

Umatilla River Fish Passage Operations Program

Annual Report
2001 - 2002



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Fish Passage Operations in the
Umatilla River, 2001-2002

Umatilla River Fish Passage Operations Program
Annual Progress Report
September 2001 - August 2002

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ABSTRACT

Threemile Falls Dam (Threemile Dam), located near the town of Umatilla, Oregon 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 22, 2001 to September 12, 2002. A total of 5,519 summer steelhead (*Oncorhynchus mykiss*); 1,146 adult, 1,158 jack, and 970 subjack fall chinook (*O. tshawytscha*); 22,792 adult and 80 jack coho (*O. kisutch*); and 5,058 adult and 188 jack spring chinook (*O. tshawytscha*) were counted. All fish were enumerated at the east bank facility.

Of the fish counted, 261 adult and 14 jack spring chinook were hauled upstream from Threemile Dam for release. There were 5,359 summer steelhead; 622 adult, 1,041 jack and 867 subjack fall chinook; 22,513 adult and 76 jack coho; and 4,061 adult and 123 jack spring chinook either released at, or allowed to volitionally migrate past, Threemile Dam. In addition, 110 summer steelhead; 462 adult and 24 jack fall chinook; and 560 adult and 28 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 141 days between February 22 and July 12, 2002. During that period, fish were bypassed back to the river 134 days and were trapped 5 days. An estimated 200 pounds of juvenile fish were transported from Westland. Approximately 90% of the juveniles transported were salmonids. No steelhead kelts were hauled from Westland this year.

The Threemile Dam west bank juvenile bypass was opened August 16, 2002. The bypass was run until October 31, 2001 with the exception of the period from August 29 to September 16. The bypass was reopened March 7, 2002 and ran until July 8. The juvenile trap was operated from July 8 to July 12 by the Umatilla Passage Evaluation project.

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).

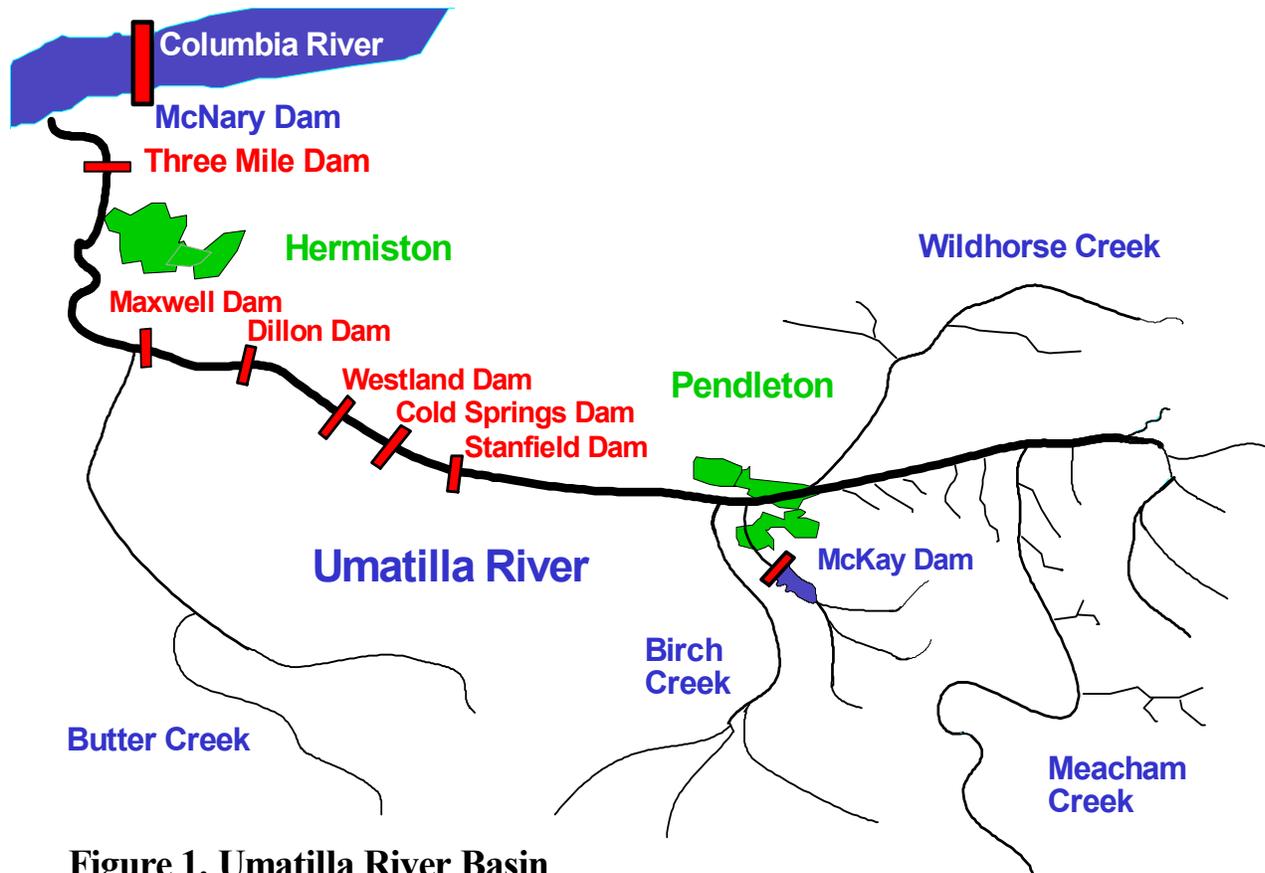


Figure 1. Umatilla River Basin

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 in the lower Umatilla River below Threemile Dam (RM 2) by use of a digital recording thermometer 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. Daily irrigation usage is monitored for Stanfield, Westland, Feed, and West Extension canals. River flow, irrigation diversion, and lower river temperature data is provided by Oregon Department of Water Resources (OWRD) and BOR 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.

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 steepness, raceway type holding pond and fish handling and sorting complex (Figure 2). Fish routed through the sorting complex are anesthetized with carbon dioxide (CO₂) 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.



Figure 2. Threemile Dam Adult Collection

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. In every year since then, the Umatilla Hatchery and Basin Annual Operations Plan (AOP) has identified criteria for the volitional migration of adults past Threemile Dam. For 2001/2002, the AOP (CTUIR & ODFW 2001) outlined that beginning December 1, trapping and volitional migration periods were to be rotated, with five days of trapping alternated with nine days of volitional migration. As of April 15, trapping was to be reduced to an as needed basis for spring chinook broodstock collection. 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, 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 and 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. This year, the length classification for subjack (or mini-jack) fall chinook was changed from less than 15 inches (381mm) to less than 400mm in fork length based on observations at Threemile Dam. 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.

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.



Figure 3. Westland Juvenile Facility

Facility trapping operations are coordinated with flow augmentation releases. As river flow drops, 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. Spring chinook are to be released at either the Pendleton boat ramp (RM 52.5) or Pendleton juvenile acclimation site (RM 56) 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 are hauled in conjunction with spring chinook and are released at the same locations. Fall chinook and coho are not identified in the AOP for upriver transport from Threemile Dam.

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 within this criteria for all

but the 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 (RM 0.5). 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 as 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 the Phase I exchange 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 Yoakum (RM 37) or the Pendleton juvenile acclimation site (RM 56).

Task 5 – Coordination of Passage Program

SubTask 5.1 - Passage Facility Operation and Maintenance Oversight

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.

SubTask 5.2 – Management of McKay Fish Flow Releases

As part of the Umatilla Basin Project (UBP) Phase II exchange program, a portion of the water stored in McKay Reservoir is designated for fish enhancement purposes. In the spring, OWRD and BOR produce a “Beginning Storage Report” for McKay Reservoir which identifies the amount of water available in the reservoir for fisheries uses for that specific year. The project then allocates the release of this water using the timing and flow quantity prioritization guidelines outlined in the AOP.

SubTask 5.3 – Coordination of Exchange Program

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 is coordinated with river conditions and diversion activities in order to maximize lower river migration conditions.

The UBP flow enhancement program has two “Phases”. 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 or in storage.

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.

RESULTS

Task 1 - Passage Conditions Monitoring

SubTask 1.1 - Monitoring of River Conditions

Water temperature and flow in the Umatilla River below Threemile Dam exhibited extreme seasonal fluctuations. A water temperature recorder was installed last fall in the Umatilla Hydromet gauging station (RM 2) replacing the recorder historically deployed at Threemile Dam. The lowest daily temperature recorded was 2.3 C (36.1 F) on January 29, 2002. The highest daily temperature was 27.6 C (81.7 F) on July 13, 2002. Flows at the Umatilla gauging station ranged from less than 1 cfs in July and August to 4,950 cfs in April.

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 4,560 cfs in April. Flows at Yoakum ranged from 104 to 4,750 cfs and flows at Pendleton ranged from 27 to 3,790 cfs. Flow and temperature information for the project year is contained in Appendix A.

SubTask 1.2 - Inspection of Passage Facilities

Four main operational concerns were observed during monitoring of the juvenile and adult passage facilities; aquatic vegetation growth in the Threemile Dam forebay, gravel and debris deposition at the facilities, operational issues at the Threemile Dam west bank juvenile facility and canal headgate operation coordination. A number of smaller problems were also noticed and corrected at the various sites.

Task 2 - Operation of Adult Trapping Facilities

SubTask 2.1 - Threemile Dam Adult Trapping

Threemile Dam east bank ladder and adult facility were opened on August 16, 2001 in conjunction with the startup of Phase I. There were three periods during the project year when the ladder had to be closed down. It was off from August 24 to August 27 and again from August 31 to September 3 due to aquatic vegetation buildup in the Threemile Dam forebay. The ladder was off for two days in February 2002 because of high debris loads in the river and was also shut down from April 16 to April 18 due to flooding and debris accumulation.

In addition to the periods when the ladder was shut off noted above, the adult facility was closed from October 24 to October 26, November 2 to November 5, and November 17 and 18 because of the overwhelming number of adults being trapped. Beginning December 8, 2001, the adult facility was generally closed for nine day periods followed by five days of trapping. Adjustments were made to this schedule based on broodstock and

data needs. 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 and enumeration occurred by video counting. The adult facility was operated in this manner until June 2, 2002 when full time trapping was resumed so adults could be hauled upriver as per passage criteria. The ladder and adult facility were closed for the summer on July 9.

The first returning salmon and steelhead were counted on August 22, 2001. A total of 5,519 summer steelhead; 1,146 adult, 1,158 jack and 970 subjack fall chinook; 22,792 adult and 80 jack coho; and 5,054 adult and 188 jack spring chinook were enumerated at Threemile Dam. Included in the spring chinook total are 13 adults captured after the trap was reopened for the fall. In addition, there were six summer steelhead designated as 2003 brood which will be included in next year's return total. There were also an estimated 110 precocious spring chinook juveniles captured in the adult trap at Threemile Dam between July 1 and July 9, 2002. These fish were not included in the spring chinook return figures.

Of the adult returns, 2,942 steelhead; 163 adult, 119 jack, and 37 subjack fall chinook; 8,260 adult and eight jack coho; and 3,205 adult and 109 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 this year. Appendix B contains a daily record of adults enumerated during 2001/2002.

Summer steelhead were enumerated from September 13, 2001 to May 21, 2002. Peak return occurred during March when 29.6% (1,633 of 5,519 fish) of the total return was counted. Approximately 66% of the run were estimated to be unmarked fish. Based on historical fork length data, 77.2% of the summer steelhead run was comprised of S1 fish and 22.8% were S2 fish.

Coho were enumerated from August 22 to December 23, 2001. Peak return month for both adults and jacks was October when 63.4% (14,440 of 22,792 fish) of the adults and 65.0% (52 of 80 fish) of the jacks were counted.

Fall chinook were enumerated from September 10, 2001 to January 14, 2002. Peak return month for adults, jacks, and subjacks was October. Of the total return, 76.3% (874 of 1,146 fish) of the adults, 71.0% (822 of 1,158 fish) of the jacks and 76.8% (745 of 970 fish) of the subjacks were counted in October.

Spring chinook were enumerated from March 28 to September 12, 2002. Peak return month for both adults and jacks was May when 83.3% (4,214 of 5,058 fish) of the adults and 67.6% (127 of 188 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. Numerous juvenile salmonids and rainbow trout also entered the adult trap and were released back to the river. One bull trout (*Salvelinus confluentus*) approximately 13 inches long was captured on May 10, 2002. It was released into the Threemile Dam forebay. Other species encountered at Threemile Dam included pacific lamprey (*Lampetra tridentata*), 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 141 days between February 22 and July 12, 2002. The juvenile facility operated in the bypass mode for 134 days and in the trapping mode for five 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 22, 2002 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 5 when it was closed as fish passage flows were tapered off for the summer. The juvenile trap was opened on July 7 and hauling began on July 8. Trap and haul operations continued until the juvenile facility was closed on July 12.

Flow enhancement releases from McKay Reservoir resulted in relatively low numbers of juvenile salmonids being captured at the Westland facility in 2002. Non-game and warmwater fish were also collected at Westland, major species included northern pikeminnow, chiselmouth, suckers, whitefish, redbelly dace (*Richardsonius balteatus*), and brown bullhead (*Ictalurus nebulosus*).

SubTask 3.2 - Threemile Dam Juvenile Facility Operation

The Threemile Dam west bank juvenile facility was opened August 16, 2001 in conjunction with the Phase I exchange startup. It shut down from August 29 to September 16 due to aquatic vegetation problems. It was reopened and ran until October 31 when the canal discontinued irrigation deliveries 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 facility were re-opened on March 7, 2002 in conjunction with WEID beginning irrigation deliveries. The juvenile bypass operated at 5 cfs throughout the spring until it was closed on July 8. Trapping was initiated that day and was concluded for the summer on July 12. The juvenile facility 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

Upstream transportation of spring chinook and summer steelhead from Threemile Dam began on June 3, 2002. There were a total of 261 adult and 14 jack spring chinook hauled upstream this year. In addition, there were 166 adults and eight jacks trapped during this period that were hauled to the South Fork facility for Walla Walla outplanting instead of being hauled upriver for release. No 2002 brood summer steelhead were hauled upstream this year but there were six steelhead classified as 2003 brood transported upriver. No fall chinook or coho were hauled again this year.

There were 462 adult and 24 jack fall chinook transferred to the Threemile Dam Fall Chinook Holding and Spawning Facility for broodstock. In addition, 110 summer steelhead were hauled to Minthorn for brood and 560 adult and 28 jack spring chinook were transported to the South Fork Walla Walla Spring Chinook Holding and Spawning Facility for brood.

There were 54 loads of fish transported by the project from Threemile Dam on 54 days during 2001/2002. The 3,000 gallon tanker was used for 25 trips, one of the 370 gallon trailer units was used for 22 trips, and the 750 gallon flatbed mounted tank for seven trips. There were 13 double haul trips made this year, all with the tanker.

Summer steelhead adults were hauled upstream from Threemile Dam on three days between June 12 and July 8, 2002. There were also 19 trips made to Minthorn holding pond with brood between September 21, 2001 and April 2, 2002. Spring chinook were hauled upstream from Threemile Dam on 25 days between June 3 and September 12, 2002. There were also trips made to the South Fork brood and holding facility on 23 days between April 22 and June 23 with spring chinook broodstock and adults for Walla Walla outplanting.

Four upriver release sites were used during 2001/2002, the Pendleton boat ramp (RM 52.5), Thornhollow (RM 73.5), Williams property (RM 83), and Bear Creek (RM 87). Fish were released at the Pendleton boat ramp on four days from June 3 to June 6, 2002, at Thornhollow on 18 days between June 7 and July 9, 2002, at the Williams property on September 12, 2002 and at Bear Creek on September 5 and 6, 2002. Fish condition at release generally appeared good in 2001/2002. Only one adult transport mortality was observed this year. Adult transport information, including dates, temperatures, liberation units used and release sites is included in Appendix C.

There were 2,417 summer steelhead; 459 adult, 923 jack and 830 subjack fall chinook; 14,253 adult and 68 jack coho; and 856 adult and 14 jack spring chinook trapped that were subsequently released into the forebay at Threemile Dam. In addition, 2,942 steelhead; 163 adult, 119 jack, and 37 subjack fall chinook; 8,260 adult and eight jack

coho; and 3,205 adult and 109 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 102 days between September 13, 2001 and May 21, 2002. Fall chinook were released at Threemile Dam on 65 days between September 10, 2001 and January 14, 2002. Coho were released at Threemile Dam on 67 days between August 22 and December 19. Spring chinook were released at Threemile Dam on 14 days between April 3 and May 23, 2002. In addition, spring chinook also were trapped and released at Threemile Dam on three days in August 2002.

There were nine days of volitional passage and video counting that occurred in October and November. Volitional migration occurred on a regular schedule from December 8, 2001 to June 2, 2002. Summer steelhead were counted volitionally passing the Threemile Dam ladder on 104 days between October 24, 2001 and May 21, 2002. Fall chinook volitionally passed through the Threemile Dam ladder on 10 days between October 24 and December 12. Coho volitionally passed through the Threemile Dam ladder on 19 days between October 24 and December 23. Spring chinook volitionally passed through the Threemile Dam ladder on 38 days between March 28 and June 2, 2002 and again on two days in August 2002. Table 1 includes release location and number by species.

Table 1. Number of adults released at each location in 2001-2002.

Release Site	Total Released	Summer Steelhead	Spring Chinook	Fall Chinook	Coho
Bear Creek	3	0	3	0	0
Williams Property	1	0	1	0	0
Thornhollow	232	6	226	0	0
Pendleton Boat Ramp	45	0	45	0	0
SFWW Brood Pond	588	0	588	0	0
SFWW Outplants	174	0	174	0	0
Minthorn Brood Pond	110	110	0	0	0
3MD Brood Pond	486	0	0	486	0
3MD Forebay – Volitional	14,837	2,942	3,308	319	8,268
3MD Forebay – Trapped	19,817	2,417	867	2,212	14,321
Total	36,293	5,475	5,212	3,017	22,589

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 2002. The project transported three loads of

juveniles from Westland on three days between July 8 and July 12, 2002. One of the 370 gallon liberation units was used for all the loads. An estimated 200 pounds of fish were hauled from the facility. The first two days, juveniles hauled from Westland were released at the Umatilla River boat ramp (RM 0.5). On July 12, the fish were released back into the Westland Canal forebay due to the high percentage of resident life history salmonids in the load that day. 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 2002.

Date	Number Sampled	No/lb	Hatchery Production			Natural Production			Other
			Coho	Chinook	STS	Coho	Chinook	STS	
7-08	228	22.4	0	25	0	39	122	20	22
7-10	213	21.4	0	16	0	35	148	3	11
7-12	162	16.7	0	3	1	91	37	8	22
Total	603	----	0	44	1	165	307	31	55

SubTask 4.4 - Threemile Dam Juvenile Hauling

Juveniles were trapped and hauled from the Threemile Dam west bank juvenile facility from July 8 to July 12, 2002. The Umatilla Passage Evaluation project operated the facility all year and transported all juveniles trapped during this period.

SubTask 4.5 - Other Hauling Operations

The project participated in two other hauling operations this year related to the Umatilla program. In late April 2002, the project hauled two loads of juveniles from Umatilla Hatchery for release at the Pendleton and Minthorn acclimation sites as part of an evaluation experiment. A total of 462 pounds were hauled in two trips (one to each acclimation site) with the 750 gallon flatbed unit.

In the fall of 2001, the project hauled excess fall chinook adults to the Umatilla River for natural spawning augmentation. The project transported 510 adults from Ringold Springs Hatchery to Threemile Dam for holding from October 23 to October 25. The surviving 503 adults were outplanted at Yoakum (RM 37) on November 6 and 7. In addition, there were 440 adults hauled from Ringold Springs and released directly into the Umatilla River at Yoakum on three days between October 30 and November 8. All trips were made using the 3,000 gallon tanker unit. Only one mortality was observed at the release site.

The project was also involved in the Walla Walla spring chinook outplanting program. The project hauled adults from both Ringold Springs and Threemile Dam to the South Fork facility and subsequently outplanted the survivors. Transport information for the

efforts listed in this section is also included in Appendix C and D.

Task 5 – Coordination of Passage Program

SubTask 5.1 - Passage Facility Operation and Maintenance Oversight

The project coordinated with UPFO&M personnel on both daily operations and facility maintenance of ladder and screen sites throughout the project year.

SubTask 5.2 – Management of McKay Fish Flow Releases

As part of the Umatilla Basin Project (UBP) Phase II exchange program, a portion of the water stored in McKay Reservoir is designated for fish enhancement purposes. Releases of fish storage water began on September 14, 2001 in conjunction with irrigation storage releases being discontinued. Flows were initiated at 100 cfs and increased to 150 cfs on October 1. Releases remained at that level until November 16. Storage releases were then tapered down to a winter release rate of 10 cfs. Storage water is released into lower McKay Creek throughout the winter and spring as needed to maintain a minimum flow level of 10 cfs to sustain juvenile production in the creek.

In the spring, fish storage releases were started on June 4, 2002. The quantity released was determined by the amount needed, in conjunction with live flow exchanges, to maintain a minimum of 150 cfs at the Dillon gauge. The release level was set at 150 cfs on July 1 and releases were tapered off beginning July 4. Fish water releases from McKay Reservoir were completely shut off for the summer on July 8.

SubTask 5.3 – Coordination of Exchange Program

Phase I of the UBP was started August 16, 2001 to increase flows for fall returning adult salmonids. It operated until October 31 when the exchange was discontinued in conjunction with the end of the WEID irrigation season. The exchange started again in the spring on May 9, 2002 and operated as needed to maintain UBP target flows until July 1 when exchanges were discontinued for the summer.

The Phase II exchange with HID began November 2, 2001 and was operated as needed to maintain UBP target flows until April, 2002. The SID Phase II exchange was initiated May 9. Initially, water was pumped to SID in exchange for live flow. After the live flow exchange was discontinued, pumping continued through the summer in exchange for SID storage water in McKay Reservoir. This exchanged storage is the primary component of the fish enhancement water available from the reservoir.

DISCUSSION

Task 1 - Passage Conditions Monitoring

SubTask 1.1 - Monitoring of River Conditions

A temperature recorder was installed in the fall of 2001 by BOR at the Umatilla Hydromet gauging station. With this recorder in place, temperature data is no longer recorded at Threemile Dam. In past years, loss of data from the field recorder at Threemile Dam occurred on a somewhat frequent basis and this new temperature gauge eliminates these concerns.

There were concerns again this year with the rating frequency for the Dillon Hydromet gauging station. Flow conditions this year required that the Dillon gauge be re-rated on almost a daily basis in the late spring. OWRD increased its effort in this area but there were still significant periods of time when the flow data reported on the Hydromet system for the Dillon gauge were inaccurate. Dillon is the most sensitive station for making storage release and passage decisions and inaccurate data from this site compounds the already complex flow management effort in the basin. Other than the Dillon station, the number and location of the Hydromet gauging stations is adequate for most exchange and fish passage decisions.

Again this year, spring operations at the Boyd hydropower facility resulted in short term spiking of flows in the lower river. While flows in the 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 spikes may provide false attraction for migrating adults at their discharge outlet.

SubTask 1.2 - Inspection of Passage Facilities

Four primary operational concerns were observed during monitoring of the juvenile and adult passage facilities; aquatic vegetation growth in Threemile Dam forebay, gravel and debris deposition at the passage facilities, Threemile Dam juvenile facility operations, and canal headgate coordination.

Aquatic vegetation in Threemile Dam forebay became a major problem this year for both the adult and juvenile facilities. The ladder and adult facility had to be closed twice because of vegetation buildups. Daily maintenance efforts could not keep up with the large amount of material present. The UPFO&M staff had to mechanically remove vegetation from the forebay in order to allow the ladder and adult facility to re-open on September 4. Vegetation problems precluded the west bank juvenile facility from operating until

September 17. This was the first year that aquatic vegetation problems have precluded operation of the Threemile Dam facilities.

High flows during February, March, and April deposited large amounts of gravel and debris deposition at a number of the passage facilities. This resulted in most of the ladders being shut down for short periods for maintenance. The UPFO&M staff did a good job of responding to these problems and minimizing closure periods.

There were problems again this year in both the fall and summer during the shut down of the WEID headworks and/or juvenile facility. Sampling needs to be discontinued at the west bank facility, and the trapping gear removed from the bypass channel, a few days prior to facility shutdown. This will allow the bypass to be run at a higher flow level for a few days and then slowly lowered in order to flush any remaining fish from the system. Because the Passage Evaluation project samples right up to shutdown, large numbers of fish become stranded and die in the bypass channel.

In addition, the facility was not being operated according to criteria during the spring. Low flows and inadequate staffing to operate the sampling facility resulted in passage delays, inadequate passage conditions, and increased susceptibility to predation. Large numbers of juveniles migrate through the west bank system and passage is being compromised for evaluation purposes. The evaluation program at this site needs to be reevaluated to lessen the potential passage impacts.

There were two instances this year where poor coordination on headgate operations caused problems. In September, HID was not informed of the fish water storage releases being initiated and as a result had the Maxwell Canal headgates wide open. The majority of the flow entered the canal and caused a major buildup of weeds at the juvenile screens. The wasteway had to be opened to handle this excess water and to remove the vegetation buildup.

In July, Stanfield Canal was completely closed to remove vegetation from the canal above the juvenile screens. This is the first time the canal has been dewatered during the irrigation season. The canal was not lowered slowly and flushed to allow juveniles to exit before dewatering. If this happens again in the future, SID needs to coordinate with the UPFO&M staff so that the canal can be drained properly and not strand fish. A procedure for dewatering canals when fish are present has been established and has been used frequently at Feed Canal for a number of years. The same procedure could be used at Stanfield Canal.

The situation at the McKay Creek fish barrier was much better again 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.

There were significant numbers of spring chinook and steelhead adults observed jumping at Feed Canal diversion dam again this year. Channel conditions were not as suitable this year. A combination of the dam flash boards being in and high water resulted

in the deposition of large amounts of gravel in the area around the diversion and ladder. This caused the flow to spread out across the face of the dam and lessened the flow in the immediate area of the fish ladder. During the high flow periods, the ladder entrance gate operation was changed from criteria. The ladder was operated with both gates open in order to minimize gravel deposition in the entranceways and to concentrate more flow through the ladder and increase attraction. In spite of the less than optimal passage conditions, there did not appear to be any long term accumulation of adults below the dam. The large number of adults observed jumping at the dam was probably related to the high number of fish in the river this year and the resultant chance for observation.

There were adult spring chinook observed again this year in the downwell at the Westland Canal juvenile facility. These fish were not removed and seemed to move in and out of the downwell of their own volition. Modifications were made a few years ago 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 two adult spring chinook observed behind the screens in the WEID Canal when the upper portion was dewatered as WEID went on the Phase I exchange. It is assumed they entered the canal by jumping over the drum screens. They were salvaged and returned to the river.

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.

Task 2 - Operation of Adult Trapping Facilities

SubTask 2.1 - Threemile Dam Adult Trapping

With one major exception, the Threemile Dam east bank ladder and adult facility both performed satisfactorily again during the 2001/2002 season. Extremely high numbers of coho taxed both the facility and personnel to the limit this year. On the peak day there were over 3,000 adults in the trap. This equates to approximately one adult per 0.5 gallons per minute of flow and 0.6 adults per cubic foot of volume. While the flow density is in line with what is generally considered acceptable for long term holding of coho adults, the volume density is extremely high even for a short term holding situation.

In response to these conditions, the trapping facility was closed for three different periods when large numbers of fish were encountered. During these periods, the ladder was opened for volitional migration and adults were enumerated by video counting. Because of the difficulties discussed in last years report with video enumeration of multiple species and age classes during the fall return season, return data was tabulated based on visual subsampling of fish as they passed the counting window. The total number of adults was determined by video and then classified as to species and age class based on the percentages observed during the subsample periods.

Another change in operations due to the large numbers of coho was related to checking unmarked adults for the presence of a CWT. A portion of the returning coho are unmarked but have a CWT implanted. Since there is no external mark distinguishing these fish, detection is accomplished by use of a large tube detector. Because each individual fish has to be put through the detector, time becomes a factor in sampling. On high number days (over 300 fish) coho were released without being checked. All unmarked chinook were checked for the presence of blank wire tags.

Volitional migration of adults was scheduled to begin in December, 2001. At that time, a five day trapping/nine day volitional migration rotation was to be implemented after the majority of the fall run was over. This schedule was adjusted as needed based on steelhead broodstock collections and CWT recoveries. Video/trapping rotations continued until June 2, 2002. At that point, continuous trapping was reinitiated due to passage criteria.

This was the first year that steelhead adults were enumerated by brood year in the late spring. In previous years, all steelhead captured prior to the trap being closed in the early summer were considered to be of that brood year. This year attempts were made to segregate these fish between 2002 and 2003 brood years. Coloration and condition are used as indicators for making these brood year determinations.

This year was the first time that significant numbers of spring chinook have been captured after the trap was reopened for the fall. Over the past decade, spring chinook adults have been observed occasionally in the summer but this year 13 were trapped. These fish were initially observed on the video tape so the trap was opened to confirm that these fish were indeed spring chinook. The last of these fish was trapped on September 12.

Enumeration during the winter and spring using video counting was generally a success. Identification could generally 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. One high turbidity period occurred during spring taping this year but the ladder was closed for three days during the peak of the high flows and species differentiation between steelhead and spring chinook could generally be made. No attempts were made to determine sex or actual marks from the video tape. Sex ratio and mark group composition for all species were estimated from data collected during trapping operations.

There was a large amount of downstream movement past the counting station again this 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 was one day when the video recorder malfunctioned. The recorder had to be repaired so the adult facility was started up and trapping was initiated. Only one day of data was lost and the return numbers for this day were estimated.

A much larger percentage of the adult returns were enumerated by video this year. A total of 53.3% of the steelhead run, 9.7% of the fall chinook, 36.1% of the coho, and 63.2% of the spring chinook were video counted. One of the project objectives is to maximize the periods of volitional migration for both adults and juveniles and this year significant numbers of fish were allowed to migrate upstream without handling. In the future, if fish managers want to extend the volitional migration period into the fall, the emergency video enumeration procedures implemented this fall would provide a method for accurate data collection to assess return information.

This year had the highest observed incidence of mechanical damage to the head and jaw areas that the project has seen in spring chinook at Threemile Dam. It is thought that the low flows levels in the lower Umatilla River may have been a contributing factor to this. Numerous reports and observations of fish jumping in bedrock areas of the lower river and at Brownell Dam were documented this year. Once again, the project recommends the removal of Brownell Dam since it is no longer in use as a diversion structure.

Headburn was observed again this year at lower levels in both spring chinook and summer steelhead. 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. If the mechanical damage is primarily occurring in the lower Umatilla River then the more classic headburn symptoms may have not had time to develop in the short period before the fish arrive at Threemile Dam.

Summer steelhead adults returning in the spring had very high levels of copepods in the gill and mouth areas as well as externally on the fins. Copepods are present at some level on returning steelhead every year but never at the levels observed this year.

There were two high magnitude flow events which required that the ladder be closed for debris removal. Typically adults do not migrate during the peaks of these high flow events so there is little concern with delays associated with the ladder being closed for just a couple days at a time.

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 not been a concern at the facility the past few years.

A combination of extended natural flows and flow augmentation allowed the facility to be operated in the bypass mode until July 5. This allowed the majority of the juvenile outmigration to be bypassed at Westland. Maintaining McKay Reservoir storage releases into July is now the standard operating procedure. 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.

Fish passage storage releases were reduced in 30 cfs increments from 150 cfs on July 3 to 0 cfs on July 8. The ladder and bypass were closed July 5 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 normally based on the low number of salmonids being captured in combination with a significant increase in non-salmonids. This year the large number of resident life history salmonids present was a major consideration for closing the trap. Large numbers of subyearling coho were present at the trap this year along with significant numbers of young of the year steelhead/rainbow trout. Since these groups would normally rear in tributary areas for another year, it was decided to close the trap and not transport them to the mouth of the river.

Poor water quality conditions, primarily high water temperatures, are observed every year during trapping at Westland. This year, there were several mature whitefish mortalities recovered from the trap on the last day along with numerous salmonid mortalities. It was assumed that these mortalities were temperature related and was the other consideration for closing the trap.

SubTask 3.2 - Threemile Dam Juvenile Facility Operations

The ideal passage condition for the west bank juvenile bypass would be to operate

it at a 35 cfs flow rate. 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 bypass has to be operated at the reduced 5 cfs level with trapping gear installed in the bypass channel.

As discussed under SubTask 1.2, there were major concerns with the level of maintenance at the facility this spring. This is especially important since the facility is not being operated under optimal passage conditions. The bypass was closed on July 8. Outmigration monitoring continued until July 12 when the trap was closed for the summer. Numbers of salmonids observed at the facility just prior to closure were extremely low. 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 2001/2002. 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 June 3 to July 9. Flows at Pendleton remained sufficient for releasing adults at the Pendleton boat ramp through June 6. After that date all adults were hauled to Thornhollow for release as per criteria. Condition of adults at release generally appeared good at all sites. Only one transport mortality was observed this year. 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. 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.

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 can be 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 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. 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 and trap and haul operations are more than adequate for assisting this late outmigration component.

As discussed under SubTask 3.1, a high percentage of the fish trapped this year were resident life history salmonids. The ratio of these fish captured compared to migratory salmonids increased as trapping continued. The first two transport days, fish were transported to the mouth of the Umatilla River for release. The last day was heavily weighted to resident life history salmonids and these fish were released back into the forebay at Westland Canal.

The larger numbers of subyearling coho and steelhead observed were probably a one year exception due to the record numbers of both species spawning in the basin this past year. It is not anticipated that these levels of resident life history groups will be seen on an annual basis and the bulk of the juveniles trapped at Westland will revert back to migrating subyearling fall chinook as in past years.

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

There was a five day period when juveniles were trapped and hauled from the Threemile Dam west bank juvenile facility this year. Only a very small number of juvenile salmonids were captured during this period. The juveniles were transported by the Passage Evaluation project and released at the Umatilla boat ramp.

SubTask 4.5 - Other Hauling Operations

Fish Passage Operations personnel and equipment were used in 2001 to transport

fall chinook adults from Ringold Springs Hatchery to the Umatilla River. The NMFS requires that these fish not be outplanted until November to minimize straying concerns. This resulted in 510 adults being hauled from October 23 to October 25 to Threemile Dam for holding. The surviving fish were outplanting in early November. The NMFS did okay direct outplanting from Ringold Springs beginning October 30 and an additional 440 adults were transported from Ringold Springs and released at Yoakum.

The adults transported from Ringold Springs this year comprised approximately 60% of the adult fall chinook spawning population in the Umatilla River. This program continues to be an effective tool for utilizing surplus hatchery adults to supplement the fall chinook spawning 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 spring chinook from Ringold Springs and Threemile Dam to the South Fork Walla Walla holding and spawning facility program and outplanted the survivors as part of the Walla Walla outplanting. More detailed discussion of this activity can be found in the Walla Walla Fish Passage Operations annual report.

Transport survival for these efforts was very good again this year. There was only one mortality observed from the fall chinook releases and none from the spring chinook transports.

Task 5 – Coordination of Passage Program

SubTask 5.1 - Passage Facility Operation and Maintenance Oversight

The project coordinates with UPFO&M personnel on both daily operations and facility maintenance of ladder and screen sites. The UPFO&M crew has been together for an extended number of years and is highly experienced. This makes coordination of facility O&M requirements a much easier task.

SubTask 5.2 – Management of McKay Fish Flow Releases

The timing and magnitude of the fall McKay Reservoir fish passage flow releases remains similar to past years. Initial releases in the fall of 2001 were started September 14 in coordination with the discontinuation of WID storage releases 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 200 during most of October. No significant increase in the number of adults of any species was noted in September. However, October adult returns of all species were the highest on record. Fall flows this past year were not as high as some previous years yet adult returns were at record levels. It appears that magnitude of flow does not necessarily affect adult return timing as long as some minimum flow

threshold level is maintained. Past observations suggest this level is around 150 cfs.

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 were found rearing in lower McKay Creek. These winter releases did affect the ability of the reservoir to fill to capacity this past year. McKay Reservoir only filled to 51,000 acre-feet (af) which is 15,000 af short of full capacity. This storage shortage did not affect spring time fish flow enhancement releases but will lessen the quantity available for the fall of 2002. In addition, the shortage will shorten the length of time irrigation water is delivered which will require fish enhancement flows to be released for a longer period in the fall to sustain production in the mid Umatilla River reach.

It has become standard practice to extend spring passage releases into early July. Natural spring flows maintained the river at levels above target levels until early June. Water was released from McKay Reservoir beginning June 4 to maintain a target flow level of 150 cfs at Dillon through the end of June. McKay Reservoir releases were decreased in 30 cfs increments from 150 cfs on July 3 to 0 cfs on July 8. The AOP outlines priority flow timing and levels for use of stored water. The summer is the lowest of the three priorities outlined and not enough storage was available in McKay Reservoir to provide flows during this period.

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.

SubTask 5.3 – Coordination of Exchange Program

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, 2001 but only a couple coho were captured prior to mid September. 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.

The Phase I exchange was discontinued on July 1, 2002 as per UBP criteria. Investigations still need to be made into the operation of Phase I to provide instream flows all summer below Threemile Dam. This would allow year round opportunity for steelhead entry into the Umatilla River, provide flows for lamprey migration, and minimize problems with protecting summer fish flows when WEID would be diverting water from the river.

There were concerns this year with operation of the Phase II exchange with SID. There were a few occasions this spring when water was pumped to SID even though

sufficient water was available instream above the target flows for diversion. Unnecessary pumping increases the already high cost of electricity for the UBP.

Development of an annual operating plan for the UBP would be useful as an operating guideline for the complex exchange program. The BOR began drafting one a couple of years ago but it has never been finalized. Annual operating plans are an extremely useful tool which have been used for basin fish management decisions for many years and would provide a similar benefit for water management.

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Appendix A