number Released /a	Release Date	No./lb.	Number tagged	CWT code	Release location
81	306,279	April 82	79.0	46,707	050851	Uma RM 1.5 & 51.5
81	672,057	April 82	79.0	102,331	051057	Uma RM 1.5 & 51.5
	978,336			149,038		
81	2,828,835	April 82	92.0	102,386	072663	Uma RM 1.5
81	100,564	March 83	5.9	99,570	072741	Bonifer & Mea. CR.
82	228,412	March 84	8.6	96,448	072829	Bonifer & Mea. CR.
83	966,250	June 84	85.1	210,441	073124	Uma RM 1.5
83	198,162	March 85	7.8	88,306	073127	Uma RM 87 & Bonifer
84	3,223,172	June 85	92.3	206,756	073326	Uma RM 1.5
84	51,000	Oct 85	16.2	30,838	073162	Bonifer
84	91,036	March 86	5.0	88,396	073327	Minthorn
85	197,432	June 86	86.0	20,636	073833	Uma RM 1.5
85	198,153	June 86	86.0	21,335	073834	Uma RM 1.5
85	197,488	June 86	86.0	20,690	073835	Uma RM 1.5
85	196,952	June 86	86.0	20,170	073836	Uma RM 1.5
85	197,788	June 86	86.0	20,982	073837	Uma RM 1.5
85	208,103	June 86	86.0	20,815	073838	Uma RM 1.5
85	208,958	June 86	86.0	21,659	073839	Uma RM 1.5
85	207,550	June 86	86.0	20,269	073840	Uma RM 1.5
	208,184	June 86	86.0	20,895	073841	Uma RM 1.5
	208,994	June 86	86.0	21,694	073842	Uma RM 1.5
	2,029,602			209,145		
85	22,216	March 87	8.1	10,103	073823	Minthorn
85	22,523	March 87	8.1	10,243	073824	Minthorn
85	21,807	March 87	8.1	9,917	073825	Minthorn
85	20,881	March 87	8.1	9,496	073826	Minthorn
85	21,716	March 87	8.1	9,876	073827	Minthorn
	109,143			49,635		
85	20,786	March 87	8.6	10,253	073828	Bonifer
85	20,212	March 87	8.6	9,970	073829	Bonifer
85	20,546	March 87	8.6	10,135	073830	Bonifer
85	20,381	March 87	8.6	10,053	073831	Bonifer
85	20,438	March 87	8.6	10,081	073832	Bonifer
	102,363			50,492		
86	497,572	May 87	60.4	40,793	073912	Uma RM 9
86	501,266	May 87	60.4	41,096	073913	Uma RM 9
86	477,992	May 87	60.4	39,187	073914	Uma RM 9
	1,476,830			121,076		

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Appendix G. (cont.)

Brood	Number Released	Release Date	No./lb.	Number tagged	CWT code	Release location
86	670	July 87	20.0	643	073915	Minthorn
86	672	July 87	20.0	645	073916	Minthorn
86	658	July 87	20.0	632	074035	Minthorn
	2,000			1,920		
86	52,317	March 88	8.8	42,068	074038	Minthorn
86	48,474	March 88	8.8	38,978	074039	Minthorn
	100,791			81,046		
86	50,480	March 88	10.2	39,509	074036	Bonifer
86	49,070	March 88	10.2	38,405	074037	Bonifer
	99,550			77,914		
87	1,886,757	May 88	68.3	198,285	075007	Uma RM 23
87	4,823	Nov 88	9.8	4,438	074539	Minthorn
87	4,660	Nov 88	9.8	4,289	074540	Minthorn
87	4,925	Nov 88	9.8	4,533	074541	Minthorn
	14,408			13,260		
87	26,858	Nov 88	8.6	24,656	074536	Nr Minthorn
87	25,493	Nov 88	8.6	23,403	074537	Nr Minthorn
87	27,330	Nov 88	8.6	25,089	074538	Nr Minthorn
	79,681			73,148		
88	797,904	May 89	66.6	52,228	074646	Uma RM 23
88	797,903	May 89	66.6	49,771	074647	Uma RM 23
88	797,903	May 89	66.6	52,244	074648	Uma RM 23
	2,393,710			154,243		
88	26,770	Oct 89	10.9	26,358	074753	Minthorn
88	26,617	Oct 89	10.9	25,028	074754	Minthorn
88	25,438	Oct 89	10.9	25,438	074757	Minthorn
	78,825			76,824		
88	27,071	Oct 89	11.1	26,790	074758	Nr Minthorn
88	25,428	Oct 89	11.1	24,285	074760	Nr Minthorn
88	25,633	Oct 89	11.1	25,350	074763	Nr Minthorn
	78,132			76,425		
89	808,567	May-Jun 90	87.5	52,612	075403	Uma RM 70-79
89	808,560	May-Jun 90	87.5	53,160	075404	Uma RM 70-79
89	808,554	May-Jun 90	87.5	53,248	075405	Uma RM 70-79
	2,425,681			159,020		
89	25,311	Oct 90	9.2	23,396	075325	Minthorn
89	23,724	Oct 90	9.2	21,929	075326	Minthorn
89	22,828	Oct 90	9.2	21,101	075327	Minthorn
	71,863			66,426		

Revised: 4/24/96

File Name: C:\123R3\DATA\CHFREL95

Appendix G. (cont.)

Brood	Number Released	Release Date	No./lb.	Number tagged	CWT code	Release location
89	25,472	Oct 90	8.8	23,413	075322	Nr Minthorn
89	25,694	Oct 90	8.8	23,617	075323	Nr Minthorn
89	25,480	Oct 90	8.8	23,420	075324	Nr Minthorn
	76,646			70,450		
90	1,343,311	May 91	82.0	52,252	075225	Uma RM 70-79
90	1,343,042	May 91	82.0	51,728	075226	Uma RM 70-79
90	100,642	May 91	73.0	48,266	075328	Uma RM 70-79
90	99,962	May 91	73.0	48,481	075449	Uma RM 70-79
90	99,225	May 91	73.0	48,301	070016	Uma RM 70-79
90	52,326	May 91	82.0	51,814	075450	Uma RM 70-79
90	52,706	May 91	82.0	52,444	075451	Uma RM 70-79
	3,091,214			353,286		
90	26,481	May 91	80.5	26,173	075563	Minthorn
90	26,585	May 91	80.5	24,762	075601	Minthorn
90	26,606	May 91	80.5	25,476	075602	Minthorn
	79,672			76,411		
90	25,862	May 91	86.0	25,720	075560	Nr Minthorn
90	25,708	May 91	86.0	25,425	075561	Nr Minthorn
90	23,295	May 91	86.0	22,309	075562	Nr Minthorn
	74,865			73,454		
90	122,639	March 92	7.7	26,160	075619	Uma RM 56
90	97,801	March 92	7.6	26,178	075618	Uma RM 70
	220,440			52,338		
91	286,578	May 92	70.6	31,892	071429	Uma RM 42.5
91	281,350	May 92	65.1	32,287	071430	Uma RM 42.5
91	182,931	May 92	56.2	28,951	071431	Uma RM 42.5
91	191,257	May 92	58.3	29,425	071432	Uma RM 42.5
91	303,878	May 92	61.0	29,066	071433	Uma RM 42.5
91	306,802	May 92	65.7	31,224	071434	Uma RM 42.5
91	297,331	May 92	60.9	30,326	071435	Uma RM 42.5
91	302,555	May 92	61.9	30,365	071436	Uma RM 42.5
91	223,830	May 92	55.2	30,508	071437	Uma RM 42.5
91	301,831	May 92	64.5	30,924	071438	Uma RM 42.5
	2,678,343			304,968		
91	66,345	March 93	9.1	23,239	071461	Uma RM 73.5
91	68,492	March 93	9.1	23,863	071460	Uma RM 73.5
	134,837			47,102		
92	292,895	May 93	63.0	28,964	076330	Uma RM 73.5
92	269,336	May 93	62.9	27,092	070127	Uma RM 73.5
92	282,175	May 93	68.0	29,958	076334	Uma RM 73.5
92	282,125	May 93	67.3	29,537	076331	Uma RM 73.5
92	273,662	May 93	60.3	29,718	076333	Uma RM 73.5

Revised: 4/24/96

File Name: C:\123R3\DATA\CHFRELS5

Appendix G. (cont.)

Brood	Number Released	Release Date	No./lb.	Number tagged	CWT code	Release location
92	277,931	May 93	61.5	29,451	076332	Uma RM 73.5
92	268,001	May 93	59.3	29,594	070126	Uma RM 73.5
92	203,731	May 93	66.7	30,706	076329	Uma RM 73.5
92	272,496	May 93	60.3	29,360	070125	Uma RM 73.5
92	207,565	May 93	59.4	30,462	076335	Uma RM 73.5
	2,629,917			294,842		
92	233,629	March 94	10.4	23,699	070255	Uma RM 73.5
92	49,824	April 94	8.5	23,470	070252	Uma RM 73.5
93	322,867	May 94	63.0	31,162	070663	Uma RM 73.5
93	327,700	May 94	72.4	31,658	070719	Uma RM 73.5
93	314,518	May 94	65.4	30,528	070720	Uma RM 73.5
93	326,408	May 94	66.2	30,447	070723	Uma RM 73.5
93	303,843	May 94	68.0	30,950	070722	Uma RM 73.5
93	306,105	May 94	68.7	28,474	070721	Uma RM 73.5
93	280,046	May 94	60.1	31,239	070662	Uma RM 73.5
93	279,965	May 94	64.2	31,040	070718	Uma RM 73.5
93	191,321	May 94	59.1	30,502	070716	Uma RM 73.5
93	190,439	May 94	60.0	32,481	070717	Uma RM 73.5
	2,843,212			308,481		
93	111,817	April 95	7.8	24,865	070658	Thornhollow
93	115,271	April 95	8.2	24,374	070659	Thornhollow
	227,088			49,239		
94	287,313	May 95	63.0	28,623	071023	Thornhollow
94	274,110	May 95	66.5	29,784	071025	Thornhollow
	561,423			58,407		
94	271,129	May 95	67.8	29,736	071017	Imeques
94	241,342	May 95	65.1	29,132	071018	Imeques
94	286,459	May 95	62.7	29,353	071019	Imeques
94	275,613	May 95	65.6	29,460	071020	Imeques
94	152,098	May 95	58.7	29,327	071021	Imeques
94	280,406	May 95	63.0	28,472	071022	Imeques
94	151,943	May 95	62.3	30,204	071024	Imeques
94	245,885	May 95	58.0	30,106	071026	Imeques
	1,904,875			235,790		

Revised: 4/24/96

File Name: C:\123R3\DATA\CHFREL95

/a The following releases are not included in the table:

115,779 non-tagged fish at 4.7/lb. were acclimated and released from Bonifer in March, 1986
 35,574 non-tagged fish at 11.6/lb. were acclimated and released from Minthorn in October, 1986
 1,429,250 non-tagged fish at 93.1/lb. were released at Umatilla RM 9 in June, 1988
 217,443 non-tagged fish at 8.6/lb. were released at Umatilla RM 63 & 73.5 in March, 1989
 255,614 non-tagged fish at 8.2/lb. were released at Umatilla RM 70 in March, 1990
 629,800 non-tagged fish at 82.4/lb. were released at Umatilla RM 70 & 79 in May, 1990
 194,847 non-tagged fish at 7.8/lb. were released at Umatilla RM 56, 70 and 79 in March, 1991
 10,462 non-tagged fish at 80-194/lb. were released at Umatilla RM 3 in April and May, 1991
 504,369 non-tagged fish at 53.4/lb. were released at Umatilla RM 42.5 in May, 1992
 7,837 non-tagged fish at 62.8-112/lb. were released at Umatilla RM 3 in April and May, 1992
 29,681 non-tagged fish at 95.5-142/lb. were released between Umatilla RM 0.5 and 27.3 in March through May, 1993
 22,174 non-tagged fish at 85 to 171/lb. were released between Umatilla RM 27.3 and 32.5 in April and May, 1994

Appendix H. Liberation information for coho salmon coded—wire tagged and released in the Umatilla River Basin.

Brood	Number Released /a	Release Date	No./lb.	Number tagged	CWT code	Release location
85	37,245	April 87	13.5	13,440	073617	Minthorn
85	53,754	April 87	13.5	19,879	073624	Minthorn
85	70,890	April 87	13.5	26,740	073625	Minthorn
	161,889			60,059		
86	334,038	Mar—Apr 88	16.8	20,592	074356	Uma RM 9 & 23
86	360,689	Mar—Apr 88	17.3	18,963	074357	Uma RM 9 & 23
86	301,706	Mar—Apr 88	15.7	18,513	074358	Uma RM 9 & 23
	996,433			58,068		
87	75,970	March 89	17.2	27,062	074609	Nr Minthorn
87	72,627	March 89	17.3	26,416	074610	Minthorn
87	84,672	March 89	19.1	26,739	074611	Minthorn
	233,269			80,217		
88	67,309	March 90	13.5	28,033	074814	Minthorn
88	59,682	March 90	13.3	26,881	074813	Nr Minthorn
88	65,095	April 90	11.2	27,226	074815	Minthorn
	192,086			82,140		
89	152,974	March 91	15.4	24,584	075535	Minthorn
89	449,678	March 91	16.5	25,338	075534	Uma RM 56—60
89	352,977	March 91	16.8	25,407	075533	Uma RM 63—70
	955,629			75,329		
90	472,221	March 92	15.5	27,908	075620	Uma RM 56
90	244,615	March 92	15.7	27,705	075621	Uma RM 60
90	244,550	March 92	15.7	27,458	075622	Uma RM 60
	961,386			83,071		
91	454,794	April 93	17.6	28,273	071521	Uma RM 60
91	218,618	April 93	17.5	27,821	071522	Uma RM 42.5
91	219,266	April 93	17.5	27,984	071523	Uma RM 42.5
	892,678			84,078		
92	418,222	April 94	18.1	27,166	070337	Uma RM 42.5
92	233,105	April 94	17.0	27,452	070338	Uma RM 60
92	232,778	April 94	17.1	27,010	070339	Uma RM 60
	884,105			81,628		

Revised: 4/24/96

File Name: C:\123R3\DATA\95COHREL

Appendix H. (cont.)

Brood	Number Released /a	Release Date	No./lb.	Number tagged	CWT code	Release location
93	250,970	Mar-Apr 95	14.7	26,421	070557	Uma RM 42.5
93	251,135	Mar-Apr 95	14.7	26,381	070558	Uma RM 42.5
93	<u>497,449</u>	March 95	14.5	<u>26,498</u>	070559	Uma RM 60
	999,554			79,300		

Revised: 4/24/96

File Name: C:\123R3\DATA\95COHREL

/a The following releases are not included in the table:

- 786,660 non-tagged fish at 14.0/lb. were released at Umatilla RM 23 in April, 1987
- 753,637 non-tagged fish at 17.6/lb. were released at Umatilla RM 56 and 70 in March, 1989
- 594,527 non-tagged fish at 14.8/lb. were released at Umatilla RM 70 in March and April, 1990
- 202,315 non-tagged fish at 14.5/lb. were released at Umatilla RM 23 in March, 1990
- 191,854 non-tagged fish at 13.9/lb. were released at Umatilla RM 60 in April, 1995
- 322,858 non-tagged fish at 20.3/lb. were released at Umatilla RM 42.5 in February and March, 1995

Appendix I. Umatilla River summer steelhead broodstock collection in 1994–95. /a

Date Collected	Ad LV		Total Ad LV	Unmarked		Total Unmarked	Total		Total
	Male	Female		Male	Female		Male	Female	
10/13				1		1	1		1
10/31	2	2	4	1	2	3	3	4	7
11/16	1	3	4				1	3	4
11/17	1		1		2	2	1	2	3
11/21				1		1	1		1
11/28				1	1	2	1	1	2
11/29	1		1				1		1
12/2				1		1	1		1
12/14	1		1	1	1	2	2	1	3
12/19	2	3	5	1	2	3	3	5	8
12/22	2	2	4	3	2	5	5	4	9
12/23	3	3	6	3	3	6	6	6	12
12/27	1	1	2	1	1	2	2	2	4
1/20	1	2	3	4	4	8	5	6	11
1/23		2	2					2	2
1/25	1		1				1		1
1/30	6	4	10	2	4	6	8	8	16
1/31	3	3	6	5	3	8	8	6	14
2/13	2	2	4	1	2	3	3	4	7
2/23	1	1	2				1	1	2
2/24				1	1	2	1	1	2
2/27		1	1	6	5	11	6	6	12
3/6				1	1	2	1	1	2
3/8	1		1				1		1
3/13	1	2	3	3	3	6	4	5	9
3/24	2	2	4	1	2	3	3	4	7
3/27	1		1	1	1	2	2	1	3
4/3					1	1		1	1
4/6				1		1	1		1
4/10	1		1	2	1	3	3	1	4
4/13		1	1					1	1
4/20				1	1	2	1	1	2
TOTALS	34	34	68	43	43	86	77	77	154

Revised: 5/11/95

File Name: C:\123R3\DATA\95BRCOL

/a Data provided by CTUIR and ODFW Trap and Haul personnel.

Appendix J. Summer steelhead broodstock spawning at Minthorn Acclimation Facility in 1995.

Date Spawed	Fish No.	Sex	Family No.	Fork Ln. mm	MEHP Ln. mm	Weight gms.	Fin Mark	Comments	Green Eggs	Eyed Eggs
3/29/95	1	F	1	---	495	1330	AdLV			
	2	F	1	700	595	2400	AdLV			
	3	F	1	---	610	2570	None			
	4	M	1	644	535	2340	None			
	5	M	1	730	615	3310	None			
	6	M	1	611	510	1740	AdLV			
	7	F	2	685	575	2370	None			
	8	F	2	619	540	1730	None			
	9	F	2	658	560	2100	None			
	10	M	2	---	640	3970	None			
	11	M	2	670	555	2920	None			
	12	M	2	691	570	2740	None			
									34,030	29,811
4/5/95	13	F	3	---	660	3050	None			
	14	F	3	669	560	2350	None			
	15	F	3	718	615	2500	None			
	16	M	3	585	492	1800	None			
	17	M	3	630	575	2670	None			
	18	M	3	---	620	3640	None			
	19	F	4	---	650	2660	None			
	20	M	4	731	620	3890	None			
									22,656	19,207
4/12/95	21	F	5	758	650	3120	None			
	22	F	5	651	550	1870	None			
	23	M	5	831	680	4430	None			
	24	M	5	668	553	2560	None			
	25	F	6	---	620	2720	AdLV			
	26	F	6	561	485	1440	AdLV			
	27	M	6	729	600	3170	None			
	28	M	6	646	555	2410	None			
									27,830	26,560
4/19/95	29	F	7	605	515	1490	None			
	30	F	7	---	520	1390	None			
	31	F	7	750	645	3160	None			
	32	M	7	749	627	3640	None			
	33	M	7	627	521	2130	None			
	34	M	7	761	630	3850	None			
	35	F	8	751	635	2770	None			
	36	F	8	---	536	1900	None			
	37	F	8	---	585	2310	None			
	38	M	8	634	455	1230	AdLV	Live spawned		
	39	M	8	---	---	---	AdLV	Live spawned		
	40	M	8	---	---	---	AdLV	Live spawned		
	41	F	9	620	540	1580	AdLV			
	42	M	9	573	485	1570	None			
									42,595	32,780
4/26/95	43	F	10	605	530	1490	AdLV			
	44	F	10	546	470	1210	AdLV			
	45	M	10	717	615	3260	None			
	46	M	10	835	620	3610	None			
	47	F	---	625	510	2550	AdLV	Green, not used		
	48	F	11	549	475	1310	None			
	49	F	11	683	580	2230	None			
	50	M	11	588	500	1590	AdLV			
	51	M	11	643	545	2070	AdLV			
									17,225	16,515

Revised: 10/10/95

File Name: C:\123R3\DATA\SPAWN95

Appendix J. (Cont.)

Date Spawned	Fish No.	Sex	Family No.	Fork Ln. mm	MEHP Ln. mm	Weight gms.			Green Eggs	Eyed Eggs
5/3/95	52	F	12	705	600	2300	None			
	53	F	12	---	520	1650	None			
	54	F	12	690	590	2290	None			
	55	M	12	---	---	---	None	Live spawned		
	56	M	12	---	---	---	None	Live spawned		
	57	M	12	---	---	---	None	Live spawned		
	58	F	13	720	625	2540	None			
	59	F	13	705	610	2570	None			
	60	F	13	615	535	1690	None			
	61	M	13	---	---	---	AdLV	Live spawned		
	62	M	13	---	---	---	AdLV	Live spawned		
	63	M	13	---	---	---	AdLV	Live spawned		
	64	F	14	590	500	1390	AdLV			
	65	F	14	555	470	1210	AdLV			
	66	M	14	---	---	---	None	Live spawned		
	67	M	14	---	---	---	None	Live spawned		
									37,391	33,629
5/10/95	68	F	15	713	615	2480	None			
	69	F	15	651	546	2180	None			
	70	F	15	685	590	2180	AdLV			
	71	M	15	---	---	---	None	Live spawned		
	72	M	15	---	---	---	None	Live spawned, used for 2nd time		
	73	M	15	---	---	---	None	Live spawned, used for 2nd time		
	74	F	---	---	555	2140	None	Bad eggs, not used		
									18,479	17,010
5/17/95	75	F	16	645	550	2270	None			
	76	F	16	580	490	1410	AdLV			
	77	F	16	580	495	1360	AdLV			
	78	M	16	---	---	---	None	Live spawned		
	79	M	16	---	---	---	None	Live spawned		
	80	M	16	---	---	---	None	Live spawned, used for 2nd time		
									13,474	12,638
5/24/95	81	F	17	---	615	2500	None			
	82	F	17	554	480	1050	AdLV			
	83	M	17	525	621	1830	AdLV	Green, not used		
	84	M	17	485	566	1700	None	Used to fertilize both females		
									9,845	9,001
Total									223,525	197,201
Fecundity									5,452	

Revised: 10/10/95

File Name: C:\123R3\DATA\SPAWN95

Appendix K. Coho salmon broodstock spawning and mortality at Minthorn Acclimation Facility in 1995. /a

Date	Number of Fish Spawned		Number of Mortalities		Green Eggs	Eyed Eggs
	Females	Males	Females	Males		
10/03/95				1		
10/12/95				1		
10/13/95			1			
10/17/95			2			
10/18/95			1			
10/23/95			2	3		
10/24/95			3	1		
10/25/95			4	1		
10/30/95	28 /b	28 /c	6	7	74,202	50,850
11/01/95			1	2		
11/02/95	8 /d	8 /e		2	15,756	11,640
11/03/95			1			
11/06/95				3		
11/07/95	20	20 /c			55,416	29,880
11/10/95				3		
11/12/95				4		
11/13/95	33	33 /e	3	5	89,916	58,500
11/16/95			2	1		
11/17/95	84	84	7	5	245,088	177,300
11/21/95			4	5		
11/22/95	81	81	3		226,962	162,450
11/27/95	59	59	28	13	174,054	129,870
11/30/95	24	24 /f	6	8	64,434	45,450
TOTAL	337	337	74	65	945,828	665,940

Revised: 03/26/96

File Name: C:\123R3\DATA\95COSPAW

/a After spawning was completed, 26 males and nine females were released into the Umatilla River.

/b Does not include three with bad eggs.

/c Does not include two green.

/d Does not include one overripe and one green.

/e Does not include one green.

/f Does not include one excess killed.

Appendix L. Liberation and survival information for summer steelhead released in the Umatilla River.

Brood	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival					
							%	Total	Idaho & Canada	Oregon		
										Col.R Net	Col.R Sport	Umatilla River
87	10,187	Apr 88	7.4	9,829	073859	Minthorn	0.57	58	0	12	0	46
87	10,075	Apr 88	7.4	9,721	073860	Minthorn	0.81	82	0	35	0	47
87	10,287	Apr 88	7.4	9,925	073861	Minthorn	0.70	72	0	21	2	49
Total	30,549			29,475			0.69	212	0	68	2	142
87	21,940	Apr 88	6.5	9,689	073856	Nr. Minthorn	0.75	164	5	25	23	111
87	21,409	Apr 88	6.5	9,455	073857	Nr. Minthorn	0.51	109	2	16	0	91
87	21,392	Apr 88	6.5	9,448	073858	Nr. Minthorn	0.32	68	0	0	5	63
Total	64,741 /a			28,592			0.53	341	7	41	28	265
88	10,033	Dec 88	57.5	0		Uma RM 89	NA					
88	17,372	May 89	6.6	8,784	074720	Minthorn	0.06	10	0	0	6	4
88	17,382	May 89	6.6	8,789	074723	Minthorn	0.02	4	0	0	0	4
88	17,372	May 89	6.6	8,784	074724	Minthorn	0.03	6	0	0	0	6
Total	52,126 /b			26,357			0.04	20	0	0	6	14
88	9,873	May 89	5.6	8,800	074715	Nr. Minthorn	0.08	8	0	0	0	8
88	9,864	May 89	5.6	8,791	074717	Nr. Minthorn	0.11	11	0	0	0	11
88	9,849	May 89	5.6	8,778	074718	Nr. Minthorn	0.01	1	0	0	0	1
Total	29,586			26,369			0.07	20	0	0	0	20
89	20,240	May 90	5.9	9,331	075212	Bonifer	0.87	176	0	22	20	134
89	19,811	May 90	5.9	9,133	075213	Bonifer	0.99	197	0	15	4	178
89	19,696	May 90	5.9	9,080	075214	Bonifer	0.91	180	0	48	13	119
Total	59,747 /c			27,544			0.93	553	0	85	37	431
89	9,830	May 90	5.5	9,511	075215	Nr. Bonifer	0.99	97	0	19	7	71
89	9,845	May 90	5.5	9,525	075216	Nr. Bonifer	1.08	106	0	20	4	82
89	9,771	May 90	5.5	9,454	075217	Nr. Bonifer	0.86	84	0	14	26	44
Total	29,446			28,490			0.97	287	0	53	37	197
90	14,221	May 91	6.2	9,835	075340	Bonifer	0.88	125	0	20	23	82
90	14,198	May 91	6.2	9,819	075341	Bonifer	0.75	106	0	25	10	71
90	14,191	May 91	6.2	9,814	075342	Bonifer	0.97	138	0	25	19	94
Total	42,610 /d			29,468			0.87	369	0	70	52	247
90	11,084	May 91	8.7	9,432	075343	Nr. Bonifer	0.88	98	0	19	7	72
90	11,125	May 91	8.7	9,467	075344	Nr. Bonifer	0.70	78	0	9	7	62
90	11,114	May 91	8.7	9,458	075345	Nr. Bonifer	0.90	100	0	25	2	73
Total	33,323 /e			28,357			0.83	276	0	53	16	207
91	22,474	Mar 92	5.8	10,394	073759	Bon. & Min.	0.22	50	0	22	4	24
91	22,902	Mar 92	5.8	10,594	073862	Bon. & Min.	0.13	30	0	13	0	17
91	22,059	Mar 92	5.8	10,203	074127	Bon. & Min.	0.25	56	0	0	0	56
	67,435			31,191			0.20	136	0	35	4	97
91	22,262	Apr 92	5.0	10,108	075841	Meacham Cr.	0.02	4	0	4	0	0
91	21,365	Apr 92	5.0	9,498	075842	Meacham Cr.	0.00	0	0	0	0	0
91	20,923	Apr 92	5.0	9,747	075843	Meacham Cr.	0.04	9	0	9	0	0
	64,550			29,353			0.02	13	0	13	0	0

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Appendix L (cont.)

Brood	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	%	Estimated Adult Survival				
								Total	Idaho & Canada	Oregon		
										Col.R Net	Col.R Sport	Umatilla River
91	24,283	Apr/May 92	5.5	10,562	075838	Meacham Cr.	0.01	2	0	0	0	2
91	24,492	Apr/May 92	5.5	10,275	075839	Meacham Cr.	0.00	0	0	0	0	0
91	24,087	Apr/May 92	5.5	10,105	075840	Meacham Cr.	0.01	2	0	0	0	2
	72,862 <i>f</i>			30,942			0.01	4	0	0	0	4
92	15,115	April 93	4.5	10,194	076058	Bonifer	0.38	58	0	7	4	47
92	14,922	April 93	4.5	9,792	076059	Bonifer	0.23	35	0	0	3	32
92	14,787	April 93	4.5	9,440	076060	Bonifer	0.52	77	0	0	8	69
	44,824			29,426			0.38	170	0	7	15	148
92	16,016	April 93	5.6	10,031	076055	Minthorn	0.40	64	2	0	0	62
92	15,940	April 93	5.6	9,418	076056	Minthorn	0.31	49	0	2	0	47
92	16,023	April 93	5.6	9,643	076067	Minthorn	0.38	61	0	0	5	56
	47,979			29,092			0.36	174	2	2	5	165
92	23,862	May 93	6.1	13,117	076052	Bonifer	0.01	2	0	0	0	2
92	21,644	May 93	6.1	11,410	076053	Bonifer	0.00	0	0	0	0	0
92	19,959	May 93	6.1	9,907	076064	Bonifer	0.01	2	0	0	0	2
	65,465			34,434			0.01	4	0	0	0	4

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- /a The number released includes 33,984 adipose clipped fish at 10.3/lb. released at Umatilla RM 23 in May
 /b The number released includes 22,274 adipose clipped fish at 5.5/lb. acclimated and released at Bonifer in May
 /c The number released includes 29,522 adipose clipped fish at 7.7/lb. acclimated and released with the coded-wire tagged fish in May
 /d The number released includes 12,389 adipose clipped fish at 7.5/lb. acclimated and released with the coded-wire tagged fish in May
 /e The number released includes 3,998 adipose clipped fish at 12.5/lb. released at Umatilla RM 3 in April
 /f The number released includes 5,443 adipose clipped fish at 5.8/lb. released at Umatilla RM 3 in April

Appendix M. Liberation and survival information for Spring Creek tule stock fall chinook salmon released in the Umatilla River (1982).

Br. Yr.	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival				
							%	Total	Ocean	Col. & Snake R.	Uma.R.
81	306,279	Apr 82	79.0	46,707	050851	Umatilla R. /1	0.46	1,423	767	656	0
81	672,057	Apr 82	79.0	102,331	051057	Umatilla R. /1	0.56	3,730	2,154	1,576	0
Total	978,336			149,038			0.53	5,153	2,921	2,232	0
81	2,828,835	Apr 82	92.0	102,386	072663	Umatilla R. (RM 1.5)	0.46	12,930	7,515	5,415	0
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/1 Approximately 48.7% of the fish were released at RM 1.5 and 51.3% at RM 51.5.

Appendix N. Liberation and survival information for Bonneville URB stock yearling fall chinook salmon released in the Umatilla River (1983-1995). /1

Br. Yr.	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /2				
							%	Total	Ocean	Col. & Snake R.	Uma.R.
81	100,564	Apr 83	6.9	99,570	072741	Bonifer & Meacham Cr.	0.17	169	89	80	0
82	228,412	Apr 84	8.6	96,448	072829	Bonifer & Meacham Cr.	0.08	178	126	52	0
83	198,162	Mar 85	7.8	88,306	073127	Uma.R. (RM 87) & Bonifer	0.80	1,593	880	711	2
84	206,815	Mar 86	5.0	88,396	073327	Bonifer & Minthorn	3.17	6,560	3,552	2,716	292
85	22,216	Mar 87	8.1	10,103	073823	Minthorn	2.22	493	231	205	57
85	22,523	Mar 87	8.1	10,243	073824	Minthorn	2.07	466	204	229	33
85	21,807	Mar 87	8.1	9,917	073825	Minthorn	2.22	483	224	200	59
85	20,881	Mar 87	8.1	9,496	073826	Minthorn	2.37	495	165	299	31
85	21,716	Mar 87	8.1	9,876	073827	Minthorn	2.17	471	196	235	40
Total	109,143			49,635			2.21	2,408	1,020	1,168	220
85	20,786	Mar 87	8.6	10,253	073828	Bonifer	2.27	472	227	229	16
85	20,212	Mar 87	8.6	9,970	073829	Bonifer	2.27	458	235	207	16
85	20,546	Mar 87	8.6	10,135	073830	Bonifer	2.73	561	245	294	22
85	20,381	Mar 87	8.6	10,053	073831	Bonifer	2.21	451	201	207	43
85	20,438	Mar 87	8.6	10,081	073832	Bonifer	2.45	500	227	243	30
Total	102,363			50,492			2.39	2,442	1,135	1,180	127
86	52,317	Mar 88	8.8	42,068	074038	Minthorn	3.32	1,738	751	512	475
86	48,474	Mar 88	8.8	38,978	074039	Minthorn	3.13	1,517	680	410	427
Total	100,791			81,046			3.23	3,255	1,431	922	902
86	50,480	Mar 88	10.2	39,509	074036	Bonifer	2.41	1,216	571	318	327
86	49,070	Mar 88	10.2	38,405	074037	Bonifer	2.61	1,279	563	394	322
Total	99,550			77,914			2.51	2,495	1,134	712	649
87	217,443	Mar 89	8.6	0		Uma RM 63-70	NA				
88	255,614	Mar 90	8.2	0		Uma RM 70	NA				
89	194,847	Mar 91	7.8	0		Uma RM 66-79	NA				
90	122,639	Mar 92	7.7	26,160	075619	Uma RM 66	0.02	24	0	19	5
90	97,801	Mar 92	7.6	26,178	075618	Uma RM 70	0.02	19	19	0	0
Total	220,440			52,338			0.02	43	19	19	5
91	66,345	Mar 93	9.1	23,239	071461	Uma RM 73.5	0.05	34	11	3	20
91	68,492	Mar 93	9.1	23,863	071460	Uma RM 73.5	0.03	20	9	0	11
Total	134,837			47,102			0.04	54	20	3	31
92	233,629	Mar 94	10.4	23,699	070255	Uma RM 73.5	0.21	502	39	79	384
92	49,824	Apr 94	8.5	23,470	070252	Uma RM 73.5	0.08	38	0	2	36
93	111,817	Apr 95	7.8	24,865	070658	Thornhollow (RM 73.5)	0.19	211	0	0	211
93	115,271	Apr 95	8.2	24,374	070659	Thornhollow (RM 73.5)	0.11	128	0	0	128
	227,088			49,239			0.15	339	0	0	339

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/1 Adult returns from the 1990-1993 broods are incomplete.
/2 The data reported in the table are expanded numbers.

Appendix O. Liberation and survival information for Bonneville URB and Umatilla River stock subyearling fall chinook salmon released in the Umatilla River (1984-1993). /1

Br. Yr. Stock /2	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /3				
							%	Total	Ocean	Col. & Snake R.	Uma.R.
83 B	966,250	Jun 84	85.1	210,441	073124	Umatilla R.(RM 1.5)	0.79	7,594	2,406	5,188	0
84 B	3,223,172	Jun 85	92.3	206,756	073326	Umatilla R.(RM 1.5)	0.87	28,170	11,115	17,008	47
84 B	51,000	Oct 85	18.2	30,838	073162	Bonifer	0.67	342	147	192	3
85 B	35,574	Oct 86	11.6	0		Minthorn	NA				
85 B	197,432	Jun 86	86.0	20,636	073833	Umatilla R.(RM 1.5)	0.75	1,473	526	947	0
85 B	198,153	Jun 86	86.0	21,335	073834	Umatilla R.(RM 1.5)	0.37	734	362	372	0
85 B	197,488	Jun 86	86.0	20,690	073835	Umatilla R.(RM 1.5)	0.37	735	372	363	0
85 B	196,952	Jun 86	86.0	20,170	073836	Umatilla R.(RM 1.5)	0.51	996	254	742	0
85 B	197,788	Jun 86	86.0	20,982	073837	Umatilla R.(RM 1.5)	0.51	1,009	255	754	0
85 B	208,103	Jun 86	86.0	20,815	073838	Umatilla R.(RM 1.5)	0.39	810	330	480	0
85 B	208,958	Jun 86	86.0	21,659	073839	Umatilla R.(RM 1.5)	0.55	1,148	289	859	0
85 B	207,550	Jun 86	86.0	20,269	073840	Umatilla R.(RM 1.5)	0.56	1,157	625	532	0
85 B	208,184	Jun 86	86.0	20,895	073841	Umatilla R.(RM 1.5)	0.61	1,265	149	1,116	0
85 B	208,994	Jun 86	86.0	21,694	073842	Umatilla R.(RM 1.5)	0.44	925	289	636	0
Total	2,029,602			209,145			0.51	10,252	3,451	6,801	0
87 B	1,429,250 /4	Jun 88	93.1	0		Umatilla R.(RM 9)	NA				
89 B	1,018,502	May-Jun 90	87.5	52,612	075403	Umatilla R.(RM 70-79)	0.20	2,032	774	1,045	213
89 B	1,018,493	May-Jun 90	87.5	53,160	075404	Umatilla R.(RM 70-79)	0.22	2,222	900	1,207	115
89 B	1,018,486	May-Jun 90	87.5	53,248	075405	Umatilla R.(RM 70-79)	0.13	1,339	727	421	191
Total	3,055,481 /5			159,020			0.18	5,593	2,401	2,673	519
89 B	25,311	Oct 90	9.2	23,396	075325	Minthorn	0.03	7	4	2	1
89 B	23,724	Oct 90	9.2	21,929	075326	Minthorn	0.11	26	12	12	2
89 B	22,828	Oct 90	9.2	21,101	075327	Minthorn	0.07	15	2	9	4
Total	71,863			66,426			0.07	48	18	23	7
89 B	25,472	Oct 90	8.8	23,413	075322	Nr. Minthorn	0.05	12	3	9	0
89 B	25,694	Oct 90	8.8	23,617	075323	Nr. Minthorn	0.00	1	0	1	0
89 B	25,480	Oct 90	8.8	23,420	075324	Nr. Minthorn	0.06	16	13	2	1
Total	76,646			70,450			0.04	29	16	12	1
90 B	1,347,858	May 91	82.0	52,252	075225	Umatilla R.(RM 70-79)	0.11	1,420	439	542	439
90 B	1,347,587	May 91	82.0	51,728	075226	Umatilla R.(RM 70-79)	0.11	1,432	755	469	208
90 B	100,983	May 91	73.0	48,266	075328	Umatilla R.(RM 70-79)	0.32	320	100	182	38
90 B	100,300	May 91	73.0	48,481	075449	Umatilla R.(RM 70-79)	0.17	175	62	72	41
90 B	99,561	May 91	73.0	48,301	070016	Umatilla R.(RM 70-79)	0.18	179	76	80	23
90 B	52,503	May 91	82.0	51,814	075450	Umatilla R.(RM 70-79)	0.23	122	55	41	26
90 B	52,884	May 91	82.0	52,444	075451	Umatilla R.(RM 70-79)	0.22	117	67	36	14
Total	3,101,676 /6			353,286			0.12	3,765	1,554	1,422	789
90 B	26,481	May 91	80.5	26,173	075553	Minthorn	0.13	34	13	14	7
90 B	26,585	May 91	80.5	24,762	075501	Minthorn	0.23	61	33	23	5
90 B	26,606	May 91	80.5	25,476	075502	Minthorn	0.22	59	29	20	10
Total	79,672			76,411			0.19	154	75	57	22
90 B	25,862	May 91	86.0	25,720	075550	Nr. Minthorn	0.17	45	18	22	5
90 B	25,708	May 91	86.0	25,425	075551	Nr. Minthorn	0.16	40	16	20	4
90 B	23,295	May 91	86.0	22,309	075552	Nr. Minthorn	0.18	42	18	16	8
Total	74,865			73,454			0.17	127	52	58	17

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Appendix C. (cont.)

Br. Yr. Stock /2	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /3				
							%	Total	Ocean	Snake R.	Uma R.
91 B	286,864	May 92	70.6	31,892	071429	Umatilla R. (RM 42.5)	0.00	9	0	0	9
91 B	281,630	May 92	66.1	32,287	071430	Umatilla R. (RM 42.5)	0.00	0	0	0	0
91 B	183,113	May 92	66.2	28,951	071431	Umatilla R. (RM 42.5)	0.00	0	0	0	0
91 B	191,448	May 92	66.3	29,425	071432	Umatilla R. (RM 42.5)	0.00	0	0	0	0
91 B	304,181	May 92	61.0	29,066	071433	Umatilla R. (RM 42.5)	0.00	0	0	0	0
91 B	307,108	May 92	65.7	31,224	071434	Umatilla R. (RM 42.5)	0.00	0	0	0	0
91 B	297,627	May 92	60.9	30,326	071435	Umatilla R. (RM 42.5)	0.00	10	0	0	10
91 B	302,857	May 92	61.9	30,365	071436	Umatilla R. (RM 42.5)	0.00	7	0	0	7
91 B	224,053	May 92	65.2	30,508	071437	Umatilla R. (RM 42.5)	0.00	0	0	0	0
91 B	302,132	May 92	64.5	30,924	071438	Umatilla R. (RM 42.5)	0.00	26	0	0	26
	2,681,013 /7			304,968			NA				
91 U	504,369	May 92	53.4	0	0	Umatilla R. (RM 42.5)	NA				
91 U	5,167 Apr-May 92	62.8		0	0	Umatilla R. (RM 3)	NA				
92 B&U	296,200	May 93	63.0	28,964	076330	Umatilla R. (RM 73.5)	0.02	51	0	31	20
92 B&U	272,376	May 93	62.9	27,092	076331	Umatilla R. (RM 73.5)	0.03	90	60	0	30
92 B&U	285,360	May 93	62.0	29,958	076334	Umatilla R. (RM 73.5)	0.02	48	0	0	48
92 B&U	285,309	May 93	67.3	29,537	076331	Umatilla R. (RM 73.5)	0.02	68	0	29	39
92 B&U	276,750	May 93	60.3	29,718	076333	Umatilla R. (RM 73.5)	0.02	66	0	47	19
92 B&U	281,068	May 93	61.5	29,451	076332	Umatilla R. (RM 73.5)	0.02	67	0	10	57
92 B&U	271,026	May 93	59.3	29,594	070126	Umatilla R. (RM 73.5)	0.02	55	0	0	55
92 B&U	206,090	May 93	66.7	30,706	076329	Umatilla R. (RM 73.5)	0.02	40	7	20	13
92 B&U	275,571	May 93	60.3	29,360	070126	Umatilla R. (RM 73.5)	0.05	149	84	9	56
92 B&U	209,908	May 93	59.4	30,462	076335	Umatilla R. (RM 73.5)	0.04	90	28	0	92
	2,659,598 /8			294,842			0.03	724	179	146	399

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- /1 Adult returns from the 1989-1992 brood years are incomplete.
 /2 B = Bonneville URB stock; U = Umatilla River stock
 /3 The data reported in the table are expanded numbers.
 /4 These fish were not coded-wire tagged, but to estimate adult contribution, they were included in the Priest Rapids URB stock subyearling release in 1988 (075007). Both stocks were reared at Trigon Hatchery.
 /5 The number released includes 628,800 non-tagged Priest Rapids URB stock subyearlings released at 82.4/lb. in May at Umatilla RM 70-79
 /6 The number released includes 10,482 non-tagged fish at 80-194/lb. released at Umatilla RM 3 in April and May
 /7 The number released includes 2,670 non-tagged fish at 112/lb. released at Umatilla RM 3 in April and May
 /8 The number released includes 29,681 non-tagged fish at 96.5-142.0/lb. released between Umatilla RM 0 and RM 27.3 in April through May

Appendix P. Liberation and survival information for Priest Rapids URB and Umatilla River stock fall chinook salmon released in the Umatilla River (1987-1994) /1.

Br. Yr.	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /2				
							%	Total	Ocean	Col. & Snake R.	Uma R.
86	497,572	May 87	60.4	40,793	073912	Umatilla R.(RM 1.5)	0.71	3,549	1,537	1,939	73
86	501,266	May 87	60.4	41,096	073913	Umatilla R.(RM 1.5)	0.88	4,391	1,939	2,403	49
86	477,992	May 87	60.4	39,187	073914	Umatilla R.(RM 1.5)	0.86	4,099	2,086	1,891	122
Total	1,476,830			121,076			0.82	12,039	5,562	6,233	244
86	670	July 87	20.0	643	073915	Minthorn	0.00	0	0	0	0
86	672	July 87	20.0	645	073916	Minthorn	0.00	0	0	0	0
86	658	July 87	20.0	632	074035	Minthorn	0.79	5	0	5	0
Total	2,000			1,920			0.25	5	0	5	0
87	3,316,007 /3	May 88	68.3	198,285	075007	Umatilla R.(RM 23)	0.07	2,458	1,321	886	251
87	4,823	Nov 88	9.8	4,438	074539	Minthorn	0.43	21	11	9	1
87	4,660	Nov 88	9.8	4,289	074540	Minthorn	0.23	10	4	5	1
87	4,925	Nov 88	9.8	4,533	074541	Minthorn	0.62	31	21	10	0
Total	14,408			13,260			0.43	62	36	24	2
87	26,858	Nov 88	8.6	24,656	074536	Nr. Minthorn	0.39	105	41	50	14
87	25,493	Nov 88	8.6	23,403	074537	Nr. Minthorn	0.62	156	98	41	17
87	27,330	Nov 88	8.6	25,089	074538	Nr. Minthorn	0.53	144	62	60	22
Total	79,681			73,148			0.51	405	201	151	53
88	797,904	May 89	66.6	52,228	074646	Umatilla R.(RM 23)	0.12	978	443	428	107
88	797,903	May 89	66.6	49,771	074647	Umatilla R.(RM 23)	0.12	994	433	497	64
88	797,903	May 89	66.6	52,244	074648	Umatilla R.(RM 23)	0.11	886	428	443	15
Total	2,393,710			154,243			0.12	2,858	1,304	1,368	186
88	26,770	Oct 89	10.9	26,358	074753	Minthorn	0.13	33	15	16	2
88	26,617	Oct 89	10.9	25,028	074754	Minthorn	0.10	27	6	14	7
88	25,438	Oct 89	10.9	25,438	074757	Minthorn	0.07	19	4	8	7
Total	78,825			76,824			0.10	79	25	38	16
88	27,071	Oct 89	11.1	26,790	074758	Nr. Minthorn	0.10	27	11	12	4
88	25,428	Oct 89	11.1	24,285	074760	Nr. Minthorn	0.09	24	16	7	1
88	25,633	Oct 89	11.1	25,350	074763	Nr. Minthorn	0.06	16	7	5	4
Total	78,132			76,425			0.09	67	34	24	9
89	629,800 /4	May 90	82.4	0		Umatilla R.(RM 70-79)	NA				
93	325,385	May 94	63.0	31,162	070663	Umatilla R.(RM 73.5)	0.01	21	0	0	21
93	330,256	May 94	72.4	31,658	070719	Umatilla R.(RM 73.5)	0.01	41	0	10	31
93	316,971	May 94	65.4	30,528	070720	Umatilla R.(RM 73.5)	0.01	21	0	0	21
93	328,954	May 94	66.2	30,447	070723	Umatilla R.(RM 73.5)	0.01	22	0	11	11
93	306,213	May 94	68.0	30,950	070722	Umatilla R.(RM 73.5)	0.01	20	0	10	10
93	308,492	May 94	68.7	28,474	070721	Umatilla R.(RM 73.5)	0.00	0	0	0	0
93	282,230	May 94	60.1	31,239	070662	Umatilla R.(RM 73.5)	0.00	0	0	0	0
93	282,149	May 94	64.2	31,040	070718	Umatilla R.(RM 73.5)	0.01	18	0	0	18
93	192,813	May 94	69.1	30,502	070716	Umatilla R.(RM 73.5)	0.01	13	13	0	0
93	191,924	May 94	60.0	32,481	070717	Umatilla R.(RM 73.5)	0.01	12	0	0	12
	2,865,387 /5			308,481			0.01	168	13	31	124

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/1 Adult returns from the 1993 brood year are incomplete.

/2 The data reported in the table are expanded numbers.

/3 The number released includes 1,429,250 Bonneville URB stock subyearlings released at 93.1/lb. in June at Umatilla RM 9.

/4 These fish were not coded-were tagged, but to estimate adult contribution, they were included in the Bonneville URB stock subyearling release in 1990. Both stocks were reared at Irrigon Hatchery.

/5 The number released includes 22,174 non-tagged fish at 85-171/lb. released between Umatilla RM 27.3 and 32.5 in April and May.

Appendix Q. Liberation and survival information for spring chinook salmon released in the Umatilla River (1988-1994).

Brood	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /a			
							%	Total	Columbia & Snake Rivers	Umatilla River
86	99,895	April 88	20.6	0		Uma.R. (RM 23)	NA			
86	35,946	Mar-Apr 88	10.1	26,640	074325	Bonifer	0.95	342	34	308
86	35,148	Mar-Apr 88	10.1	25,863	074326	Bonifer	0.94	332	98	234
86	<u>35,137</u>	Mar-Apr 88	10.1	<u>25,853</u>	074327	Bonifer	<u>0.94</u>	<u>332</u>	<u>53</u>	<u>279</u>
Total	106,231			78,356			0.95	1006	185	821
86	64,142	April 88	8.6	26,319	074328	Uma.R. (RM 23-81)	0.65	419	53	366
86	62,991	April 88	8.6	25,722	074329	Uma.R. (RM 23-81)	0.48	304	86	218
86	<u>64,013</u>	April 88	8.6	<u>26,252</u>	074330	Uma.R. (RM 23-81)	<u>0.92</u>	<u>588</u>	<u>95</u>	<u>493</u>
Total	191,146 /b			78,293			0.69	1311	234	1077
87	416	Nov 88	21.4	410	074420	Bonifer	0.00	0	0	0
87	399	Nov 88	21.4	393	074423	Bonifer	0.25	1	0	1
87	<u>381</u>	Nov 88	21.4	<u>376</u>	074424	Bonifer	<u>0.26</u>	<u>1</u>	<u>0</u>	<u>1</u>
Total	1,196			1,179			0.17	2	0	2
87	26,109	Nov 88	11.1	25,987	074427	Uma.R. (RM 89)	0.06	15	0	15
87	24,183	Nov 88	11.1	24,070	074429	Uma.R. (RM 89)	0.12	28	3	25
87	<u>25,475</u>	Nov 88	11.1	<u>25,356</u>	074430	Uma.R. (RM 89)	<u>0.09</u>	<u>22</u>	<u>0</u>	<u>22</u>
Total	75,767			75,413			0.09	65	3	62
87	26,135	Mar-May 89	10.6	25,427	074433	Bonifer	0.35	92	11	81
87	27,756	Mar-May 89	10.6	27,004	074434	Bonifer	0.25	69	9	60
87	<u>26,093</u>	Mar-May 89	10.6	<u>25,386</u>	074436	Bonifer	<u>0.25</u>	<u>66</u>	<u>14</u>	<u>52</u>
Total	79,984			77,817			0.28	227	34	193
87	28,153	March 89	10.6	27,585	074439	Nr. Bonifer	0.32	90	24	66
87	28,116	March 89	10.6	27,550	074440	Nr. Bonifer	0.33	94	16	78
87	<u>24,663</u>	March 89	10.6	<u>24,165</u>	074443	Nr. Bonifer	<u>0.35</u>	<u>86</u>	<u>15</u>	<u>71</u>
Total	80,932			79,300			0.33	270	55	215
88	24,968	Oct 89	12.0	24,801	075063	Bonifer	0.07	17	11	6
88	28,299	Oct 89	12.0	28,109	075101	Bonifer	0.12	35	4	31
88	<u>27,483</u>	Oct 89	12.0	<u>27,299</u>	075102	Bonifer	<u>0.09</u>	<u>25</u>	<u>5</u>	<u>20</u>
Total	80,750			80,209			0.10	77	20	57
88	27,287	Oct 89	12.0	27,137	075103	Nr. Bonifer	0.07	18	2	16
88	28,718	Oct 89	12.0	28,560	075104	Nr. Bonifer	0.11	32	16	16
88	<u>27,848</u>	Oct 89	12.0	<u>27,695</u>	075105	Nr. Bonifer	<u>0.05</u>	<u>13</u>	<u>0</u>	<u>13</u>
Total	83,853			83,392			0.08	63	18	45
88	99,775	April 90	18.6	0		Uma.R. (RM 23)	NA			
88	38,224	March 90	9.0	26,638	075106	Bonifer	0.49	186	37	149
88	37,538	March 90	9.0	26,160	075107	Bonifer	0.65	244	59	185
88	<u>38,583</u>	March 90	9.0	<u>26,888</u>	075108	Bonifer	<u>0.47</u>	<u>183</u>	<u>48</u>	<u>135</u>
Total	114,345			79,686			0.54	613	144	469
88	39,012	March 90	9.6	25,611	075109	Nr. Bonifer	0.73	283	61	222
88	40,072	March 90	9.6	26,307	075110	Nr. Bonifer	0.75	302	84	218
88	<u>38,343</u>	March 90	9.6	<u>25,172</u>	075111	Nr. Bonifer	<u>0.54</u>	<u>208</u>	<u>60</u>	<u>148</u>
Total	117,427			77,090			0.68	793	205	588

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Appendix Q. (Cont.)

Brood	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /a			
							%	Total	Columbia & Snake Rivers	Umatilla River
89	26,757	Oct 90	11.5	26,670	074505	Bonifer	0.01	3	0	3
89	26,805	Oct 90	11.5	26,717	074506	Bonifer	0.01	2	0	2
89	<u>26,876</u>	Oct 90	11.5	<u>26,788</u>	074507	Bonifer	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	80,438			80,175			0.01	5	0	5
89	26,050	Oct 90	13.4	25,876	074508	Nr. Bonifer	0.01	2	2	0
89	26,279	Oct 90	13.4	26,104	074509	Nr. Bonifer	0.00	0	0	0
89	<u>25,669</u>	Oct 90	13.4	<u>25,497</u>	074510	Nr. Bonifer	<u>0.01</u>	<u>2</u>	<u>0</u>	<u>2</u>
Total	77,998			77,477			0.01	4	2	2
89	33,473	Mar 91	10.1	25,947	075114	Bonifer	0.24	82	19	63
89	33,440	Mar 91	10.1	25,921	075115	Bonifer	0.22	72	6	66
89	<u>33,593</u>	Mar 91	10.1	<u>26,039</u>	075116	Bonifer	<u>0.25</u>	<u>83</u>	<u>6</u>	<u>77</u>
Total	100,506			77,907			0.24	237	31	206
89	31,932	Mar 91	11.8	24,365	075440	Nr. Bonifer	0.15	47	0	47
89	32,187	Mar 91	11.8	24,559	075441	Nr. Bonifer	0.21	66	11 /c	55
89	<u>32,032</u>	Mar 91	11.8	<u>24,441</u>	075442	Nr. Bonifer	<u>0.18</u>	<u>58</u>	<u>7</u>	<u>51</u>
Total	96,151			73,365			0.18	171	18	153
89	96,733	Apr-May 91	20.3	23,797	635661	Uma.R. (RM 3 & 89)	/d			
90	27,040	Nov 91	16.5	26,769	075826	Bonifer	0.08	22	0	22
90	27,007	Nov 91	16.5	26,737	075827	Bonifer	0.06	16	0	16
90	<u>27,098</u>	Nov 91	16.5	<u>26,827</u>	075828	Bonifer	<u>0.10</u>	<u>26</u>	<u>0</u>	<u>26</u>
Total	81,145			80,333			0.08	64	0	64
90	26,019	Nov 91	16.8	25,499	075829	Nr. Bonifer	0.05	12	0	12
90	25,900	Nov 91	16.8	25,382	075830	Nr. Bonifer	0.06	16	0	16
90	<u>26,561</u>	Nov 91	16.8	<u>26,029</u>	075831	Nr. Bonifer	<u>0.04</u>	<u>11</u>	<u>0</u>	<u>11</u>
Total	78,480			76,910			0.05	39	0	39
90	96,254	April 92	18.7	31,851	633962	Uma.R. (RM 3 & 89)	0.00	0	0	0
90	36,351	April 92	9.2	26,570	075835	Bonifer	0.02	8	3	5
90	36,154	April 92	9.2	26,426	075836	Bonifer	0.02	7	0	7
90	<u>36,596</u>	April 92	9.2	<u>26,750</u>	075837	Bonifer	<u>0.04</u>	<u>15</u>	<u>0</u>	<u>15</u>
Total	109,101			79,746			0.03	30	3	27
90	32,994	April 92	8.5	25,503	075832	Nr. Bonifer	0.03	9	1	8
90	32,953	April 92	8.5	25,472	075833	Nr. Bonifer	0.04	12	6	6
90	<u>32,982</u>	April 92	8.5	<u>25,493</u>	075834	Nr. Bonifer	<u>0.01</u>	<u>4</u>	<u>0</u>	<u>4</u>
Total	98,929			76,468			0.03	25	7	18
91	97,013	May 92	32.1	50,611	071443	Uma.R. (RM 80)	0.00	0	0	0
91	63,585	May 92	31.2	48,051	071444	Uma.R. (RM 80)	0.00	0	0	0
91	63,305	May 92	32.2	49,498	071445	Uma.R. (RM 80)	0.00	0	0	0
91	95,456	May 92	32.1	50,045	071446	Uma.R. (RM 80)	0.00	0	0	0
91	104,670	May 92	36.4	50,047	071447	Uma.R. (RM 80)	0.00	0	0	0
91	104,929	May 92	36.3	51,707	071448	Uma.R. (RM 80)	0.00	0	0	0
91	109,528	May 92	38.3	51,518	071449	Uma.R. (RM 80)	0.00	0	0	0
91	109,997	May 92	37.8	51,271	071450	Uma.R. (RM 80)	0.00	0	0	0
91	98,617	May 92	39.2	52,128	071451	Uma.R. (RM 80)	0.00	0	0	0
91	<u>108,652</u>	May 92	36.8	<u>51,659</u>	071452	Uma.R. (RM 80)	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>0</u>
	955,752			506,535			0.00	0	0	0

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Appendix Q. (Cont.)

Brood	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /a			
							%	Total	Columbia & Snake Rivers	Umatilla River
91	25,104	Nov 92	13.0	25,104	076042	Uma.R. (RM 80)	0.06	15	1	14
91	25,075	Nov 92	13.0	24,992	076043	Uma.R. (RM 80)	0.04	9	3	6
91	15,730	Nov 92	13.1	15,423	076044	Uma.R. (RM 80)	0.03	5	0	5
91	24,638	Nov 92	9.9	24,638	076045	Uma.R. (RM 80)	0.04	9	0	9
91	24,715	Nov 92	10.0	24,221	076046	Uma.R. (RM 80)	0.08	20	0	20
91	17,667	Nov 92	10.1	17,269	076047	Uma.R. (RM 80)	0.05	8	0	8
	132,929			131,647			0.05	66	4	62
91	50,736	Nov 92	19.3	26,136	071542	Uma.R. (RM 80)	0.00	0	0	0
91	50,680	Nov 92	19.5	25,633	071543	Uma.R. (RM 80)	0.00	0	0	0
	101,416			51,769			0.00	0	0	0
91	92,728	Mar 93	14.5	19,951	071455	Uma.R. (RM 80)	0.20	181	14	167
91	94,220	Mar 93	14.5	20,022	071456	Uma.R. (RM 80)	0.13	127	14	113
	186,948			39,973			0.16	308	28	280
91	50,310	Mar 93	8.3	21,499	075739	Uma.R. (RM 80)	0.00	0	0	0
91	50,109	Mar 93	8.3	20,880	075740	Uma.R. (RM 80)	0.01	7	0	7
91	54,347	Mar 93	8.3	21,157	075741	Uma.R. (RM 80)	0.08	41	0	41
91	54,016	Mar 93	8.3	20,307	075742	Uma.R. (RM 80)	0.04	21	0	21
	208,782			83,843			0.03	69	0	69
91	96,086	April 93	20.3	31,421	635950	Uma.R. (RM 3-89)	0.00	0	0	0
92	105,290	June 93	27.0	52,588	076136	Uma.R. (RM 80)	0.00	0	0	0
92	109,473	June 93	27.3	51,680	076135	Uma.R. (RM 80)	0.00	0	0	0
92	113,852	June 93	28.5	52,893	076132	Uma.R. (RM 80)	0.00	0	0	0
92	111,103	June 93	27.1	52,172	076137	Uma.R. (RM 80)	0.00	0	0	0
92	111,333	June 93	27.4	51,963	076134	Uma.R. (RM 80)	0.00	0	0	0
92	116,316	June 93	28.1	52,335	076133	Uma.R. (RM 80)	0.00	0	0	0
	667,367			313,631			0.00	0	0	0
92	49,694	Nov 93	20.3	34,541	070159	Uma.R. (RM 80)	0.00	0	0	0
92	52,211	Nov 93	21.5	35,657	070161	Uma.R. (RM 80)	0.00	0	0	0
92	47,867	Nov 93	20.8	36,102	070216	Uma.R. (RM 80)	0.00	1	0	1
92	49,081	Nov 93	20.9	35,408	070160	Uma.R. (RM 80)	0.00	0	0	0
92	48,343	Nov 93	20.2	35,467	070162	Uma.R. (RM 80)	0.00	0	0	0
92	49,318	Nov 93	20.8	36,157	070163	Uma.R. (RM 80)	0.00	0	0	0
92	40,661	Nov 93	18.5	35,710	070155	Uma.R. (RM 80)	0.00	0	0	0
92	39,656	Nov 93	18.0	34,857	070157	Uma.R. (RM 80)	0.00	0	0	0
92	42,734	Nov 93	18.8	33,999	070156	Uma.R. (RM 80)	0.00	0	0	0
92	41,244	Nov 93	19.2	34,130	070158	Uma.R. (RM 80)	0.00	0	0	0
	460,809			352,028			0.00	1	0	1
92	51,938	March 94	8.4	20,982	070220	Uma.R. (RM 80)	0.00	0	0	0
92	52,620	March 94	8.8	20,971	070219	Uma.R. (RM 80)	0.00	0	0	0
92	51,210	March 94	8.5	20,070	070217	Uma.R. (RM 80)	0.00	0	0	0
92	49,375	March 94	8.1	19,920	070218	Uma.R. (RM 80)	0.00	0	0	0
	205,143			81,943			0.00	0	0	0
92	75,835	March 94	11.5	26,305	070251	Uma.R. (RM 73.5)	0.03	20	3	17
92	77,019	March 94	11.5	26,716	070250	Uma.R. (RM 73.5)	0.02	14	0	14
	152,854			53,021			0.02	34	3	31
92	130,925	March 94	12.3	20,219	075945	Uma.R. (RM 80)	0.01	19	0	19
92	130,213	March 94	12.3	20,109	075944	Uma.R. (RM 80)	0.01	13	0	13
	261,138 /e			40,328			0.01	32	0	32

Appendix Q. (Cont.)

Brood	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	%	Estimated Adult Survival /a		
								Total	Columbia & Snake Rivers	Umatilla River
93	140,591	May 94	30.7	49,726	070734	Imeques (RM 80)	0.00	0	0	0
93	141,901	May 94	30.7	52,298	070735	Imeques (RM 80)	0.00	0	0	0
93	139,717	May 94	30.1	52,636	070736	Imeques (RM 80)	0.00	0	0	0
93	142,513	May 94	30.1	53,172	070737	Imeques (RM 80)	0.00	0	0	0
93	139,687	May 94	30.5	51,042	070738	Imeques (RM 80)	0.00	0	0	0
93	<u>134,968</u>	May 94	30.5	<u>52,317</u>	070739	Imeques (RM 80)	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>0</u>
	839,377			311,191			0.00	0	0	0
93	38,234	Nov 94	9.5	34,808	070728	Imeques (RM 80)	0.00	0	0	0
93	39,551	Nov 94	10.5	35,156	070726	Imeques (RM 80)	0.00	0	0	0
93	39,548	Nov 94	9.0	34,124	070724	Imeques (RM 80)	0.00	0	0	0
93	40,383	Nov 94	9.4	35,160	070729	Imeques (RM 80)	0.00	0	0	0
93	39,487	Nov 94	9.2	34,819	070727	Imeques (RM 80)	0.00	0	0	0
93	39,517	Nov 94	9.3	34,827	070725	Imeques (RM 80)	0.00	0	0	0
93	37,096	Nov 94	7.8	35,750	070731	Imeques (RM 80)	0.00	0	0	0
93	34,649	Nov 94	9.6	34,220	070733	Imeques (RM 80)	0.00	0	0	0
93	37,073	Nov 94	7.2	34,915	070730	Imeques (RM 80)	0.00	0	0	0
93	<u>32,687</u>	Nov 94	7.4	<u>32,251</u>	070732	Imeques (RM 80)	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>0</u>
	378,225			346,030			0.00	0	0	0

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/a. The data reported in the table are expanded numbers

/b. The number released includes 89,268 non-tagged fish at 10.3/lb. released in the upper Umatilla River in April, 1988

/c. Includes 4 from Alaskan commercial fishery

/d. The same coded-wire tag code was released both in the Wind River (Washington) and Umatilla River. This eliminates any possible evaluation of survival from the Umatilla River.

/e. The number released includes 8,890 non-tagged fish at 8.1 to 8.3/lb. released at Umatilla RM 3 and 29.2 in March and April.

Appendix R. Liberation and survival information for coho salmon released in the Umatilla River (1987-1995). /a

Brood	Number Released	Date of Release	Size at Release	Number Tagged	CWT Code	Release Location	Estimated Adult Survival /b				
							%	Total	Ocean	Col.R.	Uma.R.
85	212,266	Apr 87	13.5	13,440	073617	Minthorn	1.94	4122	1974	1911	237
85	313,961	Apr 87	13.5	19,879	073624	Minthorn	1.68	5259	3048	2053	158
85	<u>422,322</u>	Apr 87	13.5	<u>26,740</u>	<u>073625</u>	Minthorn	<u>1.55</u>	<u>6555</u>	<u>3822</u>	<u>2543</u>	<u>190</u>
Total	948,549 /c			60,059			1.68	15936	8844	6507	585
86	334,038	Mar-Apr 88	16.8	20,592	074366	Lower Umatilla R.	4.58	15314	8387	4088	2839
86	360,689	Mar-Apr 88	17.3	18,963	074367	Lower Umatilla R.	4.41	15901	8407	3652	3842
86	<u>301,706</u>	Mar-Apr 88	15.7	<u>18,513</u>	<u>074368</u>	Lower Umatilla R.	<u>4.48</u>	<u>13510</u>	<u>7464</u>	<u>2852</u>	<u>3194</u>
Total	996,433			58,068			4.49	44725	24258	10592	9875
87	829,607	Mar 89	17.2	27,062	074609	Nr. Minthorn	0.57	4690	2790	1318	582
87	72,627	Mar 89	17.3	26,416	074610	Minthorn	1.04	756	533	121	102
87	<u>84,672</u>	Mar 89	19.1	<u>26,739</u>	<u>074611</u>	Minthorn	<u>1.08</u>	<u>918</u>	<u>690</u>	<u>108</u>	<u>120</u>
Total	157,299			53,155			1.06	1674	1223	229	222
88	67,309	Mar 90	13.5	28,033	074814	Minthorn	3.07	2069	821	1054	194
88	856,524 /d	Mar 90	13.3	26,881	074813	Uma Rm 63-70	3.11	26606	11216	13096	2294
88	65,095	Apr 90	11.2	27,226	074815	Minthorn	4.04	2630	1129	1274	227
89	152,974	Mar 91	15.4	24,584	075536	Minthorn	0.20	305	187	81	37
89	449,678	Mar 91	16.5	25,338	075534	Uma Rm 56-60	0.17	746	302	302	142
89	<u>352,977</u>	Mar 91	16.8	<u>25,407</u>	<u>075533</u>	Uma Rm 63-70	<u>0.16</u>	<u>556</u>	<u>320</u>	<u>69</u>	<u>167</u>
Total	802,655			50,745			0.16	1302	622	371	309
90	472,221	Mar 92	15.5	27,908	075620	Uma Rm 56	0.71	3367	1032	1574	761
90	244,615	Mar 92	15.7	27,705	075621	Uma Rm 60	1.07	2622	909	1068	645
90	<u>244,550</u>	Mar 92	15.7	<u>27,458</u>	<u>075622</u>	Uma Rm 60	<u>0.75</u>	<u>1844</u>	<u>490</u>	<u>944</u>	<u>410</u>
Total	961,386			83,071			0.81	7833	2431	3586	1816
91	454,794	Apr 93	17.6	28,273	071521	Uma Rm 60	0.20	901	0	322	579
91	218,618	Apr 93	17.5	27,821	071522	Uma Rm 42.5	0.26	574	0	228	346
91	<u>219,266</u>	Apr 93	17.5	<u>27,984</u>	<u>071523</u>	Uma Rm 42.5	<u>0.17</u>	<u>376</u>	<u>39</u>	<u>78</u>	<u>259</u>
Total	892,678			84,078			0.21	1851	39	628	1184
92	418,222	Apr 94	18.1	27,166	070337	Uma Rm 42.5	0.22	908	169	293	446
92	233,105	Apr 94	17.0	27,452	070338	Uma Rm 60	0.30	705	136	153	416
92	<u>232,778</u>	Apr 94	17.1	<u>27,010</u>	<u>070339</u>	Uma Rm 60	<u>0.20</u>	<u>465</u>	<u>95</u>	<u>34</u>	<u>336</u>
	884,105			81,628			0.24	2078	400	480	1198
93	250,970	Mar-Apr 95	14.7	26,421	070557	Uma Rm 42.5	0.00	9	0	0	9
93	251,135	Mar-Apr 95	14.7	26,381	070558	Uma Rm 42.5	0.00	10	0	0	10
93	<u>497,449</u>	March 95	14.5	<u>26,498</u>	<u>070559</u>	Uma Rm 60	<u>0.00</u>	<u>19</u>	<u>0</u>	<u>0</u>	<u>19</u>
	999,554			79,300			0.00	38	0	0	38

Revised: 4-16-96

File Name: C:\123\DATA\COHSURV

/a Survival data for the 1993 brood includes age-2 fish only (1995 returns).

/b The data reported in the table are expanded numbers

/c The number released includes 786,660 non-tagged fish at 14.0/lb. released at Umatilla RM 23 in April

/d The number released includes 694,627 non-tagged fish at 14.8/lb. released at Umatilla RM 70 in March and April, and 202,315 non-tagged fish at 14.5/lb. released at Umatilla RM 23 in March

Appendix S. Fish sampled at the Westland Canal fish trapping facility in 1995. /a

Date	No. Fish Sampled	Salmonids								Non—game & Warm Water Species
		Marked			Unmarked					
		Fall Chinook (SY)	Chinook (Y)	STS (Y)	Coho (SY)	Coho (Y)	Chinook	Rainbow Trout	Whitefish	
6/8	393	378		1			12			2
6/9	472	453				2	17			
6/12	563	533					30			
6/14	328	289		1			30	4		4
6/16	396	355					38			3
6/19	344	311				2	31			
6/21	347	288				1	49			9
6/23	228	155				2	1	57		13
6/26	470	204		1	3	4	252	1		5
6/28	123	44				1	73			5
6/30	189	44				1	2	137		5
7/5	151	50					3	90		8
7/10	99	20	1				1	54	1	22
7/14	82	65								17
TOTAL	4185	3189	1	3	7	16	870	5	1	93

Revised: 8/7/95

File Name: C:/123R3/DATA/WLSAMP95

/a Y = yearling; SY = subyearling.