

# Umatilla River Fish Passage Operations Program

**Annual Report  
2000 - 2001**



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Fish Passage Operations in the  
Umatilla River, 2000-2001

Umatilla River Fish Passage Operations Program  
Annual Progress Report  
October 2000 - September 2001

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## ABSTRACT

Threemile Falls Dam (Threemile Dam), located near the town of Umatilla, is the major collection and counting point for adult salmonids returning to the Umatilla River. Returning salmon and steelhead were enumerated at Threemile Dam from August 17, 2000 to July 7, 2001. A total of 3,662 summer steelhead (*Oncorhynchus mykiss*); 643 adult, 437 jack, and 4,948 subjack fall chinook (*O. tshawytscha*); 4,654 adult and 1,276 jack coho (*O. kisutch*); and 4,382 adult and 185 jack spring chinook (*O. tshawytscha*) were counted. All fish were enumerated at the east bank facility.

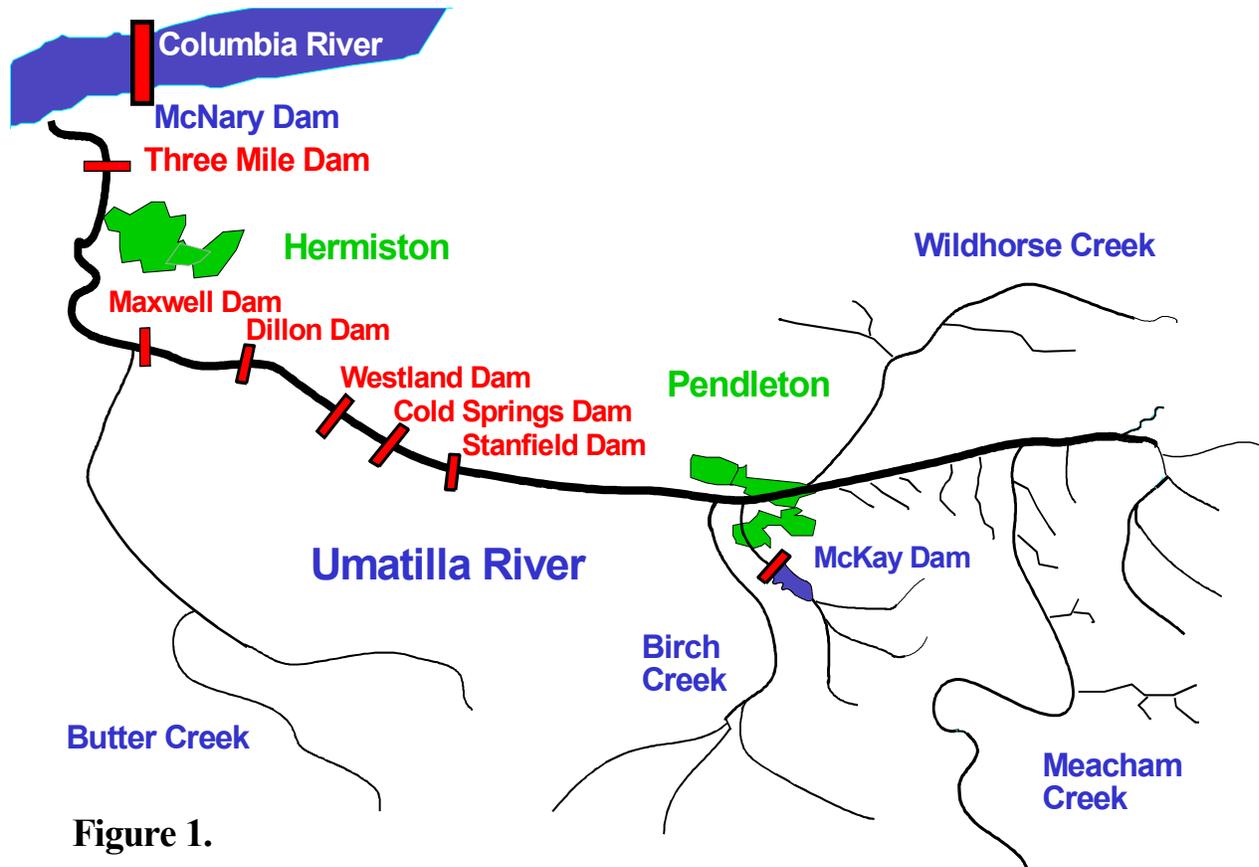
Of the fish counted, 14 summer steelhead and 847 adult and 74 jack spring chinook were hauled upstream from Threemile Dam. There were 3,433 summer steelhead; 71 adult, 298 jack and 4,647 subjack fall chinook; 4,435 adult and 1,180 jack coho; and 2,873 adult and 55 jack spring chinook either released at, or allowed to voluntarily migrate past, Threemile Dam. In addition, 116 summer steelhead; 565 adult and 38 jack fall chinook; and 646 adult and 31 jack spring chinook were collected for brood.

The Westland Canal juvenile facility (Westland), located near the town of Echo at rivermile (RM) 27, is the major collection point for outmigrating juvenile salmonids and steelhead kelts. The canal was open for 147 days between February 5 and July 26, 2001. During that period, fish were bypassed back to the river 127 days and were trapped 18 days. An estimated 350 pounds of juvenile fish were transported from Westland to the Umatilla River boat ramp (RM 0.5). Approximately 92% of the juveniles transported were salmonids. No steelhead kelts were hauled from Westland this year.

The Threemile Dam west bank juvenile bypass was open throughout the summer of 2000 and continued to run until October 27, 2000. The bypass was reopened March 8, 2001 and ran until July 9, 2001. The juvenile trap was not operated this year.

## INTRODUCTION

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Oregon Department of Fish and Wildlife (ODFW) are cooperatively working to rehabilitate runs of coho, fall and spring chinook and summer steelhead in the Umatilla River Basin (Figure 1). The Bonneville Power Administration (BPA) and other federal agencies are funding several projects to accomplish that goal (CTUIR, et al. 2001). Included among these projects is Umatilla River Fish Passage Operations (formerly known as Trap and Haul, project number 198802200).



**Figure 1.**

The lower 32 miles of the Umatilla River historically provided obstacles to the migration of both adult and juvenile salmonids. Passage inadequacies have been identified as a major contributor to the decline of summer steelhead and extinction of salmon populations in the basin (CTUIR, et al. 2001, CTUIR & ODFW 1989, CTUIR & ODFW 1990, ODFW 1986). During both juvenile and adult migration periods, parts of the lower river between the mouth and Stanfield Dam were dewatered, stranding migrating salmonids. The U.S. Fish and Wildlife Service (USFWS)(1981) and U.S. Bureau of Reclamation (BOR)(1988) identified flows ranging from 150 cubic feet per second (cfs) to 300 cfs as being necessary for fish passage through this river reach. With implementation of the Umatilla Basin Project, the duration and extent of these low flow periods have decreased substantially from what occurred historically.

In addition to low flows, diversion structures associated with irrigation canals also provided physical barriers to passage. Adult ladder and juvenile screen and bypass improvements have been completed at most diversions in the basin. With implementation of these flow enhancement and physical passage improvements, passage conditions have improved dramatically. However, even with these improvements in place there are still periods when inadequate passage conditions may occur.

Initially, this project was implemented as the Umatilla River Trap and Haul Program. The primary responsibility of the project through the early years was to capture and safely transport adult and juvenile migrants around dewatered stream reaches in the lower basin. The project has evolved with implementation of the flow enhancement and fish passage improvements in the basin. The project title has been changed to Umatilla River Fish Passage Operations to more accurately reflect the transformations which have occurred within the project and in the overall passage program in the basin. While transportation is still an important function, operation and coordination of flow enhancement efforts and passage facilities are now the major focus for the project.

The objective of the Umatilla River Fish Passage Operations Project is to maximize survival of adult and juvenile salmonids migrating through the lower Umatilla River. The project has four primary areas of responsibility to meet this objective: 1) Monitoring of flow and passage conditions in the basin; 2) Daily operation and refinement of operating criteria for passage and trapping facilities, and transportation equipment; 3) Oversight of the flow enhancement effort (Umatilla Basin Project); and 4) Coordination of the overall fish passage program. It is critical that facility operations and flow enhancement efforts are coordinated with passage requirements to ensure that optimal passage conditions exist and passage inadequacies are no longer a limiting factor to restoration efforts in the basin.

## METHODS

### ***Task 1 - Passage Conditions Monitoring***

#### SubTask 1.1 - Monitoring of River Conditions

Temperatures are monitored during the project year to help refine project operating guidelines. Temperatures are measured daily at Threemile Dam by use of digital recording thermometers and at loading stations and release sites with hand held thermometers.

Daily river flow is monitored at Pendleton (RM 54), Yoakum (RM 37), Dillon (RM 24.5) and Umatilla (RM 2). Daily irrigation usage is monitored for Stanfield, Westland, Feed, and West Extension canals. River flow and irrigation diversion data is provided by Oregon Department of Water Resources (OWRD) from the Hydromet flow gauging stations.

#### SubTask 1.2 - Inspection of Passage Facilities

Juvenile fish screens/bypasses and adult ladder facilities, associated with irrigation diversions within the basin, are monitored throughout the year to ensure that adequate passage conditions exist for upstream and downstream migrants. Inspections include checking for proper installation and operation of screens, gaps and holes in screens or seals, debris buildup on screens and trash racks, proper flows to smolt bypasses and adult ladders, adequate access and exit conditions at bypasses and ladders, and signs of fish activity.

#### SubTask 1.3 - Coordination of Passage Projects

There are two components of the fish passage program in the lower Umatilla River; flow enhancement and physical passage facilities. It is essential that operation of these components are coordinated with river conditions and diversion activities in order to maximize lower river migration conditions.

The Umatilla Basin Project (UBP) flow enhancement program has two components. Phase I of the UBP is comprised of a live flow exchange with West Extension Irrigation District (WEID). Phase II of the UBP has three individual components; live flow exchanges with both Hermiston (HID) and Stanfield (SID) irrigation districts and a reservoir storage exchange with SID. In all components of the UBP, Columbia River water is pumped from the McNary pool to the affected irrigation district in "exchange" for that district leaving natural Umatilla River flow instream.

Operation of this complex exchange program is coordinated by the project in conjunction with other CTUIR and ODFW staff, BOR, OWRD, and the affected irrigation districts. Criteria for operation of the flow enhancement program is based on a combination of project observations of adult and juvenile migration, UBP target flows (BOR 1988), and

USFWS (1981) minimum flow recommendations.

The physical passage portion of the program includes juvenile fish screens, bypasses, and adult ladders. Operation of passage facilities are coordinated with the Umatilla Passage Facility Operation and Maintenance (UPFO&M) crews using criteria developed by National Marine Fisheries Service (NMFS) as a general guideline for facility operations.

## ***Task 2 - Operation of Adult Trapping Facilities***

### **SubTask 2.1 - Threemile Dam Adult Trapping**

Threemile Dam, located approximately three miles upstream from the mouth of the Umatilla River, is the major collection and counting point for all adults returning to the Umatilla River. The main collection facility is located on the east bank and includes a vertical slot ladder, Denil steppass, raceway type holding pond and fish handling and sorting complex (Figure 2). Fish routed through the sorting complex are anesthetized with carbon dioxide (CO<sub>2</sub>) to reduce stress during the handling process. Captured adults can be directed back into the holding pond, into recovery tanks for release upstream of the dam, to a broodstock holding and spawning facility, directly into the dam forebay, or into transport tanks for hauling.



Up until the 1999/2000 return year, all adults returning to Threemile Dam were

trapped. That year, criteria were outlined for volitional migration of adults past Threemile Dam with enumeration occurring through video recording. Again in 2000/2001, the Umatilla Hatchery and Basin Annual Operations Plan (AOP)(CTUIR & ODFW 2000) identified criteria for volitional migration of adults past Threemile Dam. Beginning in the fall, in conjunction with flow augmentation releases from McKay Reservoir, trapping and volitional migration were to occur in alternating weeks. Starting December 1, trapping was to be reduced to five day periods with volitional migration occurring for nine day periods. As of April 15, trapping was to be reduced even more, to an as needed basis for collection of spring chinook broodstock. Trapping periods would be increased if broodstock collection goals or passage criteria were not being met.

Data collected during adult trapping operations includes date, number of fish trapped, species, age and sex composition, marks and disposition. Observations are also made of marine mammal damage, net marks, mechanical damage, and general fish condition. In addition, fork length, mid-eye/hypural plate (MEHP) length, scales, and snouts are collected from a percentage of the fish with coded wire tags (CWT). During volitional migration periods, enumeration occurred by video camera. Data collected during volitional migration includes date, species, number of fish moving upstream and downstream, jack or adult salmon, and wild or hatchery steelhead. General observations were also made such as time of movement and other species observed.

Fall and spring chinook salmon were classified as either adults (fork length greater than or equal to 24 inches) or jacks (fork length less than 24 inches) as outlined in ODFW sport fishing regulations. Subjack (or mini-jack) fall chinook were defined as less than 15 inches in fork length based upon historical length frequency data (CTUIR files). Coho adults were defined as fork length greater than or equal to 18 inches and jacks as fork length less than 18 inches based upon historical length frequency data (CTUIR files). Based on scale analysis of Umatilla River summer steelhead, adult summer steelhead were classified as either one ocean (S1, fork length less than 26 inches) or two ocean (S2, fork length greater than or equal to 26 inches) (CTUIR files). Visual determinations are made to differentiate resident rainbow trout from summer steelhead (but generally less than 18 inches). No data are collected from fish designated as resident trout.

The east bank facility is manned 24 hours a day during the adult capture season. Permanent, on-site housing is provided for watch personnel. In addition to providing security, watch personnel monitor facility operations, assist trap and haul operations, and make observations of fish activity.

The west bank at Threemile Dam also has an adult collection facility. It consists of a vertical slot ladder, a combination V-trap/holding pond, and fish loading apparatus. The trap/holding pond and fish loading complex have no enumeration or sorting capabilities. The ladder was designed with the ability to enumerate fish using video equipment.

## SubTask 2.2 - Westland Adult Trapping

Summer steelhead kelts may be captured at the Westland Canal juvenile facility during trapping operations. The facility has the ability to bypass kelts downriver during high flows or to trap them for transport during low flow periods. It is generally operated in the bypass mode during the majority of the kelt outmigration period. Other adults (such as spring chinook) may also be captured incidentally at the facility during trapping operations and are held for transport upstream. Information collected from adults trapped at Westland includes date, species, and number.

### ***Task 3 - Operation of Juvenile Trapping Facilities***

#### SubTask 3.1 - Westland Juvenile Facility Operation

The Westland Canal juvenile facility (Figure 3) is the major collection point for outmigrating juvenile salmonids. It is intended to be operated whenever Westland Canal is delivering water. The facility consists of rotary drum screens, fish bypass, fish trap, adult/juvenile separator (horizontal bar grader), and adult and juvenile holding ponds.



Figure 3.

During periods of flow adequate for downstream migration, the facility is designed to operate in the bypass mode. In this mode, fish that enter the irrigation canal are directed back to the river without entering the holding ponds. During periods of inadequate flow, the facility is designed to trap fish, separate juveniles from adults, and direct them to their respective holding units. Juveniles can then be loaded onto trucks or trailers for transport downstream.

Facility trapping operations are coordinated with flow augmentation releases. As river flows drop, the Westland ladder is closed and as much of the river flow as possible is diverted into the Westland Canal headworks and through the juvenile facility prior to being returned to the river. This forces outmigrants into the trapping facility and minimizes the number of fish that may become stranded in the low flow river reach below Westland Dam.

Information collected at Westland includes dates of both canal operation and facility operational modes. Because the majority of the fish are now bypassed at Westland rather than trapped, the facility is no longer manned on a 24 hour basis.

### SubTask 3.2 - Threemile Dam Juvenile Facility Operation

A juvenile collection facility is also located at Threemile Dam on the west bank. This facility consists of rotary drum screens, fish bypass channel, fish trap, sampling station and holding tank. It is designed to bypass outmigrating juveniles during periods of adequate flow or to trap them during low flow periods. The trapping portion of this facility was designed as a sampling and evaluation station rather than a production trapping facility. The trap can be used for sampling during bypass periods but is ineffective for trapping and hauling anything but small numbers of fish.

Because of the insufficient trapping capabilities at this site, the operation of the facility is closely coordinated with the Westland facility in order to minimize the number of fish captured at Threemile Dam. Normally, the entire river flow is diverted at Westland to preclude additional downstream volitional movement for a few days prior to the river flow going to zero. This allows smolts located in the reach between Westland and Threemile dams to be bypassed at Threemile Dam prior to trapping being initiated.

Information collected at Threemile Dam west bank includes dates of both canal operation and facility operational modes. The facility is not manned on a 24 hour basis.

## ***Task 4 - Adult and Juvenile Transportation***

### SubTask 4.1 - Threemile Dam Adult Hauling

The Fish Passage Operations program has one 3,000 gallon and two 370 gallon fish liberation units. The 3,000 gallon unit is a diesel operated tractor-trailer equipped with a 12 inch discharge opening and two holding chambers capable of isolating two groups in the same load. The unit is also equipped with both liquid oxygen and electric aeration to reduce fish stress during transport. The two 370 gallon transport tanks are mounted on

dual axle trailers and are pulled by pick-up trucks. Each unit is equipped with both compressed oxygen aeration and a re-circulation system. Both units have an eight inch discharge opening. ODFW liberation protocols are used as the basic guideline for adult hauling operations.

In addition to these units, the project also has access to a Bureau of Indian Affairs 750 gallon portable fiberglass tank which can be mounted on a flatbed truck. This unit is also equipped with both compressed oxygen aeration and a re-circulation system and has a 12 inch discharge opening.

Adult transportation requirements are based on flow criteria outlined in the 1981 USFWS study and past project observations of salmon migrations in the Umatilla River. The AOP also identifies criteria for transportation of adults collected at Threemile Dam. Generally, returning adults are to be hauled whenever flows in the Umatilla River are projected to fall below 150 cfs at Dillon within 30 days. The project is also responsible for the collection and transportation of broodstock from Threemile Dam.

The AOP outlines release locations for adults hauled upstream from Threemile Dam. Fall chinook and coho are to be released at either the Pendleton boat ramp (RM 52.5) or ODFW District Office juvenile acclimation site (RM 56). Spring chinook are also to be released at these two sites unless flows at Pendleton drop below 250 cfs. Releases are then to be made as high in the basin as temperature differentials will allow. Summer steelhead releases are to be alternated between the various upriver release locations.

Returning adults are to be released at Threemile Dam whenever flows at Dillon are anticipated to remain above 150 cfs for a minimum of 30 days after release. Now that the UBP flow enhancement program is in place, flows generally remain above 150 cfs for all but the very beginning and end of the adult return season. The majority of adults entering the Umatilla River are either released at, or volitionally migrate past, Threemile Dam. The AOP identified the following groups for release at Threemile Dam regardless of flow condition; fall chinook minijacks and excess fall chinook jacks, coho adults, and coho jacks.

#### SubTask 4.2 - Westland Adult Hauling

Summer steelhead kelts and other adults may be captured at the Westland Canal juvenile facility during trapping operations. Adults entering the trap can be separated from juveniles by a horizontal bar grader and directed into an adult holding pond. Kelts can then be loaded onto tanks for hauling downstream for release at the Umatilla River boat ramp. Other adults captured incidentally at Westland, such as spring chinook, are hauled upstream to natural production areas.

#### SubTask 4.3 - Westland Juvenile Hauling

With the UBP flow enhancement program in place, spring flows are usually high enough that most juveniles are bypassed at Westland. Trapping only occurs at the very end of the outmigration season and the biomass of juveniles captured is very low. During

periods when these low numbers of fish are being captured, the fish are manually loaded onto the transport trailers by dipnet.

Juvenile trapping and transportation requirements are based on flow criteria from the 1981 USFWS study and past observations of juvenile outmigration in the Umatilla River. Downstream migrants are generally trapped and hauled beginning when enhancement flows are tapered off.

The same transport units used for adults are used for hauling juveniles. ODFW liberation protocols are also used as the basic guideline for juvenile hauling operations. Data collected for each transport includes date, transport unit, number of pounds hauled, and an estimate of mortality. Umatilla Hatchery Satellite Facility personnel collect information related to smolt outmigration such as size and species composition. All juveniles are to be released at the Umatilla River boat ramp.

#### SubTask 4.4 - Threemile Dam Juvenile Hauling

The capability exists at the Threemile Dam west bank juvenile facility to trap and haul only small numbers of outmigrants. Fish are to be hauled when Phase I exchange flows and flow augmentation efforts are discontinued. If coordinated with trap operations at Westland Canal, few smolts are present above Threemile Dam when trapping operations begin. Any juveniles hauled from the facility are released at the Umatilla River boat ramp.

#### SubTask 4.5 - Other Hauling Operations

Fish Passage Operations personnel and equipment are available for other transportation needs related to the Umatilla Basin fisheries restoration program as long as project priorities do not preclude participation. It has become an annual practice for the project to haul excess fall chinook adults from Priest Rapids and/or Ringold Springs hatcheries to the Umatilla River for natural spawning augmentation. The AOP has identified up to 1,000 adults for transfer with releases to occur at the Pendleton boat ramp (RM 52.5) and/or ODFW juvenile acclimation site (RM 56).

## **RESULTS**

## **Task 1 - Passage Conditions Monitoring**

### SubTask 1.1 - Monitoring of River Conditions

Water temperature and flow, measured at Threemile Dam, exhibited extreme seasonal fluctuation during the year. The temperature recorder at Threemile Dam was lost along with the data from mid January to mid June. Temperatures recorded during this period were taken with a hand held thermometer during trapping operations. The lowest daily temperature recorded was 1.7 C (35.0 F) on January 26 and February 9 and 12, 2001. The highest daily temperature was 24.4 C (76.0 F) on July 10, 2001. Flows at the Umatilla gauging station ranged from less than 2 cfs in July to 1,470 cfs in May.

Umatilla River flows at Dillon are affected by McKay Reservoir storage releases, irrigation withdrawals and natural flows. Flows at Dillon ranged from a low of less than 3 cfs in July to a high of 1,770 cfs in March. Flows at Yoakum ranged from 126 to 1,840 cfs and flows at Pendleton ranged from 34 to 1,540 cfs. Flow and temperature information for the project year is contained in Appendix A.

### SubTask 1.2 - Inspection of Passage Facilities

Three main operational concerns were observed during monitoring of the juvenile and adult passage facilities; aquatic vegetation growth in Maxwell Canal, gravel blocking the Stanfield Ladder exit, and shutdown problems WEID Canal. A number of smaller problems were also noticed and corrected at the various sites.

### SubTask 1.3 - Coordination of Passage Projects

Phase I of the UBP was started August 16, 2000 to increase flows for fall returning adult salmonids. It operated until October 27 when the exchange with WEID was discontinued in conjunction with the end of the WEID irrigation season. The exchange restarted May 21, 2001 and operated as needed to maintain UBP target flows until July 3 when exchanges were discontinued for the summer.

The Phase II exchange with HID began November 1, 2000 and ran off and on as needed to maintain UBP target flows until May 7, 2001. The SID Phase II exchange was initiated May 18. Initially, water was pumped to SID in exchange for live flow. Pumping continued through the summer in exchange for SID storage water in McKay Reservoir to be used for fish passage releases.

Water was released continuously from McKay Reservoir from the summer of 2000 to July 2001 to enhance both fish passage and juvenile production. Water was released throughout the summer of 2000 at a rate of 50 cfs. Releases were increased in mid September as irrigation storage releases were discontinued. These increased releases were designed to help maintain juvenile production in the reach down to Westland Canal and augment flows for migrating adult salmon and steelhead. Fall releases were tapered

down in mid November from 150 cfs to 10 cfs. A 10 cfs flow rate from the reservoir was maintained all winter to sustain juvenile rearing in lower McKay Creek.

Releases from McKay Reservoir were increased again beginning May 21, 2001. Releases were made as needed to maintain a target flow of 150 cfs at the Dillon gauge to assist migration of both juveniles and adult spring chinook. Flows were tapered down from beginning July 5 and discontinued July 9. Ladders and bypasses were operated in conjunction with flow enhancement efforts to maximize passage conditions for both adult and juvenile salmonids.

## ***Task 2 - Operation of Adult Trapping Facilities***

### SubTask 2.1 - Threemile Dam Adult Trapping

Threemile Dam east bank ladder was open the entire summer of 2000. It was operated with the lead gate out until August 16, 2000. The lead gate was installed and the adult facility opened on August 16 in conjunction with the startup of Phase I. The ladder ran continuously until July 10, 2001. With two exceptions, the adult facility operated continuously until March 23, 2001. The facility was off two days in August 2000 to repair the steppass liner and four days in January due to silt and debris. Starting with the week of March 23, 2001, the facility was closed basically every other week to allow for volitional migration to occur. During the periods when the adult facility was closed, the lead gate was pulled from the ladder in order to allow volitional upstream migration of adults. The adult facility was operated in this manner until May 25 when full time trapping was resumed so adults could be hauled upriver as per passage criteria. The adult facility was closed for the summer on July 10.

The first returning salmon and steelhead were counted on August 17, 2000. A total of 3,662 summer steelhead; 643 adult, 437 jack and 4,948 subjack fall chinook; 4,654 adult and 1,276 jack coho; and 4,382 adult and 185 jack spring chinook were enumerated at Threemile Dam. In addition, there were 17 spring chinook subjacks captured in the adult trap at Threemile Dam in August 2000 and 267 trapped between June 26 and July 10, 2001. These fish were not included in the spring chinook return figures.

Of the adult returns, 734 steelhead; two adult, six jack, and 44 subjack fall chinook; 15 adult and 16 jack coho; and 1,902 adult and 47 jack spring chinook were counted by video as they passed through the east bank ladder. All other adults were enumerated during trapping operations at the east bank adult facility. The west bank adult facility was not operated again in 2000/2001. Appendix B contains a daily record of adults enumerated during 2000/2001.

Summer steelhead were enumerated from August 17, 2000 to July 5, 2001. Peak return occurred during March when 40.7% (1,489 of 3,662 fish) of the total return was counted. Approximately 70% of the run were estimated to be unmarked fish. Based on historical fork length data, 53.0% of the summer steelhead run was comprised of S1 fish and 47.0% were S2 fish.

Coho were enumerated from September 1, 2000 to February 5, 2001. Peak return month for both adults and jacks was October when 65.6% (3,051 of 4,654 fish) of the adults and 79.8% (1,018 of 1,276 fish) of the jacks were counted.

Fall chinook were enumerated from September 1 to December 8, 2000. Peak return month for adults, jacks, and subjacks was October. Of the total return, 73.6% (473 of 643 fish) of the adults, 60.0% (262 of 437 fish) of the jacks and 68.5% (3,391 of 4,948 fish) of the subjacks were counted in October.

Spring chinook were enumerated from March 24 to July 7, 2001. Peak return month for both adults and jacks was May when 62.3% (2,728 of 4,382 fish) of the adults and 50.3% (93 of 185 fish) of the jacks were counted.

In addition to capturing adult salmonids, thousands of non-game fish were collected at the east bank facility during trapping operations. Major species collected were northern pikeminnow (*Ptychocheilus oregonensis*), chiselmouth (*Acrocheilus alutaceus*), and suckers (*Catostomus spp.*). Northern pikeminnows were sacrificed; all other non-game fish were released upstream of the dam. Juvenile salmonids and rainbow trout also entered the adult trap and were released back to the river. Other species encountered at Threemile Dam included carp (*Cyprinus carpio*), smallmouth bass (*Micropterus dolomieu*), and whitefish (*Prosopium williamsoni*).

#### SubTask 2.2 - Westland Adult Trapping

No adult salmonids were captured at Westland this year.

### **Task 3 - Operation of Juvenile Trapping Facilities**

#### SubTask 3.1 - Westland Juvenile Facility Operation

Westland Canal was in operation for a total of 147 days between February 5 and July 26, 2001. The juvenile facility operated in the bypass mode for 127 days and in the trapping mode for 18 days. There were also two days when fish were directed into and held in the canal forebay between the time the bypass was closed and the trap opened. This occurred during the period when the fish passage flows were being tapered down.

Westland Canal opened for groundwater recharge deliveries on February 5, 2001 and switched from winter recharge to standard irrigation delivery in late March. Natural and enhanced river flow levels were adequate to continue operation of the juvenile bypass for downstream migration until July 6 when it was closed as fish passage flows were tapered off for the summer. The juvenile trap was opened on July 8 and hauling began on July 9. Trap and haul operations continued until the facility was closed on July 26.

Flow enhancement releases from McKay Reservoir resulted in relatively low

numbers of juvenile salmonids being captured at the Westland facility in 2001. Non-game and warmwater fish were also collected at Westland, major species included northern pikeminnow, chiselmouth, suckers, redbelt shiner (*Richardsonius balteatus*), black crappie (*Pomoxis nigromaculatus*), and yellow perch (*Perca flavescens*).

### SubTask 3.2 - Threemile Dam Juvenile Facility Operation

The Threemile Dam west bank juvenile bypass ran continuously through the summer of 2000. The canal discontinued irrigation deliveries on October 27 and the headworks and bypass were closed for off-season canal maintenance. The bypass operated at the 5 cfs level the entire period.

The headworks and bypass were re-opened on March 8, 2001 for outmigration evaluation monitoring. The canal actually began irrigation deliveries on March 22. The juvenile bypass operated at 5 cfs throughout the spring until it was closed for the summer on July 9. No trapping occurred at the facility this year. The juvenile trap was operated for outmigration sampling by the Umatilla Passage Evaluation personnel the entire season.

### **Task 4 - Adult and Juvenile Transportation**

#### SubTask 4.1 - Threemile Dam Adult Hauling

Even though flow enhancement releases from McKay Reservoir continued through the spring and into early summer, more spring chinook trapped at Threemile Dam were hauled this year than in the past few years. This resulted from a combination of early, low natural streamflows in Pendleton and larger numbers of spring chinook returning in June. A total of 847 adults and 74 jacks were hauled upstream. No fall chinook or coho were hauled again this year and only 14 summer steelhead.

There were 565 adult and 38 jack fall chinook transferred to the Threemile Dam Fall Chinook Holding and Spawning Facility for broodstock. In addition, 116 summer steelhead were hauled to Minthorn for brood and 646 adult and 31 jack spring chinook were transported to the South Fork Walla Walla Spring Chinook Holding and Spawning Facility for brood.

There were 52 loads of fish transported by the project from Threemile Dam on 50 days during 2000/2001. The 3,000 gallon tanker was used for 18 trips, one of the 370 gallon trailer units was used for 30 trips, and the 750 gallon flatbed mounted tank for four trips. There were five double haul trips made this year, three with the tanker and one each with a trailer and the flatbed.

Summer steelhead adults were hauled upstream from Threemile Dam on 8 days between May 31 and July 5, 2001. There were also 29 trips made to Minthorn holding pond with brood between September 6, 2000 and April 8, 2001. Spring chinook were hauled upstream from Threemile Dam 29 days between May 27 and July 5, 2001. There were also 10 trips made to the South Fork brood facility between April 17 and June 1 with spring

chinook broodstock.

The only upriver release site used during 2000/2001 was Thornhollow (RM 73.5). Adult transport information, including dates, temperatures, liberation units used and release sites is included in Appendix C.

There were 2,699 summer steelhead; 69 adult, 292 jack and 4,603 subjack fall chinook; 4,420 adult and 1,164 jack coho; and 971 adult and eight jack spring chinook trapped that were subsequently released into the forebay at Threemile Dam. In addition, 734 steelhead; two adult, six jack, and 44 subjack fall chinook; 15 adult and 16 jack coho; and 1,902 adult and 47 jack spring chinook volitionally migrated upstream through the east bank fish ladder.

Summer steelhead adults were trapped and released into the forebay at Threemile Dam on 153 days between August 17, 2000 and May 23, 2001. Fall chinook were released at Threemile Dam on 64 days between September 5 and December 8, 2000. Coho were released at Threemile Dam on 83 days between September 1, 2000 and February 5, 2001. Spring chinook were released at Threemile Dam on 18 days between March 24 and May 24, 2001. An initial volitional passage and video counting period occurred from September 11 to September 17. No more volitional migration occurred until late March. All the fall chinook and coho volitional migration occurred during the September period and there were also 27 steelhead counted during that week. The majority of the steelhead volitionally passing the Threemile Dam ladder were counted on 28 days between March 24 and May 23, 2001. Spring chinook were counted volitionally passing the Threemile Dam ladder on 35 days between March 24 and May 24, 2001. Table 1 includes release location and number by species.

Table 1. Number of Adults Released at each location in 2000-2001.

Release Site	Total Released	Summer Steelhead	Spring Chinook	Fall Chinook	Coho
Thornhollow	935	14	921	0	0
SFWW Brood Pond	677	0	677	0	0
Minthorn Brood Pond	116	116	0	0	0
3MD Brood Pond	603	0	0	603	0
3MD Forebay – Volitional	2,766	734	1,949	52	31
3MD Forebay – Trapped	14,226	2,699	979	4,964	5,584
Total	19,323	3,563	4,526	5,619	5,615

Fish condition at release generally appeared good in 2000/2001. There were only three spring chinook mortalities observed at the Thornhollow release site. The supplemental oxygen system was not turned on during one broodstock load hauled to the South Fork Walla Walla Brood Holding Facility. There were 43 mortalities out of 94 spring chinook transported that day. No other transport mortalities were observed at the South Fork facility.

#### SubTask 4.2 - Westland Adult Hauling

No summer steelhead kelts or spring chinook fallbacks were hauled from Westland this year.

#### SubTask 4.3 - Westland Juvenile Hauling

McKay water releases through the spring and into the early summer limited the number of juveniles captured at Westland in 2001. The project hauled eight loads of juveniles from Westland on eight days between July 9 and July 26, 2001. One of the 370 gallon liberation units was used for all the loads. An estimated 350 pounds of fish were hauled from the facility. All juveniles hauled from Westland were released at the Umatilla River boat ramp (RM 0.5). Juvenile transportation information is located in Appendix D.

Based on species composition sampling conducted by Umatilla Hatchery Satellite Facility personnel, approximately 92% of the fish transported from Westland were juvenile salmonids. Species composition information is included in Table 2.

Table 2. Species composition of fish sampled at Westland in 2001.

Date	Number Sampled	No/lb	Hatchery Production			Natural Production			Other
			Coho	Chinook	STS	Coho	Chinook	STS	
7-09	460	52.2	0	73	0	9	368	6	4
7-11	248	18.7	0	79	0	5	146	5	13
7-13	283	35.4	0	84	0	5	191	0	3
7-16	255	27.6	0	180	0	2	64	0	9
7-20	77	8.4	0	0	0	2	48	2	25
7-23	100	8.0	0	0	0	6	57	1	36
7-26	105	9.8	0	0	0	1	68	1	35
Total	1,528	----	0	416	0	30	942	15	125

#### SubTask 4.4 - Threemile Dam Juvenile Hauling

No juveniles were trapped and hauled from the Threemile Dam west bank juvenile facility during the project year. The Umatilla Passage Evaluation project closed the bypass and sampling station in July when the fish enhancement flows were discontinued.

#### SubTask 4.5 - Other Hauling Operations

In November, the project hauled excess fall chinook adults from Priest Rapids Hatchery to the Umatilla River for natural spawning augmentation. There were 471 adult fall chinook transported from Priest Rapids and released directly into the Umatilla River at Yoakum (RM 37). The fish were hauled in four trips between November 1 and November 14, 2000. All trips were made using the 3,000 gallon tanker unit. There were an estimated 19 mortalities observed at the release site.

In addition, the project hauled 30 adult spring chinook on August 8, 2001 from the South Fork Walla Walla Brood Holding and Spawning Facility to North Fork Meacham Creek for natural spawning augmentation. These fish were out of a group transferred from Ringold Springs Hatchery in May/June for outplanting in the Walla Walla Basin. The fish were hauled in a 370 gallon trailer unit. There was one mortality at release.

## DISCUSSION

### ***Task 1 - Passage Conditions Monitoring***

#### SubTask 1.1 - Monitoring of River Conditions

The temperature recorder at Threemile Dam was lost along with the data from mid January through the end of June. These type recorders are set for long periods, so if anything happens large blocks of data are lost. Point temperatures were taken through this period during trapping operations but are not daily averages. This time frame was when the coldest daily temperatures were recorded.

There were concerns again this year with the rating frequency for the Hydromet gauging stations. Numerous flow discrepancies were observed between stations during the late fall and winter. The OWRD increased its effort in this area and the data from these stations was much more consistent during the spring. The number and location of the Hydromet gauging stations is adequate for most fish passage decisions. However, the accuracy and timeliness of the flow data is largely dependent on the rating frequency

Spring operations at the Boyd hydropower facility continue to result in short term spiking of flows in the lower river. While flows in the facility stream bypass reach stay above permit requirements, intermittent power generation results in pulses of water being discharged during generation periods. This is usually followed by flows receding back to bypass target flow levels. There remain concerns that these sudden flow increases may provide false attraction for spring chinook adults at their discharge outlet.

#### SubTask 1.2 - Inspection of Passage Facilities

Three main operational concerns were observed during monitoring of the juvenile and adult passage facilities; aquatic vegetation growth in Maxwell Canal, gravel blocking the Stanfield Ladder exit, and shutdown problems at WEID Canal.

Aquatic vegetation in Maxwell Canal continues to be a major problem for both HID and fish passage. The district has discontinued use of aquatic herbicides and has to rely on mechanical means to contain this growth which is not nearly as efficient. The canal became choked with weeds to a point where flows could not be maintained. The bypass is located approximately one mile from the headworks there are concerns with the time and distance smolts have to travel to reach the bypass. Low velocities intensify these concerns. Also, the canal elevation could not be maintained which precluded operation of the bypass and resulted in the screens operating well below submergence criteria. A new high pressure spray mechanism for removing aquatic vegetation is being investigated for maintaining the canal. This system uses high water pressure to cut or chop weeds. It is assumed that fish would be able to avoid the high pressure streams and would be unaffected.

In addition to installing flashboards in the dam, SID usually also pushes up a gravel

dam for summer time diversion. Last fall, when the gravel dam was removed, the equipment ford created a shallow area blocking the exit from the Stanfield Ladder at low flows. This resulted in low flows to the ladder and provided a source of disturbed gravel for deposition in the ladder at high flow. This material needs to be removed from the stream or relocated instream in the future so as not to affect passage through the ladder.

There was poor communication between the Passage Evaluation, UPFO&M, and Fish Passage Operations projects during the shut down of the WEID headworks. In the past, when the Passage Evaluation project was done sampling for the fall at WEID, they removed the sampling gear and closed the trap. The headworks and bypass have continued to remain open for a period of time prior to shut down. This year, Passage Evaluation staff decided to close the headworks and leave the sampling gear in place. This did not allow the facility to flush for an extended period and resulted in large numbers of fish stranded and dying in the bypass channel. Most of these fish appeared to be non-salmonids. In addition, the headgate stems were severely damaged when they closed them and needed to be replaced. It is recommended that in the future the shut down of this facility occur as in the past with Passage Evaluation shutting down the sampling station and removing the sampling gear and Fish Passage Operations and UPFO&M closing the bypass and headworks.

A similar situation occurred when the facility was closed in July. The sampling station was operated up until the bypass was closed for the summer. Instead of removing the sampling gear and allowing the bypass system to flush for a couple days prior to being closed, the bypass was shut off which resulted in a significant number of fish being stranded and dying in the bypass channel.

The situation at the McKay Creek fish barrier was much better this past year. The frequency of O&M conducted by BOR, especially during the fall resulted in much fewer opportunities for adults to access the creek. Few adults were observed in the creek during juvenile population sampling.

As noted last year, a major change in the UPFO&M staff and organizational structure occurred. This helped alleviate the concerns expressed last year with the preventative maintenance and inspection programs for the passage facilities. Equipment breakdowns and malfunctions at the facilities were much less frequent this year.

There were a significant number of spring chinook observed jumping at Feed Canal diversion dam again this year even though the river channel maintained itself on the north side (nearest the ladder and headworks). There did not appear to be any accumulation of adults below the dam this year either and was probably also related to the large number of adults in the river and the resultant chance for observation.

There were adult spring chinook and steelhead observed this year in the downwell at the Westland Canal juvenile facility. These fish were removed and released into the Umatilla River at the facility. This is the first time in a number of years that adults have been seen in the downwell. This was a common occurrence a few years ago and

modifications were made to the downwell to preclude adults from continuing past the downwell and entering the pumpback bay. No adults were observed in the pumpback bay.

There were also reports in late June of spring chinook adults in the Stanfield Ladder. The occurrence of spring chinook adults in these two locations would suggest that some fish do not migrate upstream to summer holding areas for whatever reason. These fish appear to be seeking out dark, secluded refuge areas as temperatures begin to elevate in the lower river. However, the number of fish observed is so low that this does not seem to be a problem of significant concern.

The last five annual reports have identified the need to update the passage facilities operational criteria developed by NMFS. Changes have been made to the criteria at a number of facilities without being formalized. It is important that these criteria be reviewed and updated.

### SubTask 1.3 - Coordination of Passage Projects

The Phase I exchange with WEID was conducted during both the fall and spring this past operational year. The summer start date for the Phase I exchange continues to be mid-August to match fall chinook migration timing in the mainstem Columbia River. The exchange was initiated August 16, 2000 but no fall chinook adults were captured until September 5. However, the first summer steelhead was trapped August 17. Tributary entry of all species appears to be based on an inherent biological timing as long as flow and temperature conditions do not preclude entry. This factor may be most important for summer steelhead as adults have been captured during every month each of the past two project years.

The Phase I exchange was discontinued on July 3, 2001 as per UBP criteria. Investigations still need to be made into the operation of Phase I all summer to provide instream flows all summer below Threemile Dam. As discussed above, this would allow year round opportunity for steelhead entry into the Umatilla River, provide flows for lamprey (*Lampetra tridentata*) migration, and minimize the problem with protecting summer fish flows during years where that situation occurred since WEID would not be diverting water from the river.

The summer of 2000 was the first time that releases of storage water from McKay Reservoir for fish were made all summer. Releases were maintained at 50 cfs until September 13. This resulted in summer instream flows being maintained throughout the lower Umatilla River for probably the first time since irrigated agriculture was developed in the early 1900's. As stated above, these summer flows are designed to provide passage for adult pacific lamprey and summer steelhead and, potentially, provide flow for juvenile production in the river below Westland Canal. At least two adult lamprey were observed at Threemile Dam in 2000 during the period when the river would normally be dewatered (Preston Bronson, CTUIR, personal communication).

These summer releases also allowed the continued operation of both the Threemile

Dam juvenile bypass and ladder through this period. However, the ladder was operated with the lead gate out and the trap off through the summer until flows increased with the startup of Phase I in mid August 2000.

The moisture conditions that allowed for summer flow releases in 2000 from McKay Reservoir did not exist in 2001. Drought conditions did not provide enough storage to allow summer releases and still maintain the spring and fall flow enhancement levels. The AOP outlines priority flow timing and levels for use of stored water. The summer is the lowest of the three priorities outlined and McKay Reservoir releases were discontinued July 9, 2001.

The timing and magnitude of the fall McKay Reservoir fish passage flow releases remains similar to past years. Although 50 cfs were released from McKay Reservoir through the summer of 2000, flow releases were not increased until September 14. This flow increase was coordinated with the discontinuation of WID storage releases for the year in order to maintain flows in the mainstem below McKay Creek for juvenile production as well as for adult attraction and passage in the lower river.

These releases resulted in observed flows below Threemile Dam in excess of 150 cfs throughout late September. Releases were increased October 1 to 150 cfs which resulted in lower river flows of over 250 during October. No significant increase in the number of adults of any species were noted in September. However, adults returns of all species during the first half of October were the highest observed in recent years and the highest by far on record for summer steelhead.

For the first time, flow releases into lower McKay Creek below McKay Reservoir were continued year round. Fall enhancement flows were tapered down from 150 cfs to 10 cfs in mid November. A minimum flow of 10 cfs was maintained all winter to sustain juvenile production in this stream reach. In the past, significant numbers of juvenile steelhead and coho, as well as a few bull trout (*Salvelinus confluentus*) were found rearing in lower McKay Creek. These winter flows are anticipated to continue due to Endangered Species Act (ESA) requirements. Potentially, these winter releases could impact the ability of the reservoir to fill to capacity which would result in less water available for passage during critical migration periods.

It has become standard practice to extend spring passage releases into July. Natural spring flows maintained flow levels over target levels until late May. Water was released from McKay Reservoir beginning May 21 to maintain a target flow level of 150 cfs at Dillon through the end of June. McKay Reservoir releases were decreased beginning July 5 and were tapered down to 0 cfs on July 9.

Water releases during the late spring/early summer from McKay Reservoir provides both juvenile and adult passage benefits. It extends the natural upstream migration period for spring chinook and provides a longer period for volitional outmigration of both natural and hatchery fall chinook juveniles. It also significantly reduces the reliance on artificial transportation for both adults and juveniles.

Coordination and cooperation among the various UBP entities is critical for ensuring adequate fish passage conditions exist in the lower river. The Basin Project exchanges, McKay Reservoir storage releases, and basin fish passage facilities are three equally important components of the fish passage equation. Coordination of these components with irrigation activities is necessary in order to optimize passage conditions.

## ***Task 2 - Operation of Adult Trapping Facilities***

### **SubTask 2.1 - Threemile Dam Adult Trapping**

The Threemile Dam east bank ladder and adult facility both performed satisfactorily again during the 2000/2001 season. Fewer high magnitude flow events and debris loads were experienced again this year which resulted in the ladder being open the entire season. The adult facility was only closed for one four day period in January due to river conditions. A switch from perforated plate to wedge wire material for the facility pump bay screens significantly reduced the labor required for maintenance.

Debris and silt in the forebay can restrict flows to the ladder and adult facility and limit the ability to release fish directly into the river at the site. Again this year, there was a lesser amount of silt and debris accumulation in the dam forebay. A combination of forebay dredging and the lack of high flow events minimized siltation problems.

Volitional migration of adults was to occur essentially year round this year. Starting in the fall, with flow enhancement increases, trapping was to be conducted for one week with volitional migration occurring in alternating weeks. The ladder lead gate was pulled out September 10, 2000 and the first weekly video taping period was initiated. There were major difficulties in determining from the video taping the various species and life histories. With three species returning concurrently, identification of certain life histories, especially coho jacks and fall chinook jacks and minijacks was next to impossible. Fall video counting was discontinued after this one week. More advanced videotape equipment with higher resolution may make this a feasible alternative to explore again in the future.

Beginning in December a five day trapping, nine day volitional migration rotation was to be implemented after the majority of the fall run was over. However, due to shortfalls in both steelhead broodstock collected and CWT sacrifice samples, video counting was not initiated again until March 23, 2001. Video, trapping rotations continued until May 24. At that point, continuous trapping was reinitiated due to passage criteria. Flows at Pendleton had dropped below the 250 cfs level outlined in the AOP for transporting adults above Pendleton. Trapping continued for the rest of the season.

Enumeration during the spring using video counting was generally a success. No high turbidity periods occurred during taping this year. If high turbidity occurs during periods when multiple species are expected at Threemile Dam, then species identification could be a problem. Generally, identification could be made of adipose clipped versus unmarked steelhead and jack versus adult spring chinook. During low visibility periods, mark identification on summer steelhead could not always be determined and these steelhead

were listed in the records as being of unknown origin. No attempts were made to determine sex or actual marks from the video tape. Sex ratio and mark group composition for each species were estimated from data collected during trapping operations.

There was much more downstream movement past the counting station this year than observed last year. This occurred with both steelhead and spring chinook. However, with the timing of the lead gate change of operation for a low movement period (noon) the double counting of adults located in the area between the counting station and the lead gate is minimized. Also, kelts are generally identifiable. This allows kelts to be recorded separately and not mis-classified as fallbacks.

There were two dates when the video recorder malfunctioned. This has always been a concern as data can be lost for entire 24 hour periods. The facility technician now checks the recorder on a more frequent schedule to minimize data loss if a malfunction occurs. The return numbers for these days were estimated.

Headburn was observed in both spring chinook and summer steelhead this year. However, the incidence was much lower this year and confined more to the later portion of the chinook run. There was a very high incidence of spring chinook with various types of mechanical damage. Mechanical damage to the head area, net marks, and marine mammal wounds were all observed on a very high percentage of the returning spring chinook. It has been theorized that mechanical abrasions could be a contributing factor in the number of headburn cases observed (Larry Basham, Fish Passage Center, personal communication). However, the high number of fish with mechanical abrasions to the head area observed this year did not correlate with the low incidence of headburn seen. It appears that headburn may be more related to saturated gas levels. The low incidence this year corresponds to this being a drought year with very little spill at the mainstem Columbia River dams. Conversely, the high incidence observed last year was during a good water year with extended spill at the mainstem dams.

A tremendous number of fall chinook subjacks were trapped this year. The AOP stated that all CWT fall chinook subjacks were to be sacrificed. Due to the excessive number of subjacks trapped and the corresponding number of CWT fish, only a subsample of the CWT subjacks were actually sacrificed. The size of the subjacks was larger this year also. Historically, the size range for subjacks was set at less than 15 inches (380mm). This year, the subjacks observed at Threemile Dam were noticeably larger and the size range for this group was expanded up to 400mm.

Again this year, significant numbers of spring chinook "minijacks" were captured in the Threemile Dam trap. These fish are confirmed to be from the current year releases. All the CWT subjacks were sacrificed in order to determine origin. The rest were released into the forebay at Threemile Dam. None were transported upstream. These fish were not included in the spring chinook return counts.

The west bank ladder and trap were not operated again this year. Previous evaluations recommended that operations take place exclusively at the east bank facility

unless it becomes inoperable.

## SubTask 2.2 - Westland Adult Trapping

The combination of extended natural and enhanced flows the last few years have resulted in the Westland bypass being open until early summer. This allows kelts to volitionally migrate out of the system and none were captured at Westland again this year.

## ***Task 3 - Operation of Juvenile Trapping Facilities***

### SubTask 3.1 - Westland Juvenile Facility Operations

There were few problems at the Westland juvenile collection facility. Problems noted in earlier years with fluctuating canal forebay elevations and the bypass outfall have ceased to be a concern the past couple of years.

A combination of extended natural flows and flow augmentation allowed the facility to be operated in the bypass mode until July 6. This allowed the majority of the juvenile outmigration to be bypassed at Westland. Maintaining McKay Reservoir storage releases into the summer is now the standard operating procedure except for all but the driest years. This permits Westland to be operated primarily in the bypass mode during the juvenile outmigration period and the majority of the smolts will be able to migrate volitionally. The number of juveniles trapped at Westland continues to be low and trap and haul operations are more than adequate for assisting this late outmigration component under this operating scenario.

Fish passage storage releases were tapered down in 30 cfs increments from 150 cfs on July 4 to 0 cfs on July 9. The ladder and bypass were closed July 6 as flows were reduced to minimize the number of juveniles below Westland Dam. Even though flows continued to crest Westland Dam, the minimal depth of this spill seems to be a deterrent to juveniles. In combination with the large flow volume entering Westland Canal, most juveniles are thought to enter the canal where they can be captured.

With the low number of juveniles being trapped at Westland and no adults being captured, the trapping facility is operated without the separator and adult holding pond being used. All fish that enter the facility are trapped in the juvenile holding pond where they are more readily accessed.

The decision to discontinue trapping is based on the low number of salmonids in combination with a significant increase in non-salmonids. This condition is usually signaled by an increase in the poundage of fish hauled from the facility towards the end of the trapping period. This increase in poundage is almost exclusively comprised of larger sized non-salmonids.

Poor water quality conditions are generally observed every year during trapping at Westland. However, the low numbers of juveniles being trapped lessen the constraints of

the facility and the site is adequate for current operations.

### SubTask 3.2 - Threemile Dam Juvenile Facility Operations

The ideal passage condition for the west bank juvenile bypass would be to operate it at the 35 cfs level. However, the facility is now utilized annually by the Umatilla Passage Evaluation project in order to monitor juvenile outmigration. To facilitate the monitoring program, the headworks and juvenile facility were opened on March 8, two weeks before WEID began irrigation deliveries, and the bypass has to be operated at the reduced 5 cfs level. Outmigration monitoring continued until July 9 when the facility was closed for the summer. Numbers of salmonids observed at the facility just prior to closure were extremely low and the trap was not operated. Once again, it would be beneficial to let the bypass system flush for a couple days prior to complete shutdown.

### ***Task 4 - Adult and Juvenile Transportation***

#### SubTask 4.1 - Threemile Dam Adult Hauling

Project hauling equipment was generally adequate for adult transport needs in 2000/2001. The flatbed mounted, 750 gallon tanker now provides a much needed function for hauling adult chinook when numbers are too low to justify use of the 3,000 tanker.

The UBP flow enhancement effort has substantially reduced the number of fish that need to be transported upstream from Threemile Dam. With the exception of brood, adults were only hauled from late May to early July. There were more spring chinook adults hauled upstream this year than in the past few years. This resulted from a combination of early, low natural streamflows in Pendleton and larger numbers of spring chinook returning in June. However, the number hauled this year is still drastically lower than what was transported prior to implementation of the UBP. Fish were either released at, or volitionally migrated past, Threemile Dam the rest of the year.

The use of McKay Reservoir storage releases in the fall and spring for adult passage is anticipated to continue in the future for all but the driest years. This will permit the majority of adults to migrate volitionally. The number of adults requiring transportation on an annual basis should continue to remain low under this operating scenario.

As noted in past annual reports, a decision has been reached to discontinue transporting early fall returning adults (late August/early September). Even though the 30 day, 150 cfs criteria is not met when these fish return, only small numbers are generally trapped and fall flow enhancement efforts usually increase flows to criteria levels within one or two weeks.

There was one major adult transportation loss this year. The supplemental oxygen system was not turned on during one broodstock load hauled to the South Fork Walla Walla Brood Holding Facility. There were 43 mortalities out of the 94 spring chinook transported that day. Other than that load, condition of adults at release generally

appeared good at all sites. No other transport mortalities were observed at the South Fork facility and only three spring chinook mortalities were noted at the Thornhollow release site.

No lower river release sites were used for fish hauled from Threemile Dam this year. The Yoakum site was used for the fall chinook hauled from Priest Rapids Hatchery. Yoakum is the only suitable lower river adult release site available. This site is located on private property and can only be used with advance permission. Release conditions at the site during low flows are marginal. The Pendleton boat ramp provides good stream access but release conditions here are even more marginal during low flows as the site is located on a side channel, not the main river channel. The release site located at the Pendleton acclimation facility (ODFW) has not been used yet. With the limited numbers of adults currently being hauled, the available release sites should meet project needs. This assumes that access will continue to be available at Yoakum.

#### SubTask 4.2 - Westland Adult Hauling

No adults were hauled from Westland this year.

#### SubTask 4.3 - Westland Juvenile Hauling

Due to the extended flow enhancement efforts, only small numbers of juveniles were trapped again this year at Westland. The use of McKay Reservoir storage releases to extend the spring/summer passage period for juveniles is anticipated to continue in the future for all but the driest years. This will maximize instream migration of juveniles and minimize transportation. The number of juveniles requiring transportation on an annual basis should continue to remain low under this operating strategy.

The small numbers of fish being trapped at Westland eliminates the need for a fish pump and all fish are loaded using dipnets. The Pescalator fish pump is still stationed at Westland and would be available for use by another project in the Columbia Basin.

#### SubTask 4.4 - Threemile Dam Juvenile Hauling

Only a very small number of juvenile salmonids were observed at the Threemile Dam west bank juvenile facility in the week prior to shutdown. The trap was not turned on and no juveniles were transported from the facility.

#### SubTask 4.5 - Other Hauling Operations

Fish Passage Operations personnel and equipment were used again in 2000 to transport fall chinook adults from Priest Rapids Hatchery to the Umatilla River. The NMFS requires that these fish not be outplanted until November to minimize straying concerns. This year, with the limited number of fall chinook available, adults were not hauled until November and could be directly released into the river. This eliminated the intermediate step of holding adults transported in October at Threemile Dam until outplanting could occur in November. Fish availability and return timing to Priest Rapids and Ringold Springs

hatcheries will determine whether fish are hauled in October, November, or both.

Even though only 471 adults were transported this year, they comprised over 85% of the adult fall chinook spawning population in the Umatilla River. This program continues to be an effective tool for utilizing surplus hatchery adults and for supplementing the natural fall chinook population in the Umatilla River. The handling and transportation aspects appear to have little or no adverse impact on natural spawning success.

The project also transported 30 spring chinook from the South Fork facility to the North Fork of Meacham Creek in August. These fish were out of a group originally hauled from Ringold Springs Hatchery in May/June and held at the South Fork for outplanting in the Walla Walla Basin. Just as with fall chinook, spring chinook are held to just prior to spawning to help preclude adults from migrating out of the target areas.

Transport survival for both these efforts was very good again this year. There were 19 observed mortalities out of the 471 (4.0%) fall chinook adults released in November and only one mortality from the spring chinook release.

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APPENDIX A